ATTACHMENT 4

Resolution 23-____ entitled "A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF GOLETA, CALIFORNIA, ADOPTING AN ADDENDUM TO THE ELLWOOD MESA MONARCH BUTTERFLY HABITAT MANAGEMENT PLAN INITIAL STUDY/MITIGATED NEGATIVE DECLARATION PURSUANT TO SECTION 15164 OF STATE CEQA GUIDELINES AND APPROVING A DEVELOPMENT PLAN/IN-CONCEPT COASTAL DEVELOPMENT PERMIT FOR THE PHASE I IMPLEMENTATION PLAN OF THE ELLWOOD MESA MONARCH BUTTERFLY HABITAT MANAGEMENT PLAN."

RESOLUTION 23-___

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF GOLETA, CALIFORNIA, ADOPTING AN ADDENDUM TO THE ELLWOOD MESA MONARCH BUTTERFLY HABITAT MANAGEMENT PLAN INITIAL STUDY/MITIGATED NEGATIVE DECLARATION PURSUANT TO SECTION 15164 OF STATE CEQA GUIDELINES AND APPROVING THE DEVELOPMENT PLAN AND IN-CONCEPT COASTAL DEVELOPMENT PERMIT FOR THE PHASE I IMPLEMENTATION PLAN OF THE ELLWOOD MESA MONARCH BUTTERFLY HABITAT MANAGEMENT PLAN.

The City Council of the City of Goleta does resolve as follows:

SECTION 1: *Recitals***.** The City Council finds and declares that:

A. Development and implementation of the Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan (MBHMP) is identified as a priority policy object and goal in the City General Plan Open Space Element; and

B. The MBHMP outlines the programmatic approach and methods for the City of Goleta to manage and improve the Ellwood Mesa eucalyptus forest for the benefit of the overwintering behavior of the monarch butterfly, other wildlife, and the public's use and enjoyment and the MBHMP is to be effectuated through subsequent implementation plans; and

C. The MBHMP was adopted by City Council on March 19, 2019 via Resolution No. 19-14; and

D. The City reviewed the MBHMP's environmental impacts in accordance with the California Environmental Quality Act (Public Resources Code §§ 21000 *et seq*., "CEQA"), the regulations promulgated thereunder (14 California Code of Regulations §§ 15000 *et seq.*, the "CEQA Guidelines"), and the City's Environmental Review Guidelines ("Goleta Guidelines"), and adopted a Final IS-MND for the MBHMP attached as Exhibit 2 to this Resolution and incorporated by reference and was prepared in full compliance with CEQA and concluded that the project will not have a significant effect on the environment; and

E. A $3.9 million California Coastal Conservancy grant has funded extensive studies whose findings have been utilized to develop the first phase of the MBHMP implementation plan to restore the greatly diminished monarch butterfly habitat and begin sustainable and science-based management of Ellwood Mesa; and

F. For decades the regionally-important monarch butterfly overwintering habitat has been studied and overwintering monarch butterflies counted and recorded. In 2020 the City and a diverse team of consulting entomologists, biologists, arborists, landscape designers, engineers, and environmental consultants began focused

studies to develop the implementation of activities envisioned in the MBHMP, which became the Phase 1 Implementation Project; and

G. The Phase 1 Implementation Project is a subset of the MBHMP and includes enhancement activities necessary to meet specific goals of the MBHMP, including installation of a permanent irrigation system, improvements to butterfly viewing areas, installation of a temporary water meter, and emergency/maintenance road renovation ("Project").

H. The Project will require a Development Plan/Coastal Development Permit in concept from the City and a Coastal Development Permit from the California Coastal Commission; and

I. The City determined that an Addendum for the Project was appropriate pursuant to CEQA Guidelines § 15164 since the Project made minor technical changes to the MBHMP and no circumstances exist calling for the preparation of a subsequent or supplemental Mitigated Negative Declaration pursuant to CEQA Guidelines §§ 15162 and 15163; and

J. The CEQA Addendum for the Project was prepared in full compliance with CEQA, the CEQA Guidelines, and Goleta's Guidelines; and

K. On or before October 2, 2023, the Project site was posted for the October 17, 2023 City Council hearing by the applicant, the City Public Works Department (a minimum of 15 days prior to the City Council meeting); and

L. On October 5, 2023, notice of the public hearing was published in the Santa Barbara Independent and notices were mailed to owners within 500 feet of the project site and occupants within 500 feet of the project site; and

M. This Resolution is adopted based upon the entirety of the administrative record including, without limitation, staff reports, and evidence submitted during the public hearing.

SECTION 2: *Factual Findings and Conclusions.* The City Council finds as follows:

A. The Project site is entirely within Ellwood Mesa Open Space and Sperling Preserve and includes historic monarch aggregation sites: Ellwood North, Ellwood Ironbark, Ellwood West, Ellwood Main, Ellwood Main Annex, and Ellwood East at Assessor Parcel Numbers 079-210-069, 079-210-024, 079-210-051, 079-210-050, 079-491-016, 079-445-001, 079-395-015, 079-395-016, and 079-395-012.

B. The entire site is zoned OSPR (Open Space-Passive Recreation) with an Environmentally Sensitive Habitat Area (ESHA) overlay and is located within the Coastal Zone.

C. Access to the project site is from 13 public trail entrances and throughout the network and is accessible from roads at Hollister Avenue and the Ellwood Mesa Sperling Preserve public parking lot, the terminus of Santa Barbara Shores Drive, and the terminus of Coronado Drive.

D. The proposed project adequately addresses the policy objectives of 2004 Draft Ellwood-Devereux Open Space Area and Habitat Management Plan in a manner which balances habitat management and enhancement with improved public safety, access, and passive coastal recreational opportunities.

E. The project site is entirely City-owned and no easements are required for implementation from private property owners.

F. Upon approval of the City Council, the City will file an application for a Coastal Development Permit for Phase I implementation of the Ellwood Mesa Monarch Butterfly Habitat Management Plan that would be considered for approval by the California Coastal Commission.

G. Based on the location, size, and nature of the Project, an Addendum was prepared pursuant to CEQA Guidelines section 15164.

H. The factual findings in this Section are based upon substantial evidence found within the entirety of the administrative record. Notwithstanding the identification of specific facts within this Section, the entire administrative record adequately provides substantial evidence for all findings set forth in this Resolution.

SECTION 3: *Environmental Assessment for the Project.* The City Council makes the following environmental findings:

A. The Project was analyzed for its environmental impacts and the Addendum was prepared pursuant to CEQA Guidelines §15164. An Addendum is appropriate as there are only minor technical changes or additions that do not result in any new significant impacts or a substantial increase in the severity of previously identified significant impacts. The Addendum is attached as Exhibit 3 and incorporated herein by reference.

B. The Addendum need not be circulated for public review (CEQA Guidelines §15164(c)). While the Addendum has not been circulated for public review it has been available to the public since April 18, 2019. An addendum must be considered by the decision-making body before making a decision on the Project (CEQA Guidelines §15164(d)).

C. There is substantial evidence in the record showing that the Addendum is appropriate for the Project.

D. Pursuant to CEQA Guidelines §15074, the Addendum reflects the City's independent judgment and analysis. The City Council has independently reviewed and analyzed the Addendum prepared for the Project. The Addendum is an

accurate and complete statement of the potential environmental impacts of the Project. The Addendum was prepared by the City of Goleta and reflects its independent judgment and analysis of the environmental impacts.

SECTION 4. *Development Plan Findings*. The City Council makes the following findings in accordance with Sections 17.52.070 (Common Findings), 17.59.030 (Required Findings)

A. 17.52.070.A (Common Procedures Required Findings for Approval)

1. *There are adequate infrastructure and public services available to serve the proposed development, including water and sewer service, existing or planned transportation facilities, fire and police protection, schools, parks and legal access to the lot.*

   Public services to the existing project site are currently provided by the Santa Barbara County Fire Department, Goleta Water District, Goleta Sanitary District, Southern California Edison, Southern California Gas Company, and Santa Barbara County Sheriff. Such public services to the existing site will not change. With these existing utility services, the proposed Development Plan has adequate infrastructure and public services available

2. *The proposed project conforms to the applicable regulations of Title 17, and, any zoning violation enforcement on the subject premises has been resolved as permitted by law.*

   The proposed MBHMP Phase I implementation will meet Title 17 zoning code requirements for height, lighting, and setbacks as applicable to projects located in Environmentally Sensitive Habitat Areas. No zoning violations exist on the site where the proposed project will be built.

3. *The proposed development is located on a legally created lot.*

   The project is located on City-owned parcels and maintained by the City of Goleta. Project development included title searches, and all title clearances appear in order to proceed with final project design and construction.

4. *The development is within the project description of an adopted or certified CEQA document or is statutorily or categorically exempt from CEQA.*

   The proposed project is within the project description of the Final IS-MND for the Ellwood Mesa Monarch Butterfly Habitat Management Plan adopted by the City Council on March 19, 2019. The environmental impacts associated with the proposed project were analyzed within the Final IS-MND and impacts anticipated with the construction and operation of the project have been mitigated to the maximum extent feasible upon final permitting and compliance with mitigation measures included in the MMRP.

B. 17.59.030. (Required Findings, Development Plans)

1. *The project as proposed is consistent with the General Plan.*

   The MBHMP Phase 1 implementation is consistent with the City of Goleta General Plan which identifies this project and proposed project elements on Figure 3-3 and 3-4, and policies OS 5.1 – OS 5.6. (Open Space and Habitat Management Plan maps), These plans are also consistent with prior planning documents from the County of Santa Barbara, prior to Goleta incorporation, as well.

2. *The site for the project is adequate in size, shape, location, and physical characteristics to accommodate the density and density of development proposed.*

   The 60-acre project site is located in an area designated for open space and habitat management. No physical development other than trail and bridge repair, minor drainage improvements, and public trail interpretive signage is associated with the project.

3. *Any significant environmental impacts are mitigated to the maximum extent feasible.*

   The Project has been primarily analyzed for its impacts in the IS-MND that was was approved on March 19, 2019 for the entire MBHMP. The additional activities proposed in the Project have been evaluated in the Addendum and no additional impacts have been identified, and the previous analysis in the IS-MND continues to apply. All potential environmental effects associated with construction of the Project and identified mitigation measures to minimize such adverse effects ensure with implementation of all mitigation measures in the IS/MND, no significant environmental impacts are anticipated with the Project. Additional analysis by state and federal permitting authorities will also guarantee minimization of environmental effects.

4. *The project will not conflict with any easements required for public access through, or public use of a portion of the property.*

   The project is located on City-owned parcels and no private property or easements are necessary for implementation. Because the intent of this project is to improve public access along existing trails located on public lands, it will not conflict with the public's use of the property or any easements.

SECTION 5. *Design Review Findings.* The City Council makes the following findings, pursuant to authority granted in Section 17.50.030.H. and 17.58.040.C.2 for the MBHMP Phase 1 Implementation project:

A. *The development is compatible with the neighborhood, and its size, bulk, and scale will be appropriate to the site and the neighborhood.*

The proposed project improvements, including habitat improvements, trail improvements, creek crossing improvements, monarch butterfly viewing area improvements, signage, and sitting benches, are designed to be compatible with current site characteristics and the surrounding neighborhoods as much as the site topography and public safety requirements will allow. Conceptual design of these features are intended to respect to the maximum extent feasible the physical characteristics of the monarch grove and adjoining open space areas. Details of project's design elements will be developed during final design of the project that can be reviewed on an advisory basis by the Design Review Board if Council directs staff to do so to further enhance the project's compatibility with nearby neighborhoods.

B. *Site layout, orientation, and location of structures, including any signage and circulation, are in an appropriate and harmonious relationship to one another and the property.*

Signage has been designed to be as discrete and unobtrusive as possible, yet still visible and legible, and meet the requirements of all applicable Plans as well as the California Coastal Conservancy grant agreement. The footbridge has been designed to allow users to cross the creek safely and to be harmonious with the natural environment. Monarch butterfly habitat, nectaring gardens, and native vegetation have been designed to both be consistent with the existing habitat and improve the quality of the habitat.

C. *The development demonstrates a harmonious relationship with existing adjoining development, avoiding both excessive variety as well as monotonous, repetition, but allowing similarity of style, if warranted.*

All proposed structural development (signage, footbridge and benches) would include sensitive design details and colors to blend it into the natural setting of the surrounding habitat areas and be compatible with the overall natural aesthetic of the grove and surround neighborhood.

D. *There is harmony of materials, colors, and composition on all sides of structures.*

The project as proposed includes sensitive design details that will blend it into the natural setting of the grove and be compatible with the surrounding habitat areas and be compatible with the surrounding neighborhoods.

E. *Any outdoor mechanical or electrical equipment is well integrated in the total design and is screened from public view to the maximum extent practicable.*

No mechanical or electrical equipment is proposed as part of the project.

Future design details can be reviewed by Design Review Board, if City Council directs on an advisory basis prior to final plan preparation and construction.

F. *The site grading is minimized and the finished topography will be appropriate for the site.*

Site grading for the for the project will be limited to approximately 500 cubic yards necessary for the installation of three new 24-inch CMP culverts, an open-bottom 72 inch diameter culvert to replace and existing 72-inch culvert in Devereux creek, and recreational trail and butterfly viewing area renovations requiring the minimal necessary amount of soil movement to provide public safety and accessibility. Overall grading will be minimized to the greatest extent feasible while still allowing for proper site drainage. The amount of disturbed soil area for the culvert installation is anticipated to be 0.058 acres and this will be minimized to the maximum extent feasible while still meeting City design standards.

G. *Adequate landscaping is provided in proportion to the project and the site with due regard to the preservation of specimen and protected trees, and existing native vegetation.*

Landscaping is adequate to restore and enhance the historic monarch grove. Findings from extensive studies have been utilized to determine the number and location of trees to plant to recreate the characteristics of the tree canopy for monarch overwintering sites. Specimen and protected trees, and native vegetation have been mapped and will be protected and retained.

Future final design details can be reviewed by Design Review Board, if City Council directs them on an advisory basis prior to final plan preparation and construction.

H. *The selection of plant materials is appropriate to the project and its environment, and adequate provisions have been made for the long-term maintenance of the plant materials.*

Plant materials and locations for planting have been selected specifically to be consistent with the grove's main characteristics and have long-term success. Invasive vegetation species will be removed and native species planted. Long term maintenance will be conducted in compliance with the MBHMP, as described in the Final Monitoring Plan section of the

Implementation Plan prepared for the Coastal Commission review, and all approvals from regulatory agencies.

Future design details can be reviewed by Design Review Board, if City Council directs, on an advisory basis prior to final plan preparation and construction.

I. *All exterior lighting, including for signage, is well designed, appropriate in size and location, and dark-sky compliant.*

No lighting is proposed.

J. The project architecture will respect the privacy of the neighbors, is considerate of private views, and is protective of solar access of site.

The project will not adversely affect privacy, private views, and solar access of other properties given the fact that no significant structural vertical development is included in the project.

K. The proposed development is consistent with any additional design standards as expressly adopted by the City Council.
There are no additional design standards expressly adopted by the City Council applicable to the Project.

SECTION 6: *Coastal Development Permit Findings*. In addition to the findings required pursuant to Section 17.52.070, Common Procedure—Findings for Approval, and any other finding required by this Title, a Coastal Development Permit application may be approved or conditionally approved only after the Review Authority has made the following additional finding:

A. *The proposed development conforms to the public access and public recreation policies of Chapter 3 of the California Coastal Act. (Ord. 20-03 § 6)*

During construction, only daily temporary trail closures will be necessary and alternative trail routes will be provided. These improvements were developed in close coordination with a team of biologists and resources experts to ensure monarch and other sensitive habitats will be protected to the maximum extent feasible. As such, the project is inherently consistent with the public access and public recreation policies of the Coastal Act which provides (specifical policies 30210 and 30213) for providing maximum access and lower-cost recreational opportunities in a manner which protects the rights of private property owners and natural resources areas from overuse.

SECTION 7: *General Plan Consistency Findings.* Based on the General Plan/Coastal Land Use Plan Consistency Analysis (Exhibit 4), which is incorporated herein by reference, the City Council finds that the project conforms to the General Plan/Coastal Land Use Plan.

SECTION 8*: Zoning Ordinance Consistency.* Based on the exclusion of capital improvement projects from zoning ordinance provisions per Title 17, the City Council finds that the Project is consistent with the Zoning Ordinance:

SECTION 9*: Actions*. The City Council hereby takes the following actions:

A. Adopt the Addendum provided as Exhibit 3 to this Resolution, which is incorporated by reference, required by CEQA § 21081.6 and CEQA Guidelines § 15097, based on the findings of Section 3 above. Direct staff to file a Notice of Determination within five (5) business days.

B. Approves the Development Plan and the In Concept Coastal Development Permit for the Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan Phase 1 Implementation Project, based on the Findings provided in Sections 3 through 8 above and the General Plan Consistency analysis, attached as Exhibit 4, provided to this Resolution, subject to the Conditions of Approval attached as Exhibit 5 to this Resolution, and incorporated herein by reference

C. Authorize transmittal of the Coastal Development Permit (CDP) application to the California Coastal Commission.

SECTION 10 *Reliance on Record*. Each and every one of the actions in this Resolution is based on the competent and substantial evidence, both oral and written, contained in the entire record relating to the Project. The findings and determinations constitute the independent findings and determinations of the City Council in all respects and are fully and completely supported by substantial evidence in the record as a whole.

SECTION 11: *Limitations.* The City Council analysis and evaluation of the project, including this Resolution, are based on the best information currently available. It is inevitable that, in evaluating a project, absolute and perfect knowledge of all possible aspects of the project will not exist. One of the major limitations on analysis of the project is the City Council's lack of knowledge of future events. In all instances, best efforts have been made to form accurate assumptions. Somewhat related to this are the limitations on the City's ability to solve what are in effect regional, state, and national problems and issues. The City must work within the political framework within which it exists and with the limitations inherent in that framework.

SECTION 12: *Summaries of Information*. All summaries of information in the findings, which precede this section, are based on the substantial evidence in the record. The absence of any particular fact from any such summary is not an indication that a particular finding is not based in part on that fact.

SECTION 13: This Resolution will remain effective until superseded by a subsequent Resolution.

SECTION 14: This Resolution will become effective immediately upon adoption.

SECTION 15: The City Clerk shall certify to the passage and adoption of this resolution and enter it into the book of original resolutions.

PASSED, APPROVED AND ADOPTED this 17th day of October 2023.

_____
PAULA PEROTTE
MAYOR

ATTEST:

_____
DEBORAH S. LOPEZ
CITY CLERK

APPROVED AS TO FORM:

_____
MEGAN GARIBALDI
ASSISTANT CITY ATTORNEY

STATE OF CALIFORNIA)
COUNTY OF SANTA BARBARA) ss.
CITY OF GOLETA)

I, DEBORAH S. LOPEZ, City Clerk of the City of Goleta, California, DO HEREBY CERTIFY that the foregoing Resolution No. 23-__ was duly adopted by the City Council of the City of Goleta at a regular meeting held on the 17th day of October, 2023 by the following vote of the Council:

AYES:

NOES:

ABSENT:

(SEAL)

_____
DEBORAH S. LOPEZ
CITY CLERK

Coastal Development Permit Application

Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan Implementation – Phase IP

Prepared by: Rincon Consultants, Inc.

Planning & Environmental Review Department / Public Works Department

130 Cremona, Suite B

Goleta, California 93117

City Contact:

George Thomson, Parks and Open Space Manager

gthomson@cityofgoleta.org

(805) 961-7578

Submitted to:

California Coastal Commission

89 South California Street, Suite 200

Ventura, California 93001

Contact: Jonathon Hasbun

June 2023

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TABLE OF CONTENTS

Summary iii
1.0 Project Background 1
Ellwood Mesa Open Space MBHMP 4
Studies Conducted at Ellwood Mesa 4
Ellwood Mesa - Past Coastal Development Permits 6
Waiver de Minimis 7
Habitat Conditions as of 2022 9
2.0 Project Description 12
Habitat Re-establishment 12
Public Access Improvements 16
Sensitive Resource Protection 19
3.0 Public Engagement 21
Public Input 24
4.0 Regulatory Setting 26
Federal 26
State 26
City of Goleta 26
Regulatory Agencies, Permits and Approvals 27
5.0 Final Monitoring Program 28
Annual Monarch Butterfly Surveys 28
Habitat Assessments and Management 28
Forest Health 28
Planted Native Vegetation 29
Invasive and Non-native Plants 29
Irrigation 29
Microclimate Success Criteria 30
Nesting Bird Surveys 30
Annual Reporting 30
Compensatory Mitigation for Project Impacts 31
6.0 Adaptive Management 33
7.0 References 35

List of Tables

Table 1 Field Survey Summary....6

List of Figures

Figure 1 Regional Location....2
Figure 2 Project Location....3
Figure 3 Monarch Butterfly Aggregation Sites....5

List of Appendices

Appendix A Waiver De Minimis
Appendix B Past Coastal Development Permit NOI Special Conditions Matrix
Appendix C Resource Avoidance Program
Appendix D Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Overwintering Habitat Analysis and Recommendations for Restoration Report
Appendix E Construction Documents
Appendix F Biological Resources Assessment Report
Appendix G Jurisdictional Delineation Report

3

SUMMARY

This document provides a detailed summary of the actions the City of Goleta will take with the implementation of the Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan (March 2019). The project activities are the maintenance and management of the regionally important overwintering habitat for monarch butterflies at Ellwood Mesa Open Space and are the first phase of implementation for the management plan.

Ellwood Mesa Open Space Monarch Butterfly Habitat management area is located on a coastal bluff top and is comprised of 90 acres of blue gum eucalyptus forest. Over the past decade the eucalyptus tree forest that protects the seasonally migrating monarchs from winter storms has begun to die at a rate and pace that has resulted in open trees canopies that no longer provide adequate protection during winter winds and rain, where the monarchs have sought and found protection for many decades.

Over the past five years the City and its team of consulting scientists, including Califorina's foremost experts in monarch butterfly overwintering habitat, utilized state of the art technology to study the monarch habitat at Ellwood Mersa to develop this plan to manage and enhance the historic eucalyptus habitat. Native habitat within the management area, including seasonal drainages and waters of Devereux Creek, be enhanced for the benefit of the wider ecosystem, the aggregation viewing sites will be repaired, and public access and public safety improved. The City has engaged in an extensive public outreach effort and has carefully planned the enhancements to be in balance with and to retain the rustic character of the open space.

The numerous project technical reports, project construction documents, and applicable plans are attached as appendices and are referenced throughout this document.

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1.0 PROJECT BACKGROUND

The story of the monarch butterfly habitat at the City of Goleta's Ellwood Mesa Open Space (Ellwood Mesa) begins with Mr. Ellwood Cooper, who bought and planted the land with a variety of eucalyptus species, but predominately favored Tasmanian blue gum (*Eucalyptus globulus*) to create a forest. By 1876 what's now Ellwood Mesa contained roughly 150,000 blue gum eucalyptus trees on 100-plus acres. Records as early as the 1960s show monarch butterflies were using the eucalyptus forest for over-wintering and in the 1990s the forest became a regionally important overwintering site for monarch butterflies (*Danaus plexippus*). Ellwood Mesa as it's known today (**Figure** 1 and Figure 2) was formed in 2004 when private development rights were transferred to the City of Goleta (City) and the forest was zoned for recreation and designated an open space.

The unprecedented regional drought from 2012 to 2016 led to massive tree die-off in the eucalyptus forest. The quality of habitat for overwintering monarchs and other wildlife has been diminished greatly by the tree die-off. While monarch overwintering counts have increased in 2022/2023 at Ellwood Mesa compared to the last several years, the grove no longer provides shelter to the monarchs from winter storms. Many trees have fallen at the historic site that provided shelter for the greatest number of overwintering monarchs regionally, known as Ellwood Main. Trees have fallen on the viewing site at Ellwood Main damaging the seats, at the other historic sites, across trails, and into water ways throughout the grove. For a detailed discussion regarding the drought and impacts to the eucalyptus trees at Ellwood Mesa see Section 4.4 of the Monarch Butterfly Overwintering Habitat Analysis and Recommendations For Restoration (A&M Habitat Report) by Althouse and Meade, Inc

Fire is presently the highest risk to the monarch habitat and historic overwintering sites, as well as to the surrounding neighborhoods. The high fire risk is being addressed by the City via a Waiver de Minimis (Waiver) request to remove high risk fire fuel (vegetation). The waiver request was submitted to the Coastal Commission in March of 2023. The most important factor for successful management of the habitat, after the high fire risk is addressed through vegetation management described in the Waiver, is implementing the actions described here and in the corresponding construction documents (Appendix A).

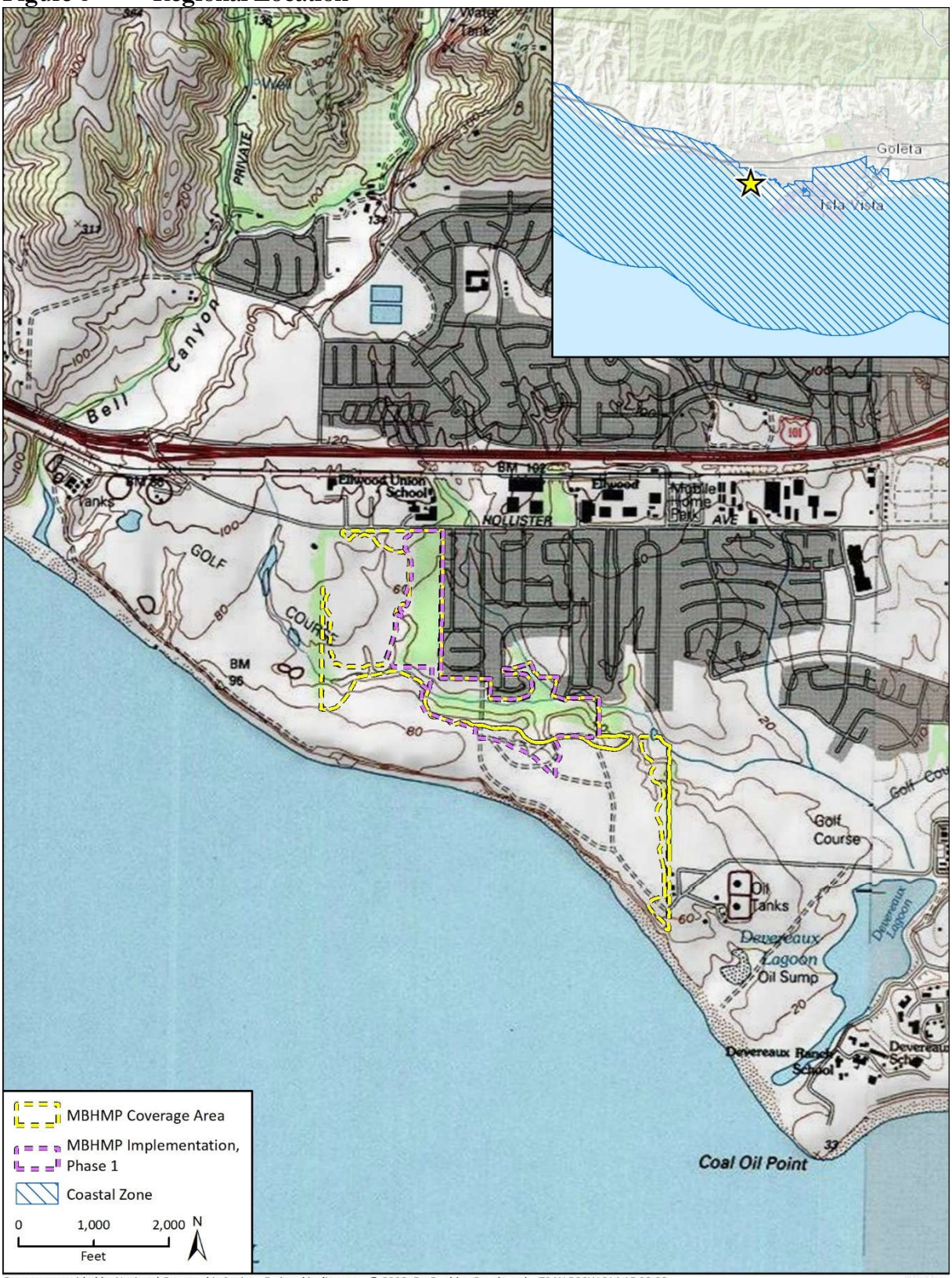
The public has been intrinsically involved with the Ellwood Mesa open space and was instrumental in its preservation. Proposed management actions at Ellwood Mesa have been met with both strong support and strong opposition. For the past four years the City has engaged with its constituents through outreach events and meetings, requested input and feedback, and modified this plan to address concerns, reduce impacts, and retain its unique character.

In 2019 the California Coastal Conservancy awarded the City a $3.9 million which created the unique opportunity to restore lost monarch butterfly habitat and begin sustainable and science-based management of Ellwood Mesa. Restoration solutions have been analyzed using the best available technology and methodologies. This Implementation Plan provides details to manage and improve the eucalyptus forest for the benefit of the overwintering monarch butterfly, other wildlife, and for the public's use and enjoyment.

Appendices A – F provide the in-depth results of those studies, which have informed the actions presented in this report.

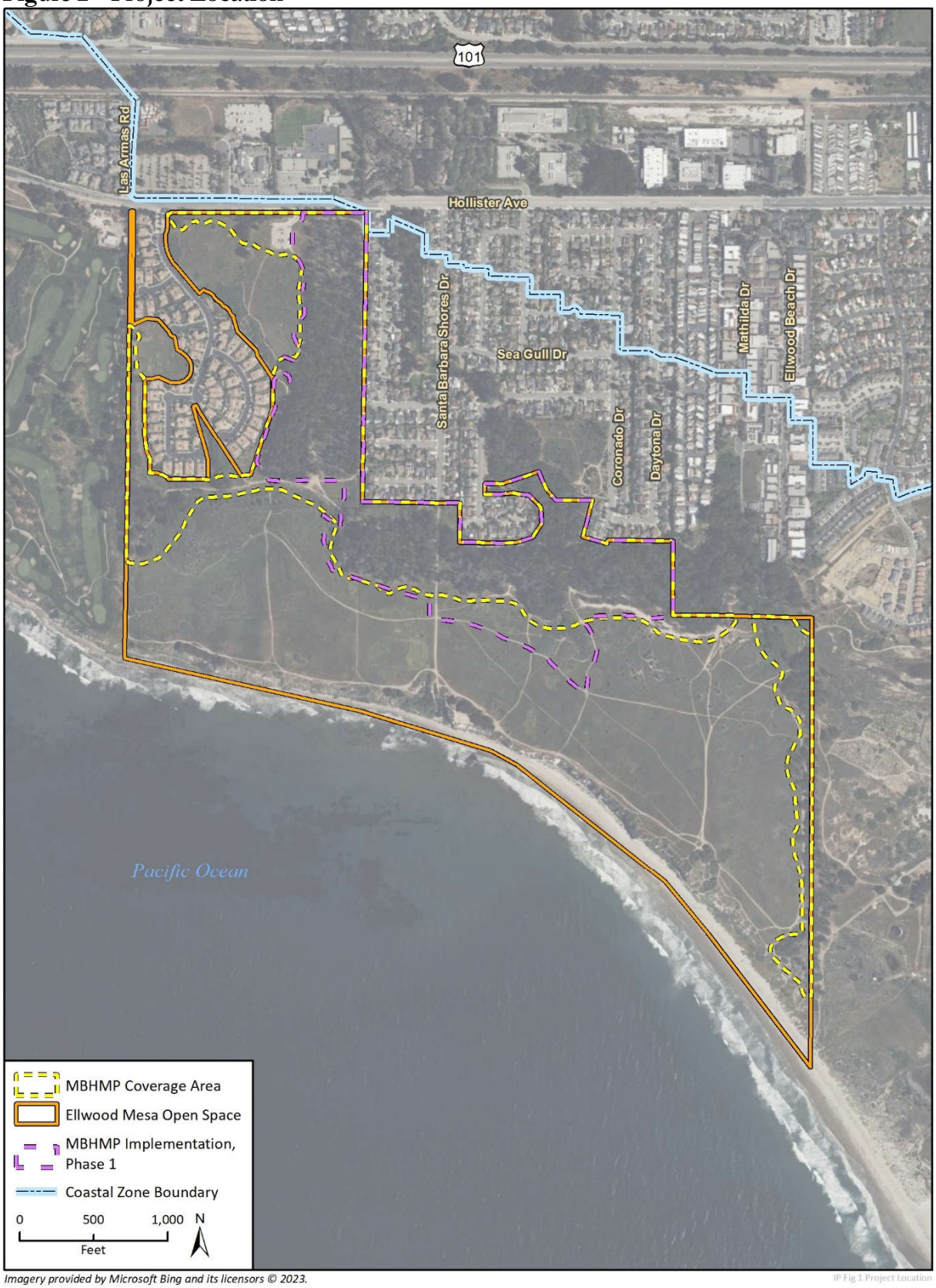
The time to act to preserve the Ellwood Mesa Open Space monarch habitat is now. June 2025 is the deadline for implementing these actions funded by the grant from the Coastal Conservancy.

Figure 1 **Regional Location**



Basemap provided by National Geographic Society, Esri and its licensors © 2023. Do Pueblos Quadrangle. T04N R29W S14,15,22,23. The topographic representation depicted in this map may not portray all of the features currently found in the vicinity today and/or features depicted in this map may have changed since the original topographic map was assembled.

Figure 2 Project Location



ELLWOOD MESA OPEN SPACE MBHMP

To address enhancement and management of the monarch habitat, Goleta City Council approved the 2019 Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan (MBHMP). The MBHMP is a management plan for the approximately 90-acres of Ellwood Mesa. It identifies 22 programs, each with specific goals, policies, and actions that are the management strategy for the sustainability of monarch habitat at Ellwood Mesa. The MBHMP management area encompasses the six sites where monarch butterflies have historically formed overwintering aggregations within Ellwood Mesa's eucalyptus groves: Ellwood Main, Ellwood West, Ellwood East, Ocean Meadows, Ellwood North, and Sandpiper (Figure 3).

The MBHMP calls for an implementation plan with specific details when enhancement actions will be taken. This Implementation Plan, Phase 1, addresses the portions of the management area that have historically hosted the highest number of aggregating monarchs (Figure 3) and is limited to the area that the funding can feasible cover prior to the funding deadline. Phase 2 is anticipated to be developed in the coming 3-5 years and will cover the remaining portions of the management area. This plan provides the detailed approach to managing and maintaining Ellwood Main, Ellwood West, and Ellwood North, as well as enhancements to promote a new site called Ellwood Ironbark. Ellwood Main is known to have the highest number of aggregating monarchs throughout the management area, Ellwood North has sustained some of the worst eucalyptus die-off, Ellwood West and East are reliable overwintering sites, and Ellwood Ironbark provides potential for new over-wintering habitat. Actions for Ellwood East are proposed only for the portion of habitat that is owned by the city.

STUDIES CONDUCTED AT ELLWOOD MESA

Beginning in 2017 numerous focused biological studies were conducted within the management area to obtain data needed to prepare the plan to address the dead and down trees, and design Phase 1 of the implementation. Studies were conducted by the City Parks and Open Space Manager, biologists, butterfly experts, GIS technicians, botanists, arborists, avian and wildlife experts, engineers, surveyors, and landscape architects. Field studies included reconnaissance surveys, jurisdictional delineations, native tree surveys, native plants surveys, and various site walks with the team to assess monarch habitat, discuss tree removals and replacement planting, identify strategies to remove down and dead trees while maintaining live trees and habitat, and identify zones in which to plant native nectaring plants. Table 1 below provides a summary of studies completed in 2022 and the numerous additional studies that have occurred since 2017.

Figure 3 Monarch Butterfly Aggregation Sites E



Table 1 Field Survey Summary

Date	Survey Type
February 2022	Reconnaissance Survey for Biological Resources
February and December 2022	Jurisdictional Delineation
March 2022 and January 2023	Fuel Load and Grove Survey and Analysis
December 2022	Hazardous Tree Assessment
March 2022	Arborist Tree Survey
April and June 2022	Native Plant Survey
March and April 2022	Restoration of Monarch Habitat Survey
March 2022	Restoration of Native Vegetation Survey
February 2022	Nesting Bird Surveys
2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023	Biweekly Monarch Surveys
1997 – 2023	Western Monarch Thanksgiving Count
1990, 1998, and 2021	Hemispherical photography
2017-2018	Tree Health Assessment
September and October 2021	LiDAR, digital imagery, and ground survey
November 2022	Wind Model verification
2011 - 2023	Monarch butterfly overwintering habitat assessments and site visits

The Biological Resources Assessment Report is included in Appendix G, and the Jurisdictional Delineation Report is included in Appendix H.

ELLWOOD MESA - PAST COASTAL DEVELOPMENT PERMITS

Applications to conduct habitat management activities at Ellwood Open Space have been submitted to the CCC, beginning in 2016. This section provides a timeline regarding the City's application requests and CCC resulting approvals and requirements:

Coastal Development Permit 4-16-1055

2016: Application submitted through the Santa Barbara County Trails Council.

August 2019: The City received issued CDP No. 4-16-1055 - Implementation of the Ellwood Mesa Coastal Trails and Habitat Restoration Project issued to the Santa Barbara County Trails Council. As discussed below under CDP 4-18-1223, the City is currently modifying the project description for the Trails and Habitat project and anticipates submitting the modified project description and supporting documents in the next 1-2 years.

Emergency Permit G-4-17-0048

September 26, 2017: The City submitted an emergency notification to remove 29 eucalyptus trees that were dead or at high risk of failure. The CCC approved the request through Emergency Permit G-4-17-0048 with the requirement of a follow-on CDP application.

Coastal Development Permit 4-18-1223

April 2018: The City submitted the follow-on CDP application for emergency tree removal under Emergency Permit G-4-17-0048 and the 2018 Ellwood Mesa/Sperling Preserve Open Space Implementation Plan, with the detailed approach to implement MBHMP activities at Ellwood North.

October 23, 2019: The CCC issued the City a Notice of Intent to Issue CDP No. 4-18-1223 for the follow-on application of Emergency Permit G-4-17-0048 and approving the implementation of the 2018 Final Implementation Plan for Ellwood North. The NOI for CDP No. 4-18-1223 was conditioned with six special conditions and required that the Special Conditions be satisfied within two years of issuance of the NOI (October 23, 2021).

Presently: The City revised the strategy to implement the MBHMP at only Ellwood North and has instead developed a new Phase 1 Implementation Plan to address the entire management area, including enhancement at Ellwood Main, Ellwood West, Ellwood Ironbark, and Ellwood North. Phase 1 addresses 60 acres of the 90-acre management area. Phase 2 will address the remaining 30 acres and is anticipated to be submitted in 2024/2025. The City is currently preparing applications, documents, and plans to meet the NOI CDP No. 4-18-1223 Special Conditions and will do so by applying for two CDPs for each phase. Appendix J provides a matrix that summarizes the Special Conditions and the status of the City's compliance with the conditions or describes the permitting strategy where it differs from the Ellwood North Implementation Plan.

WAIVER DE MINIMIS

On March 13, 2023, the City submitted a Waiver de Minimis request to the Coastal Commission to remove dead and hazardous eucalyptus trees in order to address the high fire risk of the management area. The waiver request was to implement the MBHMP CWPP vegetation treatments which are the removal of dead and downed trees, and trimming and removing vegetation zero to six feet in height. Fire risk reduction became essential due to 2022/2023 winter storms that brought precipitation to the region in record amounts and created the scenario for more abundant growth of high fire risk vegetation for the summer and early fall of 2023.

From 2020 - 2022 the City and its consulting team carefully assessed the monarch aggregation habitat in relationship to the dead eucalyptus trees and heavy vegetative fuel loads. Using the vegetation management treatments from the CWPP in the MBHMP and based on the ground assessments with the monarch butterfly experts, the team refined an approach to reduce the fire risk without negatively altering the character and integrity of the aggregation sites. Treatments in the CWPP were strategically modified by the team and were mapped. Appendix A has the Wavier application package and includes mapping, the written modifications to the CWPP treatments, a letter from butterfly experts regarding vegetation management and its impact on monarch habitat, and the matrix of extensive resource protection measures from the MND and MBHMP. Other resources that will be considered and avoided during vegetation management are the presence of sensitive resources such as wildlife, native plants, native trees, or an active bird nest, vegetation treatments have been refined.

For the area within 100 feet of structures, 100-foot x 100-foot work zones were created and mapped. The squares were mapped in zones for various reasons including for recording the modified treatments, tracking progress, future tracking, and based on functionality of the vegetation in relationship to the historic aggregation sites.

A comprehensive Resource Avoidance Plan (RAP) was developed to protect environmental resources, it includes measures from the MND, CWPP, as well as Applicant Proposed Measures. All measures have and will be complied with during any/all MBHMP implementation actions. A qualified biologist and/or arborist will be on site for all activities during vegetation management. The biologist or arborist

will be on the ground advising and monitoring vegetation management crews at all times. The Resource Avoidance Program can be found in Appendix C. The City will provide compliance updates in a transparent way for the public as well as meeting the requirements of all agencies who provide authorizations, permits, certifications, etc.

During the execution of Waiver great care will be taken to remove only dead eucalyptus trees and vegetation that are creating a fire risk. Three types of dead wood that do not create a fire risk will be retained in the management area, including snags or standing dead trees with cavities for wildlife, large trunks that are in contact with the ground and are decomposing, and twigs gathered into a brush pile. Where snags are known to provide perching opportunities or nest habitat, they will be retained. Where an opportunity exists to create cavities in standing dead wood for potential wildlife habitat, holes will be drilled. Large down trunks and branches in contact with the ground will be stripped of small branches, twigs and foliage that create fire risk and left in place to decompose. Brush piles will be strategically retained or placed, where they do not cause fire risk and for the benefit of wildlife.

Vegetation management, specifically that of the trees and the CWPP, is approved in the MBHMP through numerous programs, goals and actions. Most of the goals and actions in the MBHMP directly relate to managing the eucalyptus trees and forest, the three that address the current fire risk reduction, and state of the trees and overall habitat are:

MBHMP Program 4 - Community Wildfire Protection Plan

- **Goal 4.** To provide management practices within the eucalyptus groves and windrows that support healthy monarch butterfly habitat and are compatible with the City's CWPP.
- **Policy 4-1.** The goals, policies, and actions of this MBHMP shall be consistent with the intent of the CWPP to reduce the ignitability of homes and structures.
- **Action 4-1.1.** Support implementation of Goleta's CWPP in the 100-ft. buffer from homes and structures as the 100 ft. extends into the Ellwood Mesa eucalyptus groves with actions outlined in Table 1 (as seen in Table 14 of the CWPP).

MBHMP Program 9 - Catastrophic Event Response Program

- **Goal 9.** To prepare for possible catastrophic environmental events within the monarch butterfly aggregation sites by adopting a set of actions that potentially minimize the impacts and plan for a response should such events affect the groves in which aggregation sites are located.
- **Policies 9-1 and 9.2** including: The City shall adopt a set of protocols that could minimize the impacts from potential catastrophic environmental events.
- **Action 9-1.1. through 9-2.3** There are six actions under this program.

MBHMP Program 12 - Tree Management Program

- **Goal 12.** To manage the eucalyptus groves within monarch butterfly aggregation sites at Ellwood Mesa in a manner that provides for (1) healthy trees, (2) suitable aggregation site structure, (3) sustainable butterfly aggregation sites, (4) public safety while visitors are on trails within the groves, and (5) sensitivity to wildfire hazards.
    - **Policies 12-1 through 12-4 including:** eucalyptus trees in the groves within the Coverage Area shall be managed, as feasible, to ensure tree health and longevity. Nothing in this program should be interpreted to preclude tree maintenance work required to address immediate hazards to life or property.

- **Actions 12.1 through 12-4.5** There are 27 actions listed under this program.

The Althouse and Meade's Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Overwintering Habitat Analysis and Recommendations for Restoration Report (A&M Habitat Report), Appendix D provides aggregation site-specific recommendations for dead tree removal that will be carefully followed by the City's contractors. A qualified butterfly habitat ecologist will be on site for vegetation management activities at the aggregation sites.

HABITAT CONDITIONS AS OF 2022

Ellwood Mesa contains topographic features that provide conditions supportive of the microclimate needs of migratory monarch butterflies. Overwintering monarch butterflies tend to cluster in specific areas where cold air is allowed to sink and drain away from the aggregation trees. The loss of trees and canopy cover throughout the management area has opened the overwintering sites to increased wind exposure from various directions. See Section 5 of the A&M Habitat Report for extensive data and wind simulations of the existing habitat.

Monarchs adjust their distribution among trees and branches as winds and insolation shift, and will completely abandon sites if the microclimate, primarily wind, exceeds their tolerance. When weather is mild, monarchs will use a wide variety of sites and have an expansive micro-distribution. When storms approach monarchs concentrate in the most wind-sheltered spots and as the front passes, monarchs may readjust their cluster sites when they can fly again. Overwintering habitat has a delicate balance of dense canopy cover and open areas for sunlight. Dense perimeter trees and/or sheltering topography for wind protection in all directions, with an interior canopy gap for a varied insolation environment, is an ideal habitat configuration sometimes referred to as a "cathedral" or central opening.

Monarch butterflies choose preferable and suitable habitat and display their location preferences with their numbers at any given site. There is a direct relationship between suitable habitat and monarch counts. In a year with a decent population abundance to span the entire distribution of overwintering sites, we can assume that the sites with suitable and protective habitat will have higher monarch butterfly counts relative to those sites with less suitable and poorly protective habitat. Therefore, the decline of habitat quality can be shown in the relative decline of monarch numbers at a site over time. Monarch butterfly surveys and counts have been conducted for many years at Ellwood Mesa. See Appendix D and the A&M Habitat Report Section 4.1 for a detailed overview.

Early in the overwintering season of November 2022 biologists observed the highest number of aggregating monarchs at Ellwood since 2016, 12,387 butterflies. The first winter storm occurred the first week of December 2022 and was followed by intermittent systems with heavy rain and high winds that month. The count of monarchs on December 30th was 1,911. This illustrates that the sites did not provide monarchs shelter, either the monarchs perished, or they moved to another site.

Ellwood Main

Ellwood Main is a stand of predominantly blue gums that surrounds a north-south running side drainage of Deveraux Creek. The stand of trees has a distinctive cathedral structure, with an elongated north-south gap over the drainage feature that allows significant insolation into the cluster sites. The trees on the shoulders of the drainage, extending onto the mesa top, provide multiple layers of shelter from southerly, easterly, and westerly winds. This unique combination of features has made Ellwood Main a premiere overwintering site for monarchs for several decades.

However, recent mass mortality of blue gums has greatly weakened wind shelter for the monarch roosting areas. Ellwood Main supported season-long aggregations, with suitable site factors for protection from powerful winds. At this time (March 2023), significant gaps in shelter have formed to the west and southwest resulting in what may be an "ecological trap," attracting monarchs early in the overwintering season but leaving them vulnerable to strong winter storms each year. Several trees have fallen on the eastern viewing area, causing damage to the log seats. To the west of Ellwood Main, the eucalyptus die-off has been at the forest level, thousands of trees have fallen. For additional information regarding the current status of the habitat by aggregation site please see A&M Habitat Report Section 5, pages 51-108.

The drainage below the Ellwood Main site has been subject to sedimentation over the past decade. Observations by scientists who have monitored the site for the past several decades have observed a rise as much as 5 feet in the elevation. Sedimentation has also changed the type of dominant vegetation from what was wet to now be drier upland species.

Ellwood West

Ellwood West is a subsidiary overwintering site to Ellwood Main, where the monarchs roost in a cathedral opening along Deveraux Creek. The area has experienced massive tree mortality with many dead trees still standing and a significant amount of dead wood on the forest floor. The site generally has a closed canopy with maximum directional exposure to the east. While some areas receive substantial insolation in October, by December much of the site is in deep shade, and as a result, Ellwood West tends to be abandoned mid-season. The low insolation and east exposure may contribute to the relative low use of Ellwood West by December and the abandonment by mid-season. Additionally, the east exposure may pose a problem during storms as it is a common wind direction with occasionally strong winds.

Ellwood Ironbark

The Ellwood Ironbark region is situated at the southwest corner of Ellwood North. It encompasses a stand of red ironbark (*Eucalyptus sideroxylon*) trees located between blue gums alongside the drainage channel to the west and another stand of blue gums to the east. Monarch observations were documented in 2019, and the dead standing trees and downed trees in the map are exclusively blue gums. The red ironbark trees are planted closely together, resulting in dense stands that are highly effective in blocking wind but also obstruct insolation, except in narrow gaps along trails. At the southern end of the stand, there is a double row of ironbarks running east-west with a narrow trail on the north-side, which proves to be effective in minimizing south exposure. The interior of the ironbark stand is exceptionally dim, with low directional exposure in almost all directions.

Ellwood North

Ellwood North is a large rectangular area covered by eucalyptus forest, where monarch butterflies have historically aggregated in the northern portion, but more recently have been observed closer to the center of the area, which are referred to as Ellwood North-North and Ellwood North-Central, respectively. Ellwood North-Central is the area located south of the cross trail within Ellwood North and has the highest potential for cluster sites. However, only single butterflies or small groups have been observed in this area since the 2017-2018 season. The entire Ellwood North area has experienced significant tree mortality, particularly in Ellwood North-North. While there are scattered areas of tree mortality in Ellwood North-Central, the most severe instances are concentrated along the cross trail. Notably, Ellwood North does not feature a cathedral structure over a creek or gully like the other sites

(Ellwood Main, West, and East), and historical cluster sites have occurred in small gaps within the forest.

Ellwood East

Ellwood East is in the eastern portion of the eucalyptus forest, south of Deveraux Creek in a topographic bowl at the base of a slope and provides some intrinsic wind shelter from east through southwest. The Ellwood East stand has several species of eucalyptus in addition to blue gums, including red river gums (*E. camaldulensis*), and numerous non-native evergreen ash (*Fraxinus uhdei*) trees, some of which are up to 100 feet tall. Substantial mortality of blue gum on the slope and in the flat has opened the forest and dead downed trees are strewn across the forest floor.

Ellwood East has been heavily used in recent years (see Althouse and Mead Habitat Report, Section 4.1). In 2021-2022, monarchs abruptly abandoned Ellwood Main in late December, and many moved to Ellwood East for the remainder of the season. A similar, less abrupt movement from Ellwood Main to Ellwood East occurred in 2022-2023. But unlike 2022, Ellwood East was abandoned as monarch numbers throughout Ellwood crashed following a series of intense winter storms in late December 2022 and early-January 2023.

2.0 PROJECT DESCRIPTION

Through the actions detailed here, the City will fulfill a major commitment to the natural resources of Ellwood Mesa and its residents, and to all those committed to the conservation of monarch butterflies. This Phase, Phase 1, addresses implementation of the MBHMP at five of the eight aggregation sites at Ellwood Mesa: Ellwood North, Ellwood Ironbark, Ellwood West, and Ellwood Main, and Ellwood East (Figure 3) and implements 20 of the 22 programs outlined in the MBHMP.

The Phase I project area includes 60 acres containing the four aggregation sites with the highest number of overwintering populations historically, within the overall management area. The approximate center of Ellwood Mesa is located at latitude 34.423149 and longitude -119.892695 (NAD83). It is depicted on the *Dos Pueblos Canyon, California*, United States Geographical Survey (USGS) 7.5-minute topographic quadrangle, and is located within Township 4 North, Range 29 West, and Sections 14, 15 and 23 (San Bernardino base and meridian) (see **Figure** 1 above).

Two types of activities will occur in Phase1:

1. Habitat re-establishment of the management area. Habitat enhancement will include strategic planting of trees for monarch roosting, specific tree planting to restore wind protection around roosting sites, planting of nectaring vegetation for monarchs and other pollinators, and planting of native vegetation for other wildlife and the overall habitat health of the management area.
2. Public access improvements for the safety of and use by the public. Public access improvements will include the replacement of deteriorated wooden planks that served as a footbridge to cross Devereux Creek at the main aggregation site, replacement of culverts conveying water to and in Devereux Creek, emergency/maintenance road renovation, earthen trail repairs and rerouting, improvements to the two viewing areas at Ellwood Main, and way-finding signage.

It is important to note that Ellwood Mesa Open Space has a unique quality that will not be altered through the implementation of the MBHMP, with this Phase or those into the future. Through this plan the City will strike the delicate balance of restoring the diminished habitat of non-native eucalyptus forest that is ESHA and monarch habitat, while preserving and enhancing the native ecosystem it resides within. Ellwood Mesa has a forested coastal bluff characteristic that allows the experience of getting away from the city and neighborhoods, and into nature. The amenities are sparse and natural, the signage minimal, and trails plentiful.

All activities planned in Phase 1 were reviewed in the MND for the MBHMP. A subsequent application addressing the remaining portions of the management area is planned to be submitted to the Coastal Commission in 2024.

HABITAT RE-ESTABLISHMENT

The short-term goal of these actions is to plant and establish trees and vegetation in order to restore the characteristics of Ellwood Mesa and the long-term goal is to retain them. The first recommendation from the monarch butterfly biologists' technical report is to conduct strategic fuel reduction. The second is to restore wind protection to the historic overwintering locations. This includes restoration of historic aggregations sites and as well as the greater grove that provides transitory sites. Transitory sites often have several of the overwintering elements but are lacking key elements to offer the full spectrum of protection for monarchs through the entire overwintering season and are where the monarchs both arrive to aggregate and disperse after over-wintering.

Replacement trees for wind protection at and around aggregations sites were selected by the monarch butterfly experts based on several factors including their canopy structure for wind protection, canopy height at maturity, relatively fast growth rate, increased likelihood for survival during drought conditions compared to blue gums, reduced propensity to spread (invasiveness) compared to other eucalyptus species, and distribution in Mediterranean climates similar that that in Goleta. Red ironbark (*Eucalyptus sideroxylon*) and karri (*Eucalyptus diversicolor*) will be strategically planted to provide wind protection and provide typical overwintering canopy structure. Blue gums that served as aggregation trees at the historic aggregation sites in the past and have died will replaced with blue gum eucalyptus trees. This replacement of blue gums will occur either be replaced by trained resprouts with strong leaders from existing trees, transplanted saplings from within the immediate aggregation site, or planted saplings grown from eucalyptus experts at Cal Poly.

Native trees will also be planted to provide wind protection including Western sycamores (*Platanus racemosa*), California bay laurel (*Umbellularia californica*), toyon (*Heteromeles arbutifoli*a), coast live oak (*Quercus agrifolia*) and Freemont cotton wood (*Populus freemontii).* The native trees will also improve ecologic richness. They will create opportunistic shade and/or enhance native plant communities. Toyon will compliment the tall trees because it grows to a mature height of 20 feet, which fills potential wind gaps of the red ironbark's lower canopy that are naturally thin in maturity. This will create a continuous wall of wind protection from the ground to the top of the canopy.

Transitional vegetation, from tallest to shortest (at full maturity), will be planted from the edge of the eucalyptus canopies to the adjacent grasslands. Nectaring and native vegetation will be planted in designated areas selected due to proximity to aggregation sites, existing conditions such as water availability, slopes, overstory, and surrounding vegetative communities. All native vegetation and native plant communities will be retained and in the long-term, native vegetative communities will establish where non-natives are currently present. Invasive non-native herbs and shrubs will be removed. Where ground disturbance occurs along Devereux Creek, the banks will be restored with native plants appropriate for waters and wetland areas as required by regulatory agencies.

Native plants will be planted in gardens for nectaring and to enhance the overall ecosystem including shrubs, sub-shrubs and herbaceous species.

Ellwood Main

To restore the aggregation habitat at Ellwood Main, dead trees that have historically served as roosting trees will be replaced with blue gum eucalyptus, blue gum recruitment and growth will be promoted, tall trees will be retained for shelter, fuel reduction will be carefully managed, standing dead trees and smaller diameter wood will be removed, red ironbark shelterbelts will be planted to fill in gaps, karri trees will be planted for tall canopy, and California bay and other naive trees will be planted along the south side of Devereaux Creek. It is important to note that standing dead trees threaten nearby cluster and windbreak trees. It is, therefore, crucial to monitor the stand and remove any standing dead trees to maintain the structural integrity of the windbreaks and the overwintering habitat for the monarchs.

To enhance the drainage habitat beneath Ellwood Main, built up sediment will be removed, earthen and/or rock weirs will be placed to hold water, and wetland vegetation planted. Enhancement by restoring a wetland quality to the site will contribute to the microhabitat conditions of humidity, provide a water source for a longer period of time during the dry season, and create vegetative ladders that monarchs can use to climb off of the ground if blown off the roosting trees during storms.

Ellwood West

To improve the habitat for monarch butterflies at Ellwood West blue gum eucalyptus trees will be planted, establishment of existing trees and saplings will be encouraged, standing trees that pose a hazard to the site will be removed, and red ironbark and karri trees will be planted to address wind vulnerability. Blue gum trees will be planted to replace monarch roosting trees. A double ironbark row will be planted on the north side and the south edge to provide wind shelter. Only native trees will be planted in the riparian zone along Devereux Creek while maintaining the cathedral structure. Understory native shrubs and oaks will be planted. The overhead canopy will be studied to understand a potential need for opening of the canopy.

Ellwood North

Where the historic aggregation site is located karri and red ironbark (*Eucalyptus sideroxylon*) will be strategically planted with blue gum (*Eucalyptus globulus*) so that the canopy density is sufficiently dense for roosting. Aggregation trees will be spaced so that the trees have enough space to grow to their typical size when mature and far enough apart that the overall canopy structure doesn't become overly dense.

To address vulnerabilities to wind, three red ironbark shelterbelts will be established, including a double row south of the cross trail, an inner shelterbelt on the east side, and one on the west side. The forest interior will contain well-spaced karri to add diversity. Future management should avoid densification of the blue gums, which have thinned to a density commensurate with drought intensity. Native shrubs and live oak trees will fill the understory. Fuels management is crucial, as mismanagement of the fuels buffer zone to the east could expose the forest to northeast, east, and southeast winds.

Ellwood Ironbark

The enhancement of Ellwood Ironbark requires a set of improvements. The primary action is the creation of a new gap within the well-protected interior of the ironbark stand, where the current insolation levels are inadequate for roosting monarchs. Similar gap creation has been successfully executed at three other sites in California.

In addition to gap creation dead standing trees, high fractions of downed wood, and accumulated litter within the ironbark stand will be removed to reduce fuel loads and promote new growth. To improve wind shelter within the gaps in the interior, ironbark and karri will be planted, while maintaining a lower density of blue gums established after the drought. Dieback zones will be replanted with a native understory such as live oaks and should be managed to promote their growth and restoration.

Ellwood East

The cluster site is bisected by a property line, the City owns the western section, and the Rancho Estates owns the eastern section. The actions described here are for the City's portion of the site. Blue gum eucalyptus will be planted where monarch aggregation trees have died, and recruitment and establishment of blue gum saplings will be encouraged. An ironbark shelterbelt will be planted along the crest of the Mesa slope in an arc from southwest to south to southeast. Red ironbark and karri will be planted north of cluster zone to address north-northwest wind vulnerability.

Plant Propagation and Storage

Eucalyptus trees and some native trees will be grown by California Polytechnic State University in San Luis Obispo under the direction of Dr. Matt Ritter. Replacement eucalyptus trees will be grown from seeds to 5-gallon pots.

Native plant nursery, Santa Barbara Natives, will propagate and store local native plants from Santa Barbara County. Santa Barbara Natives practices integrated pest management and uses organic fertilizers. All nursery plants will be maintained in a healthy condition until delivery. All plants obtained from the native plant nursery will be free of Argentine ants (*Linepithema humile*).

Plant Installation Methods

Most non-tree species will be installed in up to 1-gallon containers, but other sizes may be used depending on the species. On average, plant spacing will range from 5 to 15-foot spacing for shrubs, vines, grasses, and forbs. Trees will be installed as 5-gallon to 24-inch gallon containers. On average, tree species will be installed at 20-foot spacing.

Holes for the container plants will be dug by hand using a shovel, hang auger, or similar device. Care will be taken not to disturb the root ball, stems, or branches when installing each container plant. Planting pits will be backfilled with native soil so that the soil surface of the container plant is level with the ground. Soils will be prepared and amended per specifications from the laboratory, if needed.

After installation, a minimum 2-4-inch layer of bark mulch will be placed on all exposed soil surfaces in planting areas. If applicable, mulch originating from the dead eucalyptus removal efforts would be allowed dry and then would be used around installed plants as feasible. See the planting plans developed by RRM Design Group, L3.0-L3.7 for details.

Plant Protection

Signage and temporary boundaries will be placed around the native gardens to inform people to stay out of the restoration area to minimize trampling of native plants.

Irrigation

An irrigation system will be installed to irrigate areas where replacement trees and native vegetation are planted to promote establishment. The main lines of the system will be installed permanently within the existing trails. Trenches will be dug 6 inches wide by 18 inches deep and will temporarily displace approximately 210 cubic yards of soil. The displaced soil will be placed back in the trench and recompacted immediately after the mainline is installed.

Temporary lateral lines will be phased and coordinated with vegetation plating. Lateral lines will be connected to the main lines and placed on the ground. Where lateral lines cross trails, 6 inch wide by 12-inch-deep trenches will be dug, temporarily displacing approximately 14 cubic yards of soil. Lateral lines installed on-grade will be held in place on grade by 18-inch-long U-shaped sections of rebar at 20 foot intervals.

Temporary lateral lines will be disassembled in phases, removed from established areas and reassembled to irrigate new planting areas. No more than 41,000 linear feet of above ground irrigation will be on site at any given time.

An agreement with Goleta Water District (GWD) will be established to provide temporary water service for habitat mitigation or restoration purposes under Chapter 6.12.060(4) of the 2022 Goleta

Water District Code. Under the agreement with GWD, a temporary 3-inch water meter will be installed at an existing fire hydrant located near the southwestern corner at the intersection of Hollister Avenue and Ellwood Elementary School. A reduced pressure backflow prevention device will be installed near the temporary point of connection. Beginning at the downstream side of the backflow prevention device, the main line will be trenched and permanently installed below grade and will transition above grade to supply temporary irrigation valve manifolds and quick coupler devices. These valves will be controlled by battery operated irrigation controllers to meter the application of irrigation water to the on grade lateral lines and spray rotors. The system's temporary components will be removed upon the establishment of the replacement trees and native vegetation. See the Irrigation Plans developed by RRM Design Group, sheets L2.0-L2.8 for additional detail.

Use of Pesticides

No pesticides will be used.

PUBLIC ACCESS IMPROVEMENTS

Public access throughout Ellwood Mesa has been diminished by falling trees, and heavy winter winds and rain have caused a culvert failure, compromised the only emergency access road and exacerbated trail erosion. During the December 2022 and January 2023 rain storms the footbridge comprised of wooden planks lying directly over Devereux Creek and providing passage to the Ellwood Main viewing area were washed away. The culvert in Devereux Creek providing water conveyance under the only emergency access road to the coastal bluffs at Ellwood Mesa failed. The emergency access road is now vulnerable to being fully compromised.

The MBHMP has three Municipal programs that address Trail Management, Waste Management, and Aesthetic Resource Management. The sections below address the actions the City will take to repair and improve public access.

Construction documents (Appendix A) provide details for actions described below. All public access improvements detailed in this section will meet California Building Code and Americans with Disabilities Act (ADA) requirements. Safe public access to the beach will be maintained throughout construction, implementation, and habitat restoration.

Viewing Areas Repair and Improvement

Dead and dying eucalyptus trees have fallen on and around the viewing areas on the west and east sides of the aggregation site at Ellwood Main, rendering them unusable. The existing eastern viewing area will be repaired via the replacement of the existing seating with new wood benches constructed from downed eucalyptus trees and replacement of the degraded delineating ropes that serve to keep the public away from the aggregation trees. A series of new interpretive signage panels will be installed to detail the migratory cycle of monarch butterflies and the unique history of monarchs at this site.

On the west, the existing viewing area will receive minor grading to provide a similar terraced area with two benches for visitors to access. The interpretive signs and delineating ropes described above will also be installed at the western viewing area. See the Public Access Plans developed by RRM Design Group, sheets L1.0-L1.10 for additional detail.

Culvert Replacements

The existing 72" galvanized steel corrugated metal pipe (CMP) culvert in Devereux Creek located near the southern terminus of Santa Barbara Shores Drive is failing and is proposed for replacement. The

culvert spans an important creek crossing that provides emergency and maintenance vehicle access into the open space. A larger open bottom culvert made of corrugated aluminum is proposed as a replacement and has been sized to accommodate 100-year storm flows without overtopping.

A failing existing 24" CMP culvert on the west side of the access road will be replaced in kind. To reduce trail erosion two additional 24" CMP culverts will be installed on the north side of Devereux Creek to convey storm water flows from the terminus of Santa Barbara Shores into the creek. A new 24" CMP culvert is proposed on the south side of Devereux Creek to convey storm water under an existing trail crossing and into the creek. See the Grading Plans developed by RRM Design Group, sheets C1.0-C2.1 for additional detail.

Footbridge Replacement

A citizen constructed wooden plank has served as a ground level footbridge over Devereux Creek, spanning from the trail on the northern bank to the Ellwood Main aggregation site to the south. The existing bridge and the trail used for access along the northern side of the creek are located in a flood zone and are periodically impassable during the wet season. The existing bridge will be replaced with an elevated wooden pedestrian bridge that will meet current California Building Code and ADA requirements and will provide a safe pedestrian creek crossing during the wet season. The proposed bridge will span the identified jurisdictional areas and grading required for installation of the three concrete bridge abutments will remain outside of these jurisdictional areas. Helical piers are proposed within jurisdictional areas to support the bridge. See the Public Access Plans developed by RRM Design Group, sheets L1.0-L1.10 for additional detail.

Emergency/Maintenance Road Renovation

A portion of the access road spanning the southern terminus of Santa Barbara Shores and extending south approximately 800 linear feet will be replaced with a new road designed to comply with current Santa Barbara County Fire Development Standards. The proposed road surface will mostly be compacted road base with a short section exceeding a maximum allowable 10% gradient requiring concrete or asphaltic concrete surfacing. An approximately 250-foot portion of the existing earthen trail on the west side of Ellwood Main will be graded slightly, compacted and surfaced for emergency access from the bluff top. The Grading Plans developed by RRM Design Group, sheets C1.0-C2.5 for additional detail.

Vehicles expected to be used during habitat enhancement activities include rubber-tired flatbed trucks, pickup trucks, and water trucks. The enhancement areas will largely be accessed by these vehicles from the emergency access road, existing parking lot and the existing dirt trails currently used by maintenance vehicles.

Trail Repair

Trails within the work area will be improved to provide a consistent, well-drained surface as detailed in Figure 18 of the 2004 Ellwood-Devereux Coast Open Space Management Plan. Trail types that apply within the work area are excerpted from the Management Plan and included on sheet L1.10 of RRM Design Group's Public Access Plans. Steep, unsustainable trails in key areas will be re-routed to facilitate access by impaired users and to promote positive drainage over trail surfaces. Abandoned sections of trail will be restored with native vegetation and decommissioned. Approximately 975 linear feet of new trail will be created. 1,150 feet of trail will be restored to native vegetation. See the Public Access Plans developed by RRM Design Group, sheets L1.0-L1.10 for additional detail.

Staging Areas

Approximately 9,300 square feet (0.25 acres) of currently disturbed or non-native grassland will be utilized as four separate staging areas for implementation. These locations will provide efficient temporary access to container plants, tools, materials, and construction equipment. No other materials will be stored overnight within the staging area; and only the number of plants needed for the day's activities will be brought on-site at any given time. The staging areas will be temporarily fenced with 6-foot-tall chain-link fence installed on grade. Staging locations and fencing are shown in the Public Access Plans developed by RRM Design Group, sheets L1.0-L1.10 for additional detail.

Water will be stored at the site in a temporary aboveground water tank. The water tank area will be sufficient to accommodate a 5,000-gallon water tank at approximately 111 square feet (0.003 acre).

Signage Program

A signage program will be implemented to provide wayfinding directional signage, interpretive educational signage, and regulatory signage. Interpretive educational signage will be permanently mounted to low-profile prefabricated metal structures and located in key areas to provide educational content for trail users. Possible topics for interpretive educational signage include monarch butterflies, local flora and fauna, habitat restoration, and the history of Ellwood Mesa. Wayfinding signage will include wooden posts with butterfly symbols and arrows to direct trail users to the Ellwood Main monarch butterfly aggregation site and trail maps at major entrances and intersections mounted in the same fashion as the interpretive educational signage panels. Permanent regulatory signage will be fastened to fencing at existing and proposed open space entrances and pole mounted at aggregation site entrances. See the Public Access Plans developed by RRM Design Group, sheets L1.0-L1.10 for additional detail.

Erosion Control

Erosion control mitigation measures will be implemented during any/all grading activities.

Temporary Fencing

Sensitive, rare and native vegetation will be temporarily protected by flagging or fencing (orange plastic snow fencing or similar) each day by a qualified biologist within and near work activities. Staging areas will be delineated with temporary 6-foot chain link fencing. All fencing/flagging will immediately be removed as enhancement activities are completed.

Work Area Delineation and Safety

At the beginning of each workday the work zone and staging areas will be delineated with highly visible flagging/fencing to exclude the public. A designated safety foreman will be on site daily to direct vehicles and equipment into and out of the enhancement area. The foreman will be responsible for public safety.

Open Space Accessories

Trash receptacles, dog pick-up stations, and bike racks will be installed in key areas within the work area. See the Public Access Plans developed by RRM Design Group, sheets L1.0-L1.10 for additional detail.

Access Routes

Workers will utilize trails to access the enhancement areas on foot as needed. Access routes from staging areas to the enhancement activities will be the least impactful route and will not require vehicles to traverse native habitats. See the Public Access Plans developed by RRM Design Group, sheets L1.0-L1.10. The City will maintain coastal access within Ellwood Mesa at all times, temporary trail closures and temporary detours will be posted and updated daily on signs within the open space and online for the public.

Phasing and Timeline

Timing constraints to complete phase 1 project activities include overwintering monarchs, timeframes of approval for work in regulated waters, nesting birds, weather, and the Coastal Conservancy grant funding deadline. Civil improvements (culvert replacements, mainline irrigation installation, the bulk of the Santa Barbara Shores Drive entrance and maintenance road repair, and the Ellwood Main access road repair) are scheduled to occur May through July. Boardwalk replacement, trail work and viewing area work is scheduled from July through mid-September. Final road repair work is scheduled for August through mid-September. Planting will be ongoing and will begin after the irrigation mainline is installed.

SENSITIVE RESOURCE PROTECTION

A comprehensive resource protection program has been developed and will be complied with in order to protect sensitive resources within the management area. Daily biological and arboricultural monitoring and/or surveys prior to any activities occurring, and coordination with Native American tribe monitors, and Best Management Practices (BMPs) for vehicle and equipment use. The program includes the mitigation measures described in the MND and MBHMP and applicant proposed measures listed in the Biological Resources Assessment technical report. In addition, the City is engaged with agencies who regulate resources including waters and threatened and endangered species, as well as fire authorities and the California Coastal Commission to acquire needed permits and approvals. Appendix D provides the comprehensive list of measures that the City will implement and that will provide protection to sensitive resources.

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3.0 PUBLIC ENGAGEMENT

Many residents and visitors over the years have been inspired to help in the preservation and conservation of the important natural phenomenon of Ellwood Mesa. Public engagement helped drive the 2004 land transaction that led to City's acquisition of it and its designation as open space. Beginning in 2020 the City held public engagement events to present these implementation concepts and details, request public input and feedback, and answer questions. The table below provides a summary of public engagement activities the city has held.

Table 2 – Summary of Public Engagement

Date	Event	Location	Key Issues	Response
JAN 2002	Community meeting on the future of the Ellwood and Devereux hosted by the County, UCSB and developers	Ellwood School	Support for protection of open space. Opposition to number of proposed parking lots and paving	Pre- City of Goleta
JAN 2002	City of Goleta Incorporated and assumed jurisdictional responsibility for Ellwood Mesa		The protection of Ellwood Mesa from development was a key issue that led to the City's incorporation	
APR 2004	Community meeting on Ellwood Mesa Open Space & Habitat Management Plan (Joint Management Plan) hosted by the County	Isla Vista School	Opposition to parking lots, trail closure, loss of golf range and potential environmental impacts	Pre- City of Goleta. Comments addressed by the County in final draft
APR-JUL 2004	The City of Goleta Planning Agency and City Council jointly held eight duly noticed public hearings to consider the proposed Ellwood-Devereux Coast Open Space and Habitat Management Plan	Various		
JUL 2004	Goleta City Council adopts the Ellwood Mesa Open Space & Habitat Management Plan as it pertains to City property, certifies Final EIR & Addendum	Goleta City Hall		
FEB 2005	City of Goleta takes ownership of Ellwood Mesa		Goleta Mayor Jean Blois called the preservation of Ellwood Mesa "one of the city's most significant accomplishments since incorporation three years ago."	
OCT 2010	Goleta City Council authorizes a contract for preparation of a Monarch Butterfly Inventory and Habitat Management Plan in association with preparation of a	Goleta City Hall	Consent agenda, approved with no discussion	

	Community Wildfire Protection Plan			
NOV 2012	Goleta City staff presented results of meetings with neighborhood groups and public meetings to address growing concerns arising from increasing numbers of visitors to the Butterfly Grove		Impact to neighborhoods: parking, traffic, safety, buses, speed, vandalism and trash. Impacts to the grove: how do visitors impact trees and butterflies? Extended discussion re: proposed renaming to Goleta Butterfly Grove. Some locals feel like the name change loses the history of the community saving Ellwood Mesa.	Staff responded to public concerns with 3 goals: redirect butterfly parking to the Ellwood Mesa parking lot; rebrand as the Goleta Butterfly Grove; create a website to provide information about the grove and the docent program. Renaming is for signage and website - capturing non-local visitors looking for butterflies in Goleta. Official maps and docs still refer to Ellwood Main Aggregation Site. Issues will be addressed further in the Ellwood Trails and Habitat Restoration Design project and the MBHMP
JUL 2017	Goleta City Council considers Tree Assessment prepared for Monarch Butterfly Habitat Management Plan, with recommendations for trail closure and tree removal	Goleta City Hall	Strong opposition to trail closure and large-scale tree removal. Concern over public access, impacts to butterflies and lack of environmental assessment. Friends of the Ellwood Monarchs' (FOTEM) lawyer worked with staff and consultants to draft an alternative solution that would allow removal of minimal number of trees, keep some trails open, and delay further tree removal until the habitat management plan is prepared and approved	Council supported the FOTEM-proposed option. The City also agreed to prioritize and fund completion of the Ellwood Mesa Monarch Butterfly Habitat Management Plan, including several in-depth scientific studies to better understand the forest habitat. The City was granted emergency approval from the Coastal Commission to remove 29 critically hazardous trees. A follow-on Coastal Development Permit (CDP) application was required
JUL 2017	Public discussion on proposal to close trails and remove dead and dying trees	Goleta City Hall		
SEP 2017	City Council to consider scope of tree removal work and next steps	Goleta City Hall		
SEP 2017	Special meeting: City Council to review public comments and decide	Goleta City Hall		
AUG 2018	Individual Stakeholder Meetings	Various	City dept responsible for implementation, definitions, dogs, environmental impacts, fire, funding, handicap access, human impacts, irrigation, native habitats, public involvement, restoration details, and signs	Comments and staff response included in Appendix B
AUG 2018	Public Workshop to review and discuss the Habitat Management Plan and Implementation Plan	Goleta City Hall		
SEP 2018	City Council Meeting	Goleta City Hall		
SEP 2018	Public Tree Advisory Commission	Goleta City Hall		Comments and Staff Response included in Appendix B
JAN-FEB 2019	Comment period for Draft Initial Study and Mitigated Negative Declaration prepared for the Monarch Butterfly Habitat Management Plan	NA	Chemical use, butterfly tagging, visual character, monitoring and reporting, historic and cultural value, fire safety, migratory and nesting birds, vagueness of mitigation measures, staging, and timing of the MBHMP	Comments and staff response included in Appendix C

MAR 2019	City Council adopts Ellwood Mesa / Sperling Preserve Monarch Butterfly Habitat Management Plan	Goleta City Hall	Support for butterfly habitat restoration, replanting and maintaining trees in the grove, fire safety and vegetation management; request to abate risks to adjacent properties/power lines and include native habitat restoration in the MBHMP	Comments and staff response considered by City Council prior to adopting the plan
FEB 2020	Forum on Monarch Butterflys and the Monarch Butterfly Habitat Management Plan hosted by the City of Goleta	Ellwood School	Frustration among those in the community at the slow pace of action. Plans to rehabilitate Ellwood have existed in some form or another since 2011	Educational forum – no formal response
JAN 2021	Public Tree Advisory Commission	City Hall	Informational item, no public comment. Concerns about other species/wood rats, tree removal method. Staff emphasized intent to use waiver process rather than emergency permit process for tree removal. Expecting major work through 2025	
JUL 2022	Walking tours of the butterfly grove with City of Goleta Parks and Open Space Manager George Thomson to show proposed enhancements	Ellwood Mesa Monarch Butterfly Grove		Educational forum – no formal response
AUG 2022	Informal Q&A session to address neighbor's questions about what the City is proposing to improve the Ellwood Mesa Butterfly Grove.	Ellwood Mesa Parking Lot & Devereux crossing		Informal Q&A session – no formal response
SEP 2022	Ellwood Mesa Monarch Butterfly Habitat Management Plan Workshop	Ellwood School	Impact on butterflies, over-development of park infrastructure, effectiveness of proposed planting for butterfly habitat (tree species) and the fire risk of dead trees and brush to the neighborhood	Design modifications were made to address community concerns: eliminate eastern footbridge, change remaining footbridge to wood construction and make it smaller, make benches from fallen eucalyptus trees, cover plastic irrigation with wood chips, shrink kiosk height and width
OCT 2022	Monarch Butterfly Habitat Management Plan presented to the City of Goleta Parks and Recreation Commission	Goleta City Hall	Entrances and access, scale and location of infrastructure, tree species, future plans, relevancy of some project components to butterfly habitat, and developing nature preserve into city park. Commission supports staff's work and proposals on the MBHMP and encourages staff to	Commission's recommendation goes to Goleta City Council, no response necessary

			continue working with the community, keep the improvements as natural as possible and balance accessibility and fire risk with the mitigation of environmental impact	
FEB 2023	Individual Stakeholder Meetings	Various	Eucalyptus species, creek restoration	Prepare fact sheet with backup information on species selection

PUBLIC INPUT

Implementation Plan Changes Based on Public Input

Public access improvements have been redesigned.

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4.0 REGULATORY SETTING

FEDERAL

In 2014, the Center for Biological Diversity petitioned the USFWS to list the monarch butterfly as a threatened species under section 4(d) of the Federal Endangered Species Act (ESA; Center for Biological Diversity, 2014). The USFWS updated their status assessment on December 15, 2020 (USFWS, 2020), finding listing of the western monarch population was warranted but precluded. The finding stated that the USFWS could not identify Evolutionary Significant Units (ESUs) for monarchs, because historically when invertebrates, including butterflies, are evaluated, they are evaluated across the entire range. The evaluation was based on the global population which includes monarchs that occur East of the Rocky Mountains and on multiple continents. Hence, the listing was precluded by species of higher priority. Monarchs were ranked at priority level #8 on species list, where they still remain, with the next USFWS determination set for 2024 (USFWS 2022). The USFWS will review/revisit the status of Western monarchs on an annual basis. The extremely low counts for 2021 were not included in the determination despite having been announced by the time the USFWS released their findings in 2022. The monarch butterfly therefore remains a candidate species for federal ESA listing.

STATE

Monarchs are included on the California Department of Fish and Wildlife (CDFW) Terrestrial and Vernal Pool Invertebrates of Conservation Priority list with a State Ranking of S2S3, Imperiled/Vulnerable (CDFW, 2017). The monarch is also listed as a Species of Greatest Conservation Need on California's State Wildlife Action Plan (CDFW, 2015). The Sacramento Superior Court recently ruled in Almond Alliance of California v. California Department of Fish and Wildlife, Sacramento Superior Court No. 34-2019-80003216 (Nov. 13, 2020) that insects are not protected under the California Endangered Species Act. This applies to Monarchs. However, monarchs are protected under California Fish and Game Code Section (1002) which prohibits the take or possession of wildlife and California Code of Regulations Title 14 Sections 650(a) and (b) which requires a valid Scientific Collection Permit issued by CDFW for "handling monarchs, removing them from the wild, or otherwise taking them for scientific or propagation purposes, including captive rearing." The California Coastal Commission also considers all monarch overwintering sites within the Coastal Zone to be Environmentally Sensitive Habitat Areas (ESHA). However, many Local Coastal Plans do not explicitly list overwintering sites as such, and thus enforcement of ESHA status is inconsistent across overwintering sites (International Environmental Law Project and Xerces, 2012).

CITY OF GOLETA

The MBHMP was developed to be consistent with the other local governing documents:

- The Goleta General Plan/Coastal Land Use Plan (General Plan; City of Goleta 2006)
- The Ellwood-Devereux Coast Open Space and Habitat Management Plan (Open Space Plan; City of Goleta et al. 2004).
    - The Goleta Urban Forest Management Plan (as amended and approved February 21, 2017)

REGULATORY AGENCIES, PERMITS AND APPROVALS

Agencies with authority over sensitive resources at Ellwood Mesa were notified during the preparation of the MBHMP. They reviewed and provided comments on the document, to which the City responded. All agencies will be notified again, before the City commences of activities described in this project description. In instances when regulatory permits/approvals/ certifications/etc. are required, the City will ascertain them prior to commencement of project activities including from the Regional Water Quality Control Board, California Department of Fish and Wildlife, Federal Emergency Management Agency, and in the event a federally protected species is observed or present the United States Fish and Wildfire Service. All agency requirements for pre, during and post project activities including those for impacts to protected resources will be met by the City.

5.0 FINAL MONITORING PROGRAM

The Biological Monitoring Program, Program 20 in the MBHMP, will be implemented. This monitoring plan is consistent with the MBHMP and provides additional detail. After tree replacement and native plant installation is complete, monitoring will commence and will continue for a 10-year monitoring period. During Year 1, points will be established so that photographs can be taken from the same vantage point, at the same scale, and of the same area each year. Photographs will qualitatively document plant establishment, hydrologic conditions, and other site conditions. Each photo point location will be documented using global positioning system (GPS) and marked in the field with PVC pipes anchored by rebar, or a similar mechanism, which will be removed after completion of the 10-year monitoring period. The photographs will be included in the annual monitoring report to allow comparison between monitoring years. The goal of the monitoring program integrates various components of the biological resources of the eucalyptus groves that support seasonal monarch butterfly aggregation sites.

ANNUAL MONARCH BUTTERFLY SURVEYS

The City will conduct annual counts of the butterfly population at the aggregation sites. Counts will be conducted twice a month throughout the overwintering season (October 1 through March 15) utilizing the counting protocol established by the Xerces Society (The Xerces Society for Invertebrate Conservation 2017). Counts will be recorded and reported to the Xerces Society and regulatory agencies as needed or requested. Tree numbers will be linked to observed aggregations where applicable (Policy 20-1 and Action 20-1.1 of the MBHMP).

HABITAT ASSESSMENTS AND MANAGEMENT

Monitoring the overwintering habitat should be done by a qualified biologist/entomologist using the Western Monarch Butterfly Count Long Form Habitat Assessment for Year 1, and every 3-5 years thereafter.

Replacement eucalyptus trees will be monitored by a certified arborist or monarch butterfly expert contracted with the City to track tree health and adjust care to so that establishment occurs. Replacement trees that die will be assessed and replaced, so that aggregation or wind barrier trees are sufficient to provide monarch overwintering habitat.

Depending upon the size of the trees planted and planting conditions (soil, water availability, etc.), trees could take up to 20 years to reach full maturity and height, and shrubs could take 5-10 years. The goal of the plantings is to provide wind protection in the management area and particularly at the aggregation site. Wind penetration will be measured every 3-5 years to understand the effectiveness of the plantings. Results of this analysis shall be synthesized with the Tree Management Program in order to determine necessary management actions.

FOREST HEALTH

The City will conduct annual assessments of ecosystem-wide vegetation and overall tree and forest health throughout Ellwood Mesa. The assessment will include assessing the presence and extent of pests and disease, fire risk due to dense and/or dead vegetation, any issues that arise due to flooding and erosion, vandalism, and presence of non-native or invasive plants.

Selective thinning will be done to reduce competition between trees and benefit the overall grove health. Trees selected for removal should include trees that are of lesser health, trees that are generally within the understory of the grove and should include trees that are evenly spaced out to prevent large canopy openings. Selective thinning will reduce competition and better distribute essential resources such as water and soil nutrients, allowing the remaining groves health to increase. The remaining canopy will expand and fill in the gaps of the removed trees over time. Selective thinning would also decrease the groves susceptibility to a high-intensity crown fire by decreasing the overall canopy fuel load. Care should be taken to not overthin the grove. In addition to forest thinning, tree limbs and trees that have naturally fallen throughout the management area will be actively removed to decrease fuel loading and eliminate ladder fuel within the understory. Mid-story trees and shrubs will be separated from each other and the tree canopy by offsetting the plantings to avoid the creation of ladder fuels to the maximum extent feasible.

Ellwood Mesa experiences massive tree die-off in the future, a forest-wide assessment will be accomplished through use of high resolution multispectral and hyperspectral imaging and analysis, or similar means.

Results of this analysis shall be synthesized with the Tree Management Program (Program 12 of the MBHMP) in order to determine necessary management actions and any adaptations needed.

PLANTED NATIVE VEGETATION

Where native vegetation is planted a qualified biologist will qualitatively monitor establishment and health monthly, for a year. After the first year of establishment the areas will be quantitatively monitored once in the spring and once in the winter for 10 years. If planted vegetation dies and the area is not vegetated to the extent that a naturally occurring community would be, the City will replant the native vegetation annually.

INVASIVE AND NON-NATIVE PLANTS

Monitoring of invasive plants will be conducted at a minimum annually to identify and eradicate or control occurrences of invasive non-native plant species classified by the California Invasive Plant Council (Cal-IPC) as "High" or "Moderate" priority for control (Program 15 of the MBHMP) (Cal-IPC 2012). Eradication efforts and tracking of invasive non-native plant populations will be included in the annual monitoring reports.

Non-native plants will be monitored simultaneously and removed primarily using hand removal methods, such as hand-held weed whips, loppers, and hoes.

The majority of invasive non-native plant removal efforts will be conducted during the peak growing season (winter and spring) when non-native plant species are most prevalent. A regular but lower level of effort during the rest of the year is recommended to minimize the spread of non-native plant seeds. The maintenance schedule and crew size will be adjusted based on the abundance of non-native plants on-site and the effort it takes to remove them before going to seed.

IRRIGATION

Replacement trees will be watered until established, which may require several years depending on rainfall patterns. Native vegetation will be watered until established or no longer than 5 years. An irrigation schedule to maximize growth of the eucalyptus plantings and native vegetation will be established after the first year of monitoring. The schedule will account for natural rainfall and will

minimize growth of invasive non-native plants. Generally, if irrigation is needed, more irrigation will be provided during the growing season (winter and spring) to mimic seasonal weather patterns, and minimal irrigation will be provided during the summer and fall as needed to keep plants alive.

MICROCLIMATE SUCCESS CRITERIA

Current scientific understanding provides a general model of climatic factors necessary for favorable monarch butterfly overwintering habitats (refs). However, the microclimates that are available vary with latitudinal from north to south across the overwintering range, and monarch butterflies select habitat from what is available rather than selecting a singular suite of conditions across all sites (refs). Consequently, criteria for success based on a singular combination of physical climate measures such as temperature, humidity, wind, and light cannot be quantified in any meaningful, science-based way and would not be sufficient to document success relative to our long-term restoration goals (refs). The microclimate conditions, especially wind, that drive monarch micro-distributions are highly transient (Leong 2016). In addition, predicting how many monarchs will cluster and where they will cluster is impractical over the 10-year monitoring period. This is because the overall population size fluctuates annually and the relative proportion of the overwintering population at any one grove varies across years (refs).

To better define these goals, success criteria should be more management based and monitoring should document the transformation from former conditions. Planting eucalyptus and other trees at a set density in areas with considerable canopy loss is intended to create a heterogeneous aged forest that provides suitable habitat for monarchs. Thus, our primary goal must be to actively encourage and maintain future canopy creation via forest management and new tree planting, with adaptive management conducted through replacing lost trees. From this perspective, success would be measured using forest management and tree planting metrics, such as percent of initial canopy gaps filled in 10 years (these canopy gaps are identified in the A&M Habitat Report and can be measured with hemispherical photography), survivorship rate of planted trees, and occupancy patterns of the grove by monarch butterflies (given other groves in the region also continue to be occupied).

NESTING BIRD SURVEYS

The City will avoid vegetation disturbance throughout the nesting bird season (March 15 to August 15) to the extent feasible. If habitat enhancement activities involving vegetation disturbance is scheduled during nesting bird season, a biological monitor will conduct pre-activity nesting surveys to ensure no active nests are present in the work area and vicinity (Action 11-1.3, MBHMP).

ANNUAL REPORTING

The City will create an annual monitoring report detailing the progress and findings documented during the monarch surveys and assessments described above and will include a summary of management actions taken. This report will include information recorded in monitoring logs maintained during implementation of the MBHMP and Visitor Impact Assessment to track trail use trends, potential impacts on trails, erosion changes on trails, and potential impacts on aggregation sites near trails. Any corrective actions implemented to address threats to monarch habitat and changes to monarch habitat use.

As needed, recommendations for adaptive management strategies will be provided in the annual report. The results of this report will be assessed alongside the Adaptive Management Program (Program 22 of the MBHMP) to determine if changes in management actions are necessary.

Annual reports will be submitted to the Coastal Commission for a period of ten years for the review and approval of the Executive Director.

COMPENSATORY MITIGATION FOR PROJECT IMPACTS

When regulatory agencies require compensatory mitigation for impacts to protected resources the City will conduct required monitoring and reporting to meet agency approval requirements. A separate restoration plan will be prepared for each agency as required.

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6.0 ADAPTIVE MANAGEMENT

A tremendous amount of study and analysis informed the selection and location of the eucalyptus and native trees and native plants to be planted. This IP is unique in nature, namely in that Ellwood Mesa is a eucalyptus forest now comprised of severely degraded trees and is ESHA. The City is balancing the restoration, enhancement, and management of monarch habitat within the context of an open space that also has rich native biological resources and provides habitat to numerous flora and fauna. The translation of success of the replacement tree plantings, and therefore the habitat, will be told somewhere in the range of 20-30 years from now, when the tees achieve the height and structure needed for monarch overwintering. Changes in our climate are likely to continue to affect the health and viability of all of the vegetation in California, and we are not able to predict what that will look like. Monarch counts in the future are likely to fluctuate greatly, regionally and at this, site due to many factors including climate change.

The monitoring program described in Section 4, above, will be implemented and will contribute to the information base that provides insight into the MBHMP, which plantings are performing well and those that could be performing better or differently with changing situations. Program 8 of the MBHMP and this section of the document provides a vehicle for the City to make adjustments in management approaches on an as-needed basis, especially as new information provides new opportunities for improved management practices and resource stewardship. Ongoing maintenance, restoration, monitoring, and research programs will be pivotal in understanding and addressing any evolving needs of the habitat.

If the western monarch butterfly population is listed as threatened or endangered by the USFWS the agency will designate critical habitat for the species. It is likely the known or historic overwintering sites will be included as critical habitat. As a result, the regulatory setting for managing their habitat will become more complex and will include review and approval by USFWS. This management plan would very likely require an update or amendment to be consistent with the federal habitat protection requirements.

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7.0 REFERENCES

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The Xerces Society for Invertebrate Conservation. 2017. *Step-by-Step Western Monarch Thanksgiving Count Monitoring Guide*. Available: https://www.westernmonarchcount.org/downloads. Last updated: October 2017

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Appendix A

Waiver De Minimis

Rincon Consultants, Inc.

209 East Victoria Street
Santa Barbara, California 93101

805 319 4092

info@rinconconsultants.com
www.rinconconsultants.com

March 10, 2023
Project No: 20-10199

California Coastal Commission
South Central Coast District Office
89 South California Street, Suite 200
Ventura, California 93001-4508

Subject: **Waiver Request – Ellwood Mesa Neighborhoods** Hazardous Fuel Reduction

Name, mailing address, telephone number of all applicants/owners:

City of Goleta – Public Works Department
130 Cremona Drive, Suite B
Goleta California, 93117
(805) 961-7578

Name, mailing address, telephone number of applicant's representative:

George Thomson, Parks and Open Space Manager
City of Goleta
130 Cremona Drive, Suite B
Goleta California, 93117
(805) 961-7578

Project location (Address & APN): Goleta, CA 93117

APNs of Waiver de Minimis CWPP		
079-210-019	079-210-069	079-395-015
079-210-024	079-210-070	079-442-023
079-210-050	079-210-071	079-445-001
079-210-051	079-210-072	079-491-016

See Figure 1.

Project Description

(Include detailed description of the proposed development, including existing and proposed square footage, and existing and proposed height, as applicable – attach additional sheets if needed):

The City of Goleta (City) submits this request to the California Coastal Commission (Commission) for review and approval of a Waiver de Minimis (waiver) to conduct immediate removal of dead and downed eucalyptus trees (hazardous fuel reduction activities) as described in the City of Goleta's Community Wildfire Protection Plan (CWPP 2012) at Ellwood Mesa. Reduction of the hazardous fuel load within Ellwood Mesa is critical for preventing potential catastrophic fire in Ellwood Mesa and the surrounding residential neighborhoods. Implementation of the CWPP on 78 acres of open space will

protect life and property and the environmentally sensitive habitat areas (ESHA), the monarch butterfly overwintering habitat and raptor habitat.

The City and its consulting team have carefully assessed monarch aggregation habitat and the CWPP vegetation treatments to develop a refined approach to reduce fire risk without negatively altering the character and integrity of monarch aggregation sites (Figure 2a through Figure 2d). Treatments in the CWPP were strategically modified and mapped to avoid resources, including native plants, native trees, and active bird nests. Great care will be taken to remove dead eucalyptus trees and vegetation that are creating fire risk while retaining three types of dead wood that do not create a fire risk and do provide wildlife habitat: snags or standing dead trees with cavities, large trunks in contact with the ground and in decomposition, and twigs gathered into a brush pile.

Description of Need

In 2019 the CWPP determined that Ellwood Mesa has one of the highest levels of ignition risk within Goleta, with an average 0.68 ignitions per year during 1998-2020, and a Hazard Level Code of "3" which indicates the highest fire threat level. The threat has continued to increase due to the ongoing drought and increasing temperatures in central California. Between 2012 and 2023 the City witnessed an unprecedented die off in the eucalyptus grove. High winds and heavy rains in 2022 and 2023 have caused dozens of eucalyptus trees to fall or be at imminent likelihood of failure. In addition, as of March 2023 the City has received 111% of its rainfall for a normal water-year, which is anticipated to result in increased vegetation growth/fuel load and increased fire risk during the upcoming 2023 dry summer/fall months.

Values at risk include residences, powerlines, hiking trails, public coastal access, ESHA, sewer collection and water distribution lines, and monarch butterfly aggregation sites.

Recent fire events in the immediate region include the Alisal and Hollister fires that have burned approximately 17,500 acres immediately north of the City boundary (in November 2021 and March of 2022 respectively). These fires are indicative of the vulnerability of the Goleta area to fire.

Attachment 1 is a summary prepared by the monarch biologists describing the need and benefit of the dead wood removal on the monarch habitat that the City proposes in this waiver.

Attachment 2 provides photographs of representative fuel loads from 2021 and 2022, throughout the forest.

Permit History

Has any application for development on this site including any subdivision been submitted previously to the Coastal Commission? If yes, state previous application number (s), date, and brief description. Previous application numbers: Yes.

> G-4-17-0048, September 26, 2017, Emergency approval to remove 29 eucalyptus trees that were dead or at high risk of failure at Ellwood Mesa open space. Follow-on CDP application was required.

4-18-1223, October 23, 2019, Notice of Intent to Issue Permit issued for implementation of the 2018 Final Implementation Plan for Ellwood Mesa to restore habitat for overwintering monarch butterflies. This was a follow-on application to G-4-17-0048. The 2018 Final Implementation Plan described how work was planned that would fulfill the requirements and conditions of the Emergency Permit. The NOI Permit Application No. 4-18-1223 was conditioned with six special conditions.

The City is currently preparing applications, documents and plans to meet the special conditions and will do so by applying for two CDPs to implement the MBHMP for the entire management area: 1) Phase One of the Comprehensive Management Plan includes enhancement of the habitat for 60 acres of the management area and public access improvements, and Phase Two of the Comprehensive Management Plan includes the same for the remaining 30 acres. The first phase application will be submitted to the Commission in June 2023, and second in 2024/2025.

4-16-1055, August 2019, Implementation of the Ellwood Mesa Coastal Trails and Habitat Restoration Project through the Santa Barbara County Trails Council. The City is currently developing a revised strategy to improve the trail system and will submit a CDP application amendment in 2024/2025.

In February 2022 a Waiver de Minimis, Waiver 4-21-0358-W, was issued to Southern California Edison (SCE) to trim eucalyptus trees within the management area, along the company's distribution power lines.

Applicable CEQA Review

The Goleta City Council approved the Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan (MBHMP) (Attachment 3) Initial Study-Mitigated Negative Declaration (IS-MND) in 2019 (Attachment 4). The MBHMP includes specific measures for protecting monarch aggregation sites and other sensitive biological resources and incorporates CWPP vegetation removal prescriptions. Environmental impacts associated with fuel management activities within the butterfly habitat areas were analyzed under CEQA approval of the IS-MND. The Ellwood-Devereux Coast Open Space Plan and the MBHMP and the City's General Plan serve as governing documents for the management of Ellwood Mesa.

Timeline

In 2019 the Coastal Conservancy executed a $3.9 million grant to the City, to implement the MBHMP for habitat management and safety. Since that time, the City and its team of consultants have performed numerous studies to understand and assess the conditions of the diminished habitat and high fire risk, and develop a strategy to enhance the ESHA while reducing the fire risk.

In 2021 the City applied for and was awarded a $1.7 million grant from CAL FIRE to implement the CWPP at Ellwood Mesa. The City is prepared to begin implementing the CWPP activities in the Spring of 2023.

Fuel Reduction Activities

The highest priority areas for prescribed vegetation management are those within the 100-foot defensible space buffer. Defensible space is the space between a structure and the wildland area or neighboring structures that, under normal conditions, creates a sufficient buffer to slow or halt the spread of a wildfire to a structure. Defensible space protects a structure from direct flame impingement, radiant heat, and some burning embers and is essential for structure survivability during wildfires. In California, citizens are required to follow 100' defensible space guidelines specified in PRC-4291 (CWPP 2012).

The CWPP Prescription Guidance for Vegetation Management Units (VMUs) prescribed by CAL FIRE, is provided in Attachment 5. The fuel management prescriptions for each of Goleta's VMUs were developed to guide treatments to achieve a less hazardous fuel profile through mechanical and hand vegetation management. Treatment types depend largely on vegetation type, site topography, project objectives, and may have limitations due to sensitive habitat, archaeological concerns, soil, water courses, and proximity to structures. Treatment zones were identified in consideration of these factors and proximity to developed and/or recreational areas as specified by CAL FIRE, the Goleta City Project Manager, monarch butterfly biologists, and certified arborists.

Equipment

Equipment to be utilized to conduct vegetation management will be:

- Grapple saws,
- Chippers,
- Skid steers,
- Crane,
- Spider lift,
- Aerial bucket trucks,
- Standard work trucks,
- Mowers,
- Hand tools - including trimmers, weed whackers, hedgers, shovels, wheelbarrows, and rakes

Chipped materials will be spread around the groves to enhance water retention and promote healthy trees.

Work areas will be accessed via existing roads for work trucks, and existing trails for crews to walk to work areas. Access to the coastline via Ellwood Mesa will not be blocked by the vegetation management activities. The work areas will be delineated daily so that the work area extent is visible from a distance.

A safety foreman will be on site daily to direct the public around the work areas and to alternative trails as needed.

Neighboring property owners will be notified if planned vegetation management activities are expected to occur within 100' of their property boundary. They will be provided an approximate schedule for work planned near their property at least 30-days in advance of the start of construction.

Best professional standards will be employed at all times. The City's methods for the emergency tree removals will be included in the contractor's bid specifications and are as follows:

- Securing areas where tree removal work will be conducted from public access during the time that work is being conducted. Ensuring the safety of workers and the community at large is of paramount importance.
- Construction notification signs will be posted at the staging and access areas alerting the public to the presence of heavy equipment and tree work.
- Branches and cut wood will be chipped in place where feasible, and trunks or large branches too large to chip will be laid on the forest floor or cut to appropriate length and used as trail barriers.
- Soil disturbance will be minimized and appropriate erosion controls will be used.
- Construction equipment staging, fueling, and storage areas shall be located outside of the eucalyptus groves (the outer dripline plus 5 feet), and no closer than 100 feet from Devereux Creek. Localized staging along the sewer line road north of Devereux Creek is permissible when removing trees along trails, as the road represents the least environmentally damaging staging area for this location.
- Wooden boards or other protective devices (rubber matting) should be placed within groves and under heavy equipment to distribute the weight of any heavy machinery used during removal (trucks, cranes, etc.).
    - Pesticides and herbicides will not be used.
    - Fire suppression equipment will be onsite at each work area.

The City's onsite arborist and/or environmental monitor will work with the Contract Manager to minimize tree removal impacts to adjacent habitat and public access.

Trails and Signage

During fire risk reduction activities trails will be closed within at least 100 feet of work, for public safety. Trails will be open every day, after activities conclude. During daily activities, signs will be posted to reroute the public to the open trails. The City will post the weekly schedule on their website dedicated to this effort. Signs will be posted at all 13 entrances to the open space with the following information: Need for Project, City Contact, Background, Applicable Permits, and a For More Information link. Alternative routes and construction staging areas will not disrupt native habitats and will utilize the existing trail network, as shown in Figure 3a and Figure 3b. Signs, site demarcation materials, and equipment will be removed daily. No overnight trail closures will occur.

Refined Fuel Treatment Design

The City and its team of consulting biologists, including monarch butterfly specialists Dr. Dan Meade of Althouse and Meade and Dr. Stu Weiss of Creekside Center for Earth Observation, have carefully assessed the monarch aggregation site habitat in relationship to the dead eucalyptus trees and the project team has refined the fuel reduction activities, specially to remove only the dead eucalyptus trees and dead debris that will help meet the treatment objectives but will maintain the character and integrity of the habitat that supports the monarch aggregation sites.

Where actual conditions on the ground require special consideration or a modification to the treatments described in the CWPP Table 14 (Attachment 5), the City has assigned a more refined treatment (for vegetation removal). This may be due to the presence of native plants, orientation of vegetation that provides important wind protection to aggregation sites, etc. Figure 2a through Figure 2d shows the treatment areas as individual zones. Attachment 6 provides a table with a general summary of the treatment types as well as a table with the CWPP Treatment Zones mapped in Figure 2a through Figure 2d (including details regarding the treatments based on the on-the-ground assessment of current monarch habitat). Note that both Modified and Unmodified Aggregation treatments retain the trees that provide wind protection to the aggregation sites, and vegetation removal is focused on dead and downed trees and vegetation that is zero to six feet in height.

Ecological Surveys and Studies

The City has completed and continues to conduct extensive surveys to identify and map native biological resources that will be avoided during fuel reduction activities and implementation of the MBHMP. The City has conducted surveys for sensitive vegetation communities, native and rare plants, native trees, special-status wildlife species (including monarch butterfly over-wintering aggregation sites), historic nesting bird sites and perching sites, locally known migrating bird congregation sites, jurisdictional waters and wetlands, ESHA that is protected by both the City General Plan and the California Coastal Act.

Sensitive Resource Protection

The City will take actions prior to and during fuel reduction activities to protect biological resources. All fuel reduction activities will be conducted in compliance with the MBHMP and corresponding final MND. The project will also comply with the Conditions of Approval associated with NOI Permit Application No. 4-18-1223. The current status of the City's implementation of Special Conditions from NOI Permit Application No. 4-18-1223 is provided in Attachment 7.

Project Plans

Include two (2) sets of proposed project drawings (site plan, floor plan, and other plans as necessary). Drawings must be to scale with dimensions shown. All oak trees and riparian vegetation (canopy), streams and drainages, wetlands, easements, and public hiking and equestrian trails (including existing offers to dedicate trails) must be identified on the site plan.

See Figure 3a and Figure 3b.

Structures Destroyed by Disaster

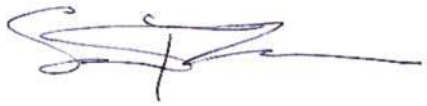
If the proposed development is the replacement of a structure(s) destroyed due to disaster, please include copies of previous building or site plans, if available, to indicate the location, size and height of structure(s). Other potential information that can be used to demonstrate the size and location of structures includes, but is not limited to, photos of the property, surveys showing foundation(s), building permits, and assessor's records.

Not applicable.

Filing Fee

Per the application fee schedule (effective July 1, 2021), the filing fee for an exemption determination is $706.00.

Sincerely,
Rincon Consultants, Inc.



Stephanie Lopez, ISA Certified Arborist
Supervising Biologist

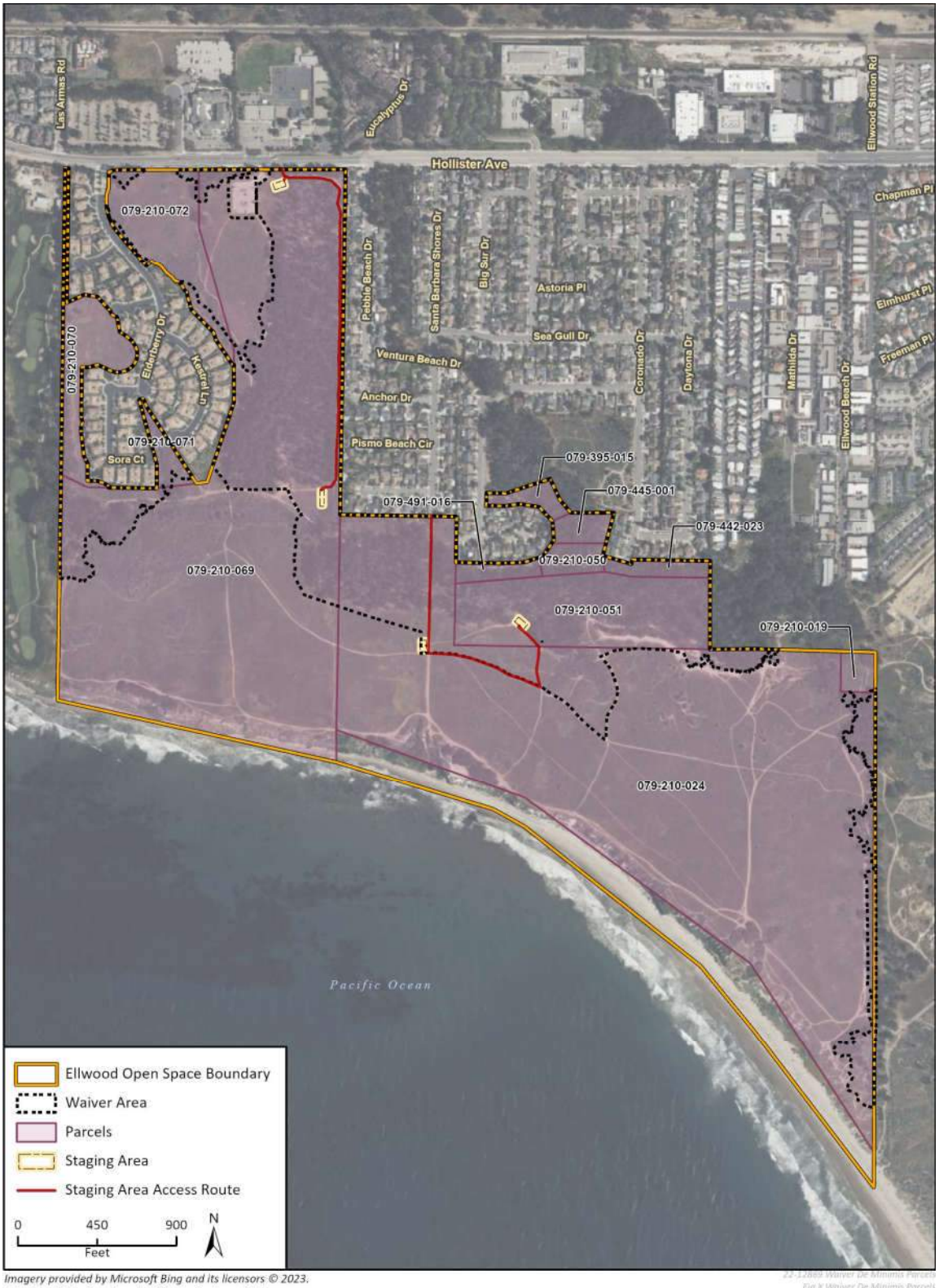


Christopher Julian
Principal Regulatory Specialist

Attachments

Attachment 1 – Letter Regarding Dead Tree Removal and Habitat Values
Attachment 2 – Example Photos of Vegetative Fuel Load at Ellwood Mesa
Attachment 3 – Monarch Habitat Management Plan
Attachment 4 – Initial Study – Mitigated Negative Declaration
Attachment 5 – Community Wildfire Protection Plan – Fuels Mitigation Prescription Guidance
Attachment 6 – Refined Vegetation Fuel Load Reduction
Attachment 7 – Special Conditions from NOI Permit Application No. 4-18-1223

Figure 1 Waiver 1 APNs



Imagery provided by Microsoft Bing and its licensors © 2023.
Additional Data from County of Santa Barbara, 2022.

Figure 2a Waiver 1 Fuel Reduction – CWPP Treatment



Figure 22b **Waiver 1 Fuel Reduction – CWPP Treatment**

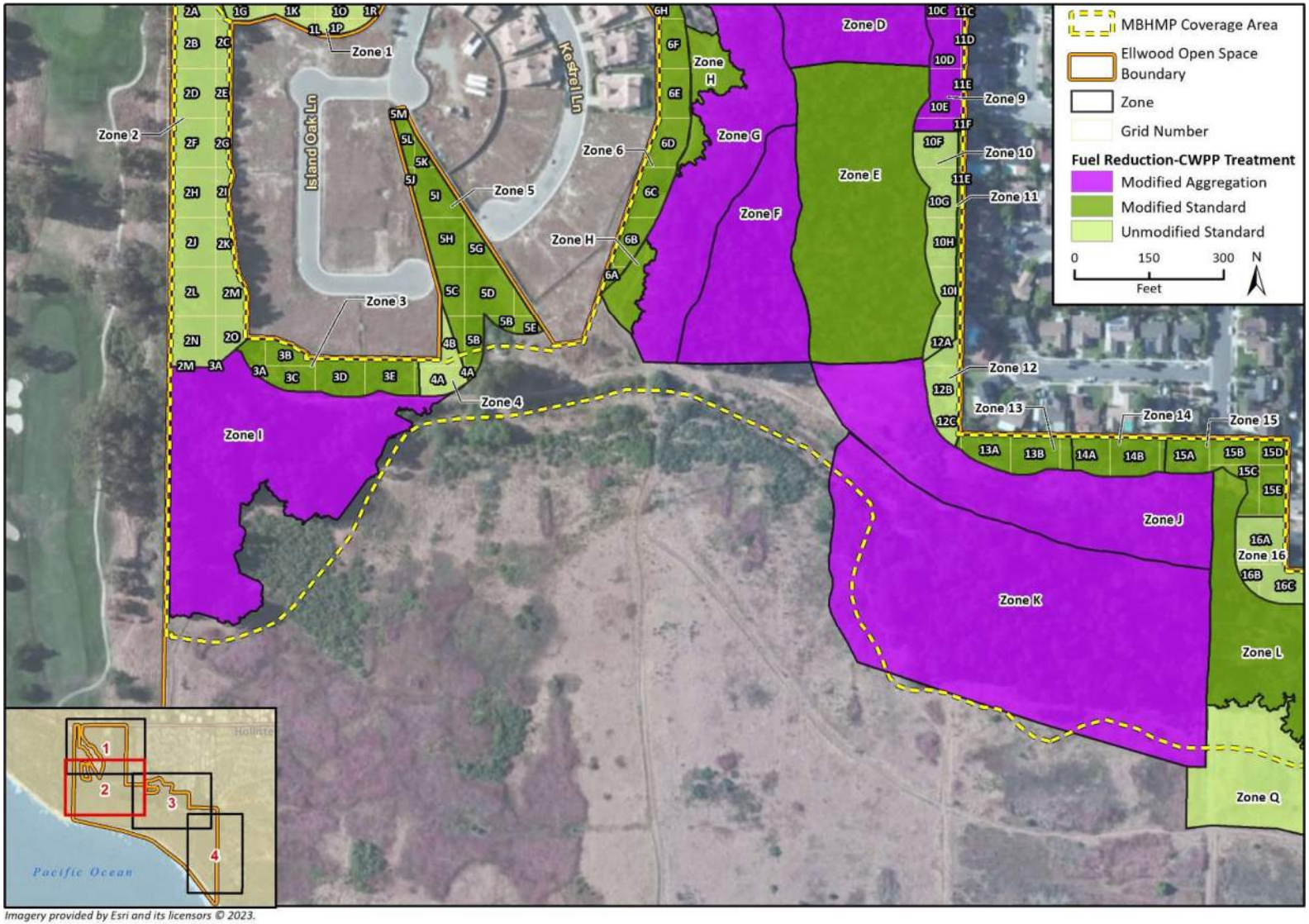


Figure 22c Waiver 1 Fuel Reduction – CWPP Treatment

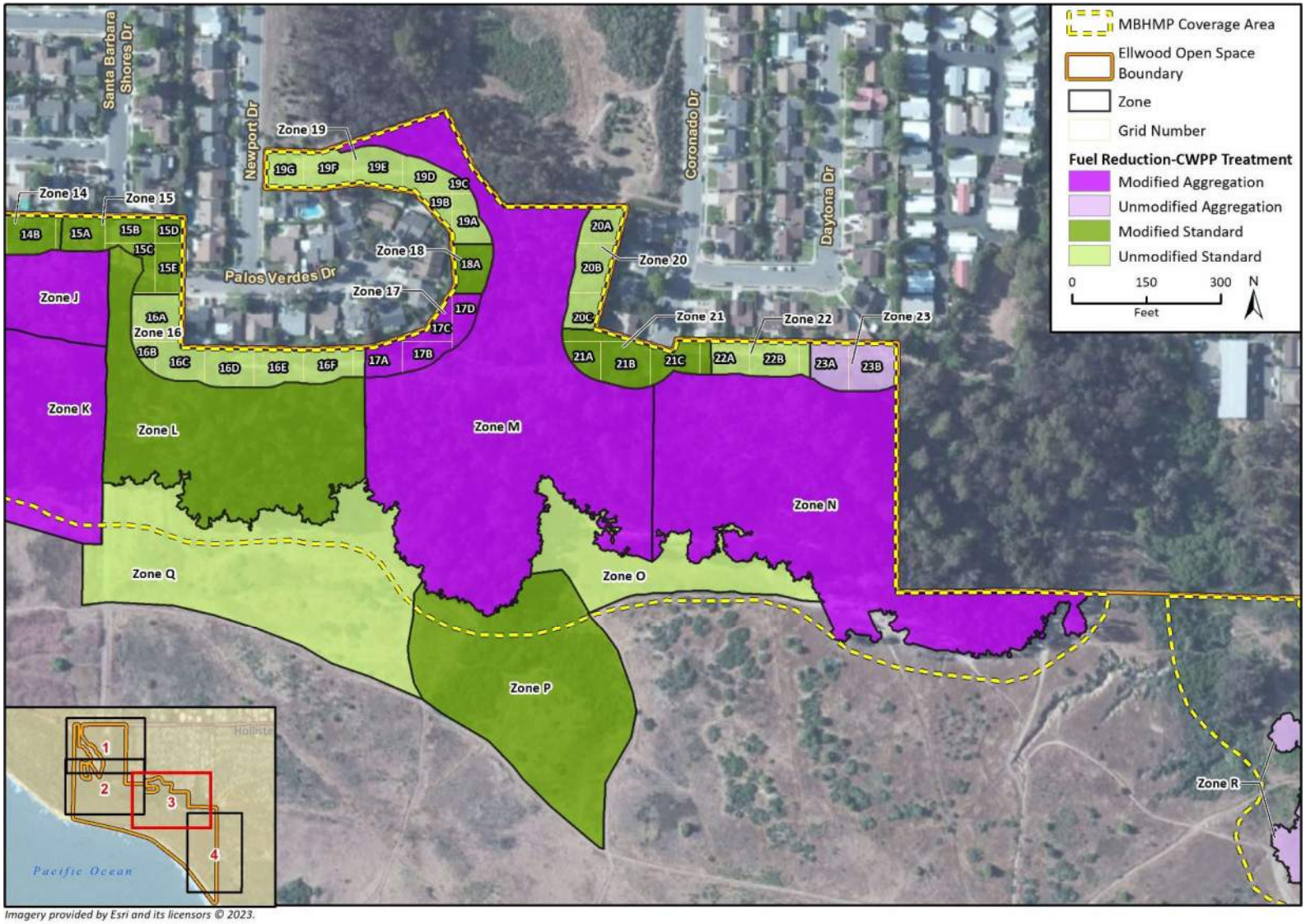


Figure 22d **Waiver 1 Fuel Reduction – CWPP Treatment**

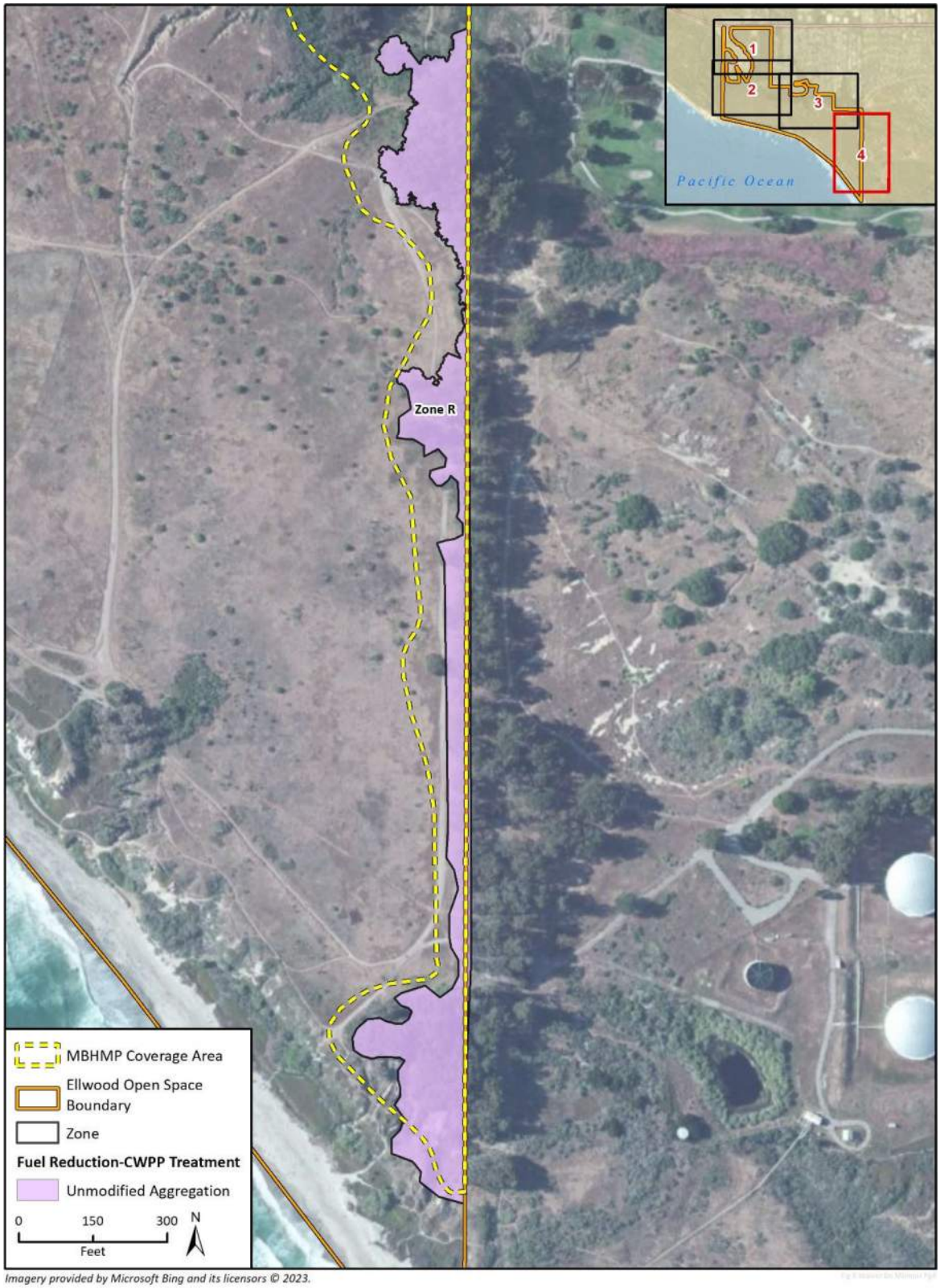


Figure 3a Waiver 1 Area Resouces

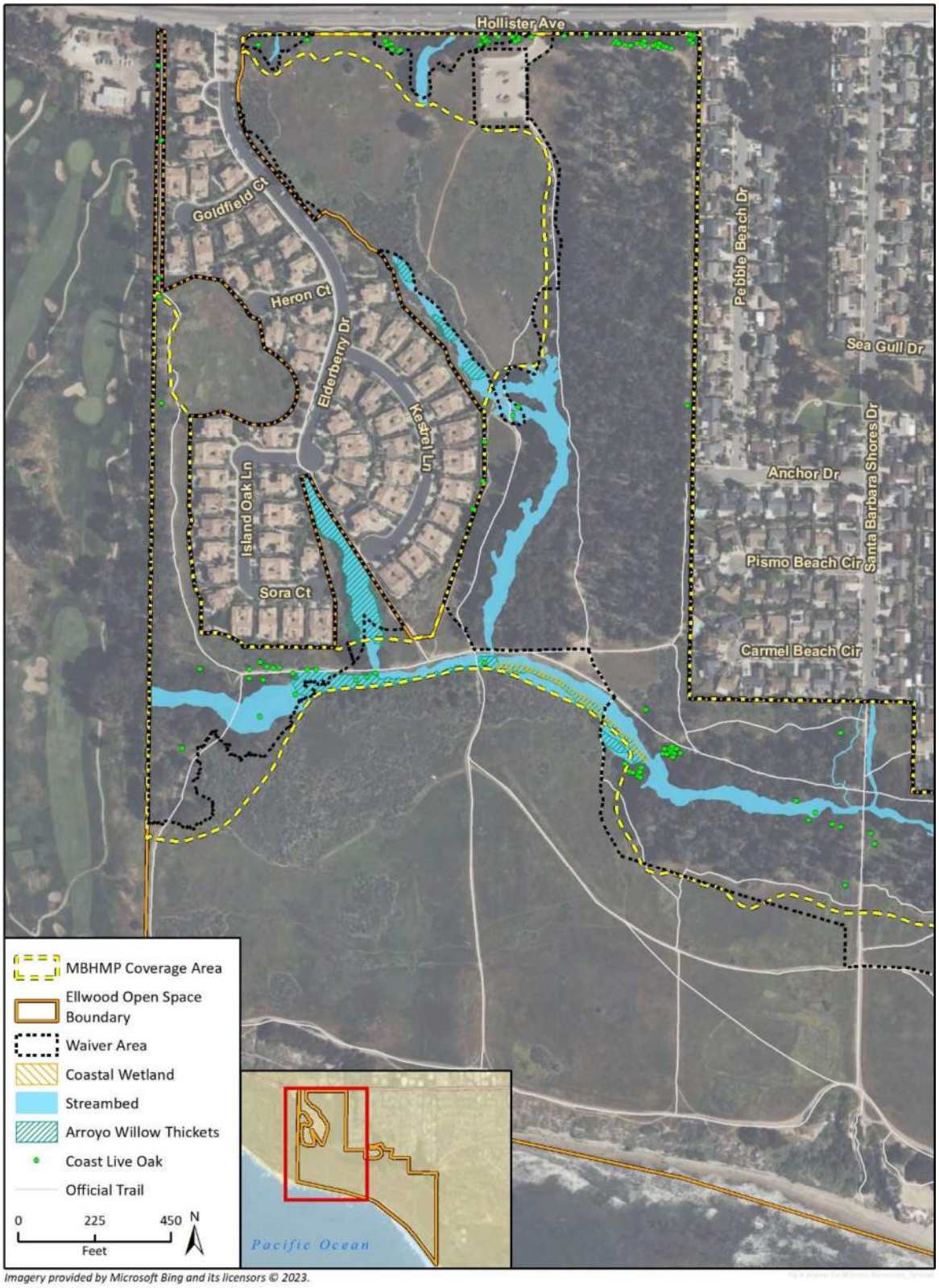


Figure 3b Waiver 1 Area Resouces



Attachment 1

Dead wood removal and monarch butterfly habitat effects

March 9, 2022

TO: George Thomson
Parks & Open Space Manager
City of Goleta - Public Works Department

FROM: Dan Meade and Stu Weiss

Removal of dead downed wood and dead standing trees benefits monarch butterfly habitat and forest health. Forest habitat is best for monarch butterflies when it provides a balance between cover and room for flight. Wind shelter by a dense outer screen of trees is critical. Inside that screen, dappled light is key to monarch aggregation locations. Very dense canopies from overcrowded trees or open canopies from death of trees are not suitable as monarch aggregation habitat.

The Xerces Society guidelines for managing monarch groves (The Xerces Society 2017) suggests that even very important trees (VITs), "…that are also hazard trees should be replaced." (pg. 14). "Completely dead trees and branches generally do not contribute to monarch habitat and are a potential liability. Felled debris from diseased and infected trees should be removed from the habitat to eliminate host material." (pg. 19). "Standing dead trees generally do not contribute to monarch habitat and are a hazard to people and other trees." (pg. 25).

The 1993 Monarch conservation and management guidelines (Bell et al. 1993) state, "The authors recognize the importance of removing hazardous trees from forests." (Recommendation 18). And, "Understory levels should be managed to prevent a localized buildup of dead plant materials." (Recommendation 30).

Monarch Habitat

In our experience of visiting scores of monarch butterfly aggregation sites during more than 30 years of observation, monarch butterflies prefer to aggregate in locations with a wind protection buffer surrounding a more open center that allows access and patrolling space for flying butterflies.. Monarchs leave roosts subject to disruptive wind (Leong 2016) for protected locations that provide dappled light and ameliorate temperature and humidity extremes. Monarch aggregation habitats often have low to moderate densities of ground vegetation with an open mid story within the wind protected area. Several famous monarch butterfly aggregation sites, such as Pismo Beach and Pacific Grove have highly managed understories free of downed wood. The relatively clear floors in those groves include wide walking paths that are not detrimental to monarch aggregations that form in the surrounding trees..

In Ellwood, monarchs have sought out wind-sheltered gaps in the forest to form their aggregations. Ellwood Main prior to the recent drought die-off was the exemplar of an aggregation site with a “Cathedral” structure consisting of an open understory, minimal ground cover, and a high vertical open space encompassed by protective trees. Surrounding slopes contributed to wind shelter and tall canopy trees formerly provided ideal dappled light and room to fly. The northern entrance to the aggregation site remained open and thicker vegetation around the edges of the site provided excellent wind buffering. The drought die-off of trees changed the site and where protective trees stood west and east of the grove, tangles of dead fallen wood and standing dead stems occupy the space and allow wind to penetrate far deeper into the grove than previously. Within the aggregation site, standing dead trees place other trees at risk,and downed trees and debris interfere with recruitment of replacement trees. Ellwood Main no longer provides the excellent aggregation habitat as in past years.

Monarchs are often observed flying through stands of trees investigating habitat. This behavior can lead them to aggregations. Groves where trees are too dense, or where debris and tangles of dead wood block patrolling areas, reduce access and increase effort to locate suitable roosting locations.

Historically, Ellwood forests were managed to remove dead wood and maintain healthy stands of trees through normal forestry practices (Santos 1997, Meade pers. observ.). Failure to manage a grove results in over recruitment of trees during periods of higher rainfall and then death of trees during times of water stress (droughts). Appropriately managing tree density based on water demand creates a more stable grove and is a fundamental tenet of forestry management, even for groves managed for wildlife (Grebner et al. 2021, Taylor 2018)

Eucalyptus does not break down as quickly as native vegetation and wood and bark debris that accumulates on the ground retains nutrients and can inhibit new growth. Fallen blue gum eucalyptus trees decompose very slowly (DiTomaso et al. 2013), especially in dry climates. The high level of phenolics in eucalyptus inhibits fungi from breaking down the wood and allows accumulation of fire fuel (Reid et al.2005). Chipping will aid the release of nutrients from woody debris by converting coarse wood to fine pieces (Russell et al. 2015). Mulching around new forest plantings can increase planting survival and growth rate (Cahill et al. 2005, Chalker-Scott 2007).

Wildfire Risk

Accumulation of bark and dead wood on the ground and leaning into the tree canopy creates a major fire hazard to monarch habitats (Xerces 2017). Ignition from camp fires and other human sources can feed on ground debris and quickly escalate into a catastrophic fire event. This risk can be managed by reducing fuel load through removal of dead branches, trunks and highly flammable vegetation that can create fire ladders into the forest crown. The Ellwood groves, once managed for wood production, now present a tangle of downed wood, dead leaning trunks and over abundant understory shrubs. The City of Goleta Community Wildfire Protection Plan (2012) provides management recommendations to reduce, “potential fire intensity, rate of spread, and severity of effects.” (pg 58). Management prescriptions in the CWPP whenimplemented will help to protect life, property, and natural resources including monarch butterflyhabitat.

The presence of large quantity of dead wood at Ellwood results in:

- Increased wind penetration and speed at aggregation locations due to downed trees.
- Higher risk to remaining live trees
- Reduction in shade at aggregation sites
- Loss of cover for butterflies from predators
- Poor recruitment and growth of replacement trees
- Increased wildfire risk - intensification of fires and a fire ladder to canopy
- Public safety hazard from dead standing and leaning trees and ground debris

Removal of dead wood from the Ellwood forests and monarch groves will have positive effects for monarch butterflies.

- Removal and replacement of dead trees will increase humidity and shade and boost protection of monarchs.
- Removal of downed trees and branches eliminates debris tangles that interfere with recruitment of saplings and growth of trees with good form.
- Space for planting trees will be opened by removing dead wood.
- Removal of leaning dead trees and branch and debris tangles will improve patrolling and clustering habitat for monarch butterflies.
- Reduction of hazards for visitors to the grove
- Preserve habitat by reducing intensity and rate of spread of fires.

Photo 1 shows the dead stand along the trail that runs west of the gully at Ellwood Main. Large tangles of fallen trees lie among the standing dead, and the canopy is very open.



The hemispherical photographs (hemiphotos) below show some of the impacts of tree mortality on the effectiveness of windbreaks. Photo 2 was taken near the same site as Photo 1 above. The hemiphoto is taken straight up - the horizon is at the circular edge, and the zenith is the center of the circle. North is at the top of the photograph, and east and west are reversed from a map view because the photograph is looking upward. The opening in the orange circle in the SW direction is where many trees died (the site in Photo1), allowing wind to penetrate well into the aggregation site. The dead standing trees block only a tiny fraction of the sky compared with the live trees in other directions. Photo 3 was taken 10 meters south of Photo 2, showing the same wind shelter gap, which affects a large area downwind. In this case, the loss of shelter against prevailing SW winds has degraded the quality of Ellwood Main.

Photo 2



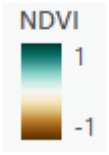
Photo 3



The map below shows a measure of canopy greeness (Normalized Difference Vegetation Index, NDVI) where the blue-green shows healthy foliage and the brown shows dead canopy (and brown grass outside of the forest). Note how much of the canopy around Ellwood Main has died, leaving dead standing trees, and large piles of downed wood.

The orange circle is the gap in Photos 1-3., which leaves the aggregation area to the east of the photograph sites (424 and 425) vulnerable to prevailing SW winds. Note also the numerous dead tree crowns throughout Ellwood Main, and the particularly large dead area at the western edge of the map, which is shown from the ground in Photo 4.

Normalized DIfference Vegetation Index (NDVI) map of Ellwood Main. Blue-green is live foliage (high NDVI) and brown is dead trunks, branches, and grass.



Map 1

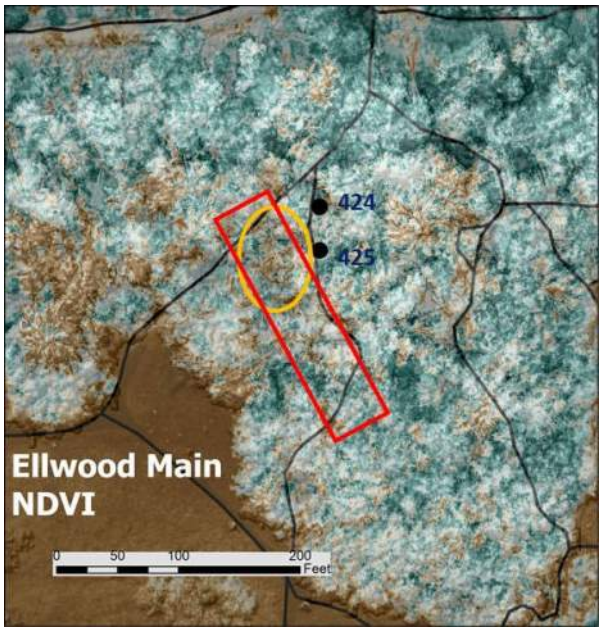
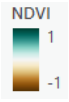
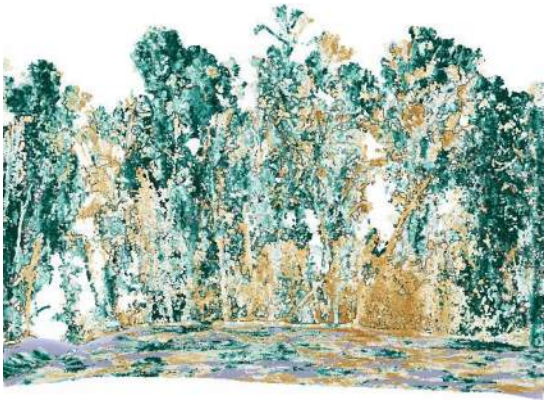
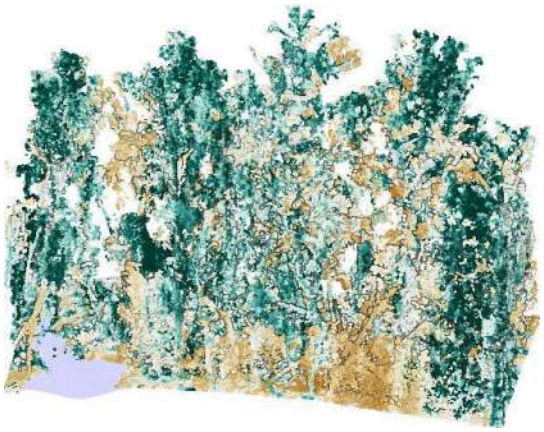


Photo 4



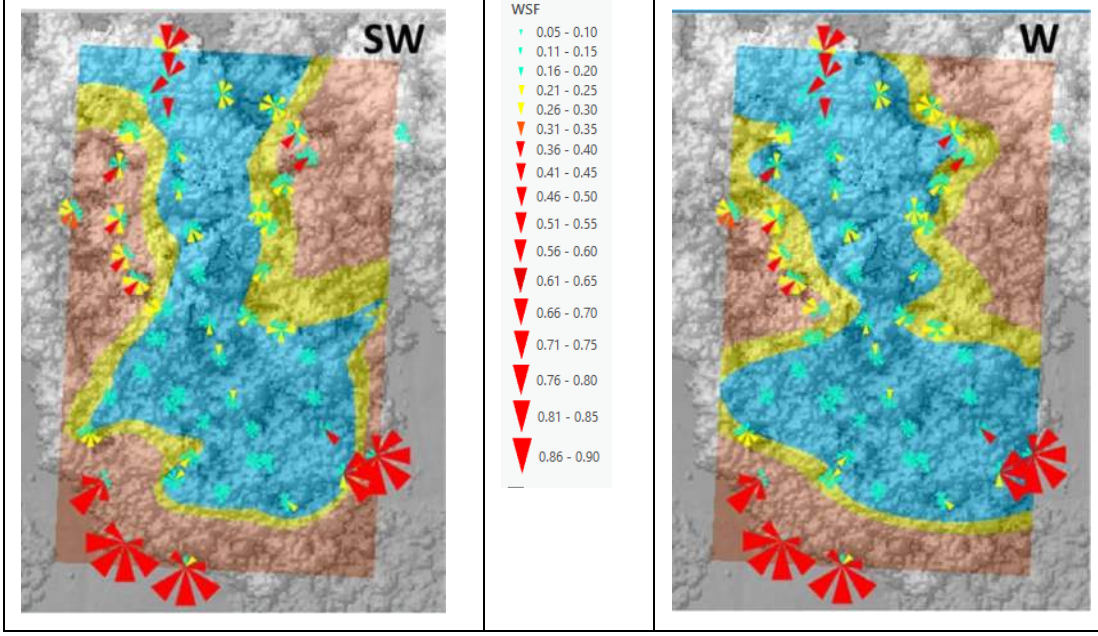
Below is a profile of forest, with the same NDVI color scale as Map 1, taken along the west edge of Ellwood Main (red rectangle). The small dip at the left is the road from the mesa going down to Deveraux Creek. The large masses of brown dead trees stand out, with a particularly dense mass of dead trees at the center-right. The oblique view gives some sense of the depth of the dead zone. All of the dead standing material will eventually fall to the ground, further opening up the canopy to wind.

Profile view west side Ellwood Main 	Oblique view west side Ellwood Main
	

Maps of wind exposure

The map below shows “wind roses” of the exposure from eight cardinal directions, with size of the arrow being proportional to the fraction of open sky in that direction. The arrows are color coded where blue is well-sheltered (<0.20), yellow is marginal (0.20-0.30) and red is high exposure (>0.30). The same colors are used for the interpolated surfaces of SW wind (left) and W wind (right).

The increased wind penetration into the western edge, caused by the tree deaths, is apparent in the red and yellow intrusions. Sealing up this edge will greatly increase habitat suitability within Ellwood Main.



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Attachment 2 – 2021/2022 Photographs



Photograph 1. View looking northeast into the Santa Barbara Shores neighborhood. High fuel load within 100 feet of a structure and over-hanging the residential fence.



Photograph 2. View facing southeast into Santa Barbara Shores neighborhood near Ellwood Main monarch butterfly over-wintering site. High fuel load within 100 feet of a structure and over-hanging the residential fence.



Photograph 3. View facing northwest into Santa Barbara Shores neighborhood near Ellwood Main monarch butterfly over-wintering site. High fuel load along hillside and within 100 feet of structures.



Photograph 4. View facing northeast into the Santa Barbara Shores neighborhood near Ellwood West monarch butterfly over-wintering site. Ornamental landscape and dense native vegetation within 100 feet of structures.



Photograph 5. View facing northeast into the Santa Barbara Shores neighborhood and Ellwood North monarch butterfly over-wintering site. High fuel load along fence line and within 100 feet of structures.



Photograph 6. View facing north into Santa Barbara Shores neighborhood and Ellwood North monarch butterfly over-wintering site. Eucalyptus branches overhanging property lines and within 100 feet of structures.



Photograph 7. View facing north into Ellwood North monarch butterfly over-wintering site. Dry, dense shrubbery and hazardous trees create high fuel load potential within monarch aggregation site.



Photograph 6. View facing south at the north end of the Ellwood North monarch butterfly over-wintering site. Downed and dead Eucalyptus trees create high fuel load within the grove near monarch aggregation sites.

Attachment 3

Final Monarch Butterfly Habitat Management Plan

Final
Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan

March 2019

Prepared by:

Planning and Environmental Review Department
Public Works Department
130 Cremona, Suite B
Goleta, California 93117
(805) 961-7500

Adopted by City Council on March 19, 2019 via Resolution No. 19-14

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TABLE OF CONTENTS

Section **Page**

EXECUTIVE SUMMARY V

INTRODUCTION 1

BACKGROUND 1

POLICY 4

Goleta General Plan/Coastal Land Use Plan – Conservation Element 4

Ellwood Mesa Open Space Plan 5

Community Wildfire Protection Plan 6

Goleta Urban Forest Management Plan 6

PURPOSE 6

METHODS 7

THE HABITAT MANAGEMENT PLAN 9

A. ADMINISTRATIVE PROGRAMS 9

1. Municipal Management Program 9
2. Fiscal Program 11
3. Interagency Cooperative Program 12
4. Community Wildfire Protection Program 13
5. Trail Management Program 19
6. Waste Management Program 20
7. Aesthetic Resources Management Program 21
8. MBHMP Review, Update, and Amendment Program 22
9. Catastrophic Event Response Program 23

B. NATURAL RESOURCES MANAGEMENT PROGRAMS 26

10. Monarch Butterfly Management Program 26
11. Wildlife Habitat Management Program 27
12. Tree Management Program 29

13. Integrated Pest Management Program....34
14. Habitat Enhancement and Restoration Program....36
15. Invasive Plant Management Program....38
16. Ecosystem-wide Management Coordination Program....41
C. OUTREACH PROGRAMS....43
17. Community Advisory and Docent Program....43
18. Interpretive Program....44
19. Education Program....45
D. MONITORING, RESEARCH, AND ADAPTIVE MANAGEMENT PROGRAMS....47
20. Biological Monitoring Program....47
21. Monarch Research Program....48
22. Adaptive Management Program....49
E. CONCLUSION....51
F. REFERENCES....52
G. LIST OF PREPARERS....53
City of Goleta....53
Althouse and Meade, Inc....53
Rincon Consultants, Inc....53
Agri-Turf Supplies, Inc....53

APPENDICES

Appendix A. Implementation Priorities, Schedule, and Estimated Costs.... A-1
Appendix B. Spectral Imaging and Analysis for Assessing Tree Health....B-1
Appendix C. Native Plants to be Included in Habitat Restoration Efforts.... C-1

LIST OF TABLES

Table 1. CWPP Prescription Guidance for Butterfly Aggregation Areas Adjacent to Structures 16

Table 2. Identified Threats and Potential Response Actions 30

Table A1. Implementation Priorities and Cost Estimates A-1

Table A2. Cost Estimates by Action A-3

LIST OF FIGURES

Figure 1. Vicinity Map 2

Figure 2. Monarch Butterfly Aggregation Sites 3

Figure 3. CWPP Related Fuel Reduction Zones within the MBHMP Area 15

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EXECUTIVE SUMMARY

This Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan (MBHMP) outlines the programmatic approach and methods for the City of Goleta (City) to manage and improve the Ellwood Mesa eucalyptus forest for the benefit of the overwintering behavior of the monarch butterfly (*Danaus plexippus*), other wildlife, and the public's use and enjoyment.

Two key local policy documents drive the protection of the monarch butterfly: the Goleta General Plan/Coastal Land Use Plan (General Plan; City of Goleta 2006) and The Ellwood-Devereux Coast Open Space and Habitat Management Plan (Open Space Plan; City of Goleta et al. 2004). The Coastal Land Use Plan is not yet certified. These policy documents provide an important context for this MBHMP.

The 22 programs detailed in this MBHMP organize and integrate the many diverse aspects of habitat management into an overall plan that can be implemented in a clear and concise manner. Each specific program identifies individual goals, policies, and actions to establish a well-organized and efficient process leading to a management strategy for the sustainability of monarch habitat at Ellwood Mesa. The programs are followed by implementation priorities, schedules, needs, and contacts for those responsible for the implementation.

The 22 programs are organized into four categories: Administrative Programs; Natural Resources Management Programs; Outreach Programs; and Monitoring, Research, and Adaptive Management Programs.

- The nine Administrative Programs are designed to assist the City with and inform the many MBHMP stakeholders of the details regarding implementation of the MBHMP.
- The seven Natural Resources Management Programs articulate the goals, policies, and actions necessary to maintain and improve the many important natural resources, including biological diversity and ecosystem functions associated with the Ellwood Mesa eucalyptus groves and the monarch butterfly aggregation sites they support.
- The three Outreach Programs are designed to provide information for visitors, educators, and students to help develop a broad appreciation for natural resources and local natural heritage, with a focus on monarch butterflies.
- The three Monitoring, Research, and Adaptive Management Programs provide a mechanism for assessing environmental conditions and conducting original studies to help understand the ecology of monarch butterflies, particularly at Ellwood Mesa. Information obtained from these programs and other sources can be used to adapt the MBHMP in response to additional information or changing conditions.

With adoption and implementation of this MBHMP, the City will fulfill a major commitment to the natural resources of Ellwood Mesa and its residents, and to all those committed to the conservation of monarch butterflies.

Funding for implementation of the MBHMP will be drawn from a variety of sources, which may include grants, donations, mitigation fees, and City funds. An implementation budget estimate is included in Appendix 1. On June 29, 2018, the California state budget for the 2018–2019 fiscal year was approved and included a provision allocating 3.9 million dollars to the City for management and restoration of the monarch butterfly habitats on Ellwood Mesa. The state funds will be maintained in an account separate from other City funds and will be used only for actions to restore, enhance, manage, and monitor butterfly habitats on Ellwood Mesa. In the near-term, this funding will be instrumental in getting the MBHMP's programs operational and in addressing some of the imminent habitat issues that presently face the grove.

INTRODUCTION

BACKGROUND

Monarch butterfly (*Danaus plexippus*) use of the eucalyptus groves on Ellwood Mesa in the City of Goleta (City), California has inspired many residents and visitors over the years to help in the preservation and conservation of this important natural phenomenon. These eucalyptus groves occur in the City-owned Ellwood Mesa/Sperling Preserve Open Space (Ellwood Mesa Open Space or Ellwood Mesa) (Figure 1).

Over-wintering monarch butterfly aggregations in Ellwood Mesa groves have numbered in the tens of thousands during some years, making Ellwood Mesa one of the most important sites for monarch butterflies in California (Pelton et al. 2016). Each fall, monarch butterflies in the western United States migrate to the coast of California from various locations throughout western North America. The butterflies arrive at Ellwood Mesa in mid-September and, as winter approaches, cluster into aggregation roosts, often called overwintering or wintering colonies. The butterflies remain until about mid-February, when they generally disperse inland.

The eucalyptus groves at Ellwood Mesa are called the Ellwood Complex. As shown on Figure 2, six monarch butterfly over-wintering sites occur in the complex: Sandpiper, Ellwood North, Ellwood West, Ellwood Main, Ellwood East, and Ocean Meadows. The Ellwood East site is on private property and not within the Ellwood Mesa Open Space and is therefore outside the scope of this Monarch Butterfly Habitat Management Plan (MBHMP); however, it is included for context. The Ellwood Main site is located along Devereux Creek and is the primary aggregation site for over-wintering butterflies in Ellwood Mesa.

Information and data regarding the condition of the butterfly population and groves—as well as trends in butterfly health, number, and behavior—were compiled over the last several years through a collaborative effort between City staff and the City's consultants—Althouse and Meade, Rincon Consultants, and Agri-Turf Supplies. Tracking butterfly numbers at Ellwood aggregation sites has been an ongoing effort that began in 1989 and has been maintained by the City since the City's incorporation in 2002. A Habitat Assessment was completed for Ellwood Mesa in 2013 to document the habitat conditions and health of the eucalyptus groves on the mesa (Althouse and Meade, Inc. 2013). In 2017, during the 5-year drought, the condition of the eucalyptus trees was assessed at the aggregation sites, and tree mortality was determined throughout Ellwood Mesa. The development of management priorities was an expanded effort between City staff, the consultant team, the City's monarch butterfly docents, and members of the public.

The monarch butterfly populations at Ellwood Mesa and in California statewide have declined at least 74% since the 1990's (Pelton et al. 2016). The monarch butterfly is listed on the California Department of Fish and Wildlife's (CDFW) Special Animals List with overwintering roosts designated as imperiled to vulnerable in the state (CDFW 2017). Currently, the species is under federal review for potential listing under the Endangered Species Act (ESA), and the U.S. Fish and Wildlife Service (USFWS) plans to make its determination of whether this species warrants ESA listing by June 30, 2019.

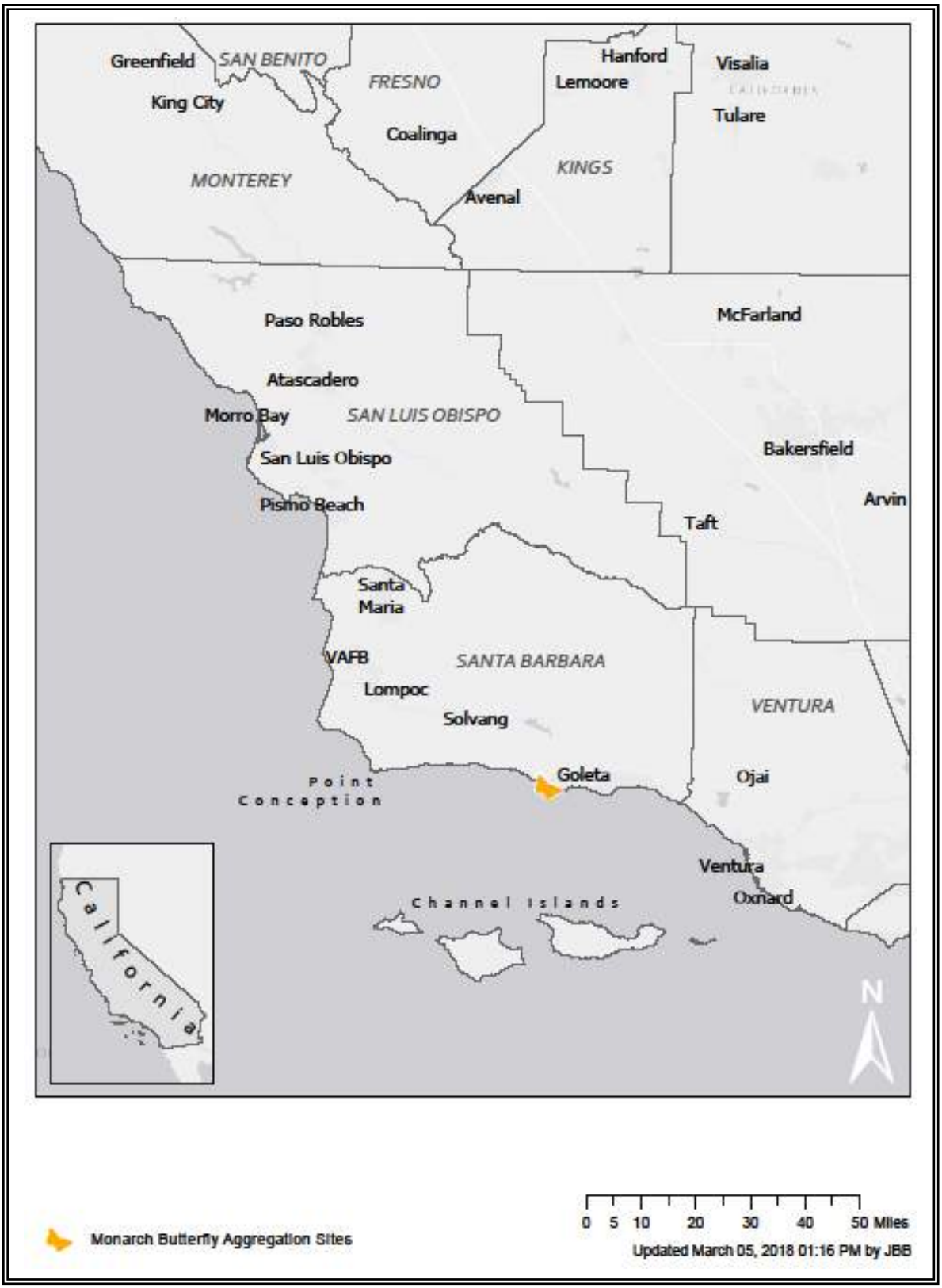


Figure 1. Vicinity Map

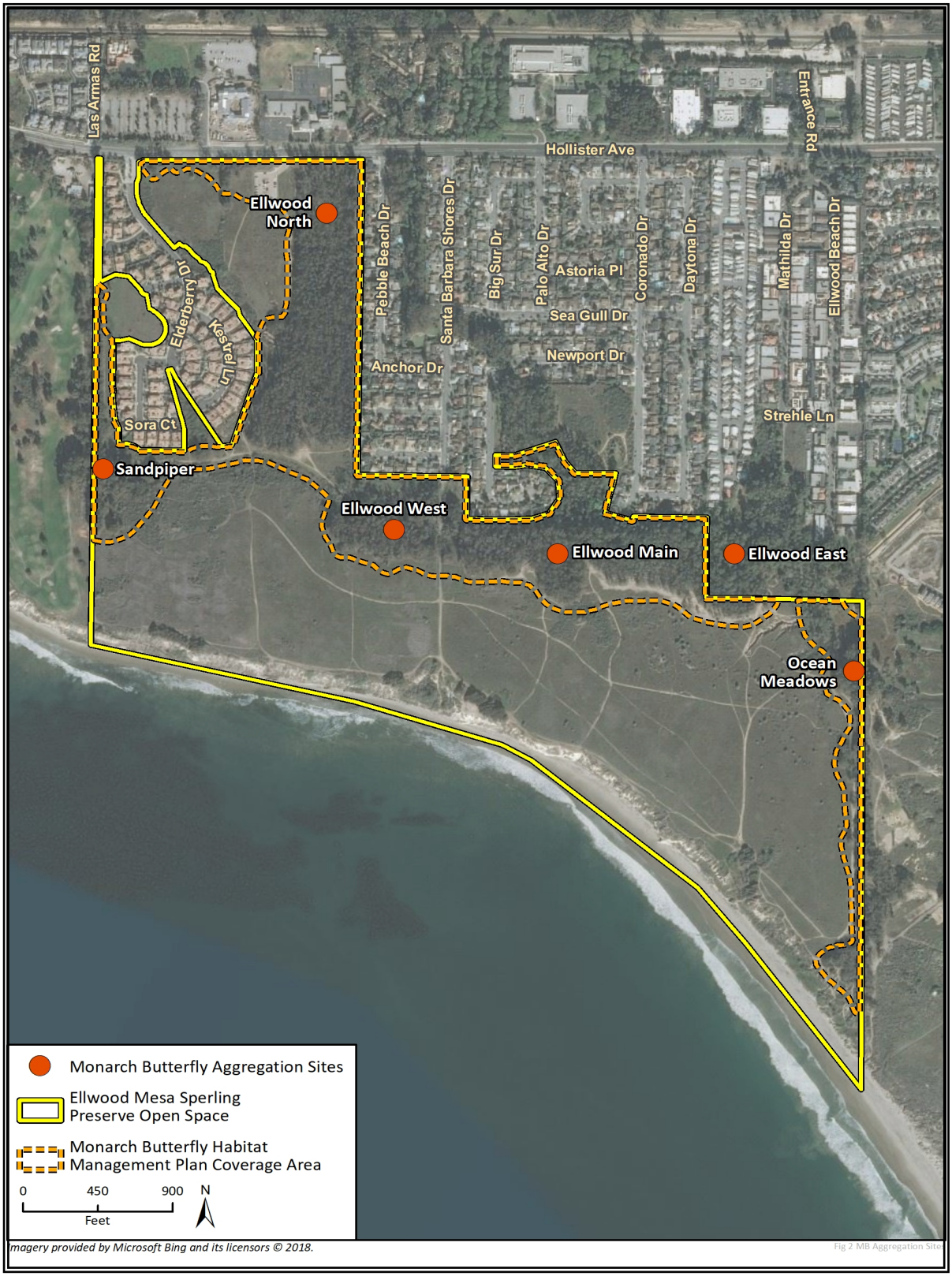


Figure 2. Monarch Butterfly Aggregation Sites



Photo 1. Monarch Butterfly (*Danaus plexippus*) Aggregation on Blue Gum (*Eucalyptus globulus*)

POLICY

Two key local policy documents drive the protection of the monarch butterfly: the Goleta General Plan/Coastal Land Use Plan (General Plan; City of Goleta 2006) and The Ellwood-Devereux Coast Open Space and Habitat Management Plan (Open Space Plan; City of Goleta et al. 2004). These policy documents provide an important context for this MBHMP. Additionally, the City's Community Wildfire Protection Plan (CWPP) was used as a key reference. The Goleta Urban Forest Management Plan (as amended and approved February 21, 2017) was also used to guide management recommendations. A summary of related policies and/or actions is provided below.

Goleta General Plan/Coastal Land Use Plan – Conservation Element

Monarch butterfly overwintering sites are considered Environmentally Sensitive Habitat Areas (ESHAs) under the Coastal Act because the occupied groves meet the definition of an ESHA in Section 30107.5 of the California Coastal Act. An ESHA is defined as follows:

> Any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

As such, autumnal and overwintering sites are protected by the Coastal Act and the General Plan. Specifically, the General Plan protects monarch butterflies and associated habitat via General Plan Conservation Element Policy 4, Protection of Monarch Butterfly Habitat Areas. The objective of the policy is as follows:

> To preserve, protect, and enhance habitats for monarch butterflies in Goleta, including existing and historical autumnal and winter roost or aggregation sites, and promote the long-term stability of over-wintering butterfly populations.

The definition of butterfly habitat is stated in subpolicy CE 4.1, Definition of Habitat Area, as follows:

> Sites that provide the key elements essential for successful monarch butterfly aggregation areas and are locations where monarchs have been historically present shall be considered ESHAs. These elements include stands of eucalyptus or other suitable trees that offer shelter from strong winds and storms, provide a microclimate with adequate sunlight, are situated near a source of water or moisture, and that provide a source of nectar to nourish the butterflies.

Additional subpolicies pertaining to the protection of this important local resource are provided in Policy CE 4 of the General Plan Conservation Element and were used to guide the preparation of this MBHMP.

Ellwood Mesa Open Space Plan

The 230-acre Ellwood Mesa is part of a 652-acre contiguous open space along the Ellwood-Devereux Coast that is managed by the City, the County of Santa Barbara, and the University of California, Santa Barbara (UCSB). In March 2004, these three agencies released The Ellwood-Devereux Coast Open Space and Habitat Management Plan (City of Goleta et al. 2004). The sections of the plan applying to the Goleta properties (referred to as the Ellwood Mesa Open Space Plan) were adopted by the Goleta City Council on June 24, 2004.

The Ellwood Mesa Open Space Plan establishes the following goal and policies that guide the management actions related to the monarch butterfly and supporting habitat:

> **Monarch Goal 1.** Protect and maintain existing monarch butterfly populations in the Open Space Plan Area, and manage the habitats to be self-sustaining.
>
> > **Monarch Policy 1.** Manage public access to protect butterflies and their habitat, while promoting public enjoyment, education, and scientific research.
> >
> > **Monarch Policy 2.** Conduct scientifically sound studies using appropriate and cautious methods to maintain and improve habitat conditions to ensure long-term viability of the population.
> >
> > **Monarch Policy 3.** Implement phased habitat improvements using pilot programs, small-scale projects, and adaptive management.

Additional overarching management goals and policies are provided in the Ellwood Mesa Open Space Plan and were used to guide the preparation of this MBHMP.

Community Wildfire Protection Plan

The City's CWPP was adopted by the City Council on March 20, 2012. The purpose of the CWPP is to enhance community wildfire protection by identifying fire hazard treatments that are in balance with sustainable ecological management and fiscal resources. The CWPP presents design standard recommendations for fuel treatments specific to areas near butterfly aggregation sites that are intended to minimize adverse effects on adjacent habitat while reducing hazardous fuels. Key recommendations focus on the coordination between butterfly and wildland fire experts during planning and implementation of fuel treatment strategy prescriptions. The CWPP was used during the preparation of this MBHMP, and this MBHMP is intended to support implementation of the CWPP, which is further discussed in detail in Program 4 (City of Goleta 2012).

Goleta Urban Forest Management Plan

The Goleta Urban Forest Management Plan (GUFMP) (as amended and approved February 21, 2017) was also used to guide management recommendations. The GUFMP provides a guide for the long-term preservation and enhancement of the urban forest within the City's jurisdiction. The urban forest is defined as all public and private trees including the street tree system, trees in parks and other public lands, and trees on private properties throughout the City. The vision statement of the GUFMP is:

> Goleta's urban forest is a thriving and sustainable mix of tree species and ages that creates a contiguous and healthy ecosystem that is valued and cared for by the City and all of its citizens as an essential environmental, economic and community benefit.

The GUFMP Section 4.7 Very Mature Tree Care calls to establish a regular maintenance program for trees located in parks, open spaces, and median islands to ensure very mature tree health. Mulching, fertilization, and pruning are three major practices used to tend to mature trees. The MBHMP fulfills this section for a tree maintenance program for Ellwood Mesa eucalyptus groves.

PURPOSE

The purpose of the MBHMP is to provide a programmatic approach to management of the habitats that support the monarch butterfly seasonal aggregation areas at the Ellwood Mesa Open Space, as well as a variety of other plant and animal species and coastal access and recreation. The intent of the management approach is to maintain and improve habitat conditions to ensure long-term viability of the monarch butterfly population, while allowing for coastal access, education and compatible recreational opportunities. The 22 programs detailed in this MBHMP organize and integrate the many diverse aspects of habitat management into an overall plan that can be implemented in a clear and concise manner.

METHODS

This MBHMP is the result of careful consideration of existing information, site surveys, inventory, and assessment of tree health within the groves, consultation with a broad array of professionals and interested public, and discussions with City staff. The City collaborated with Althouse and Meade, Inc. and Rincon Consultants, Inc. in the preparation of this MBHMP. This MBHMP is composed of 22 programs, each of which contains a goal, one or more policies, and one or more actions associated with each policy. Information on program status, needs, and contacts are also included, as well as general priority and schedule information and an annual cost estimate (Appendix 1). A main focus of each program is to establish an implementation structure with targets and actions to achieve present and future goals. . The scope of this MBHMP includes monarch butterfly habitat in the City's Ellwood Mesa Open Space, including aggregation sites, forest areas, and nectaring locations (refer to Figure 1 for a vicinity map and Figure 2 for a map of the butterfly aggregation sites and Habitat Management Area).

For the purposes of this MBHMP, the following definitions apply:

Program: a planned series of activities.

Goal: a broad statement of program intentions.

Policy: a set of plans or actions agreed upon by the interested parties.

Action: the process of doing something to achieve a goal.

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This MBHMP for the Ellwood Mesa Open Space is organized into four categories: Administrative Programs; Natural Resource Management Programs; Outreach Programs; and Monitoring, Research, and Adaptive Management Programs. These programs—including their goals, policies, actions, implementation priorities, and schedules—are described in the sections that follow. None of the MBHMP's programs should be interpreted to preclude maintenance work required to remove immediate hazards to life or property.

A. ADMINISTRATIVE PROGRAMS

Administrative programs are designed to assist the City and inform the many MBHMP stakeholders of the details regarding implementation of the MBHMP. Identifying specific programs and their goals, policies, and actions enables a well-organized and efficient process to be established that leads to a management strategy for the sustainability of monarch habitat at Ellwood Mesa.

It is the City's intent that the goals and policies of this MBHMP should be considered and incorporated into future land use planning and policy documents, such as General Plan amendments and a Local Coastal Program, as appropriate, as these documents are developed.

1. Municipal Management Program

Overview: This program focuses on the role of the City as manager of the Ellwood Mesa Open Space and, in particular, the role of the City in the implementation of this MBHMP. Habitats included in this MBHMP include primarily the eucalyptus groves and windrows used by monarch butterflies for winter aggregations at Ellwood Mesa, covering approximately 230 acres from Hollister Avenue south to the ocean bluffs and from UCSB west to the Sandpiper Golf Course. The eucalyptus groves and windrows occur in the context of coastal mesa grasslands, coastal scrub, riparian habitats, and residential development. Therefore, they are part of a larger coastal ecosystem and neighborhood, with management priorities for which the MBHMP is designed to be compatible.

Goal 1. To implement the MBHMP, with the City providing the administrative structure to oversee the programs and scheduling, and to interface with the community at large.

Policy 1-1. The City shall review, and revise as necessary, the MBHMP to reflect current data, butterfly conservation science, and management techniques that apply to the local monarch population.

Action 1-1.1. Conduct a public workshop to inform the community regarding the content and implementation of this MBHMP.

Action 1-1.2. Conduct environmental review of this MBHMP, including a public hearing.

Action 1-1.3. Prepare any necessary revisions to this MBHMP to resolve any issues identified during public review.

Action 1-1.4. Submit this MBHMP to the Goleta City Council for review and discussion, followed by adoption and implementation.

Policy 1-2. During implementation of the programs, goals, policies, and actions described in this MBHMP, and during the planning and implementation of other projects that may affect monarch butterfly habitat within the Ellwood Mesa Open Space, protection of the environment and specifically of monarch butterfly habitat shall be given the utmost consideration.

Action 1-2.1. Whenever vegetation removal, ground disturbance, construction, or other activities with the potential to significantly disrupt habitat values are proposed within the MBHMP coverage area by the City or any other agency or utility, environmental protection measures shall be implemented. These measures shall be determined in coordination with a qualified biologist, and shall include at a minimum pre-activity surveys for nesting birds or other wildlife, pre-activity surveys for monarch butterfly aggregations, presence of an environmental monitor during construction, and other protections, as deemed appropriate. The City will monitor these activities to ensure that environmental protection measures are used and that activities are limited to those permitted.

Policy 1-3. Because many of the MBHMP actions are related to trail improvements, tree work, and related project implementation monitoring and reporting, the City's Public Works Department shall oversee the implementation of this MBHMP. Public Works personnel overseeing implementation will have specific knowledge and experience to properly follow directives of this MBHMP.

Action 1-3.1. The City's Public Works Department, Neighborhood Services and Public Safety Department, and Planning and Environmental Review Department will coordinate regularly regarding MBHMP implementation.

Policy 1-4. The MBHMP is an overarching, long-term conservation strategy, setting forth the broad objectives, desired outcomes, and management policies for the Ellwood Mesa monarch butterfly habitat. Periodic Implementation Plans shall identify and describe short-term actions needed to further the goals and objectives of the MBHMP, taking into consideration current conditions and funding levels at the time each Implementation Plan is prepared.

Action 1-4.1. On an annual basis, or as warranted based on habitat conditions as determined by the City's Public Works Department, prepare an Implementation Plan identifying the actions planned to implement the MBHMP's programs, goals, policies, and actions during the coming year.

Action 1-4.2. The City's Public Works Department shall present each annual Implementation Plan at a public hearing for stakeholder input and City Council approval.

Program Status: This MBHMP has been completed and is in the process of undergoing environmental review.

Program Needs: A public workshop, MBHMP review and revision as needed, and a public hearing—followed by adoption by City Council—are to be achieved.

Program Contact: Public Works Department

2. Fiscal Program

Overview: Successful implementation of this MBHMP and related conservation of the Ellwood Mesa Open Space depend in part on the ability to provide funding for the various programs contained in this MBHMP. Funding will come from a variety of sources as identified herein.

Goal 2. To provide short-term (annual), long-term (endowment), and special project (grant) funding for the implementation of this MBHMP.

Policy 2-1. The City shall consider providing annual funding to support MBHMP implementation.

Action 2-1.1. Consider appropriating General Fund, Special Revenue Fund, or Grant Fund monies, as available, during the bi-annual and mid-cycle budget processes.

Action 2-1.2. Consider including the implementation of MBHMP as a project sheet in the Capital Improvement Program annual budget.

Action 2-1.3. Develop an annual needs list from which the annual operating budget can be determined. This list should be included in the annual Implementation Plan (see Policy 1-3).

Policy 2-2. The City shall manage and use the City's Ellwood Mesa Butterfly Fund (Butterfly Fund) (226-5-9800-706) to pay for the implementation of the MBHMP and special projects consistent with the requirements of the fund. The Butterfly Fund shall be supplemented by grant funds and compensatory mitigation fees, as available.

Action 2-2.1. Manage the Butterfly Fund such that the fund may serve as an implementation funding source. Continue to identify grant funds to supplement the Butterfly Fund. Accept donations specific to the Butterfly Fund.

Action 2-2.2. Allow payments of compensatory mitigation fees into the Butterfly Fund, as deemed appropriate during CEQA analysis for projects with limited impacts on monarch butterfly habitat.

Program Status: The City provides annual funds in support of planning initiatives and general management needs at the Ellwood Mesa Open Space. With adoption of this MBHMP, funds can be

earmarked annually for implementation of programs and specific actions within this MBHMP. Furthermore, grants and other fundraising opportunities will exist for which City funds can be used as a local match to new funds raised from external sources. In the near term, the $3.9 million allocated in the State Budget will provide a vital funding source.

Program Needs: Adoption of this MBHMP so the Fiscal Program can be implemented.

Program Contact: Public Works Department

3. Interagency Cooperative Program

Overview: In today's complex regulatory environment, important sites for natural resource conservation can be subject to conflicting regulatory goals at the federal, state, county, and municipal levels. Management of threatened or endangered species that may occur in the future—and rare species and sensitive habitats at Ellwood Mesa—require careful coordination among regulatory partners so that conflicts are minimized.

Goal 3. To develop cooperative relationships with federal, state, county, and municipal agencies toward the implementation of integrated management practices favorable to the conservation of the monarch butterfly habitats at Ellwood Mesa Open Space.

Policy 3-1. The City shall pursue cooperative relationships with other agencies regarding regulatory goals and policies that the partners have in common concerning the Ellwood Mesa Open Space, in particular, goals and policies that have an impact on the management of the monarch butterfly aggregation sites.

Action 3-1.1. As appropriate and productive, pursue cooperative relationships with federal agencies such as the USFWS and the U.S. Army Corps of Engineers to obtain potential permits, identify funding opportunities, and identify/pursue other potentially shared interests regarding the natural resources at Ellwood Mesa, with a focus on sustaining monarch butterfly aggregation sites.

Action 3-1.2. As appropriate and productive, pursue cooperative relationships with state entities such as the CDFW, Regional Water Quality Control Board (RWQCB), UCSB, and California Coastal Commission (CCC) to obtain potential permits, identify funding opportunities, and identify/pursue other potentially shared interests regarding the natural resources at Ellwood Mesa, with a focus on sustaining monarch butterfly aggregation sites.

Action 3-1.3. As appropriate and productive, pursue cooperative relationships with Santa Barbara County departments (such as Agricultural Commissioner, Fire, Parks, Planning and Development, Flood Control, and Public Works) to obtain potential permits, identify funding opportunities, solve problems, and identify/pursue other potentially shared interests regarding the natural resources at Ellwood Mesa and adjacent properties, with a focus on sustaining monarch butterfly aggregation sites.

Program Status: City staff regularly coordinates with the County of Santa Barbara and UCSB. Additionally, City staff has formed a functioning interdepartmental working relationship among the Public Works Department, Neighborhood Services and Public Safety Department, and Planning and Environmental Review Department regarding the management of Ellwood Mesa. Many additional productive relationships can be pursued related to the conservation of monarch and other butterflies.

Program Needs: Adoption of this MBHMP and implementation of its programs.

Program Contacts: Public Works Department, Neighborhood Services and Public Safety Department, and Planning and Environmental Review Department

4. Community Wildfire Protection Program

Overview: One of the most important efforts regarding coordination of potentially competing management goals is the identification and resolution of conflicts between the actions to protect the adjacent communities from the threat of wildfires while also providing protection of the habitats for seasonal aggregation of monarch butterflies at the Ellwood Mesa Open Space. The groves and windrows, composed primarily of blue gum eucalyptus (*Eucalyptus globulus*), are fire-prone and can present a threat to residential communities adjacent to the butterfly habitats. The CWPP was produced in coordination with this MBHMP to provide management practices compatible with monarch butterfly aggregation site protection. The City's adopted CWPP provides important context for the management of these resources.

Ellwood North, Main, and West sites are the aggregation locations within the groves on Ellwood Mesa that are directly adjacent to residences along eucalyptus grove boundaries (Figure 2). The Sandpiper site is not directly adjacent to structures, but it is adjacent to the Sandpiper Golf Course (Figure 2). In habitat areas that are not adjacent to structures, fuel treatments consist of mowing along the outside edge of the grove.

The Monarch Butterfly Aggregation Area Treatment Strategy section of the CWPP states that fuel treatments in areas near human developments are critical measures in the wildfire protection strategy for both residences and butterfly aggregations and habitat. Trees along grove edges provide wind and weather protection for aggregation sites. Therefore, it is important to maintain adequate tree density inside these edges (The Xerces Society 2017). Larger trees are not the primary fuel of concern in the spread of wildfire; rather, the greater hazard and threat are understory vegetation, dead/downed trees, and fuels that could create fire ladders. The CWPP describes the prescription guidance for butterfly aggregation areas adjacent to structures and outlines approved actions to be taken within 100 ft. of structures to reduce the ignitability of those structures. Figure 3 shows the CWPP fuel reduction zones within the MBHMP area.

In butterfly aggregation areas within 100 ft. of homes, the fuel treatment strategy prescribed by the CWPP includes removal of understory, ladder fuel, and dead/downed fuel. Careful thinning of smaller or unhealthy trees within 30 feet of the grove edge is recommended while considering the wind buffering needs of the aggregation site. Fuel reduction implementation and subsequent monitoring should involve input by City-approved monarch butterfly and wildfire professionals.

Goal 4. To provide management practices within the eucalyptus groves and windrows that support healthy monarch butterfly habitat and are compatible with the City's CWPP.

Policy 4-1. The goals, policies, and actions of this MBHMP shall be consistent with the intent of the CWPP to reduce the ignitability of homes and structures.



Figure 3. CWPP-related fuel reduction zones within the MBHMP area

Action 4-1.1. Support implementation of Goleta's CWPP in the 100-ft. buffer from homes and structures as the 100 ft. extends into the Ellwood Mesa eucalyptus groves with actions outlined in below in Table 1 (as seen in Table 14 of the CWPP).

Table 1. CWPP Prescription Guidance for Butterfly Aggregation Areas Adjacent to Structures

Location	Primary Defense Zone (A)*** (0 – 30')	Fuel Reduction Zone (B*** (30' – 100')
Fuel Type	Based on Defensible Space PRC – 4291 and Firefighter Safety	
Grass/ Forbs	Reduce fuel depth to 4 inches; methods include mowing, masticating, weed-whacking, biological browsing	Same treatment as (A); longer grass in isolated open areas is acceptable.
Surface dead/ down material	Clear dead/down flammable materials; methods include raking, hand-piling/ removal, masticating chipping/ dispersal on site	Reduce dead/down flammable material to < 3" depth; methods same as (A).
Brush/ Shrub fuel	Remove to a spacing (between edges of brush) generally 2x brush height on <20% slopes; methods include masticating or hand-cutting, biological browsing	Same Treatment as (A); a pocket or clump of brush can be treated as one large shrub in more open site conditions.
Trees Overstory without brush understory	Trim or thin only trees that do not provide protection to monarch butterfly aggregation sites* Thin smaller or unhealthy trees at 10 – 20 ft crown spacing (as determined by slope, tree size and type); Leave larger trees unless toppling hazard.** Reduce ladder fuels by pruning lower branches 6-15 ft up, or lower 1/3 of tree height on trees smaller than 18 ft.	Trim or thin only trees that do not provide protection to monarch butterfly aggregation sites* Thin smaller or unhealthy trees at approximately 10 ft crown spacing (as determined by slope, tree size and type);. Leave larger trees unless toppling hazard.** Reduce ladder fuels by pruning lower branches approximately 6 ft up, or lower 1/3 of tree height on trees smaller than 18 ft.

Location	Primary Defense Zone (A)*** (0 – 30')	Fuel Reduction Zone (B*** (30' – 100')
Fuel Type	Based on Defensible Space PRC – 4291 and Firefighter Safety	
Trees Overstory with brush understory	Trim or thin only vegetation that does not provide protection to monarch butterfly aggregation sites* Thin small or unhealthy trees at 10-20 ft crown spacing (based on slope, tree size and type). Leave larger trees at 10 ft. crown spacing unless toppling hazard.**(Reduce ladder fuels by pruning lower branches 6-15 ft up, or lower 1/3 of tree height on smaller trees In understory: remove brush ladder fuel. Methods include masticating or hand-cutting.	Trim or thin only vegetation that does not provide protection to monarch butterfly aggregation sites* Thin small or unhealthy trees to approximately 10 ft. crown spacing. Leave larger trees unless toppling hazard.** Reduce ladder fuels by pruning lower branches approximately 6 ft up, or lower 1/3 of tree height on smaller trees. In understory remove brush ladder fuel. In non-canopied areas, non-continuous patches of shrubs or small trees in openings is acceptable. Methods include masticating or hand-cutting.

*As determined by the Goleta City Project Manager overseeing mitigation work in consultation with a City-approved monarch butterfly specialist and a City-approved wildland fire specialist.
**As determined by the Goleta City Project Manager and Goleta City arborist.
***For further information specific to homeowner/structure mitigation measures see CWPP Section 6.2.1.

Action 4-1.2. Support implementation of Goleta's CWPP, specifically in regard to guidelines that are not in potential conflict with the management of the groves that support monarch butterfly aggregation sites, as noted below.

Action 4-1.3. Maintain and revegetate moderate cover of understory in and around aggregation sites with fire-resistant, native plant species (The Xerces Society 2017) (Appendix 3).

Action 4-1.4. Conduct all wildfire protection work within 300 feet of butterfly aggregations areas between April 1 and September 15, outside of monarch butterfly overwintering season.

Action 4-1.5. Coordinate with City-approved butterfly and wildland fire experts during planning and implementation of any fuel treatments since conditions within groves can change and aggregation locations may shift.

Action 4-1.6. Install a large, bilingual "NO PARKING-FIRE LANE" sign at Santa Barbara Shores access gate.

Policy 4-2. Trees in the groves containing monarch butterfly aggregation sites shall be managed, as feasible, to ensure their health and longevity in the context of a high fire hazard environment.

Action 4-2.1. Implement Program 12, Tree Management Program, to reduce fire hazard, improve public safety, and eliminate trees that are threatening the sustainability of the aggregation sites, including dead, diseased, and dying trees.



Photo 2. Evidence of Wildfire (Charred Trunks) at Main Grove – East, Ellwood Mesa Open Space

Program Status: The CWPP was adopted with the passage of Resolution No. 12-21 by the Goleta City Council on March 20, 2012.

Program Needs: Adoption and implementation of CWPP and the MBHMP will result in a reduction of wildfire hazards associated with eucalyptus groves.

Program Contact: Public Works Department

5. Trail Management Program

Overview: Public access trails are located through or adjacent to most of the monarch butterfly aggregation sites on Ellwood Mesa. These localized trails link together a series of regional trails, adjacent residential neighborhoods, and other preserves, such as the Coronado Butterfly Preserve managed by the Santa Barbara Land Trust and open space lands managed by the University of California system. Public access, including organized field trips to see the seasonal aggregations of monarch butterflies, is an important part of the Ellwood Mesa experience. However, repeated and increasing access along the semi-formal trails can result in negative impacts on the habitats and overall site aesthetics. Additionally, the trees constituting the butterfly habitat do occasionally die, fall, and shed limbs, creating hazardous conditions for recreationalists at certain locations.

Goal 5. To develop and maintain public access trails that provide a safe and meaningful experience for visitors while also limiting impacts on habitats and wildlife, in particular, monarch butterflies and their seasonal aggregation sites.

Policy 5-1. The City shall maintain existing public access trails that provide a safe experience for visitors to the eucalyptus groves supporting seasonal monarch butterfly aggregation sites.

Action 5-1.1. Maintain existing public access trails through the eucalyptus groves supporting monarch butterfly aggregation sites by reducing threats of trips, slips, and falls. May use Trails Council and CCC to help with maintenance.

Action 5-1.2. Implement Program 12, Tree Management Program, to reduce the threats from falling tree limbs and trunks.

Action 5-1.3. Repair damage to trial boundary ropes and posts, as needed.

Action 5-1.4. Prevent damage to seasonal monarch habitat by installing additional trail boundary posts, ropes, and signs, as necessary, consistent with those at the Ellwood Main monarch aggregation area.

Action 5-1.5. Use wood chips on trails to reduce soil compaction and decrease erosion during wet months.

Action 5-1.6. Retain and maintain Ellwood Main visitor viewing area boundary signs and rails.

Action 5-1.7. Review locations of trail and viewing area delineations and adjust if needed to protect trees or butterflies, annually.

Action 5-1.8. Review trail conditions on an annual basis and provide recommendations on improvements and modifications regarding human safety, trail maintenance, and ecosystem health, including conservation of monarch butterfly habitat in relationship to location,

condition, use of trails, and number of visitors. Include recommendations for any tree trimming, removal recommendations, or other tree safety issues in the annual Implementation Plan.

Action 5-1.9. Long-term closure of official trails is undesirable and should not be used as a management approach. It is preferable to remedy trail hazards promptly, or to allow trails to remain open with appropriate signage alerting users to the risks present.

Policy 5-2. Maintain and improve existing links between trails associated with eucalyptus groves that support monarch butterfly aggregation sites at Ellwood Mesa with the adjacent Coronado Butterfly Preserve.

Action 5-2.1. Coordinate trail improvement activities with the Santa Barbara Land Trust and UCSB staff to ensure that improvements are compatible.

Action 5-2.2. Coordinate trail improvements with proposals for the Coastal and Juan Bautista De Anza trails that traverse Ellwood Mesa, which also link to trails within the eucalyptus groves that support monarch butterfly aggregation sites, to ensure protection measures are addressed for the aggregation sites.

Program Status: Public access trails already exist within the majority of the aggregation sites, but human safety issues exist because of the poor condition of many eucalyptus trees along the trails and eroded trail conditions. Impacts on eucalyptus groves supporting monarch butterfly aggregation sites also exist as a result of public access.

Program Needs: Dead and dying trees along trails and viewing areas present a public safety risk and risk to habitat stability. The Implementation Plan should detail work to be accomplished on an annual basis to maintain access and protect the public and sensitive habitat. Eroded trail conditions and overhanging trees can be public safety issues as well as tree health issues, necessitating trail improvements.

Program Contact: Public Works Department

6. Waste Management Program

Overview: Although the City's Public Works Department staff conducts inspections and removes easily visible waste and trash, unauthorized off-trail use, homeless encampments, and related trash dumping periodically occur in the Ellwood Mesa's eucalyptus groves. The City's butterfly docents also remove trash and alert the Public Works Department staff when there are new accumulations of trash and/or other debris that are too large or abundant for hand removal.

Goal 6. To maintain a waste-, trash-, and debris-free butterfly habitat management area.

Policy 6-1. The City shall collect, remove, and appropriately dispose of all waste, trash, and debris that accumulate in habitat on Ellwood Mesa.

Action 6-1.1. Continue to remove existing accumulations of waste, trash, and debris from monarch butterfly habitat and dispose of them in an appropriate manner. Coordinate with Sheriff's Office for removal of homeless encampments, if necessary.

Policy 6-2. The City shall inform visitors of the monarch butterfly habitat of rules relating to trash and debris policies associated with monarch butterfly habitat.

Action 6-2.1. Post signs at appropriate locations stating open space user rules; for example, "Please take out your trash" and, "Day Use Only – Camping Prohibited."

Action 6-2.2. Educate the public through seasonal, on-site presence by the City's butterfly docents about the importance of maintaining the groves free of trash.

Action 6-2.3. Place trash cans in the parking lot. Inspect annually and replace as needed.

Program Status: Despite trash removal attempts by Public Works Department staff and the City's butterfly docents, various sites throughout the monarch butterfly habitat at Ellwood Mesa accumulate trash and other debris from human activity.

Program Needs: Trash and debris should be removed, where feasible, from the Ellwood Mesa habitat that support monarch butterfly aggregation sites.

Program Contact: Public Works Department, Neighborhood Services and Public Safety Department

7. Aesthetic Resources Management Program

Overview: Portions of Ellwood Mesa eucalyptus groves suffer from grove senescence, drought, pests, disease, or lack of formal management efforts that maintain consistent aesthetic values. Fencing and signs are irregularly installed and inconsistently maintained. They also lack a consistent theme. This MBHMP would provide a consistent management structure.

Goal 7. To integrate this MBHMP's programs into an effort to improve the quality of aesthetic resources of the Ellwood Mesa, in particular, the eucalyptus groves and windrows supporting monarch butterfly aggregation sites.

Policy 7.1. The City shall provide stewardship and management oversight of the eucalyptus groves, in particular, those areas supporting monarch butterfly aggregation sites.

Action 7-1.1. Adopt and implement this MBHMP, including its 22 management programs.

Action 7-1.2. Provide integration of program goals, policies, and actions to improve the overall aesthetics of the various groves, including installation of a consistently designed

interpretive program and strategically placed fencing, as more specifically outlined in Program 18, Interpretive Program.

Policy 7.2. Signs, fencing, and restoration efforts associated with monarch butterfly habitat on Ellwood Mesa shall be aesthetically compatible with natural conditions.

Action 7-2.1. Review signage and fencing design for compatibility with the Ellwood Mesa natural areas.

Action 7-2.2. Review restoration plantings and activities for appropriate aesthetic compatibility.

Program Status: Adoption and implementation of this MBHMP will result in a more sustainable and visually pleasant user experience because of the improved aesthetic value of the Ellwood Mesa eucalyptus groves and monarch butterfly aggregation sites.

Program Needs: Adopt and implement this MBHMP.

Program Contact: Public Works Department

8. MBHMP Review, Update, and Amendment Program

Overview: Reviewing and updating key planning documents would ensure that the management goals and actions are working as intended. Updating and amending programs, when needed, would ensure that the planning document is responsive to the changing needs of the community and the resource.

Goal 8. To maintain the relevance of this MBHMP with periodic reviews, updates, and amendments.

Policy 8-1. The City shall review this MBHMP as the need for updates and amendments arises (e.g., changes in physical conditions, regulations, or expansion of habitat management knowledge or strategies) or at least every 5 years.

Action 8-1.1. Conduct internal and public review of this MBHMP, as conditions warrant.

Action 8-1.2. Update information in this MBHMP, as conditions warrant.

Action 8-1.3. Amend programs, goals, polices, and actions in this MBHMP to reflect the results of the review and update process.

Action 8-1.4. Seek public input on amendments to programs, goals, polices, and actions in this MBHMP.

Action 8-1.5. Conduct environmental review, if necessary (new or modified policies and actions pose new impacts).

Action 8-1.6. Obtain approval by the Goleta City Council and adopt amended MBHMP.

Program Status: Adoption of this MBHMP by the City will provide the mechanism for review, update, and amendment.

Program Needs: Commitment to update this MBHMP to ensure that it is meeting the demands of the existing conditions.

Program Contacts: Planning and Environmental Review Department and Public Works Department

9. Catastrophic Event Response Program

Overview: The eucalyptus groves at Ellwood Mesa are at risk of catastrophic environmental events. For example, trees falling during powerful storms could cause collapse of additional trees, excessive fuel loads can spread wildfires, and infestations of insect pests can weaken or kill trees. Because such potential catastrophic events are likely to occur within the monarch butterfly aggregation sites, Program 9, Catastrophic Event Response Program, would put in place a preliminary plan of action to address the consequences of loss of trees or entire groves containing monarch butterfly aggregation sites.

For the purpose of this MBHMP, a catastrophic environmental event is defined as an event causing great ecological distress and damage, either sudden or gradual, across a significant portion of the monarch butterfly habitat within the Ellwood Mesa plan area. This is distinct from an emergency, which may involve emergency responders such as the fire department and would involve immediate actions under their direction to protect life and property. A qualifying catastrophic event could negatively affect a large portion of the eucalyptus groves within the Ellwood Mesa, or could cause substantial damage to single monarch butterfly overwintering site.

The response actions for catastrophic events would primarily involve restoration activities, would not necessarily be funded in the annual budget for this MBHMP and would likely require supplemental funding with approval from the City Council. Funding approved by the City Council should include a finding that the condition is a qualifying catastrophic event. If such a finding is made, funding received through the State Budget or other sources may be also used to address catastrophic events.

As of this writing, the 5-year drought in Goleta from 2012 to 2016 has created dire conditions for the eucalyptus trees at Ellwood Mesa (County of Santa Barbara 2018). Arborists estimate that over 1,200 trees are dead or dying due to drought, drought stress, and infestation by pests across the Ellwood Mesa. The monarch overwintering sites are suffering from the die-back of trees with the loss of canopy and wind protection and loss of roosting branches. The last similar 5-year drought on record for the Goleta area was in 1947–1951 and was not as severe, with 58.05 consecutive rainfall inches, compared with 50.83 inches during the 2012–2016 drought years (County of Santa Barbara

2018). Timing of rainfall since 2012 has also been more concentrated than in prior years, with the annual rainfall occurring in a small number of intense storm events rather than a larger number of small or gentle events. This concentration has come with an increased rainfall intensity, which leads to increased runoff, excess erosion and sediment transport, and decreased groundwater recharge. The ultimate result has been less available water for uptake by trees.

The 5-year drought and the death of over 1,200 trees may qualify as a catastrophic event, if so determined by the City Council.

Goal 9. To prepare for possible catastrophic environmental events within the monarch butterfly aggregation sites by adopting a set of actions that potentially minimize the impacts and plan for a response should such events affect the groves in which aggregation sites are located.

Policy 9-1. The City shall adopt a set of protocols that could minimize the impacts from potential catastrophic environmental events.

Action 9-1.1. Implement Program 12, Tree Management Program, to reduce potential impacts on eucalyptus groves that support monarch butterfly aggregation sites.

Action 9-1.2. Implement Program 4, Community Wildfire Protection Program, to reduce potential impacts on monarch butterfly aggregation sites from wildfire.

Action 9-1.3. Implement Program 13, Integrated Pest Management Program, to reduce the potential impacts from pest infestations.

Policy 9-2. The City shall assess the damage of catastrophic events as they occur and respond with corrective action to restore damaged monarch butterfly habitat.

Action 9-2.1. Measure the extent and assess the magnitude of the damage to the monarch butterfly overwintering habitat.

Action 9-2.2. Design and implement a response strategy with actions to correct and restore the habitat after the catastrophic event and include them in the annual Implementation Plan (Policy 1-3), if practical. When feasible, employ phased approaches with consistent monitoring to evaluate success or need for changes in strategy or actions. Assign priorities, including sources of materials, constraints, and methods for debris management.

Steps for Response Strategy:

1. Define the extent of the damage to the monarch butterfly habitat within the plan area.
2. Divide affected area into sections for a phased approach, based on level of damage and importance of overwintering site compared to other areas.
3. Assign priorities to the divided sections of the damaged area.

4. Implement guidance from Programs 4, 12, and 13 for specifics in those areas.

Example Response Strategy for a catastrophic event that causes the die-back of 25% of the trees in the MBHMP area. The catastrophic event for this example could be fire, drought, pest, disease, wind storm, etc.

1. Consider whether the catastrophic event presents an imminent danger to the public, and install warning signage and/or closures as appropriate.
2. Assess and analyze the extent of the dead/dying trees in the forest at Ellwood Mesa in relation to the monarch butterfly aggregation areas.
3. Establish a phased approach for restoration activities, starting with the most affected areas. Tag and map the trees that are dead, dying, diseased, burnt, hazardous, or otherwise affected by the catastrophic event. Confer with arborists, biologists, and/or other relevant specialist to select trees for removal to benefit the forest on a whole and facilitate restoration. Remove selected trees in the first phase area. The removed trees may be disposed of off=site or chipped for use on site as ground cover. Install new trees and native understory species with irrigation.
4. Monitor the success of the plantings and irrigation over a set time (e.g., 1–2 years). Replace plantings, as needed.
5. Adjust restoration methods if necessary and implement phased approach at the next priority phase area for restoration.
6. Repeat steps 2 through 5 until every area has been attended to and restored.
7. Continue to monitor for the presence of monarch butterflies during the aggregation season and other wildlife.

Action 9-2.3. Request City Council approval for supplemental funding, with a finding that the condition is a catastrophic event. Use funding received from the State Budget, apply for grants, and/or accept private donations for the dedicated mission of monarch butterfly overwintering habitat restoration.

Program Status: Tree condition surveys that have been completed for Ellwood Mesa eucalyptus trees have identified the number of dead trees. Cause of tree mortality has been identified as drought and pest infestations. Ellwood Main and Ellwood North monarch butterfly aggregation sites contain many dead trees. In-depth planning for management and recovery of a living eucalyptus forest will be detailed in an annual Implementation Plan. Similar events have occurred in the past and are likely to be part of the future.

Program Needs: Development of an Implementation Plan addressing the significant die-off of eucalyptus trees on Ellwood Mesa is underway. The City should have an ongoing response program in place so that careful and measured decisions following a catastrophic event can be implemented.

Program Contact: Public Works Department

B. NATURAL RESOURCES MANAGEMENT PROGRAMS

Seven natural resources management programs are provided that articulate the goals, policies, and actions necessary to maintain and improve the many important natural resources, including biological diversity and ecosystem functions, associated with the Ellwood Mesa eucalyptus groves and the monarch butterfly aggregation sites they support.

10. Monarch Butterfly Management Program

Overview: The City's General Plan includes a policy specific to the protection of monarch butterfly habitat areas, including the habitat on Ellwood Mesa. The City's Ellwood Mesa Open Space Plan further specifies the need to protect and maintain the eucalyptus habitat to be self-sustaining and identifies the need for managed public access, scientifically sound existing conditions studies, phased habitat improvements, and adaptive management. The primary focus of the Habitat Management Plan described below is to implement the directives of the General Plan and Ellwood Mesa Open Space Plan.

Goal 10. To ensure the ongoing use of Ellwood Mesa by the monarch butterfly.

Policy 10-1. The City shall implement management strategies that facilitate the use of Ellwood Mesa by monarch butterflies.

Action 10-1.1. Implement Program 12, Tree Management Program, to help facilitate the conservation of the eucalyptus groves and windrows in the Monarch Butterfly Habitat Management Plan Coverage Area as habitat for the monarch butterfly.

Action 10-1.2. Implement Program 20, Biological Monitoring Program, and Program 21, Monarch Research Program, to expand the body of knowledge and further the understanding of the monarch butterflies' use of the resources at Ellwood Mesa.

Policy 10-2. Preservation of the eucalyptus groves and windrows on Ellwood Mesa as monarch butterfly habitat shall be the focus of management activities, as feasible, and in coordination with Program 9, Catastrophic Event Response Program.

Action 10-2.1. Should one or more catastrophic events result in impacts on the sustainability of monarch butterfly aggregation sites, consider alternative management and recovery strategies that incorporate goals for sustaining aggregation sites at Ellwood Mesa.

Policy 10-3. Ecosystem functions proposed for habitat restoration projects at Ellwood Mesa shall consider inclusion of native plant species.

Action 10-3.1. Implement Program 14, Habitat Enhancement and Restoration Program, as feasible, to improve conditions for native plants and animals and the ecosystem functions

they provide in and adjacent to the eucalyptus groves containing monarch butterfly aggregation sites.

Policy 10-4. To avoid impacts on monarch butterflies while they are present at the Ellwood aggregation sites, no maintenance or restoration work, except for maintenance required to remove immediate hazards to life or property, shall be conducted in the eucalyptus groves and windrows at Ellwood Mesa from October 1 through March 31 of each year, unless protective recommendations are implemented in consultation with a qualified biologist.

Action 10-4.1. Unless authorized by a qualified biologist, conduct all site maintenance, tree trimming and removal, habitat restoration, exotic plant removal, and other potentially invasive activities between April 1 and September 30 of each year, when there would not likely be direct impacts on monarch butterflies.

Program Status: Monarch butterflies are important to the ecosystem of Ellwood Mesa and to the City's sense of community. Development and implementation of this MBHMP is an important step in the active conservation of the monarch butterflies and their habitat at Ellwood Mesa.

Program Needs: New information about monarch butterflies regularly emerges from the scientific community, and the Ellwood Main site is an important site for the sustainability of monarchs. The more monarch butterfly biology is understood, the better Ellwood Mesa can be managed.

Program Contact: Public Works Department

11. Wildlife Habitat Management Program

Overview: Eucalyptus groves supporting seasonal aggregation sites for monarch butterflies also provide habitat for other wildlife species. Examples include or have included perches for red-shouldered hawks, roosting sites for turkey vultures, and nesting sites for white-tailed kites, Cooper's hawks, great horned owls, and acorn woodpeckers. This MBHMP identifies management strategies for conserving habitat for monarch butterflies that are intended to be consistent, where feasible, with management of habitat for other wildlife species.

Goal 11. Manage eucalyptus groves at Ellwood Mesa for monarch butterflies in a manner consistent with ecosystem functions for other wildlife species that use the groves as habitat.

Policy 11-1. The eucalyptus groves at Ellwood Mesa that support monarch butterfly aggregation sites shall be managed in a manner consistent with ecosystem functions supporting other wildlife species, where feasible.

Action 11-1.1. All personnel associated with the implementation of this MBHMP will receive educational information regarding the presence of monarch butterfly and other native wildlife species and the need to protect all native wildlife species.

Action 11-1.2. Preserve some trees with cavities to provide opportunities for cavity-nesting birds, such as acorn woodpeckers.

Action 11-1.3. Avoid removal of or disturbance to trees or other woody vegetation during nesting bird season (March 15 to August 15), when feasible. If not feasible, a biological monitor will survey for nesting birds in the area of proposed vegetation removal and ensure no active nests are present prior to removal or disturbance.

Action 11-1.4. Limit vegetation removal and ground disturbance activities to the dry season. Avoid areas with open water in Devereux Creek and tributaries.

Policy 11-2. Program 14, Habitat Enhancement and Restoration Program, shall complement the Wildlife Habitat Management Program.

Action 11-2.1. Include native plant species that are important for wildlife habitat and food in enhancement and restoration projects (Appendix 3).

Action 11-2.2. Require a Planting Plan for any proposed enhancement plantings near the groves containing aggregation sites.

Action 11-2.3. Consider increasing mid-canopy and low-stature or groundcover native plant species to enhance wildlife habitat complexity and increase potential use of eucalyptus groves by a variety of wildlife species.

Action 11-2.4. Implement restoration for the Devereux Creek riparian corridor to improve functions for wildlife, consistent with the goals of this MBHMP for monarch butterflies.

Program Status: A variety of management actions have occurred in the Ellwood Mesa eucalyptus groves, including monitoring the butterfly populations, evaluating the health of the eucalyptus grove and individual trees, and educating the public regarding the sensitivity of the aggregation sites. However, a comprehensive approach to managing and educating the public as to the importance of all native wildlife species that inhabit the Ellwood Mesa eucalyptus groves will benefit both the visitors and the natural resources of the open space area.

Program Needs: Adoption and implementation of this MBHMP will include programs to improve the health of the habitats and their ecosystem functions for wildlife species in general, and monarch butterflies in particular.

Program Contact: Public Works Department

12. Tree Management Program

Overview: One of the most important aspects of this MBHMP is the set of management practices that would result in a sustainable eucalyptus forest that supports aggregation sites for monarch butterflies. Health of the individual eucalyptus trees, structure of the aggregation sites, and long-term sustainability of the groves supporting the sites are of primary importance. In response to these management needs, as well as concern for public safety within the groves and concern for wildfire hazards, City staff continues to work with professional biologists and arborists to develop protocols for managing the eucalyptus groves supporting monarch butterfly aggregation sites. The information obtained during inventories and assessments, and coordination with the development of the CWPP, resulted in the management recommendations as presented in this MBHMP.

Goal 12. To manage the eucalyptus groves within monarch butterfly aggregation sites at Ellwood Mesa in a manner that provides for (1) healthy trees, (2) suitable aggregation site structure, (3) sustainable butterfly aggregation sites, (4) public safety while visitors are on trails within the groves, and (5) sensitivity to wildfire hazards.

Policy 12-1. Eucalyptus trees in the groves within the Coverage Area shall be managed, as feasible, to ensure tree health and longevity. Nothing in this program should be interpreted to preclude tree maintenance work required to address immediate hazards to life or property.

Action 12-1.1. Include guidance for necessary tree work in the annual Implementation Plan (Action 1-4.1). Tree work will take place in the month of September each year. The Implementation Plan should specify responsible parties, work locations, individual trees addressed, work to be accomplished, restoration measures, and methods and procedures for managing tree health. An annual plan is recommended but may be prepared on an as-needed basis based on conditions and progress of the previous Implementation Plan.

Action 12-1.2. Preliminarily identify potential threats to aggregation sites that may occur over time and develop a framework for mitigating the threats and maintaining/recovering suitable overwintering habitat. Threats may include, but are not limited to, the following:

- Drought
- Pests
- Disease
- Fire
- Flood/erosion
- Vandalism
- Invasion by non-native plants (not including eucalyptus)

These threats, as well as others, may arise and impair the function of Ellwood Mesa as habitat for overwintering monarch butterflies. When threats are encountered, a specific plan

of action should be undertaken to address the needs of the situation. However, for planning purposes, the City should be prepared to undertake the response measures outlined in Table 2 below. Although not exhaustive, these measures represent a prudent suite of response tools to address future conditions. Measures listed below may prevent or rectify impacts from multiple types of threats, as the intent of the measures is to restore and encourage healthy habitat.

Table 2. Identified Threats and Potential Response Actions

Potential Actions/Tools for Management	Purpose/Goal/Target	Threat/Cause
Selective removal of standing dead trees	To protect the living trees from being taken out if a dead tree falls, and to provide space for growth of young trees.	Drought, disease, pests, fire
Selective removal of downed trees/debris	To open up space in the grove for younger trees to grow and replace dead trees. To reduce fuel load.	Drought, disease, pests, fire
Watering/irrigation	To prevent trees (established and newly planted) from declining in health because of insufficient water, or attempt to recover drought-stressed trees. Provide water to establish replacement trees. Use of reclaimed water should be explored.	Drought
Planting eucalyptus trees or planting native trees	To correct habitat deficiencies such as: ▪ The overstory has become too sparse. ▪ Wind speeds in the grove are too strong. ▪ A tree died, fell over, or was removed.	Death of one or more trees, insufficient canopy, or aggregation site protection.
Planting understory species	To add or create a diverse understory. To add nectar sources. To create variable edge barrier.	Non-native plants, poor/homogeneous understory
Planting nectar sources within and near groves	To make nectar sources for adult monarchs available near the overwintering sites.	Non-native plants, understory lacking nectar species
Selective pruning	To prune or remove understory plants when they reduce monarch butterfly flight space or aggregation areas. To protect/maintain the open interior of the grove.	Understory becomes too dense
Re-contouring/grading	In the case of a flood, to correct erosion and reshape the drainage channel to protect trees.	Flood/erosion
Installation of erosion control best management practices (BMPs)	To prevent future erosion and direct flows away from erosion-sensitive areas (exposed roots, etc.).	Flood/erosion

Action 12-1.3. Thresholds should be established to direct professional review and potential action to address conditions in the groves. Ultimately, it is envisioned that quantitative thresholds will be established based on the results of monitoring and scientific study within the groves (Programs 20, 21, and 22). However, until adequate reference data are available, action thresholds will be determined qualitatively by the City in consultation with a qualified monarch butterfly biologist.

Factors for Consideration:

- Did a major tree fall down in or adjacent to a known overwintering site?
- Is a butterfly expert recommending that action be taken?
- Has the butterfly overwintering population at a specific site decreased dramatically in a way that does not follow the populations at other sites in the vicinity?
- Is there erosion or threat of exposed roots of trees in or adjacent to a known overwintering site?
- Has the tree canopy decreased noticeably and dramatically?
- Has a certified arborist identified a high-risk tree that could degrade the aggregation site?

Steps for Taking Action:

1. Identify the threat (persistent or temporary, site-specific or large-scale).
2. Consult with a qualified monarch butterfly biologist, guided by the goals for a sustainable overwintering habitat.
3. Develop a plan of action.
    - If the problem is large-scale, a prescribed action may be taken in phases and the effect will be evaluated to assess success before any large-scale implementation of the action.
    - Manipulative experiments may occur in coordination with adaptive management, such as pilot studies, to inform decisions.
4. Obtain approvals. Depending on the plan of action, authorization from the City Council, CCC, and/or resource agencies may be needed. Environmental review may also be required, depending on the scope.
5. Implement the plan of action.
6. Monitor and document results.
    - Areas affected by response actions, especially major ones, should be included in the monitoring program conducted under Program 20, Biological Monitoring Program.

Action 12-1.4. Implement Program 13, Integrated Pest Management Program, to help maintain tree health and control infestation in the eucalyptus groves supporting monarch butterfly aggregation sites.

Action 12-1.5. Cut down or prune trees identified as a threat to butterfly aggregation sites because they may fall and cause injury or collapse on other trees important to sustaining aggregation sites.

Action 12-1.6. Maintain a living eucalyptus forest within the outline of pre-drought forest extent as determined with historic aerial photographs. Replant sections of the eucalyptus forest where dead zones occur due to multiple tree die-offs.

Action 12-1.7. Implement Program 14, Invasive Plant Management Program, particularly regarding non-native vines that could affect the quality of monarch butterfly habitat, following recommendations for eradication consistent with the California Invasive Plant Council (Cal-IPC) and conservation priorities of monarch butterflies and their habitat.

Action 12-1.8. Implement Program 20, Biological Monitoring Program, to provide information regarding management of eucalyptus groves to ensure their health and longevity.

Action 12-1.9. Annually, identify conditions that threaten trees at aggregation sites and include recommended actions in the Implementation Plan to reduce perceived threats.

Action 12-1.10. Plant trees as needed to maintain grove density and improve monarch butterfly habitat. Plant in locations that improve aggregation site conditions as per the best available scientific analysis, and replant eucalyptus in areas within historic eucalyptus grove extent where monarch habitat has deteriorated from drought die-back.

Action 12-1.11 Following evaluation of compatibility with existing habitat and functionality with respect to butterfly habitat, conduct a pilot planting for any eucalyptus species considered for tree restoration that is not present in the MBHMP area as of 2018.

Policy 12-2. Eucalyptus trees in the groves containing monarch butterfly aggregation sites shall be managed, as feasible, to provide sustainable habitat for butterfly aggregation sites.

Action 12-2.1. When considering eucalyptus or other tree replacement actions, consider tree configurations that retain open areas for monarch butterfly patrolling and monarch overwintering preferences.

Action 12-2.2. Investigate potential enhancement to monarch butterfly patrolling habitat by reducing tree tangles and fallen debris.

Action 12-2.3. Remove hazard trees as necessary to protect monarch butterfly cluster locations, as consistent with goals for public safety.

Action 12-2.4. Implement, as feasible, Program 10, Monarch Butterfly Management Program, to facilitate improvements in eucalyptus groves that help sustain aggregation sites.

Action 12-2.5. Protect blue gum saplings as necessary to encourage natural recruitment of trees in the eucalyptus forest.

Policy 12-3. Eucalyptus trees within the groves containing monarch butterfly aggregation sites shall be managed, as feasible and consistent with conservation of monarch habitat, to provide safe conditions for the visiting public.

Action 12-3.1. Prune and remove dead, dying, or particularly vulnerable tree trunks and branches that overhang trails and seating areas, or lay across trails, inside and near monarch butterfly aggregation sites to reduce the threat of injury from falling trunks and branches, debris on trails (trip hazards), or low-hanging material across trails that visitors could bump heads on.

Action 12-3.2. As recommended by the City arborist and detailed in the annual Implementation Plan, conduct work designed to protect and improve the structure of aggregation sites.

Action 12-3.3. As recommended by the City arborist and detailed in the annual Implementation Plan, remove or prune dead standing, dead suspended, dead on the ground, or thick understory trees both to improve grove tree health and monarch butterfly habitat and to correct hazard conditions for human safety along trails and at observation sites.

Action 12-3.4. Consider using downed, dead trees for seating along trails, or to add to slope stability or help control erosion, for preservation rather than removal, as feasible, considering human safety or wildfire threat.

Action 12-3.5. Remove ground debris, such as accumulations of branches and leaves, at trailheads in particular to reduce threat from wildfires, to reduce threat to human safety from obscured views, and to increase aesthetic appeal.

Action 12-3.6. In consultation with the City arborist, conduct an annual review of tree health in April and May at aggregation sites. Develop and implement an annual Implementation Plan to address issues identified during the review, including potential need for tree removal or pruning, treatment of diseases or pests, and other potential recommendations.

Policy 12-4. Eucalyptus trees within the groves containing monarch butterfly aggregation sites shall be managed, as feasible, to provide for low wildfire hazards.

Action 12-4.1. Implement Program 4, Community Wildfire Protection Plan, to provide wildfire protection consistent with the City's adopted CWPP.

Action 12-4.2. Reduce accumulations of dead, dry, and loose organic and other flammable material within eucalyptus groves to decrease potential for ground-level fires becoming canopy fires as a result of ladder effect of fire hazard materials. Sufficient downed wood, debris, and ground cover will be left in place to provide substrate and shelter for monarchs dislodged from clusters.

Action 12-4.3. Remove accumulations of dead plant material along southern grassland margins of eucalyptus groves and at southern trailheads to reduce threat of grassland fires becoming eucalyptus grove fires as a result of fire hazards at the boundary between grasslands and groves via mowing or selective weed-whacking. Herbicides shall not be used.

Action 12-4.4. Replace removed understory plants as recommended by the City monarch butterfly biologist with fire-resistant native shrubs to restore and improve habitat structure for monarch butterflies (Appendix 3).

Action 12-4.5. Coordinate (1) butterfly habitat management, (2) public access and safety needs, (3) fire management requirements, and (4) wildlife habitat restoration proposals to ensure management priorities and implementation of procedures that provide the most compatible result for the conservation of monarch butterflies, while also respecting the goals of the other MBHMP programs, as feasible.

Program Status: Although eucalyptus trees in some groves with monarch butterfly aggregation sites are in good health (e.g., Sandpiper and Ocean Meadows, both of which are more windrow-like than grove-like), others are of average health (Ellwood West), and some are rated poor (Ellwood East, Ellwood North, and the important Ellwood Main). As of July 2017, a significant die-off of trees occurred from drought and pest infestation, resulting in over 1,200 dead trees on Ellwood Mesa.

Program Needs: Quantitative habitat condition standards based on best available science that establishes thresholds for action. With adoption of this MBHMP and implementation of the 22 programs—in particular, Program 12, Tree Management Program—the health of the eucalyptus groves supporting monarch butterfly aggregation sites is anticipated to improve and become a more sustainable resource.

Program Contact: Public Works Department

13. Integrated Pest Management Program

Overview: Eucalyptus trees are subject to a variety of pests and diseases that can injure or kill trees. When trees occur in groves, the spread of pests and disease is facilitated by proximity to infected trees, resulting in the potential of widespread loses. Current and past infestations at Ellwood Mesa of blue gum and river red gum (*Eucalyptus camaldulensis*) include lerp psyllids on leaves, tortoise beetles, longhorned borer beetles, and orange sulfur fungus. Insect pests are often present in

equilibrium with their predators and do not need further control. However, new threats to trees on Ellwood Mesa may occur that require pest control measures. Invasive non-native species such as English ivy and cape ivy also can be problematic, smothering entire trees and changing or destroying wildlife habitat (Refer to Program 15, Invasive Plant Management Program). Various approaches to pest management will be necessary to try experimentally to determine which approach works best for each pest without affecting native plant and animal species, including birds, and monarch butterflies and their seasonal aggregation sites.

Goal 13. Control or eradicate, as feasible, plant, animal, fungal, and other pests that would result in detectable impacts on monarch butterflies or degrade monarch butterfly habitat.

Policy 13-1. To maintain current knowledge of pests and diseases, the City shall conduct an annual inventory of organisms negatively affecting trees in the groves at Ellwood Mesa.

Action 13-1.1. Conduct an inventory of pests and diseases throughout the groves and windrows at Ellwood Mesa.

Action 13-1.2. Conduct an inventory of pests and diseases within the monarch butterfly aggregation sites in the Ellwood North, Ellwood West, Ellwood Main, Ellwood East, Sandpiper, and Ocean Meadows groves.

Policy 13-2. The City shall consider using a variety of approaches to pest management to prevent pests and diseases from affecting eucalyptus groves, particularly those supporting seasonal aggregation sites for monarch butterflies.

Action 13-2.1. As feasible, experiment with different integrated pest management (IPM) approaches for different pests and diseases to determine which approach best suits the conditions in eucalyptus groves at Ellwood Mesa.

Action 13-2.2. Implement wise management practices in the eucalyptus groves at Ellwood Mesa that do not facilitate the spread of pests and diseases in groves.

Action 13-2.3. Identify current problems that require immediate treatment and implement appropriate treatment protocols.

Action 13-2.4. Implement a pest and disease monitoring program, as feasible, to determine success of treatments and any new infestations requiring treatment.

Program Status: Currently, no IPM approaches are implemented for eucalyptus trees at Ellwood Mesa. A tree inventory was conducted in 2017 that found over 1,200 dead eucalyptus trees on Ellwood Mesa City property. An Implementation Plan is in preparation to address tree health issues.

Program Needs: Adopt the MBHMP and implement the 22 MBHMP programs—including Program 13, Integrated Pest Management Program—to reduce the threat of impacts on tree health

and sustainability and the potential for degradation of habitat supporting monarch butterfly aggregation sites.

Program Contact: Public Works Department

14. Habitat Enhancement and Restoration Program

Overview: This program focuses on the enhancement of the eucalyptus groves from a native plant and wildlife habitat perspective and on the restoration of the Devereux Creek corridor along the northern margin of Ellwood West, Ellwood Main, and Ellwood East groves. The mid-canopy vegetation and understory of the eucalyptus groves is generally lacking or in some situations is composed of non-native invasive plant species. Enhancement of groves with native plant species would benefit native wildlife. Various native plants are present but scattered within the groves. Most of these plant species have fleshy fruits and are bird-dispersed. Restoration of portions of Devereux Creek associated with eucalyptus groves, as feasible, is consistent with the goal to restore Devereux Creek. This restoration would provide important habitat for native plant and animal species and would potentially improve water quality flowing downstream to Devereux Slough and the Pacific Ocean.

Goal 14. To provide for the enhancement of native plant and animal habitats in the context of preserving the monarch butterfly habitat associated with established eucalyptus groves.

Policy 14-1. Establishment of appropriate native plants—in particular, ground cover, shrub, and mid-canopy species—shall be encouraged in the eucalyptus groves and along the Devereux Creek corridor outside of the eucalyptus groves.

Action 14-1.1. Plant experimental plots of native ground cover species to determine which species may result in sustainable populations.

Action 14-1.2. Focus enhancement efforts on native plants existing in the eucalyptus groves, such as toyon (*Heteromeles arbutifolia*), and native plants with nectar sources for monarchs (Appendix 3).

Action 14-1.3. Coordinate with Program 13, Integrated Pest Management Program, and Program 15, Invasive Exotic Plant Management Program.

Policy 14-2. Areas between eucalyptus groves shall be considered for habitat enhancement and restoration alternatives.

Action 14.2.1. Implement priority native plant restoration activities along Devereux Creek in areas outside of eucalyptus groves.

Action 14-2.2. Eradicate non-native herbaceous cover, seedlings, and saplings (not including eucalyptus saplings) in areas between eucalyptus groves to encourage or actively plant local natives.

Policy 14.3. Restoration of Devereux Creek shall include appropriate actions to improve the habitat structure, ecological functions and processes, and native biodiversity of the existing native riparian areas.

Action 14-3.1. Restoration activities include establishment of a riparian area along the banks of Devereux Creek composed of native riparian tree species.

Action 14-3.2. Ensure that no restoration activities along Devereux Creek shall result in increased flooding.

Action 14-3.3. Coordinate to align efforts with other restoration projects under separate permits or mitigation plans for Devereux Creek.

Policy 14-4. Native plant species are considered to be local genotypes of plants occurring naturally within the Ellwood Mesa/Devereux Creek Ecosystem.

Action 14-4.1. Collect all plant materials for use in restoration projects from existing native plant populations in the Ellwood Mesa/Devereux Creek Ecosystem, where feasible.

Action 14-4.2. Collect plant material from the nearest existing populations for re-introduction of extirpated species.

Action 14-4.3. Obtain native plants for use in restoration from local nurseries or growers within the Santa Barbara area, emphasizing contract-grown material of local genotypes.

Policy 14-5. No enhancement or restoration actions shall result in negative impacts on the quality of the eucalyptus groves that provide monarch butterfly habitat.

Action 14-5.1. Coordinate with Program 10, Monarch Butterfly Management Program; Program 11, Wildlife Habitat Management Program; and Program 12, Tree Management Program.

Policy 14-6. No enhancement or restoration actions shall conflict with the goals and policies of the CWPP.

Action 14-6.1. Coordinate all enhancement and restoration activities with the guidelines and recommendations of the CWPP.

Program Status: An Implementation Plan that describes work activities to occur each year will accompany this MBHMP.

Program Needs: Adoption of this MBHMP and implementation of Program 14, Habitat Enhancement and Restoration Program, and fund-raising necessary to design, permit, implement, and maintain the projects.

Program Contacts: Public Works Department and Planning and Environmental Review Department



Photo 3. Toyon (*Heteromeles arbutifolia*), a Native Shrub or Small Tree in the Ellwood Main Grove

15. Invasive Plant Management Program

Overview: Cal-IPC has established a list of invasive, non-native plant species of concern regarding conservation of California natural heritage (www.cal-ipc.org/ip/inventory/index.php). Invasive non-native plants are defined by Cal-IPC (2006) as "plants that 1) are not native to, yet can spread into, wildland ecosystems, and that also 2) displace native species, hybridize with native species, alter biological communities, or alter ecosystem processes." Non-native invasive plants have been given High, Moderate, or Limited ratings by Cal-IPC, depending on the severity of their potential for resulting in impacts on wildland ecosystems.

The monarch butterfly aggregation sites at Ellwood Mesa are themselves characterized and dominated by non-native and potentially invasive plants species—most importantly blue gum, given a "Moderate" rating, and to a lesser degree river red gum, given a "Limited" rating. However, these stands of introduced trees are designated as an ESHA in the General Plan because of their importance to monarch butterflies as fall and winter aggregation sites. Several other aggressively invasive non-native plant species have prominent visual and habitat impacts within the monarch aggregation sites at Ellwood Mesa. These are mostly vines that climb butterfly habitat trees, and

herbaceous ground cover, which potentially endanger the character and sustainability of the aggregation sites. Examples of these deleterious invasive species at Ellwood Mesa and their ratings are listed below:

- "High" rating:
  - Canary Islands ivy (*Hedera canariensis*)
  - English ivy (*Hedera helix*)
  - Cape ivy (*Delairea odorata*)
  - Victorian box or mock orange (*Pittosporum undulatum*)
- "Moderate" rating:
  - Panic veltgrass (*Ehrharta erecta*)
  - Myoporum (*Myoporum laetum*)
- "Limited" rating:
  - Kikuyu grass (*Pennisetum clandestinum*)
  - New Zealand spinach (*Tetragonia tetragonioides*)

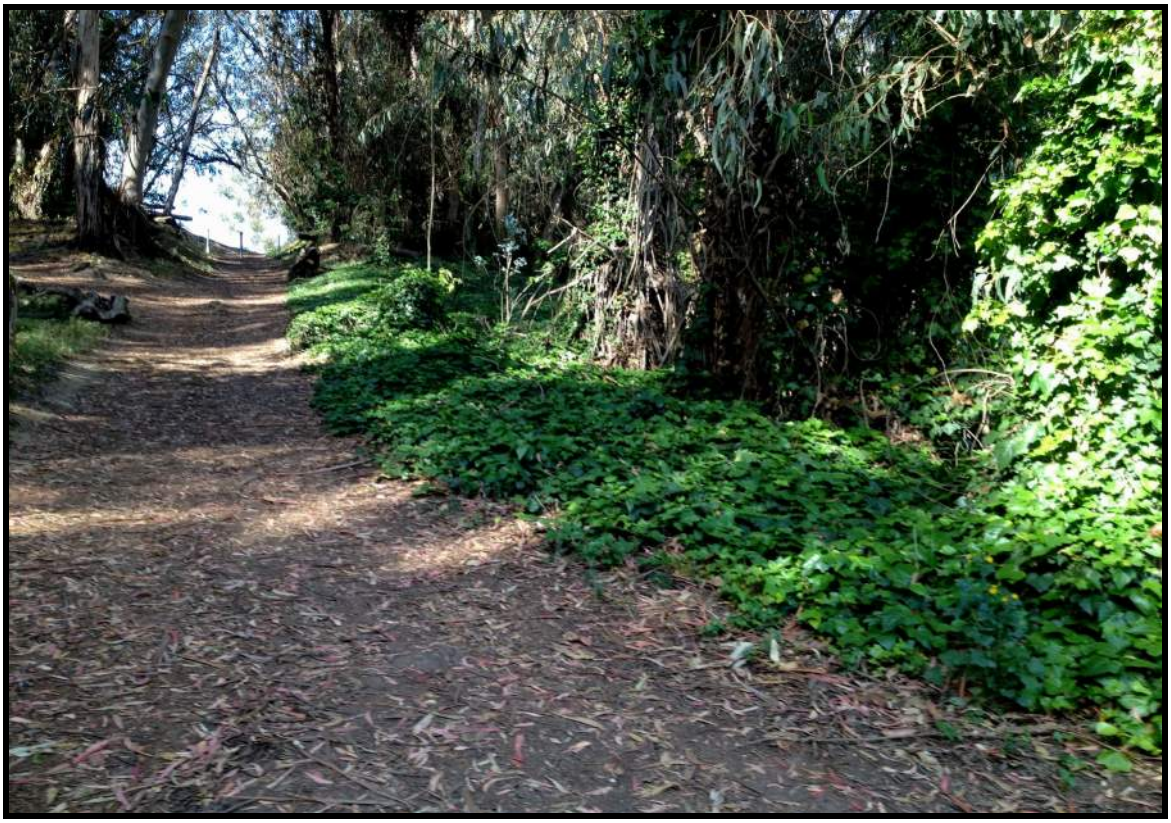


Photo 4. Canary Islands Ivy (*Hedera canariensis*) along Trail and Growing up Trees at Ellwood Main

Goal 15. To eradicate existing stands of invasive non-native species and prevent or control new occurrences of invasive non-native plant species within the monarch butterfly habitat at Ellwood Mesa.

Policy 15-1. The City shall undertake an inventory and generalized mapping program to identify, locate, and prioritize for eradication or control all invasive non-native plant species within the butterfly habitat at Ellwood Mesa.

Action 15-1.1. Identify and map all invasive non-native species identified by Cal-IPC as "High" priority species.

Action 15-1.2. Identify and map all invasive non-native species identified by Cal-IPC as "Moderate" priority species.

Action 15-1.3. Identify all invasive non-native species identified by Cal-IPC as "Limited" or unrated priority species and map any medium to large populations.

Policy 15-2. The City shall control all "High," "Moderate," and "Limited" priority invasive plant species within the monarch butterfly habitat, except those species for which monarch butterflies are dependent, as feasible.

Action 15-2.1. Control all "High" priority invasive non-native invasive plant species.

Action 15-2.2. Control all "Moderate" priority, non-native invasive plant species.

Action 15-2.3. Eradicate or control all medium or large stands of "Limited" or unrated priority non-native invasive plant species.

Policy 15-3. The City shall undertake annual monitoring as feasible to identify and eradicate or control new occurrences of "High" or "Moderate" priority invasive non-native plant species.

Action 15-3.1. Implement monitoring of eradication efforts and potential new occurrences as part of Program 20, Biological Monitoring Program.

Action 15-3.2. Coordinate with other programs in this MBHMP, including Program 14, Habitat Enhancement and Restoration Program.

Program Status: Currently, no non-native invasive plants species control or detection program is in place for the eucalyptus groves at Ellwood Mesa.

Program Needs: Adoption of this MBHMP and implementation of the MBHMP programs, including Program 15, Invasive Plant Management Program.

Program Contacts: Public Works Department and Planning and Environmental Review Department

16. Ecosystem-wide Management Coordination Program

Overview: The eucalyptus groves, including those areas where seasonal monarch butterfly aggregation sites occur, do not exist as island ecosystems but in fact are part of a broader ecosystem of the Ellwood Mesa and Devereux Creek Watershed, including UCSB's North Campus Open Space (Upper Devereux Slough) and Coal Oil Point Reserve. This MBHMP primarily addresses monarch butterfly eucalyptus tree habitat in the Ellwood Mesa Open Space.

Goal 16. To manage the eucalyptus trees supporting seasonal monarch butterfly aggregation sites by coordinating among the 22 programs directed toward the management of monarch butterfly habitat and to consider management of eucalyptus groves in the context of managing the entire Ellwood Mesa Open Space.

Policy 16-1. The City shall manage eucalyptus trees in the context of all eucalyptus habitat supporting monarch butterfly aggregation sites at Ellwood Mesa.

Action 16-1.1. When considering implementation of actions for each program, consider their relationships to other actions in the same program.

Action 16-1.2. When considering implementation of actions for each program, consider their relationships to actions in related programs.

Policy 16-2. The City shall manage eucalyptus trees supporting monarch butterfly aggregation sites in the context of all eucalyptus habitat at Ellwood Mesa.

Action 16-2.1. Through results of Program 20, Biological Monitoring Program, consider potential changes in monarch butterfly use of other aggregation locations at Ellwood Mesa, impacts of pests and diseases throughout the eucalyptus groves, or other relevant factors that can potentially affect monarch butterflies and their habitats at Ellwood Mesa.

Policy 16-3. The City shall manage eucalyptus trees supporting monarch butterfly aggregation sites in the context of all habitats at Ellwood Mesa.

Action 16-3.1. When considering implementation of management actions for eucalyptus trees, consider their relationships to management actions for other habitats and programs for all of Ellwood Mesa.

Program Status: The City regularly coordinates the management of Ellwood Mesa with adjoining public agency land managers, including UCSB and Santa Barbara County. The focus of these management meetings is to ensure that trails are connected, grant applications are coordinated, and general issues such as illegal encampments and police enforcement are discussed and collectively addressed.

Program Needs: Adopt this MBHMP and implement its 22 programs considering the potential interaction of the program actions and results. Examples include eradication of exotic plant species

(Program 15, Invasive Plant Management Program) and removal of trash and debris (Program 6, Waste Management Program), followed by habitat enhancement efforts (Program 14, Habitat Enhancement and Restoration Program) within the affected sites in eucalyptus groves, in particular along affected trails (Program 5, Trail Management Program) with potential for additional erosion.

Program Contacts: Public Works Department and Planning and Environmental Review Department

C. OUTREACH PROGRAMS

Outreach programs are designed to provide information to visitors, educators, and students to help develop a broad appreciation for natural resources and local natural heritage, with a focus on monarch butterflies.

17. Community Advisory and Docent Program

Overview: The residents of Goleta have been actively involved in the protection and acquisition of Ellwood Mesa over many decades, with a focus on the conservation of the monarch butterfly aggregation sites. The long-term sustainability of the eucalyptus groves and the aggregation sites they support will depend in part on the continuing public involvement in the process.

Goal 17. To provide a formal vehicle to involve public participation, the City shall engage with the City's butterfly docents to provide recommendations to the Public Works Department.

Policy 17-1. The City shall engage with the City's butterfly docents to review MBHMP implementation work plans and make recommendations to the Public Works Department.

Action 17-1.1. Identify a point of contact with the City's butterfly docents, referred to the as the Butterfly Docent Coordinator, who will coordinate with and speak on behalf of the docents with the Public Works Department, Planning and Environmental Review Department, and Neighborhood Services and Public Safety Department.

Action 17-1.2. Set up regular meetings between the Butterfly Docent Coordinator and City staff.

Policy 17-2. As needed, the City shall continue to support the City's Butterfly Docent Program, the Butterfly Docent Coordinator, and ongoing training for the docents to ensure that educational opportunities for the public are maintained and to demonstrate the City's stewardship of the eucalyptus groves.

Action 17-2.1. Continue to support the Butterfly Docent Program and the Butterfly Docent Coordinator.

Action 17-2.2. Continue to support and update the City of Goleta's monarch butterfly website at www.goletabutterflygrove.com.

Action 17-2.3. Continue to support development of educational materials to be used by docents during scheduled public tours of the monarch butterfly aggregation sites.

Action 17-2.4. Train docents in the details of this MBHMP.

Action 17-2.5. Expand the pool of trained docents and encourage docent assistance with the implementation of this MBHMP.

Program Status: An active Butterfly Docent Program, including a Butterfly Docent Coordinator, has been in operation since 2007.

Program Needs: With adoption and implementation of this MBHMP, the existing docent program becomes part of the structure of this MBHMP. No formal volunteer program exists to assist in the implementation of this MBHMP.

Program Contacts: Neighborhood Services and Public Safety Department, Public Works Department, and Planning and Environmental Review Department.

18. Interpretive Program

Overview: Although there are a few signs identifying the Ellwood Main grove and several behavioral signs regarding trails, there are no interpretive signs that provide information regarding the biology of monarch butterflies, general aspects of Ellwood Mesa, and the importance of the aggregation sites. There is an interpretive sign program at the nearby Coronado Butterfly Preserve. City butterfly docents at Ellwood Mesa provide an important role, and the City's monarch website has important information and links to the National Geographic monarch web information. However, for the casual visitor without web access and without the presence of a docent, there is no interpretive information to assist in understanding this significant biological phenomenon.

Goal 18. To establish a useful and informative interpretive signage program at Ellwood Mesa monarch butterfly aggregation sites that is environmentally sensitive and creates a minimum of intrusion into the habitats.

Policy 18-1. The City shall design and install an interpretive signage program that provides important information on the biology of monarch butterflies, the significance of the aggregation sites, and general information on Ellwood Mesa and the eucalyptus groves, when feasible.

Action 18-1.1. Apply for grant funding to design, construct, and install the interpretive signage program.

Action 18-1.2. Design, construct, and install an interpretive signage program that is sensitive to the environment.

Action 18-1.3. Locate the interpretive signage program in key locations minimally intrusive to the sensitive habitats of Ellwood Mesa.

Policy 18-2. The Butterfly Docent Coordinator shall provide input during design, review the draft interpretive program, and make recommendations to the City's Public Works Department.

Action 18-2.1. Involve the butterfly docents, as feasible, in development and review of the content and design of signs for the interpretive signage program.

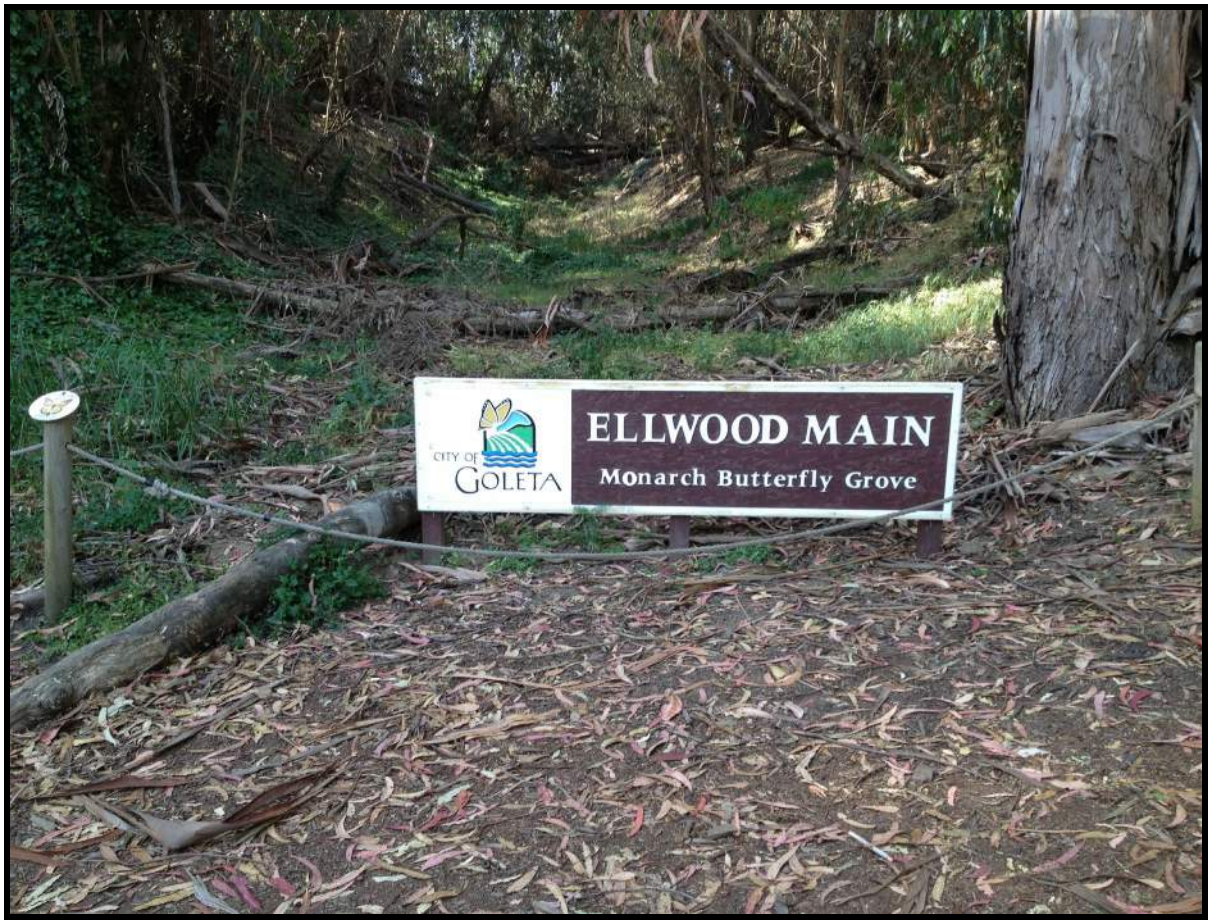


Photo 5. Ellwood Main Grove Entrance Sign at Trailhead along Devereux Creek

Program Status: No on-site interpretive program currently exists for the eucalyptus groves supporting monarch butterfly aggregation sites.

Program Needs: Adopt this MBHMP—including Program 18, Interpretive Program—and include links to the city's existing website and docent program.

Program Contact: Neighborhood Services and Public Safety Department and the Public Works Department.

19. Education Program

Overview: Education has always been an important part of the Ellwood Mesa monarch butterfly enthusiasm expressed by the residents of the area. Local and regional schools participate on a regular

basis, especially when monarch butterflies are using the seasonal aggregation sites. Also, the National Geographic educational information is available through the City's website: www.goletabutterflygrove.com. Therefore, it is important that education is a part of this MBHMP.

Goal 19. To provide educational experiences and information for K–12 students.

Policy 19-1. The City shall continue to work with K–12 students and their schools to explore educational experiences regarding Ellwood Mesa and the eucalyptus groves supporting monarch butterfly aggregation sites.

Action 19-1.1. Continue to support the educational opportunities provided by the Ellwood Mesa eucalyptus groves and their monarch butterfly aggregation sites.

Action 19-1.2. Create educational materials regarding biology of monarch butterflies and their habitats.

Action 19-1.3. Continue to support the position of Butterfly Docent Coordinator.

Policy 19-2. The City shall continue to support its website containing educational materials regarding monarch butterflies.

Action 19-2.1. Support, expand, and revise as necessary the City's website www.goletabutterflygrove.com.

Program Status: The City has active participation in K–12 education programs, including scheduled docent-led tours of the aggregation sites when monarchs are present and presentations at local area schools during science fairs. The City's website also includes a link to the Monarch Teachers' Network.

Program Needs: Adoption of this MBHMP—including Program 19, Education Program—will formalize the city's contributions to K–12 students as part of this MBHMP for Ellwood Mesa.

Program Contact: Neighborhood Services and Public Safety Department

D. MONITORING, RESEARCH, AND ADAPTIVE MANAGEMENT PROGRAMS

Monitoring and research programs provide the mechanism for assessing environmental conditions and conducting original studies to help understand the ecology of monarch butterflies, particularly at Ellwood Mesa. Information obtained from these programs and other sources can be used to adapt the MBHMP to improved or additional information or changing conditions.

20. Biological Monitoring Program

Overview: Background studies of monarch butterfly number, aggregation locations, environmental conditions, tree health, wildlife, botanical resources, and climate have been conducted at Ellwood Mesa over many years. However, more detailed studies are warranted regarding tree health and failure risk, aggregation site canopy cover and light intensity, wind patterns, microclimate, soil moisture and water demand, viable forest density, pest control, wildlife species, invasive non-native plants, eucalyptus tree health (including pest and diseases), enhancement and restoration projects within the groves, impacts from access trails, and other important aspects of the biological and physical resources related to monarch butterfly aggregation sites.

Goal 20: To develop and implement a monitoring program integrating various components of the biological resources and impacts related to the eucalyptus groves that support seasonal monarch butterfly aggregation sites.

Policy 20-1. The City shall maintain annual counts of the butterfly population at the various aggregation sites on Ellwood Mesa.

Action 20-1.1. Count and document monarch butterfly population number and cluster locations within the six Ellwood Mesa aggregation sites every year. The counts shall be conducted every 2 weeks through the overwintering season (October 1 through March 15) using the counting protocol established by Xerces Society, as funding allows. Where possible, record the tree tag numbers of trees with clustering monarchs to establish habitat use patterns (Althouse and Meade 2018).

Policy 20-2. The City shall conduct an annual assessment of ecosystem-wide tree and vegetation health on Ellwood Mesa, as funding allows.

Action 20-2.1. Track ecosystem-wide tree and vegetation health on Ellwood Mesa using high resolution multispectral and hyperspectral imaging and analysis, or similar appropriate means (Appendix 2).

Action 20-2.2. Coordinate results of the ecosystem-wide tree health assessment with Program 12, Tree Management Program, as feasible, to determine necessary and applicable management actions.

Policy 20-3. Create a Monitoring Report, updated annually, resulting from the information obtained during the implementation of the various policies and actions called for in this MBHMP.

Action 20-3.1. Track the implementation of this MBHMP in the form of a Monitoring Report.

Action 20-3.2. Conduct a Visitor Impact Assessment as part of the monitoring program to determine use patterns and potential impacts on trails, changes in erosion of trails, and potential impacts on aggregation sites through which trails are located.

Action 20-3.3. Coordinate results of the monitoring reports with Program 22, Adaptive Management Program, as feasible, to determine if changes in management actions are necessary.

Program Status: Various studies and butterfly counts have been gathered on a somewhat irregular basis. The City recently conducted a Tree Inventory and Health Analysis. However, no formal regular monitoring program has been developed or implemented at eucalyptus groves, in particular those areas that support monarch butterfly aggregation sites.

Program Needs: Adopt and implement this MBHMP, including Program 20, Biological Monitoring Program.

Program Contact: Public Works Department

21. Monarch Research Program

Overview: Although the City has conducted field studies as part of the preparation of this MBHMP, the City has not actively encouraged scientific studies using appropriate and cautious methods to maintain and improve habitat of the Ellwood Mesa habitats.

Goal 21. Encourage research projects and identify funding for research associated with monarch butterflies and their habitats at Ellwood Mesa.

Policy 21-1. The City shall allow for certain research projects that investigate the biology of monarch butterflies and their habitats at Ellwood Mesa and that provide information helpful to this MBHMP management programs.

Action 21-1.1. Evaluate requests for research and, where approved, issue Scientific Research Permits to regulate the research efforts.

Action 21-1.2. Ensure that scientists use non-invasive research projects at Ellwood Mesa, in particular those that focus on monarch butterflies and their habitats, and require that the

results of the research are provided to the City and posted on the City's website at www.goletabutterflygrove.com.

Action 21-1.3. Encourage research of the plants native to Santa Barbara County with regard to their ability to provide suitable monarch butterfly overwintering habitat and their applications for the restoration of the Ellwood Mesa.

Program Status: No formal, ongoing research projects are conducted at the Ellwood Mesa eucalyptus groves that support monarch butterfly aggregation sites.

Program Needs: Adopt and implement this MBHMP, including Program 21, Monarch Research Program.

Program Contact: Public Works Department

22. Adaptive Management Program

Overview: Management plans with ongoing maintenance, restoration, monitoring, and research programs generally develop an information base that helps provide insight into those portions of the implemented management plan that are performing well and those that could be performing better or differently with changing situations. In addition to the update and amendment process provided in Program 8, MBHMP Review, Update, and Amendment Program, the Adaptive Management Program provides a vehicle for the management authority to make adjustments in management approaches on an as-needed basis, especially as new information provides new opportunities for improved management practices and resource stewardship.

Goal 22. To establish an adaptive management approach to resource management at the eucalyptus groves that supports monarch butterfly aggregation sites and their surrounding environment at Ellwood Mesa.

Policy 22-1. The City shall use an adaptive management approach to resource management at the eucalyptus groves that supports monarch butterfly aggregation sites and their surrounding environment at Ellwood Mesa.

Action 22-1.1. Implement adaptive management procedures associated with all relevant programs of this MBHMP for Ellwood Mesa.

Action 22-1.2. Include a description of adaptive management actions in the Monitoring Report (Action 20.3-1).

Action 22-1.3. Conduct a review of management policies and actions every fifth year, as feasible, to determine possible patterns in change regarding monarch butterfly use of the aggregation sites and overall ecosystem health of the monarch butterfly habitat at Ellwood Mesa.

Program Status: Currently, there are no adaptive management procedures associated with the management of the eucalyptus groves at Ellwood Mesa.

Program Needs: Adopt and implement this MBHMP, including Program 22, Adaptive Management Program.

Program Contact: Public Works Department

E. CONCLUSION

This MBHMP for the Ellwood Mesa/Sperling Preserve Open Space provides a fully functional programmatic plan for the management of natural resources, focusing on habitat that supports the phenomenal occurrence of seasonal aggregations of thousands of monarch butterflies at six aggregation sites at Ellwood Mesa. With adoption and implementation of this MBHMP, the City of Goleta will fulfill a major commitment to the natural resources of Ellwood Mesa and its residents, and all those committed to the conservation of monarch butterflies.

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G. LIST OF PREPARERS

This MBHMP was collaborative effort. Consultants and City staff involved in the preparation of this plan are listed below.

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APPENDIX A. IMPLEMENTATION PRIORITIES, SCHEDULE, AND ESTIMATED COSTS

For the purposes of this MBHMP, implementation priorities, scheduling, and cost estimates are provided on a general programmatic basis. Programs are ranked as **Urgent**, **High**, and **Moderate** priority. They also are given an **Ongoing** and **Long-term** (+/- 5-year) scheduling estimate. Cost estimates are on an annual basis, with staff time listed as such and some first-year estimates in brackets.

Table A1. Implementation Priorities and Cost Estimates

	Cost ($)		City Labor Cost (hours)				
Program	**Annual**	**One-Time**	**Annual**	**One-Time**	**Priority**	**Schedule**	**Department Responsible**
A. Administrative Programs							
1. Municipal Management Program	$16,000	$13,000	$26,000 (260)	$9,600 (96)	High	ASAP	PW
2. Fiscal Program	$1,000	—	$19,600 (196)	—	High	ASAP	PW
3. Interagency Cooperative Program	$3,000	—	$9,600 (96)	—	High	ASAP	PW, NSPS, PER
4. Community Wildfire Protection Program	$8,000	—	$7,800 (78)	—	Moderate	Annually	PW
5. Trail Management Program	$10,000	$10,000	$45,600 (456)	$24,000 (240)	Moderate	Annually	PW
6. Waste Management Program	$1,500	—	$10,400 (104)	$1,600 (16)	Moderate	Annually	PW/NSPS
7. Aesthetic Resources Management Program	—	—	$7,000 (70)	—	Low	Annually	PW
8. MBHMP Review, Update, and Amendment Program	$10,000	—	$12,400 (124)	—	Moderate	Annually	PW, PER
9. Catastrophic Event Response Program	$75,000	—	$20,400 (204)	—	Moderate	Annually	PW
B Natural Resources Management Programs							
10. Monarch Butterfly Management Program	$2,000	—	$6,000 (60)	—	High	Annually	PW
11. Wildlife Habitat Management Program	$2,750	—	$5,600 (56)	—	Moderate	Annually	PW

Program	Cost ($)		City Labor Cost (hours)		Priority	Schedule	Department Responsible
	Annual	One-Time	Annual	One-Time			
12. Tree Management Program	$49,600	—	$99,200 (992)	—	High	ASAP	PW
13. Integrated Pest Management Program	$11,500	$5,000	$11,600 (116)	—	Moderate	As funding is available	PW
14. Habitat Enhancement and Restoration Program	$30,000	$40,000	$29,600 (296)	$16,000 (160)	High	ASAP	PW, PER
15. Invasive Plant Management Program	$5,500	$27,500	$14,800 (148)	—	Moderate	As funding is available	PW, PER
16. Ecosystem-wide Management Coordination Program	—	—	$5,000 (50)	—	Low	Annually	PW, PER
C. Outreach Programs							
17. Community Advisory and Docent Program	$5,000	—	$77,200 (772)	—	High	Annually	PW, NSPS, PER
18. Interpretive Program	$500	$3,000	$8,800 (88)	$6,000 (60)	Moderate	As needed	PW, NSPS
19. Education Program	—	—	$12,400 (124)	$2,000 (20)	Moderate	Annually	NSPS
D. Monitoring, Research, and Adaptive Management Programs							
20. Biological Monitoring Program	$20,000	—	$8,000 (80)	—	High	Annually	PW
21. Monarch Research Program	$34,000	$40,000	$4,000 (40)	$4,000 (40)	Low	As needed	PW
22. Adaptive Management Program	$5,000	—	$8,000 (80)	—	Low	Every 5 years	PW
Totals	$290,350	$138,500	$449,000 (4,490)	$63,200 (632)			
Grand Total Over 5 Years	**$1,590,250**		**$2,308,200 (23,082)**		***TOTAL: $3,898,450***		

PW = Public Works Department
NSPS = Neighborhood Services and Public Safety Department
PER = Planning and Environmental Review Department

Table A2. Cost Estimates by Action

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
A. ADMINISTRATIVE PROGRAMS					
1. Municipal Management Program					
Action 1-1.1	$4,000	—	—	24	Prepare and conduct public workshop, 40 consultant hours
Action 1-1.2	—	$8,000	—	—	IS/MND
Action 1-1.3	—	$5,000	—	40	Depends on quantity and scope of revisions
Action 1-1.4	—	—	—	32	4 hours for the review by 8 people
Action 1-2.1	—	—	200	—	City coordination
Action 1-3.1	$10,000	—	40	—	Prepare annual Implementation Plan
Action 1-3.2	$2,000	—	20	—	Prepare and conduct City Council presentation, 20 consultant hours
2. Fiscal Program					
Action 2-1.1	—	—	24	—	Accounting staff, 12 hours bi-annually
Action 2-1.2	—	—	8	—	Accounting staff
Action 2-1.3	$1,000	—	8	—	Annual needs list to be included into Implementation Plan, accounting staff to determine operating budget
Action 2-2.1	—	—	136	—	8 hrs/month + 40 hours grant application coordinating
Action 2-2.2	—	—	20	—	As compensatory mitigation fees are paid
3. Interagency Cooperative Program					
Action 3-1.1	$1,000	—	24	—	2 hr/month for coordination meetings/calls with City staff and consultants
Action 3-1.2	$1,000	—	48	—	2 hr/month for coordination meetings/calls with City staff and consultants

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
Action 3-1.3	$1,000	—	24	—	2 hr/month for coordination meetings/calls with City staff and consultants
4. Community Wildfire Protection Program (CWPP)					
Action 4-1.1	—	—	12	—	CWPP
Action 4-1.2	$2,000	—	40	—	PW's site maintenance. the majority of this cost is included in Program 14
Action 4-1.3	—	—	—	—	Restrictions on timing of work
Action 4-1.4	$6,000	—	24	—	Coordination with butterfly and fire experts 2hr/mo prior to work activates. Expert time for consultation/surveys/ inspections monthly as necessary
Action 4-2.1	—	—	2	—	Cost incorporated into Program 12
5. Trail Management Program					
Action 5-1.1	—	—	192	—	2 days/month for trail maintenance
Action 5-1.2	—	—	—	—	Cost incorporated into Program 12
Action 5-1.3	$1,000	—	—	—	Staff time in Action 5-1.1
Action 5-1.4	$5,000	$10,000	96	240	Installation cost & 2 wks x 3 staff; maintenance 1 day/mo
Action 5-1.5	—	—	64	—	2 day effort x 2 staff x twice during wet season
Action 5-1.6	—	—	16	—	2 day effort once annually
Action 5-1.7	—	—	8	—	Annual review of trails boundaries
Action 5-1.8	$4,000	—	40	—	5 days x 1 staff and risk assessor, trails, arborist, butterfly biologist
Action 5-2.1	—	—	20	—	Staff coordination time and meetings
Action 5-2.2	—	—	20	—	Staff coordination time and meetings

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
6. Waste Management Program					
Action 6-1.1	—	—	96	—	1 day/mo
Action 6-2.1	$1,500	—	—	16	2 days staff time and signs
Action 6-2.2	—	—	4	—	Cost incorporated into Program 17
Action 6-2.3	—	—	4	—	Inspection of trash cans annually
7. Aesthetic Resources Management Program					
Action 7-1.1	—	—	10	—	Read and adopt all programs
Action 7-1.2	—	—	20	—	Program 18
Action 7-2.1	—	—	20	—	Review signage and fencing. Cost included in Program 5
Action 7-2.2	—	—	20	—	Staff time to review restoration plans
8. MBHMP Review, Update and Amendment Program					
Action 8-1.1	$1,000	—	32	—	Staff and consultant time for review
Action 8-1.2	$2,000	—	24	—	City staff and consultant's' time for updates
Action 8-1.3	$2,000	—	24	—	City staff and consultants' time for updates
Action 8-1.4	$2,000	—	24	—	City staff and consultants' time for response to public comments
Action 8-1.5	$3,000	—	12	—	Update IS/MND, if necessary. Consultant time
Action 8-1.6	—	—	8	—	City Council approval/meeting
9. Catastrophic Event Response Program					
Action 9-1.1	—	—	4	—	Cost included in Program 12
Action 9-1.2	—	—	4	—	Cost included in Program 4
Action 9-1.3	—	—	4	—	Cost included in Program 13
Action 9-2.1	$25,000	—	80	—	Expert/arborist/risk/biologist consultant time, plus materials to assess
Action 9-2.2	$50,000	—	80	—	Expert/arborist/risk/biologist consultant time, plus materials to design and implement strategy
Action 9-2.3	—	—	32	—	City staff time

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
B. NATURAL RESOURCES MANAGEMENT PROGRAMS					
10. Monarch Butterfly Management Program					
Action 10-1.1	—	—	8	—	Program 12
Action 10-1.2	—	—	8	—	Program 20 and 21
Action 10-2.1	—	—	8	—	Program 9
Action 10-2.2	$1,000	—	20	—	Staying current with research, staff time, and consultant time to inform staff.
Action 10-3.1	—	—	8	—	Program 14
Action 10-4.1	$1,000	—	8	—	Guidance to staff and education
11. Wildlife Habitat Management Program					
Action 11-1.1	$1,000	—	40	—	0.5-hr training per employee
Action 11-1.2	$750	—	8	—	Arborist/biologist as needed
Action 11-1.3	$800	—	—	—	Cost of nesting bird survey if needed, NBS biologist 1 day to confirm nests $800
Action 11-1.4	$200	—	8	—	Educate City/crew to avoid water
Action 11-2.1	—	—	—	—	Program 14
Action 11-2.2	—	—	—	—	Program 14
Action 11-2.3	—	—	—	—	Program 14
Action 11-2.4	—	—	—	—	Program 14
12. Tree Management Program					
Action 12-1.1	$4,800	—	40	—	Monarch biologist (8 hrs) and arborist (16 hrs) site visits. $2400. Implementation Plan preparation 16 hrs. $2400. = $4800. Quarterly site visits 32 hrs, IP 8 hrs
Action 12-1.2	—	—	—	—	Guidance for identifying threats
Action 12-1.3	—	—	—	—	Guidance for establishing thresholds
Action 12-1.4	—	—	—	—	Program 13

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
Action 12-1.5	$23,800	—	20	—	Arborist for 5 days: $4000, Butterfly biologist for 1 day to confirm tree work: $800, Wildlife biologist to monitor work for 5 days: $4000, Tree crew for 5 days: 15,000. (Total = $23,800.) City staff to check work for 5 days @4 hrs. (Total = 20 hours.)
Action 12-1.6	—	—	—	—	Would be accomplished with replanting restoration.
Action 12-1.7	—	—	—	—	Program 14
Action 12-1.8	—	—	—	—	Program 20
Action 12-1.9	$1,600	—	—	—	Biologist/arborist field visit 2 days
Action 12-1.10	$5,000	—	60	—	Container trees and labor estimate, depends on # of trees planted.
Action 12-2.1	—	—	—	—	Direction for restoration design
Action 12-2.2	$800	—	32	—	Biologist 1 field day, City staff labor for 4 x 4 days
Action 12-2.3	—	—	—	—	Included in 12-1.5
Action 12-2.4	—	—	—	—	Program 10
Action 12-3.1	$8,800	—	768	—	Inspection of trails one per month (16 hr/mo=192hr/yr), maintenance crew to prune/remove hazard limbs and trucks every month for 2 days (3 crew, 2 d/mo = 576hr/yr). Est. 768 total staff time plus equipment. Arborist 5 days $4000, butterfly biologist 1 day to confirm tree work $800, wildlife biologist to monitor work 5 days $4000.
Action 12-3.2	—	—	—	—	Included in 12-1.5
Action 12-3.3	—	—	—	—	Included in 12-1.5
Action 12-3.4	—	—	—	—	Included in 12-1.5
Action 12-3.5	—	—	48	—	3 days x 2 staff

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
Action 12-3.6	$4,800	—	8	—	Implementation Plan. Arborist: 20 hours. Monarch biologist: 20 hours. Report prep: 8 hours. @ 100/ hr. City staff to review Implementation Plan
Action 12-4.1	—	—	0	—	Program 4
Action 12-4.2	—	—		—	Program 4
Action 12-4.3	—	—		—	Program 4
Action 12-4.4	—	—	8	—	To review programs annually
Action 12-4.5	—	—	8	—	Staff time to coordinate
13. Integrated Pest Management Program					
Action 13-1.1	—	—	—	—	Arborist pest assessment can be done during annual plan site visits, 12-3.6
Action 13-1.2	—	—	—	—	Arborist pest assessment can be done during annual plan site visits, 12-3.6
Action 13-2.1	$5,000	—	40	—	Estimate for experimental techniques
Action 13-2.2	$2,000	—	20	—	Guidance
Action 13-2.3	$3,000	—	24	—	Pest inspection by specialist with recommendations; staff time to review
Action 13-2.4	$1,500	$5,000	32	—	Pest specialist to develop and maintain pest monitoring program and materials, and staff time to implement.
14. Habitat Enhancement and Restoration Program					
Action 14-1.1	$20,000	$25,000	120	80	Container plants, planting, irrigation system, water, maintenance, and monitoring; Initial experimental plots allowance. City staff maintenance: 10 hr/month.
Action 14-1.2	—	—	—	—	Guidance
Action 14-1.3	—	—	—	—	Programs 13 and 15

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
Action 14-2.1	$10,000	$15,000	120	80	Container plants, planting, irrigation system, water, maintenance, and monitoring; Initial experimental plots allowance. City staff maintenance: 10 hr/month.
Action 14-2.2	—	—	—	—	Program 15
Action 14-2.3	—	—	20	—	Guidance
Action 14-3.1	—	—	12	—	Coordination activities
Action 14-3.2	—	—	12	—	Coordination activities
Action 14-3.3	—	—	12	—	Coordination activities
Action 14-4.1	—	—	—	—	Direction for collection locations
Action 14-4.2	—	—	—	—	Direction for collection locations
Action 14-4.3	—	—	—	—	Direction for collection locations
Action 14-5.1	—	—	—	—	Coordinate with Program 10, 11, 12
Action 14-6.1	—	—	—	—	Coordinate with Wildfire Protection Plan
15. Invasive Plant Management Program					
Action 15-1.1	$2,500	$5,000			Renew map every two years. Initial mapping for 1511.1, 1.2, and 1.3 = 40 hrs. Botanist: 10 hrs. GIS @ $100 = $5000
Action 15-1.2	—	—	—	—	Cost in 15-1.1
Action 15-1.3	—	—	—	—	Cost in 15-1.1
Action 15-2.1	$1,000	$7,500	36		Control invasive plants allowance. Hand removal, herbicide. Hand crews CCC for 5 days per year.
Action 15-2.2	$1,000	$7,500	36		Control invasive plants allowance. Hand removal, herbicide
Action 15-2.3	$1,000	$7,500	36		Control invasive plants allowance. Hand removal, herbicide
Action 15-3.1	—	—	20	—	Program 20
Action 15-3.2	—	—	20	—	Program 14

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
16. Ecosystem-wide Management Coordination Program					
Action 16-1.1	—	—	20	—	Guidance for staff
Action 16-1.2	—	—	10	—	Guidance for staff
Action 16-2.1	—	—	10	—	Guidance for staff
Action 16-3.1	—	—	10	—	Guidance for staff
C. OUTREACH PROGRAMS					
17. Community Advisory and Docent Program					
Action 17-1.1	—	—	4	—	Hire docent coordinator
Action 17-1.2	—	—	64	—	2 hrs/wk for 8 month (Aug–Mar)
Action 17-2.1	$5,000	—	640	—	20 hrs/wk for 8 month (Aug–mar), supplies for the program
Action 17-2.2	—	—	64	—	2 hrs/wk for 8 month (Aug–Mar)
Action 17-2.3	—	—	—	—	Incorporated in Action 17-2.1
Action 17-2.4	—	—	—	—	Incorporated in Action 17-2.1
Action 17-2.5	—	—	—	—	Incorporated in Action 17-2.1
18. Interpretive Program					
Action 18-1.1	—	—	40	40	Staff prepare grant applications
Action 18-1.2	$500	$3,000	20	20	Design and install signage
Action 18-1.3	—	—	20	—	Guidance for signs
Action 18-2.1	—	—	8	—	Guidance for signs
19. Education Program					
Action 19-1.1	—	—	80	—	1 hr/tour x 80 tours average, by docents
Action 19-1.2	—	—	20	20	Create education materials and keep them updated
Action 19-1.3	—	—	—	—	Incorporated in Action 17-2.1
Action 19-2.1	—	—	24	—	Monthly updates. 12 x 2 hrs. = 24 hrs
D. MONITORING, RESEARCH, AND ADAPTIVE MANAGEMENT PROGRAMS					
20. Monitoring Program					
Action 20-1.1	$4,800	—	20	—	This could be docents for 48 hours: 4 hours per survey for 12 surveys

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
Action 20-2.1	$4,800	—	—	—	Per year estimate. One field day with drone to cover 4 sites; camera use, analysis, and brief report
Action 20-2.2	—	—	20	—	Staff coordination
Action 20-3.1	$3,000	—	4	—	30 hrs for biologist for monitoring report, staff review
Action 20-3.2	$3,000	—	4	—	30 hrs for biologist for visitor impact assessment, staff review.
Action 20-3.3	$500	—	8	—	Coordination of programs for biologists and staff
21. Monarch Research Program					
Action 21-1.1	—	$15,000	16	40	Evaluate requests for research and issue permits as needed.
Action 21-1.2	—	—	8	—	Guidance for research permits
22. Adaptive Management Program					
Action 22-1.1	—	—	16	—	16 hours per year staff time
Action 22-1.2	—	—	8	—	8 hours per year staff time
Action 22-1.3	—	—	8	—	8 hours per year staff time
TOTALS	**$203,650**	**$63,500**	**3226**	**472**	

APPENDIX B. SPECTRAL IMAGING AND ANALYSIS FOR ASSESSING TREE HEALTH

To monitor and determine vegetation health within the aggregate sites, spectral imaging and analysis will be used. In the last few decades, high resolution multispectral and hyperspectral imaging have become more commonly used by agricultural and horticultural industries to manage soil, fertilizing, and irrigation, and to monitor the health of crops. Spectral imaging is similar to digital photography except that instead of just collecting an image of three primary colors or bands (red, green, and blue; RGB) the multispectral camera sensor (spectrometer) divides the color range into multiple discrete bands of colors (typically 5 to 15 bands for multispectral to greater than 100 for hyperspectral) across the visible and near-infrared spectrums. In addition, the image captures data about the amount of light for each band that reaches the sensor. Since most plants with chlorophyll absorb light in the red (650 to 700 nm) and blue spectrum (425 to 475 nm) and reflect green and yellow light (500 to 600 nm), changes in the ratio of light within these regions can be used to determine vegetation health over time or in comparison to known healthy vegetation. By using spectral imaging over traditional arborist techniques, small changes in vegetation health can be assessed rapidly, the data can be quantified, and management decisions can be monitored for effectiveness. In addition, very little quantifiable information about the health of vegetation and butterfly use of aggregation sites has been studied.

To monitor the health of vegetation in aggregate sites, a ground-based imaging spectrometer will be used at set locations within the study area and within known aggregates sites. The spectrometer will be placed on a tripod at a known elevation and location within a study site. A series of images (both spectral and RGB) will be taken at a predefined aspect and slope of the tree canopy and surrounding vegetation. All perennial vegetation (trees and shrubs) within each image will be identified, and a visual assessment of vegetation health will be recorded and catalogued in order to track changes over time. For at least the first 2 or 3 years of the study, images should be taken three times during the year to help determine phenotypical color differences (variation in color due to genetics) between members of the same species and to calibrate seasonal changes. Afterwards, image frequency can be reduced to twice a year (at the beginning and middle of the growing season). For each spectral image, key individuals will be identified, and multiple pixel groups will be sampled across the foliage using multispectral imaging software and statistically analyzed to determine relative chlorophyll absorbance and reflectance, to indicate vegetation health.

By comparing changes in spectral signatures of like species and individuals, and by looking for abnormal changes for all species over time, the health of vegetation can be assessed. Individual, chronic changes to perennial vegetation can help determine which individuals are stressed and have a higher potential for mortality, while overall changes to the ecosystem can indicate climate stressors (e.g., drought) or toxic conditions (e.g., pollution). Since modern cameras are small and light enough to be mounted to unmanned aerial vehicles (UAVs), this technique can be used to determine whole forest health by sampling upper canopy foliage (once yearly) along with below canopy aggregation sites. This would allow for a whole ecosystem assessment and would help determine stressed locations or individual species across the whole study area.

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APPENDIX C. NATIVE PLANTS TO BE INCLUDED IN HABITAT RESTORATION EFFORTS

The following plants are native to the Central Coast of California and are known to offer several valuable elements to enhance the quality and longevity of native coastal habitats, including: fall and winter nectar source for monarch butterflies, canopy for wind protection, food source for wildlife, drought resistance, and fire resistance. California native plants are plants that were present in California prior to the arrival of European explorers and colonists in the late 18th century. Native plant stock should be sourced from local populations.

Restoration Native Plant List	Location				Purpose				
Common Name (*Scientific Name*)	**Over-wintering Site**	**Open Area Adjacent to Overwintering Site**	**Devereux Creek**	**Understory Windbreak**	**Nectar Source**	**Wildlife Habitat and Forage**	**Fire Resistant**	**Drought Tolerant**	**Erosion Control**
Trees									
coast live oak (*Quercus agrifolia*)	X	X		X		X	X	X	
western sycamore (*Platanus racemosa*)			X			X			
toyon (*Heteromeles arbutifolia*)	X			X	X	X	X	X	X
arroyo willow (*Salix lasiolepis*)			X		X*	X			X
hollyleaf cherry (*Prunus ilicifolia*)		X			X*	X	X	X	
Shrubs									
seacliff buckwheat (*Eriogonum parvifolium* var. *parvifolium*)		X			X*	X			
California bay laurel (*Umbellularia californica*)	X			X	X*			X	
California wax myrtle (*Myrica californica*)	X			X				X	
lemonade berry (*Rhus integrifolia*)		X		X	X*	X	X	X	X
golden currant (*Ribes aureum*)		X		X	X	X	X	X	
mulefat (*Baccharis salicifolia*)			X		X*	X			
California brittlebush (*Encelia californica*)		X			X*	X		X	X
California goldenrod (*Solidago veluntina* ssp. *Californica*)		X			X*	X		X	
California goldenbush (*Ericameria ericoides*)		X			X*	X		X	
saltmarsh baccharis (*Baccharis glutinosa* [*douglasii*])			X		X	X			X
coyote bush (*Baccharis pilularis*)		X			X*	X		X	
black sage (*Salvia mellifera)*		X			X*	X		X	

Restoration Native Plant List	**Location**				**Purpose**				
Common Name (*Scientific Name*)	**Over-wintering Site**	**Open Area Adjacent to Overwintering Site**	**Devereux Creek**	**Understory Windbreak**	**Nectar Source**	**Wildlife Habitat and Forage**	**Fire Resistant**	**Drought Tolerant**	**Erosion Control**
seaside fleabane (*Erigeron glaucus*)		X			X*	X		X	
purple sage (*Salvia leucophylla)*		X			X	X		X	
blueblossom (*Ceanothus thyrsiflorus)*		X			X*	X		X	
heart-leaved Keckiella (*Keckiella cordifolia*)	X	X	X		X*	X		X	
Groundcovers									
black figwort (*Scrophularia atrata*)	X	X	X	X	X*	X		X	
purple needlegrass (*Nassella pulchra*)		X				X		X	X
blue-eyed grass (*Sisrinchium bellum*)		X			X*	X	X	X	
bluedicks (*Dichelostemma capitatum)*		X			X*	X		X	
Santa Barbara honeysuckle (*Lonicera subspicata* var. *supspicata*	X	X	X	X	X	X			
Sticky monkeyflower (*Diplacus aurantiacus*)		X	X	X	X*	X		X	

X* indicates species that bloom during the overwintering period (October – March)

Plant List References

The Theodore Payne Foundation for Wildflowers and Native Plants, Inc. Fire Resistant Native Plants with High Wildlife Value. Sun Valley, CA. Available; http://www.theodorepayne.org/plants/fire_resistant.htm.

The Xerces Society. 2017. Protecting California's Butterfly Grove: Management Guidelines for Monarch Butterfly Overwintering Habitat. 32+vi pp. Portland, OR: The Xerces Society for Invertebrate Conservation.

Attachment 4

Final Initial Study – Mitigated Negative Declaration



Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan

Final Initial Study – Mitigated Negative Declaration

prepared by

City of Goleta
130 Cremona Drive, Suite B
Goleta, California 93117
Anne Wells, Advance Planning Manager

prepared with the assistance of

Rincon Consultants, Inc.
209 East Victoria Street
Santa Barbara, California 93101

March 2019

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers
rinconconsultants.com

Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan

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Table of Contents

Initial Study 1
1. Project Title 1
2. Lead Agency Name and Address 1
3. Contact Person and Phone Number 1
4. Project Location 1
5. Project Sponsor's Name and Address 1
6. General Plan Designation 1
7. Background Information 4
8. Monarch Butterfly Habitat Management Plan 8
9. Approval Required by Other Public Agencies 27
10. Site Information 27
11. Environmental Setting 27
12. Have California Native American Tribes Traditionally and Culturally Affiliated with the Project Area Requested Consultation Pursuant to Public Resources Code Section 21080.3.1? 28

Environmental Factors Potentially Affected 29

Determination 29

Environmental Checklist 31
1 Aesthetics 31
2 Agriculture and Forestry Resources 37
3 Air Quality 41
4 Biological Resources 45
5 Cultural Resources 81
6 Energy 85
7 Geology and Soils 89
8 Greenhouse Gas Emissions 93
9 Hazards and Hazardous Materials 97
10 Hydrology and Water Quality 101
11 Land Use and Planning 107
12 Mineral Resources 111
13 Noise 113
14 Population and Housing 119
15 Public Services 121
16 Recreation 125
17 Transportation 127
18 Tribal Cultural Resources 131
19 Utilities and Service Systems 133
20 Wildfire 139
21 Mandatory Findings of Significance 143

References 147
Bibliography 147
List of Preparers 153

Tables

Table 1 Prescription Guidance for Butterfly Aggregation Areas Adjacent to Structures 8
Table 2 MBHMP Programs, Policies, and Actions with Potential Effects on the Environment 16
Table 3 Habitat Types in the Coverage Area with Current Classification 48
Table 4 Special-status Plant Species in the Vicinity of the Coverage Area 57
Table 5 Special-status Animal Species in the Vicinity of the Coverage Area 60
Table 6 BAAQMD/Santa Barbara County Interim Thresholds of Significance 95
Table 7 Typical Construction Equipment Noise Levels 117

Figures

Figure 1 Regional Location 2
Figure 2 MBHMP Coverage Area Location 3
Figure 3 Monarch Butterfly Aggregation Sites 6
Figure 4 Peak Monarch Populations at Ellwood Main, 1997-2018 7
Figure 5 Site Photographs 33
Figure 6 Environmentally Sensitive Habitat Areas 49
Figure 7 Drainages and Vegetation Communities 50
Figure 8 Site Photographs 51
Figure 9 Western Monarch Population, 1997-2017 65

Appendices

Appendix A Draft Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan, Updated March 2019

Appendix B Public Comments and City of Goleta responses on the Draft Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan, Updated March 2019

Appendix C Responses to Comments Received on the Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan Draft Initial Study – Mitigated Negative Declaration

Appendix D Mitigation Monitoring and Reporting Program

Initial Study

1. Project Title

Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan (MBHMP)

2. Lead Agency Name and Address

City of Goleta, Planning and Environmental Review
130 Cremona Drive, Suite B
Goleta, California 93117

3. Contact Person and Phone Number

Anne Wells, Advance Planning Manager
(805) 961-7557

4. Project Location

The coverage area for the MBHMP (Coverage Area) encompasses approximately 75 acres of habitat supporting monarch butterfly (*Danaus plexippus*) seasonal aggregation areas in Ellwood Mesa/Sperling Preserve Open Space (Ellwood Mesa Open Space), a 137-acre open space area located on Ellwood Mesa and owned by the City of Goleta (City). The Coverage Area is south of Hollister Avenue, north of Ellwood Bluffs, east of Sandpiper Golf Club, and west of Ellwood Beach Drive and the University of California, Santa Barbara (UCSB). Figure 1 shows the MBHMP's regional location, and Figure 2 shows the Coverage Area and Ellwood Mesa Open Space.

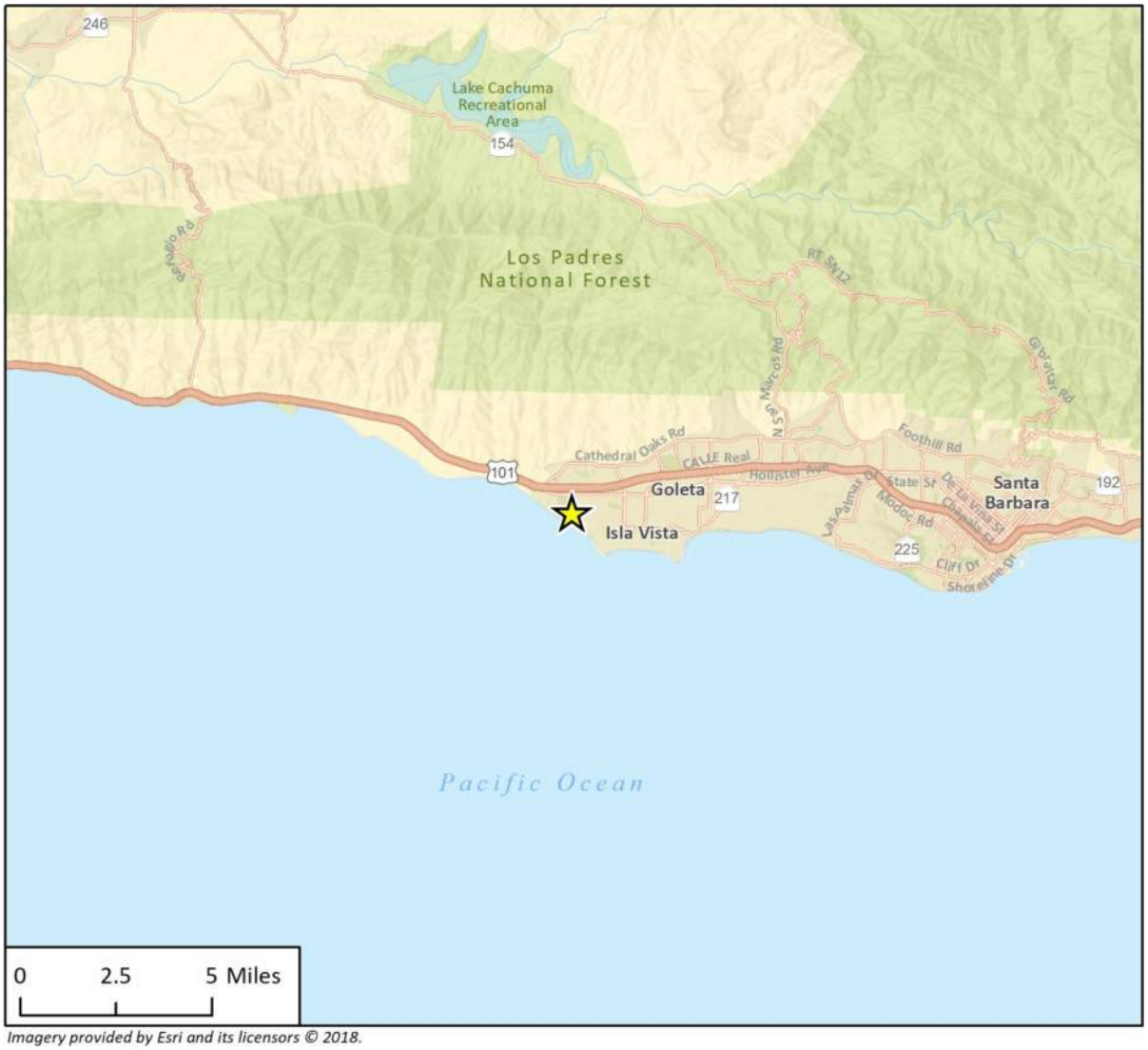
5. Project Sponsor's Name and Address

City of Goleta, Planning and Environmental Review
130 Cremona Drive, Suite B
Goleta, California 93117

6. General Plan Designation

In October 2010, the City authorized a contract for development of the MBHMP, which outlines strategies to manage the monarch butterfly population in Ellwood Mesa Open Space. The MBHMP is scheduled for City Council consideration in March 2019.

Figure 1 Regional Location



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MBHMP Location

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Figure 2 MBHMP Coverage Area Location



7. Background Information

Ellwood Mesa Open Space

Ellwood Mesa Open Space is a City-owned, 137-acre open space area on the coastal bluffs between Sandpiper Golf Course and UCSB. The current configuration of Ellwood Mesa Open Space was formed in 2004 when private development rights transferred from coastal parcels to a portion of what was formerly Santa Barbara Shores Park. This location was subsequently used for development of a Comstock Homes housing development, "The Bluffs," at which time the coastal parcels and remaining portion of the park were designated as permanent open space and zoned for Recreation (City of Goleta et al. 2004). The adjoining Coronado Butterfly Preserve is privately owned and managed by the Land Trust for Santa Barbara County, and is not part of Ellwood Mesa Open Space.

Eucalyptus Groves

Ellwood Mesa was cultivated by Ellwood Cooper in the 1870s. Cooper was a horticulturalist, entrepreneur, and a Goleta Valley rancher who introduced eucalyptus trees (*Eucalyptus* spp.) to Goleta in 1872. By the mid-1870s Cooper had successfully planted approximately 50,000 eucalyptus trees, comprised of more than 50 varieties. The eucalyptus trees thrived in the area and were intended to provide a source of lumber and pier pilings. However, the wood's grain made it difficult to cut and the wood rotted in sea water. The eucalyptus groves eventually matured and became useful for windbreaks. Eucalyptus groves present on Ellwood Mesa today are a remnant of Cooper's early attempt at eucalyptus forestry.

Ellwood Mesa is currently threatened by drought and pest infestation. The Goleta Valley is in its seventh year of the most severe drought on record, which began in 2012 (Goleta Water District [GWD] 2018). The drought has compromised the health of eucalyptus trees on Ellwood Mesa, exacerbating wildfire risk and increasing the vulnerability of eucalyptus trees to pest infestation.

Eucalyptus trees are subject to a variety of pests and diseases that can injure or kill trees. When trees occur in groves, the spread of pests and disease is facilitated by proximity, resulting in potential widespread losses. Current and past infestations at Ellwood Mesa of blue gum (*Eucalyptus globulus*) and river red gum (*E. camaldulensis*) include redgum lerp psyllids (a parasitic insect that attacks red gum eucalyptus; *Glycaspis brimblecombei*) on leaves, tortoise beetles (family Chrysomelidae), longhorned borer beetles (*Phoracantha* spp.), and orange sulfur fungus (*Laetiporus sulphureus*). Invasive, non-native species such as English ivy (*Hedera helix*) and cape ivy (*Delairea odorata*) also can be problematic, smothering entire trees and changing or destroying wildlife habitat.

The ongoing drought conditions and associated pest infestations have degraded the habitat at Ellwood Mesa, resulting in the degradation and death of numerous eucalyptus trees. According to a field study performed by Althouse and Meade, Inc., in July 2017, over 1,200 trees in the eucalyptus forest were dead, with hundreds more highly degraded and dying.

Monarch Butterflies

The monarch butterfly uses eucalyptus groves and windrows on Ellwood Mesa as winter habitat. Each fall, monarch butterflies in the western U.S. migrate to the coast of California from various locations throughout western North America. Up to tens of thousands of these butterflies converge on Ellwood Mesa annually, making this area one of the most important sites for monarch butterflies

in California. The butterflies arrive at Ellwood Mesa in mid-September and, as winter approaches, cluster into aggregation roosts, often called overwintering or wintering colonies. The butterflies remain until about mid-February, when they generally disperse inland. The congregation of butterflies attracts tourists to the site during the overwintering period. Figure 3 shows monarch butterfly aggregation sites in and around Ellwood Mesa Open Space. These include Ellwood North, Sandpiper, Ellwood West, Ellwood Main, Ellwood East and Ocean Meadows.

Monarch butterfly populations at Ellwood Mesa, and throughout California, have been in decline for several years. On average, approximately 13,800 butterflies visit Ellwood Mesa per year. In 2011, the monarch population at Ellwood Main was at a 30-year high with approximately 47,500 butterflies, as shown in Figure 4. The population has since declined to less than 0.5 percent of that level, to approximately 230 butterflies in 2018. Similarly, the state has experienced a dramatic decline in monarch populations over the last two decades, with populations in western North America currently at their lowest point in five years, despite recovery efforts (The Xerces Society 2018).

The monarch butterfly is included on the California Department of Fish and Wildlife (CDFW) Special Animals List, with overwintering roosts designated as imperiled to vulnerable in the state. The species is under review for potential listing under the federal Endangered Species Act (ESA), and the United States Fish and Wildlife Service (USFWS) plans to make its determination whether this species warrants federal ESA listing by June 30, 2019.

Community Wildfire Protection Plan

Goleta is prone to large wildfires and the combination of hot, dry weather and ignitable vegetation adjacent to structures creates a fire environment that could potentially threaten public safety. Santa Barbara County typically experiences numerous small fires throughout the summer and occasionally is hit by large, catastrophic fires. Recent large wildfires that burned near Goleta's boundaries include the 1990 Painted Cave Fire, 1997 Eagle Canyon Fire, 2008 Gap Fire, 2009 Jesusita Fire, 2016 Sherpa Fire, 2017 Whittier Fire, and 2017/2018 Thomas Fire. The Jesusita Fire burned 8,733 acres east of Goleta, destroying 74 residences and damaging 18 residences. The Thomas Fire burned 281,893 acres from Fillmore to Santa Barbara, destroying 1,063 structures and damaging 280 structures.

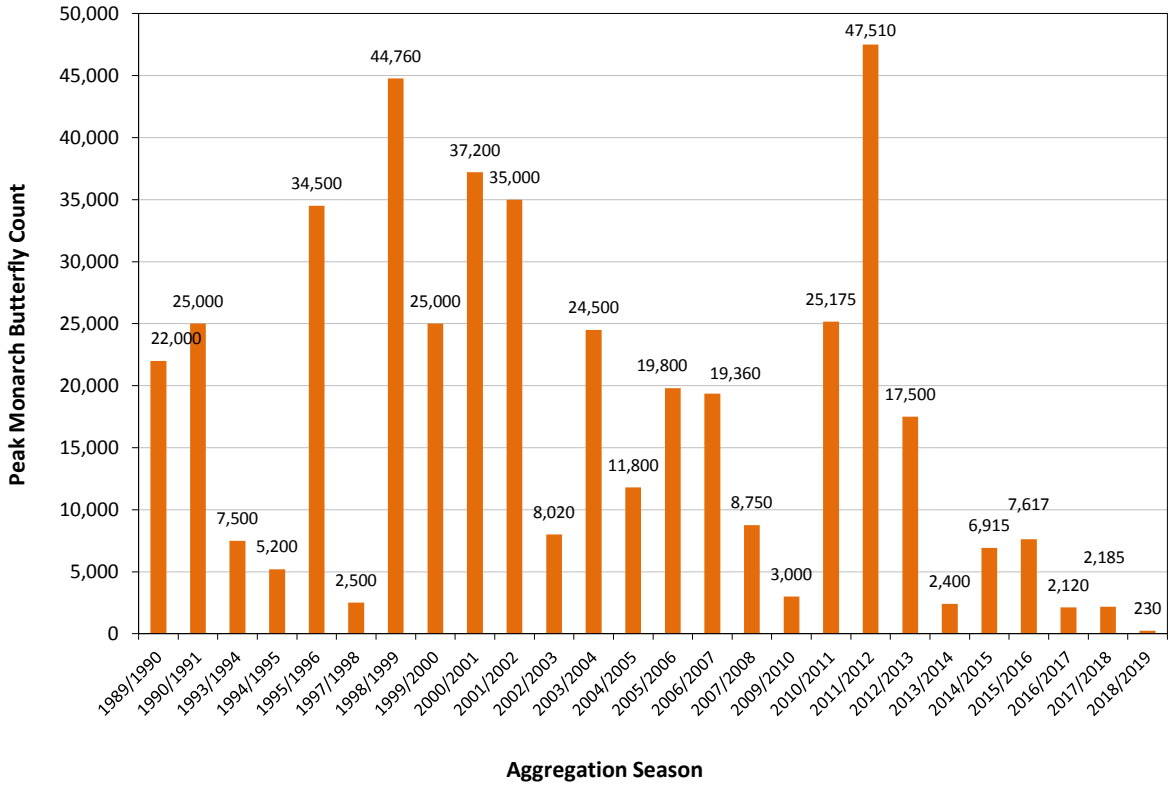
The City Council adopted the Community Wildfire Protection Plan (CWPP) in March 2012 to enhance the City's wildlife protection by identifying key hazard treatments that are in balance with sustainable ecological management and fiscal resources (City of Goleta 2012). The CWPP covers the city of Goleta, including the Ellwood Mesa area, identifies and prioritizes areas for hazardous fuel reduction treatments, and recommends the types and methods of treatment and measures to reduce the ignitability of structures throughout Goleta. The protection of human life and safety is the highest priority for all fire management strategies in Goleta, followed by the protection of property. Given the CWPP has been approved, activities under the CWPP would occur in Ellwood Mesa Open Space regardless of whether the MBHMP is implemented.

The CWPP was developed with consideration of the butterfly aggregation sites on Ellwood Mesa, and includes policies intended to minimize adverse effects on butterfly habitat while reducing fire hazards from fuel loads in these areas. The CWPP acknowledges conditions in the eucalyptus groves can change and butterfly aggregation locations may shift. The CWPP also notes the need to coordinate with City-approved butterfly and wildland fire experts during planning and implementation of any fuel treatments to minimize potential effects to butterflies. In addition, the CWPP requires any work performed near butterfly aggregation areas be conducted between April 1 and September 15, outside the monarch butterfly overwintering season.

Figure 3 Monarch Butterfly Aggregation Sites



Figure 4 Peak Monarch Populations at Ellwood Main, 1997-2018



Fuel treatments in areas near human developments are critical measures in the wildfire protection strategy for residences and butterfly aggregations and habitat. The CWPP includes prescription guidance for fuel treatments specific to the butterfly aggregation areas adjacent to structures that is less intensive than the prescription guidance for non-aggregation areas to balance fire safety with protection of butterfly aggregation areas. Table 1 details prescription guidance measures for the primary defense zone (0 to 30 feet from structures) and fuel reduction zone (30 to 100 feet from structures) by fuel type.

Because trees along the grove edges buffer aggregation sites from wind and weather, fuel treatment strategies are designed to maintain adequate tree density in these areas. These large trees are not the primary fuel of concern in the spread potential of wildfire. Instead, the greater threat is from the understory vegetation, dead-downed trees, and fuels that can create fire ladders. Therefore, fuel treatment activities focus on removing hazardous fuels rather than large trees, and the CWPP's prescription guidance for areas within 100 feet of residences and structures states only trees that do not provide protection to monarch butterfly aggregation sites should be trimmed or thinned.

The CWPP also provides prescription guidance for fuel treatment in areas not adjacent to structures; however, the CWPP limits fuel treatments for aggregation areas to mowing along the outside edge of the grove. This limited fuel treatment would apply to the Sandpiper aggregation site, adjacent to the Sandpiper Golf Course on the western edge of Ellwood Mesa Open Space, and to the Ocean Meadows aggregation site, adjacent to the undeveloped property on the eastern edge of the open space owned by UCSB.

Table 1 Prescription Guidance for Butterfly Aggregation Areas Adjacent to Structures

Fuel Type	Primary Defense Zone (A)*** (0 – 30 feet from structures)	Fuel Reduction Zone *** (30 – 100 feet from structures)
	Based on Defensible Space PRC – 4291 and Firefighter Safety	
Grass/forbs	Reduce fuel depth to 4 inches; methods include mowing, masticating, weed-whacking, biological browsing.	Same treatment as in the Primary Defense Zone; longer grass in isolated open areas is acceptable.
Surface dead/ down material	Clear dead/down flammable materials; methods include raking, hand-piling/removal, masticating chipping/dispersal on site.	Reduce dead/down flammable material to less than 3-inch depth; methods same as in the Primary Defense Zone.
Brush/shrub fuel	Remove to a spacing (between edges of brush) generally 2 times brush height on <20% slopes; methods include masticating or hand-cutting, biological browsing.	Same treatment as in the Primary Defense Zone; a pocket or clump of brush can be treated as one large shrub in more open site conditions.
Trees overstory (without brush understory)	**Trim or thin only trees that do not provide protection to monarch butterfly aggregation sites.*** Thin smaller or unhealthy trees at 10-20 foot crown spacing (as determined by slope, tree size, and type). Leave larger trees unless toppling hazard.** Reduce ladder fuels by pruning lower branches 6-15 feet up, or lower third of tree height on trees smaller than 18 feet.	**Trim or thin only trees that do not provide protection to monarch butterfly aggregation sites.*** Thin smaller or unhealthy trees at approximately 10-foot crown spacing (as determined by slope, tree size, and type). Leave larger trees unless toppling hazard.** Reduce ladder fuels by pruning lower branches approximately 6 feet up, or lower third of tree height on trees smaller than 18 feet.
Trees overstory (with brush understory)	**Trim or thin only vegetation that does not provide protection to monarch butterfly aggregation sites.*** Thin small or unhealthy trees at 10-20 foot crown spacing (based on slope, tree size, and type). Leave larger trees at 10 foot crown spacing unless toppling hazard.** Reduce ladder fuels by pruning lower branches 6-15 feet up, or lower third of tree height on smaller trees. In understory: remove brush ladder fuel. Methods include masticating or hand-cutting.	**Trim or thin only vegetation that does not provide protection to monarch butterfly aggregation sites.*** Thin small or unhealthy trees to approximately 10 foot crown spacing. Leave larger trees unless toppling hazard.** Reduce ladder fuels by pruning lower branches approximately 6 feet up, or lower third of tree height on smaller trees. In understory remove brush ladder fuel. In non-canopied areas, non-continuous patches of shrubs or small trees in openings are acceptable. Methods include masticating or hand-cutting.

*As determined by the Goleta City Project Manager overseeing mitigation work in consultation with a City-approved monarch butterfly specialist and a City-approved wildland fire specialist.

**As determined by the Goleta City Project Manager and Goleta City arborist.

***For further information specific to homeowner/structure mitigation measures, see City of Goleta CWPP Section 6.2.1.

Source: Table 14 of the CWPP (City of Goleta 2012)

8. Monarch Butterfly Habitat Management Plan

The purpose of the MBHMP is to provide a programmatic approach to management of habitats that support monarch butterfly seasonal aggregations, while maintaining the Coverage Area's functionality as habitat for other plants and other animals, such as red-shouldered hawks (*Buteo lineatus*), turkey vultures (*Cathartes aura*), and acorn woodpeckers (*Melanerpes formicivorus*). The City prepared the MBHMP in compliance with the two, key policy documents that drive the protection of monarch butterflies in Goleta: the City of Goleta General Plan/Coastal Land Use Plan (General Plan; City of Goleta 2006a) and Ellwood-Devereux Coast Open Space and Habitat

Management Plan (Open Space Plan; City of Goleta et al. 2004). In addition to Ellwood Mesa Open Space, the Open Space Plan area includes properties under the jurisdiction of UCSB and the County of Santa Barbara east of Ellwood Mesa; however, the properties under UCSB and County jurisdiction are not included in the MBHMP Coverage Area.

The MBHMP is composed of 22 programs organized into 4 categories: administrative programs; natural resources management programs; outreach programs; and monitoring, research, and adaptive management programs. Each program contains a goal, one or more policies, and one or more actions to implement each policy. The MBHMP is incorporated by reference and summarized below. Analysis in this Initial Study – Mitigated Negative Declaration (IS-MND) focuses on several programs with actions that could have direct, indirect, and/or cumulative physical effects on the environment, as summarized in Table 2. These programs include five administrative programs, six natural resource programs, one outreach program, and one monitoring, research, and adaptive management program.

The specific activities that could occur under each of the MBHMP programs and have the potential to result in direct, indirect, and/or cumulative physical effects to the environment are referred to as covered activities, and are described for each applicable program below. Restrictions or limitations to activities that could otherwise occur in Ellwood Mesa Open Space are included as covered activities because they could result in physical effects to the environment, some of which may be beneficial effects or reductions in adverse effects from other covered activities.

Administrative Programs

The MBHMP includes nine administrative programs articulating the goals, policies, and actions necessary for the City and stakeholders to implement the MBHMP. The purpose of the programs is to establish a well-organized and efficient process that supports a management strategy for the sustainability of habitat(s) for the monarch butterfly and other wildlife at Ellwood Mesa. The administrative programs include:

- Municipal Management Program
- Fiscal Program
- Interagency Cooperative Program
- Community Wildfire Protection Program
- Trail Management Program
- Waste Management Program
- Aesthetic Resources Management Program
- MBHMP Review, Update, and Amendment Program
- Catastrophic Event Response Program

Four of the administrative programs—the Municipal Management Program; Fiscal Program; Interagency Cooperative Program; and MBHMP Review, Update, and Amendment Program—relate to administrative structure, funding, agency coordination, and review and update of key planning documents. These four programs do not relate to physical effects to the environment, and therefore are not analyzed in this IS-MND. The remaining five administrative programs include covered activities that have the potential to result in direct, indirect, and/or cumulative physical effects to the environment, as described below.

Community Wildfire Protection Program

The goal of the Community Wildfire Protection Program is to provide management practices in the eucalyptus groves and windrows that support healthy monarch butterfly habitat and are compatible with the CWPP. As discussed in Section 7, Background Information, the CWPP includes policies intended to minimize adverse effects on butterfly habitat while reducing fire hazards from fuel loads in these areas. Because the CWPP was adopted in March 2012, activities that would occur under the CWPP, such as reducing ladder fuels by pruning lower branches and clearing dead wood and brush, would occur regardless of whether the MBHMP is implemented.

The Community Wildfire Protection Program pledges support for the policies and activities contained in the CWPP, particularly those related to minimizing adverse effects on butterfly habitat, and reiterates some of the restrictions contained in the CWPP. Given these activities would occur under the CWPP regardless of whether the MBHMP is implemented, the potential environmental effects of these activities are not a result of the MBHMP and are therefore not considered in this IS-MND.

The Community Wildfire Protection Program also calls for implementation of the Tree Management Program. Covered activities related to the Tree Management Program are discussed under the Natural Resource Programs. The Community Wildfire Protection Program includes one covered activity separate from the CWPP, but designed to be consistent with the intent of the CWPP:

- Maintain and revegetate moderate cover of understory in and around aggregation sites with fire-resistant, native plant species

Trail Management Program

The goal of the Trail Management Program is to develop and maintain public access trails that provide a safe and meaningful experience for visitors while limiting impacts to habitats and wildlife, in particular monarch butterflies and their seasonal aggregation sites. This program includes the following covered activities:

- Remove safety hazards such as hanging branches
- Remove tripping hazards such as fallen branches, protruding roots, and rocks
- Install and maintain trail boundary posts, ropes, rails, and signs
- Use wood chips on trails to reduce soil compaction and decrease erosion during wet months
- Adjust locations of trail and viewing areas if needed to protect trees or butterflies
- Install water bars and/or culverts to reduce erosion
- Perform minor trail relocations to avoid wet or eroded areas
- Construct and maintain crossings over drainages or other sensitive features

Waste Management Program

The goal of the Waste Management Program is to maintain a waste-, trash-, and debris-free butterfly habitat management area. This program includes the following covered activities:

- Post signs citing anti-dumping ordinances and butterfly rules
- Place trash cans in the parking lot

Aesthetic Resources Management Program

The goal of the Aesthetic Resources Management Program is to integrate the MBHMP's programs into an effort to improve the quality of Ellwood Mesa aesthetic resources, in particular the eucalyptus groves and windrows supporting monarch butterfly aggregation sites. The Aesthetic Resources Management Program relates to maintaining a consistent theme and aesthetic compatibility with natural conditions for any signage, fencing, and restoration plantings installed under some of the other programs of the MBHMP. The physical effect to the environment related to the installation of such features, and not the aesthetic components of the features, are discussed in the applicable MBHMP programs. The Aesthetic Resources Management Program includes the following covered activities:

- Ensure signs for the interpretive program are consistently designed
- Ensure any new signs, fencing, and restoration plantings are aesthetically compatible with natural conditions

Catastrophic Event Response Program

The goal of the Catastrophic Event Response Program is to prepare for possible catastrophic environmental events in the monarch butterfly aggregation sites by adopting actions that potentially minimize the impacts and plan for a response should such events affect the groves in which aggregation sites are located. This program includes implementation of some of the other programs outlined in the MBHMP. The covered activities related to these other programs are discussed under each of the applicable programs. The following covered activities would potentially occur under the Catastrophic Event Response Program:

- Install warning signage
- Implement closures of areas that are not safe for public use
- Remove trees that are dead, dying, diseased, burnt, hazardous, or otherwise affected by the catastrophic event
- Dispose of trees off site or chip for use on site as ground cover
- Plant new trees to replace trees that were removed
- Monitor the success of the plantings and irrigation over a set time
- Replace plantings as needed

Natural Resources Management Programs

The MBHMP describes seven natural resources management programs that articulate the goals, policies, and actions necessary to maintain and improve the many important natural resources, including biological diversity and ecosystem functions, associated with the Ellwood Mesa eucalyptus groves and the monarch butterfly aggregation sites the groves support. The natural resources management programs include:

- Monarch Butterfly Management Program
- Wildlife Habitat Management Program
- Tree Management Program
- Integrated Pest Management Program
- Habitat Enhancement and Restoration Program

- Invasive Plant Management Coordination Program
- Ecosystem-wide Management Coordination Program

The Ecosystem-wide Management Coordination Program includes actions focused on coordinating activities under other MBHMP programs. Such actions would not generate physical impacts beyond those associated with covered activities in other MBHMP programs. The remaining six natural resources management programs include activities that have the potential to result in direct, indirect, and/or cumulative physical effects. These programs and associated covered activities are described below.

Monarch Butterfly Management Program

The goal of the Monarch Butterfly Management Program is to facilitate the ongoing use of Ellwood Mesa by the monarch butterfly. This program incorporates actions under the Tree Management Program, Biological Monitoring Program, and Habitat Enhancement and Restoration Program, and includes the following covered activity:

- Unless authorized by a qualified biologist, limit all potentially invasive activities to the period between April 1 and September 30, including site maintenance, habitat restoration, exotic plant removal, and tree trimming and removal

Wildlife Habitat Management Program

The goal of the Wildlife Habitat Management Program is to manage eucalyptus groves at Ellwood Mesa for monarch butterflies in a manner consistent with ecosystem functions for other wildlife species that use the groves as habitat. This program includes the following covered activities:

- Preserve some trees with cavities for cavity-nesting birds
- Avoid tree or woody vegetation removal during the nesting season (March 15 to August 15), when feasible
- Limit vegetation removal and ground disturbance activities to the dry season
- Plant native trees, shrubs, and groundcover, including mid-canopy and low-stature or groundcover species in eucalyptus groves
- Plant riparian trees and vegetation along Devereux Creek
- Install irrigation system and irrigate newly planted vegetation

Tree Management Program

The goal of the Tree Management Program is to manage the eucalyptus groves in monarch butterfly aggregation sites at Ellwood Mesa in a manner that provides for healthy trees, suitable aggregation site structure, sustainable butterfly aggregation sites, public safety while visitors are on trails in the groves, and sensitivity to wildfire hazards. The program implements activities included under the Community Wildfire Protection Program, Monarch Butterfly Management Program, Integrated Pest Management Program, and Biological Monitoring Program. This program includes the following covered activities:

- Selectively prune or remove standing dead, dying, or vulnerable trees that pose a threat to public safety or monarch aggregation sites
- Selectively remove downed trees and debris that pose a threat to public safety or grove health
- Remove tree tangles or debris that interfere with monarch patrolling

- Plant new eucalyptus trees, native and/or fire-resistant understory species, and native nectar sources
- Use downed trees or logs to provide seating, slope stability, or erosion control, as feasible
- Irrigate existing and newly planted trees and other vegetation with potable and/or reclaimed water using water trucks with driplines or irrigation systems with above-ground water tanks
- Install irrigation systems, using the following steps:
  - Site above-ground water tanks such that they avoid existing eucalyptus trees
  - Utilize solar pumps to distribute water
  - Remove vegetation, as needed, to install driplines
  - Bury driplines a maximum of six inches below the surface
  - Replace soil to existing contours
  - Perform replacement plantings along disturbed soils
- Drive trucks on trails/paths to deliver and apply irrigation water
- Prune or remove understory plants
- Re-contour or grade drainage channels following flood events to protect trees
- Apply seed or mulch to disturbed soils
- Mow or weed-whack grass along the margins of eucalyptus groves

Integrated Pest Management Program

The goal of the Integrated Pest Management Program is to control or eradicate, as feasible, plant, animal, fungal, and other pests that would result in impacts on monarch butterflies or degrade monarch butterfly habitat. This program would implement management actions contained in the Invasive Plant Management Program and Tree Management Program, and includes the following covered activities:

- Introduce natural enemies of identified pests as part of planned biological control strategies
- Limit stress-inducing activities (e.g., pruning, transplanting) to periods of reduced pest activity
- Apply insecticides, herbicides, and other pesticides, as necessary
- For replacement plantings, use species that are resistant to pests and tolerant of site conditions

Habitat Enhancement and Restoration Program

The goal of the Habitat Enhancement and Restoration Program is to provide for the enhancement of native plant and animal habitats in the context of preserving the monarch butterfly habitat associated with established eucalyptus groves. This program includes the following covered activities:

- Plant experimental plots of native ground cover species
- Enhance existing native species, such as toyon (*Heteromeles arbutifolia*) and plants with nectar sources
- Plant new and replace/replant unhealthy existing native plant species individuals
- Apply chemical or mechanical weed control, as necessary
- Apply fertilizers to support new or existing native plantings, as necessary

- Apply organic material and wetting agents to soil around new plantings
- Plant native species in areas between eucalyptus groves
- Eradicate non-native herbaceous cover (except for eucalyptus saplings) in areas between eucalyptus groves through hand removal or herbicide application
- Remove vegetation along Devereux Creek riparian corridor, as needed
- Plant native riparian tree species along Devereux Creek
- Install irrigation systems and water native plantings

Invasive Plant Management Program

The goal of the Invasive Plant Management Program is to eradicate existing stands of invasive, non-native species and prevent or control new occurrences of invasive, non-native plant species in the monarch butterfly habitat at Ellwood Mesa. This program would incorporate activities under the Biological Monitoring Program and includes the following covered activities:

- Conduct hand removal of invasive, non-native plant species (excluding eucalyptus)
- Apply herbicides as needed to control invasive, non-native plant species
- Avoid removal of invasive, non-native plant species upon which monarch butterflies depend

Outreach Programs

Outreach programs are designed to provide information to visitors, educators, and students to help develop a broad appreciation for natural resources and local natural heritage, with a focus on monarch butterflies. The three outreach programs include the Community Advisory and Docent Program, Interpretive Program, and Education Program. The Community Advisory and Docent Program and Education Program would include actions targeted at improving administrative and interdepartmental coordination, creating educational materials and opportunities, and providing training to butterfly docents. Such activities would not result in physical effects on the environment and, as such, these programs are discussed no further in this IS-MND. The Interpretive Program could result in physical effects on the environment and is discussed below.

Interpretative Program

The goal of the Interpretative Program is to establish a useful and informative interpretive signage program at Ellwood Mesa monarch butterfly aggregation sites that is environmentally sensitive and minimally intrudes into habitats. This program includes the following covered activities:

- Install interpretive signage that is sensitive to the environment
- Locate interpretive signage in key locations minimally intrusive to the sensitive habitats of Ellwood Mesa

Monitoring, Research, and Adaptive Management Programs

Monitoring and research programs provide the mechanism for assessing environmental conditions and conducting original studies to help understand the ecology of monarch butterflies, particularly at Ellwood Mesa. Information obtained from these programs and other sources can be used to adapt the MBHMP to account for improved or additional information or changing conditions. The three monitoring, research, and adaptive management programs include the Biological Monitoring Program, Monarch Research Program, and Adaptive Management Program. The Biological Monitoring Program would involve maintaining butterfly counts, assessing ecosystem health using

spectral imaging, and creating monitoring reports. The Adaptive Management Program would incorporate adaptive management actions into other MBHMP programs, and includes policy review and reporting requirements. None of the actions associated with the Biological Monitoring Program or Adaptive Management Program would result in physical effects on the environment beyond those associated with other MBHMP programs, and actions associated with these programs are not discussed further in this IS-MND. The Monarch Research Program could result in physical effects on the environment and is discussed below.

Monarch Research Program

The goal of the Monarch Research Program is to encourage research projects and identify funding for research associated with monarch butterflies and their habitats at Ellwood Mesa. This program includes the following covered activities:

- Capture, tag, and release monarch butterflies for tracking
- Modify habitat structure and composition through pruning, trimming, or debris removal
- Plant plots of native species as part of experimental designs

Table 2 MBHMP Programs, Policies, and Actions with Potential Effects on the Environment

Programs		Goal	Policies	Actions
4	Community Wildfire Protection	To provide management practices within the eucalyptus groves and windrows that support healthy monarch butterfly habitat and are compatible with the City's Community Wildfire Protection Plan.	**4-1:** The goals, policies, and actions of this MBHMP shall be consistent with the intent of the *Community Wildfire Protection Plan* to reduce the ignitability of homes and structures.	**4-1.1:** Support implementation of Goleta's CWPP in the 100 ft. buffer from homes and structures as the 100 ft. extends into the Ellwood Mesa eucalyptus groves with actions outlined in Table 1 (Table 14 of the CWPP). **4-1.2**: Support implementation of Goleta's CWPP, specifically in regard to guidelines that are not in potential conflict with the management of the eucalyptus groves that support monarch butterfly aggregation sites, as noted below. **4-1.3:** Maintain and revegetate moderate cover of understory in and around aggregation sites with fire-resistant, native plant species (The Xerces Society 2017). **4-1.4:** Conduct all wildfire protection work within 300 feet of butterfly aggregation areas between April 1 and September 15, outside of monarch butterfly overwintering season. **4-1.5:** Coordinate with City-approved butterfly and wildland fire experts during planning and implementation of any fuel treatments since conditions within groves can change and aggregation locations may shift. **4-1.6:** Install a large, bilingual "NO PARKING -FIRE LANE" sign at Santa Barbara Shores access gate.
			4-2: Eucalyptus trees in the groves containing monarch butterfly aggregation sites shall be managed, as feasible, to ensure their health and longevity in the context of a high fire hazard environment.	**4-2.1:** Implement *Program 12, Tree Management Program*, to reduce fire hazard, improve public safety, and eliminate trees that are threatening the sustainability of the aggregation sites, including dead, diseased, and dying trees.
5	Trail Management	To develop and maintain public access trails that provide a safe and meaningful experience for visitors while also limiting impacts to habitats and wildlife, in particular monarch butterflies and their seasonal aggregation sites.	**5-1:** The City shall maintain existing public access trails that provide a safe experience for visitors to the eucalyptus groves supporting seasonal monarch butterfly aggregation sites.	**5-1.1:** Maintain existing public access trails through the eucalyptus groves supporting monarch butterfly aggregation sites by reducing threats of trips, slips, and falls. May use Trails council and CCC to help with maintenance. **5-1.2:** Implement *Program 12, Tree Management Program*, to reduce the threats from falling tree limbs and trunks. **5-1.3**: Repair damage to trail boundary ropes and posts, as needed. **5-1.4:** Prevent damage to seasonal monarch habitat by installing additional trail boundary posts, ropes, and signs, as necessary, consistent with those at the Ellwood Main monarch aggregation area. **5-1.5:** Use wood chips on trails to reduce soil compaction and decrease erosion during wet months. **5-1.6:** Retain and maintain Ellwood Main visitor viewing area boundary signs and rails.

Programs		Goal	Policies	Actions
				5-1.7: Review locations of trail and viewing area delineations and adjust if needed to protect trees or butterflies, annually. **5-1.8:** Review trail conditions on an annual basis and provide recommendations on improvements and modifications regarding human safety, trail maintenance, and ecosystem health, including conservation of monarch butterfly habitat in relationship to location, condition, use of trails, and number of visitors. Include recommendations for any tree trimming, removal recommendations, or other tree safety issues in the annual Implementation Plan. **5-1.9:** Long-term closure of official trails is undesirable and should not be used as a management approach. It is preferable to remedy trail hazards promptly, or to allow trails to remain open with appropriate signage alerting users to the risks present.
			5-2: Maintain and improve existing links between trails associated with eucalyptus groves that support monarch butterfly aggregation sites at Ellwood Mesa with the adjacent Coronado Butterfly Preserve.	**5-2.1:** Coordinate trail improvement activities with the Santa Barbara Land Trust and UCSB staff to ensure that improvements are compatible. **5-2.2:** Coordinate trail improvements with proposals for the Coastal and Juan Bautista De Anza trails that traverse Ellwood Mesa, which also link to trails within the eucalyptus groves that support monarch butterfly aggregation sites, to ensure protection measures are addressed for the aggregation sites.
6	Waste Management	To maintain a waste-, trash-, and debris-free butterfly habitat management area.	**6-1:** The City shall collect, remove, and appropriately dispose of all waste, trash, and debris that accumulates in monarch butterfly habitat on Ellwood Mesa.	**6-1.1:** Continue to remove existing accumulations of waste, trash, and debris from monarch butterfly habitat and dispose of them in an appropriate manner. Coordinate with the Sheriff's Office for removal of homeless encampments, if necessary.
			6-2: The City shall inform visitors of the monarch butterfly habitat of rules relating to trash and debris policies associated with monarch butterfly habitat.	**6-2.1:** Post signs at appropriate locations stating open space user rules; for example, "Please take out your trash" And, "Day Use Only = Camping Prohibited." **6-2.2:** Educate the public through seasonal, on site presence by the City's butterfly docents about the importance of maintaining the groves free of trash. **6-2.3:** Place trash cans in the parking lot. Inspect annually and replace as needed.

Programs		Goal	Policies	Actions
7	Aesthetic Resources Management	To integrate the MBHMP's programs into an effort to improve the quality of aesthetic resources of the Ellwood Mesa, in particular the eucalyptus groves and windrows supporting monarch butterfly aggregation sites.	**7-1:** The City shall provide stewardship and management oversight of the eucalyptus groves, in particular those groves supporting monarch butterfly aggregation sites.	**7-1.1:** Adopt and implement the MBHMP, including its 22 management programs. **7-1.2:** Provide integration of program goals, policies, and actions to improve the overall aesthetics of the various groves, including installation of a consistently designed interpretive program and strategically placed fencing, as more specifically outlined in Program 18, Interpretive Program.
			7-2: Signs, fencing, and restoration efforts associated with monarch butterfly habitat on Ellwood Mesa shall be aesthetically compatible with natural conditions.	**7-2.1:** Review signage and fencing design for compatibility with the Ellwood Mesa natural areas. **7-2.2:** Review restoration plantings and activities for appropriate aesthetic compatibility.
9	Catastrophic Event Response Program	To prepare for possible catastrophic environmental events within the monarch butterfly aggregation sites by adopting a set of actions that potentially minimize the impacts and plan for a response should such events affect the groves in which aggregation sites are located.	**9-1:** The City shall adopt a set of protocols that could minimize the impacts from potential catastrophic environmental events.	**9-1.1:** Implement *Program 12, Tree Management Program*, to reduce potential impacts on eucalyptus groves that support monarch butterfly aggregation sites. **9-1.2:** Implement *Program 4, Community Wildfire Protection Program*, to reduce potential impacts on monarch butterfly aggregation sites from wildfire. **9-1.3:** Implement *Program 13, Integrated Pest Management Program*, to reduce the potential impacts from pest infestations.
			9-2. The City shall assess the damage of catastrophic events as they occur and respond with corrective action to restore damaged monarch butterfly habitat.	**9-2.1:** Measure the extent and assess the magnitude of the damage to the monarch butterfly overwintering habitat. **9-2.2:** Design and implement a response strategy with actions to correct and restore the habitat after the catastrophic event and include them in the annual Implementation Plan if practical. When feasible, employ phased approaches with consistent monitoring to evaluate success or need for changes in strategy or actions. Assign priorities, including sources of materials, constraints, and methods for debris management. 9-2.3: Request City Council approval for supplemental funding, with a finding that the condition is a catastrophic event. Use funding received from the State Budget, apply for grants, and/or accept private donations for the dedicated mission of monarch butterfly overwintering habitat restoration.

Programs		Goal	Policies	Actions
10	Monarch Butterfly Management	To ensure the ongoing use of Ellwood Mesa by the monarch butterfly.	**10-1:** The City shall implement management strategies that facilitate the use of Ellwood Mesa by monarch butterflies.	**10-1.1:** Implement *Program 12, Tree Management Program,* to help facilitate the conservation of the monarch butterfly aggregation sites. **10-1.2:** Implement *Program 20, Biological Monitoring Program*, and *Program 21, Monarch Research Program*, to expand the body of knowledge and further the understanding of monarch butterflies' use of the resources at Ellwood Mesa.
			10-2: Preservation of aggregation sites on Ellwood Mesa shall be the focus of management activities, as feasible, and in coordination with *Program 9, Catastrophic Event Response Program*.	**10-2.1:** Should one or more catastrophic events result in impacts on the sustainability of monarch butterfly aggregation sites, consider alternative management and recovery strategies that incorporate goals for sustaining aggregation sites at Ellwood Mesa.
			10-3: Ecosystem functions proposed for habitat restoration projects at Ellwood Mesa shall consider inclusion of native plant species.	**10-3.1:** Implement *Program 14, Habitat Enhancement and Restoration Program,* as feasible, to improve conditions for native plants and animals and the ecosystem functions they provide, in and adjacent to the eucalyptus groves containing monarch butterfly aggregation sites.
			10-4: To avoid impacts on monarch butterflies while they are present at the Ellwood aggregation sites, no maintenance or restoration work shall be conducted in the aggregation sites from October 1 through March 31 of each year, unless authorized by a qualified biologist.	**10-4.1:** Unless authorized by a qualified biologist, conduct all site maintenance, tree trimming and removal, habitat restoration, exotic plant removal, and other potentially invasive activities between April 1 and September 30 of each year, when there would not likely be direct impacts on monarch butterflies.
11	Wildlife Habitat Management	Manage eucalyptus groves at Ellwood Mesa for monarch butterflies in a manner consistent with ecosystem functions for other wildlife species that use the groves as habitat.	**11-1:** The eucalyptus groves at Ellwood Mesa that support monarch butterfly aggregation sites shall be managed in a manner consistent with the ecosystem functions supporting other wildlife species, where feasible.	**11-1.1:** All personnel associated with the implementation of the MBHMP will receive educational information regarding the presence of monarch butterfly and other native wildlife species and the need to protect all native wildlife species. **11-1.2:** Preserve some trees with cavities to provide opportunities for cavity-nesting birds, such as acorn woodpeckers. **11-1.3:** Avoid removal of or disturbance to trees or other woody vegetation during nesting bird season (March 15 to August 15), when feasible. If not feasible, a biological monitor will survey for nesting birds in the area of proposed vegetation removal and ensure no active nests are present prior to removal or disturbance. **11-1.4:** Limit vegetation removal and ground disturbance activities to the dry season. Avoid areas with open water in Devereux Creek and tributaries.

Programs		Goal	Policies	Actions
			11-2: *Program 14, Habitat Enhancement and Restoration Program*, shall complement the Wildlife Habitat Management Program.	**11-2.1:** Include native plant species that are important for wildlife habitat and food in enhancement and restoration projects. **11-2.2:** Require a Planting Plan for any proposed enhancement plantings near the groves containing aggregation sites. **11-2.3:** Consider increasing mid-canopy and low-stature or groundcover native plant species to enhance wildlife habitat complexity and increase potential use of eucalyptus groves by a variety of wildlife species. **11-2.4:** Implement restoration for the Devereux Creek riparian corridor to improve functions for wildlife, consistent with the goals of the MBHMP for monarch butterflies.
12	Tree Management	To manage the eucalyptus groves within monarch butterfly aggregation sites at Ellwood Mesa in a manner that provides for (1) healthy trees, (2) sustainable aggregation site structure, (3) sustainable butterfly aggregation sites, (4) public safety while visitors are on trails within the groves, and (5) sensitivity to wildfire hazards.	**12-1:** Eucalyptus trees in the groves within the MBHMP coverage area ~~containing monarch butterfly aggregation sites~~ shall be managed, as feasible, to ensure their health and longevity.	**12-1.1:** Include guidance for necessary tree work in the annual Implementation Plan (Action 1-4.1 of the MBHMP). Tree work will take place in the month of September each year. The Implementation Plan should specify responsible parties, work locations, individual trees addressed, work to be accomplished, restoration measures, and methods and procedures for managing tree health. An annual plan is recommended but may be prepared on an as-needed basis based on conditions and progress of the previous Implementation Plan. **12-1.2:** Preliminarily identify potential threats to aggregation sites that may occur over time, and develop a framework for mitigating the threats and maintaining/recovering suitable overwintering habitat. Threats may include, but are not limited to, the following: ▪ Drought ▪ Pests ▪ Disease ▪ Fire ▪ Flood/erosion ▪ Vandalism ▪ Invasion by non-native plants (not including eucalyptus) These threats, as well as others, may arise and impair the function of Ellwood Mesa as habitat for overwintering monarch butterflies. When threats are encountered, a specific plan of action should be undertaken to address the needs of the situation. However, for planning purposes, the City should be prepared to undertake the response measures outlined in Table 2 of the MBHMP. Although not exhaustive, these measures represent a prudent suite of response tools to address future conditions. Measures listed below may prevent or rectify impacts from multiple types of threats, as the intent of the measures is to restore and encourage healthy habitat.

Programs	Goal	Policies	Actions
			12-1.3: Thresholds should be established to direct professional review and potential action to address conditions in the groves. Ultimately, it is envisioned that quantitative thresholds will be established based on the results of monitoring and scientific study within the groves (Programs 20, 21, and 22). However, until adequate reference data are available, action thresholds will be determined qualitatively by the City in consultation with a qualified monarch butterfly biologist. **12-1.4:** Implement *Program 13, Integrated Pest Management Program*, to help maintain tree health and control infestation in the eucalyptus groves supporting monarch butterfly aggregation sites. **12-1.5:** Cut down or prune trees identified as a threat to butterfly aggregation sites because they may fall and cause injury or collapse on other trees important to sustaining aggregation sites. **12-1.6:** Maintain a living forest within the outline of pre-drought forest extent as determined with historic aerial photographs. Restore sections of the forest where dead zones occur due to multiple tree die-offs. **12-1.7:** Implement *Program 14, Invasive Plant Management Program*, particularly regarding non-native vines that could affect the quality of monarch butterfly habitat, following recommendations for eradication consistent with the California Invasive Plant Council (Cal-IPC) and conservation priorities of monarch butterflies and their habitat. **12-1.8:** Implement *Program 20, Biological Monitoring Program*, to provide information regarding management of eucalyptus groves to ensure their health and longevity. **12-1.9:** Annually, identify conditions that threaten eucalyptus trees at aggregation sites and include recommended actions in the Implementation Plan to reduce perceived threats. **12-1.10:** Plant trees as needed to maintain grove density and improve monarch butterfly habitat. Plant in locations that improve aggregation site conditions as per the best available scientific analysis, and replant areas within historic eucalyptus grove extent where gaps have occurred from drought die-back. **12-1.11:** Following evaluation of compatibility with existing habitat and functionality with respect to butterfly habitat, conduct a pilot planting for any eucalyptus species considered for tree restoration that is not present in the MBHMP area as of 2018.

Programs	Goal	Policies	Actions
		12-2: Eucalyptus trees in the groves containing monarch butterfly aggregation sites shall be managed, as feasible, to provide sustainable habitat for butterfly aggregation sites.	**12-2.1:** When considering eucalyptus or other tree replacement actions, consider tree configurations that retain open areas for monarch butterfly patrolling and monarch overwintering preferences. **12-2.2:** Investigate potential enhancement to monarch butterfly patrolling habitat by reducing tree tangles and fallen debris. **12-2.3:** Remove hazard trees as necessary to protect monarch butterfly cluster locations, as consistent with goals for public safety. **12-2.4:** Implement, as feasible *Program 10, Monarch Butterfly Management Program*, to facilitate improvements in eucalyptus groves that help sustain aggregation sites. **12-2.5:** Protect blue gum saplings as necessary to encourage natural recruitment of trees in the eucalyptus forest.
		12-3: Eucalyptus trees within the groves containing monarch butterfly aggregation sites shall be managed, as feasible and consistent with conservation of monarch habitat, to provide safe conditions for the visiting public.	**12-3.1:** Prune and remove dead, dying, or particularly vulnerable tree trunks and branches that overhang trails and seating areas, or lay across trails, inside and near monarch butterfly aggregation sites to reduce the threat of injury from falling trunks and branches, debris on trails (trip hazards), or low-hanging material across trails that visitors could bump heads on. **12-3.2**: As recommended by the City arborist and detailed in the annual Implementation Plan, conduct work designed to protect the structure of aggregation sites. **12-3.3:** As recommended by the City arborist and detailed in the annual Implementation Plan, remove or prune dead standing, dead suspended, dead on the ground, or thick understory trees both to improve grove tree health and monarch butterfly habitat and to correct hazard conditions for human safety along trails and at observation sites. **12-3.4:** Consider using downed, dead trees for seating along trails, or to add to slope stability or help control erosion, for preservation rather than removal, as feasible, considering human safety or wildfire threat. **12-3.5:** Remove ground debris, such as accumulations of branches and leaves, at trailheads in particular to reduce threat from wildfires, to reduce threat to human safety from obscured view, and to increase aesthetic appeal. **12-3.6:** In consultation with the City arborist, conduct an annual review of tree health in April and May at aggregation sites. Develop and implement an annual Implementation Plan to address issues identified during the review, including potential need for tree removal or pruning, treatment of diseases or pests, and other potential recommendations.

Programs	Goal	Policies	Actions
		12-4: Eucalyptus trees within the groves containing monarch butterfly aggregation sites shall be managed, as feasible, to provide for low wildfire hazards.	**12-4.1:** Implement *Program 4, Community Wildfire Protection Plan*, to provide wildfire protection consistent with the City's adopted CWPP. **12-4.2**: Reduce accumulations of dead, dry, and loose organic and other flammable material within eucalyptus groves to decrease potential for ground-level fires becoming canopy fires as a result of ladder effect of fire hazard materials. Sufficient downed wood, debris, and ground cover will be left in place to provide substrate and shelter for monarchs dislodged from clusters. **12-4.3:** Remove accumulations of dead plant material along southern grassland margins of eucalyptus groves and at southern trailheads to reduce threat of grassland fires becoming eucalyptus grove fires as a result of fire hazards at the boundary between grasslands and groves via mowing or selective weed-whacking. Herbicides shall not be used. **12-4.4:** Replace removed understory plants as recommended by the City monarch butterfly biologist with fire-resistant native shrubs to restore and improve habitat structure for monarch butterflies. **12-4.5:** Coordinate (1) butterfly habitat management, (2) public access and safety needs, (3) fire management requirements, and (4) wildlife habitat restoration proposals to ensure fire management priorities and implementation of procedures that provide the most compatible result for the conservation of monarch butterflies, while also respecting the goals of other MBHMP programs, as feasible.
13 Integrated Pest Management	Control or eradicate, as feasible, plant, animal, fungal, and other pests that would result in detectable impacts on monarch butterflies or degrade monarch butterfly habitat.	**13-1:** To maintain current knowledge of pests and diseases, the City shall conduct an annual inventory of organisms negatively affecting eucalyptus trees in the groves at Ellwood Mesa.	**13-1.1:** Conduct an inventory of pests and diseases throughout the groves and windrows at Ellwood Mesa. **13-1.2:** Conduct an inventory of pests and diseases within the monarch butterfly aggregation sites within the Ellwood North, Ellwood West, Ellwood Main, Ellwood East, Sandpiper, and Ocean Meadows groves.
		13-2: The City shall consider using a variety of approaches to pest management to prevent pests and diseases from impacting Eucalyptus groves, particularly those supporting seasonal aggregation sites for monarch butterflies.	**13-2.1:** As feasible, experiment with different IPM approaches for different pests and diseases to determine which approach best suits the conditions within eucalyptus groves at Ellwood Mesa. **13-2.2:** Implement wise management practices within the eucalyptus groves at Ellwood Mesa that do not facilitate the spread of pests and diseases with groves. **13-2.3:** Identify current problems that require immediate treatment and implement appropriate treatment protocols. **13-2.4**: Implement a pest and disease monitoring program, as feasible, to determine success of treatments and any new infestations requiring treatment.

Programs	Goal	Policies	Actions
14 Habitat Enhancement and Restoration	To provide for the enhancement of native plant and animal habitats in the context of preserving the monarch butterfly habitat associated with established eucalyptus groves.	**14-1:** Establishment of appropriate native plants – in particular ground cover, shrub, and mid-canopy species – shall be encouraged within the eucalyptus groves and along the Devereux Creek corridor outside of the eucalyptus forest.	**14-1.1:** Plant experimental plots of native ground cover species to determine which may result in sustainable populations. **14-1.2:** Focus enhancement efforts on native plants existing within the eucalyptus groves, such as toyon (*Heteromeles arbutifolia*), and native plants with nectar sources for monarchs. **14-1.3:** Coordinate with *Program 13, Integrated Pest Management Program*, and *Program 15, Invasive Exotic Plant Management Program*.
		14-2: Areas between eucalyptus groves shall be considered for habitat enhancement and restoration alternatives.	**14-2.1:** Implement priority native restoration activities along Devereux Creek in areas outside of eucalyptus groves. **14-2.2:** Eradicate non-native herbaceous cover, seedlings, and saplings (not including eucalyptus saplings) in areas between eucalyptus groves to encourage or actively plant local natives.
		14-3: Restoration of Devereux Creek shall include appropriate actions to improve the habitat structure, ecological functions and processes, and native biodiversity of the existing riparian areas.	**14-3.1:** Restoration activities include establishment of a riparian area along the banks of Devereux Creek composed of native riparian tree species. **14-3.2:** Ensure that no restoration activities along Devereux Creek shall result in increased flooding. **14-3.3:** Coordinate to align efforts with other restoration projects under separate permits or mitigation plans for Devereux Creek.
		14-4: Native plant species are considered to be local genotypes of plants occurring naturally within the Ellwood Mesa/Devereux Creek Ecosystem.	**14-4.1:** Collect all plant materials for use in restoration projects from existing native plant populations in the Ellwood Mesa/Devereux Creek Ecosystem, where feasible. **14-4.2:** Collect plant material from the nearest existing populations for re-introduction of extirpated species. **14-4.3:** Obtain native plants for use in restoration from local nurseries or growers within the Santa Barbara area, emphasizing contract-grown material of local genotypes.
		14-5: No enhancement or restoration actions shall result in negative impacts on the quality of the eucalyptus groves that provide monarch butterfly habitat.	**14-5.1:** Coordinate with *Program 10, Monarch Butterfly Management Program*, *Program 11, Wildlife Management Program,* and *Program 12, Tree Management Program*.
		14-6: No enhancement or restoration actions shall conflict with the goals and policies of the *Community Wildfire Protection Plan*.	**14-6.1:** Coordinate all enhancement and restoration activities with the guidelines and recommendations of the CWPP.

Programs		Goal	Policies	Actions
15	Invasive Plant Management	To eradicate existing stands of invasive non-native species and prevent or control new occurrence of invasive non-native plant species within the monarch butterfly habitat at Ellwood Mesa.	**15-1:** The City shall undertake an inventory and generalized mapping program to identify, locate, and prioritize for eradication or control all invasive non-native plants species within the butterfly habitat at Ellwood Mesa.	**15-1.1:** Identify and map all invasive non-native species identified by Cal-IPC as "High" priority species. **15-1.2:** Identify and map all invasive non-native species identified by Cal-IPC as "Moderate" priority invasive species. **15-1.3:** Identify all invasive non-native species identified by Cal-IPC as "Limited" or unrated priority species and map any medium to large populations.
			15-2: The City shall control all "High," "Moderate," and "Limited" priority invasive plant species within the monarch butterfly habitat, as except those species for which monarch butterflies are dependent, as feasible.	**15-2.1:** Control all "High" priority non-native invasive plant species. **15-2.2:** Control all "Moderate" priority, non-native invasive plant species. **15-2.3:** Eradiate or control all medium or large stands of "Limited" or unrated priority non-native invasive species.
			15-3: The City shall undertake annual monitoring as feasible to identify and eradicate or control new occurrences of "High" or "Moderate" priority invasive non-native plant species.	**15-3.1:** Implement monitoring of eradication efforts and potential new occurrences as part of *Program 20, Biological Monitoring Program.* **15-3.2:** Coordinate with other programs in the MBHMP including *Program 14, Habitat Enhancement and Restoration Program.*
18	Interpretative Program	To establish a useful and informative interpretive signage program at Ellwood Mesa monarch butterfly aggregation sites that is environmentally sensitive and creates a minimum of intrusion into the habitats.	**18-1:** The City shall design and install an interpretive signage program that provides important information on the biology of monarch butterflies, the significance of the aggregation sites, and general information on Ellwood Mesa and the eucalyptus groves, when feasible.	**18.1-1:** Apply for grant funding to design, construct, and install the interpretive program signage. **18-1.2:** Design, construct, and install an interpretive signage program that is sensitive to the environment. **18-1.3:** Locate the interpretive signage program in key locations minimally intrusive to the sensitive habitats of Ellwood Mesa.
			18-2: The Butterfly Docent Coordinator shall provide input during design, review the draft interpretive program, and make recommendations to the City.	**18-2.1:** Involve the butterfly docents, as feasible, in ~~all phases of~~ development and review of the content and design of signs for the interpretative signage program.

Programs	Goal	Policies	Actions
21 Monarch Research Program	Encourage research projects and identify funding for research associated with monarch butterflies and their habitats at Ellwood Mesa.	**21-1:** The City shall allow for certain research projects that investigate the biology of monarch butterflies and their habitats at Ellwood Mesa and that provide information helpful to this MBHMP management programs.	**21-1.1:** Evaluate requests for research and, where approved, issue Scientific Research Permits to regulate the research efforts. **21-1.2:** Ensure that scientists use non-invasive research projects at Ellwood Mesa, in particular those that focus on monarch butterflies and their habitats, and require that the results of the research are provided to the City and posted on the City's website at www.goletabutterflygrove.com. **21-1.3**: Encourage research of the plants native to Santa Barbara County with regard to their ability to provide suitable monarch butterfly overwintering habitat and their applications for the restoration of the Ellwood Mesa.

9. Approval Required by Other Public Agencies

No approvals from other public agencies are required.

10. Site Information

Existing General Plan Land Use Designation	Open Space/Passive Recreation	
Zoning Ordinance, Zone District	Coastal Zoning Ordinance, zoned Recreation	
Site Size	137 acres	
Present Use and Development	Ellwood Mesa Open Space	
Surrounding Uses/Zoning	North:	Hollister Avenue and residences (City of Goleta, zoned 7-R-1, M-RP, DR-12.3, and MHP)
	South:	Pacific Ocean and Ellwood Bluffs
	East:	Residences (City of Goleta, zoned DR-10 and DR-6) and UCSB
	West:	Sandpiper Golf Club (City of Goleta, zoned REC)
Access	Existing:	Hollister Avenue
	Proposed:	Hollister Avenue
Utilities and Public Services	Water Supply:	Goleta Water District (GWD)
	Sewage:	Goleta West Sanitary District (GWSD)
	Power:	Southern California Edison
	Natural Gas:	Southern California Gas Company
	Cable:	N/A
	Telephone:	N/A
	Fire:	Santa Barbara County Fire Department
	School Districts:	N/A

11. Environmental Setting

The Coverage Area is on a coastal mesa with gentle slopes and terraces immediately north of the steep, coastal Ellwood Bluffs. Devereux Creek passes through the Coverage Area, generally flowing west to east before emptying to Devereux Slough east of the Coverage Area. The Coverage Area is bordered by Hollister Avenue and single- and multi-family residences to the north; residential development in Goleta and undeveloped land zoned residential in unincorporated Santa Barbara County to the east; the Ellwood Bluffs and the Pacific Ocean to the south; and the Sandpiper Golf Club to the west.

Eucalyptus woodlands form dense canopies on the northern portion of the Coverage Area and native and non-native grasslands and coyote brush scrub are the dominant habitats occurring on the mesa or southern portion of the Coverage Area. Non-native ornamental and invasive plants are also present. The area includes a parking lot and numerous trails. Previously, the area was used for oil development and remnants of the facilities are still on site.

Monarch butterflies aggregate in the on-site eucalyptus groves during winter months to "overwinter" or pass the winter season. The Coverage Area includes five monarch butterfly

aggregation areas, referred to as the Ellwood North, Ellwood West, Ellwood Main, Sandpiper, and Ocean Meadows aggregation sites (Figure 3). Ellwood East is not included in the Coverage Area because it is outside Ellwood Mesa Open Space. Based on data collected statewide and at Ellwood Mesa between 1997 and 2009, the butterflies at the Ellwood aggregations sites account for approximately 10 percent of the entire migrating population in the western United States. Therefore, these aggregation sites are important for the western population of the monarch butterfly, and accordingly, management of the eucalyptus trees that support the butterflies in such great numbers is paramount to continued overwintering by the species.

Some species of eucalyptus trees found on Ellwood Mesa, including blue gum, have deciduous bark, which is shed annually and presents a fire hazard. The bark catches fire readily and streamers from the loose bark tend to carry fire into the canopy and cast firebrands ahead of the main fire front. The leaf litter, which is the accumulation of dead, dry, and oily leaves, is also a fire hazard as it is extremely flammable.

12. Have California Native American Tribes Traditionally and Culturally Affiliated with the Project Area Requested Consultation Pursuant to Public Resources Code Section 21080.3.1?

The City prepared and mailed letters to local Native Americans on December 21, 2018. Under Assembly Bill (AB) 52, tribes have 30 days to respond and request consultation, giving tribes until January 21, 2019 to provide a response. As of the data of this draft, the 30-day response period has ended and no tribal representatives requested formal consultation with the City.

Environmental Factors Potentially Affected

This project would potentially affect the environmental factors checked below, involving at least one impact that is "Potentially Significant" or "Less than Significant with Mitigation Incorporated" as indicated by the checklist on the following pages.

■	Aesthetics	☐	Agriculture and Forestry Resources	■	Air Quality
■	Biological Resources	■	Cultural Resources	☐	Energy
■	Geology/Soils	☐	Greenhouse Gas Emissions	☐	Hazards & Hazardous Materials
■	Hydrology/Water Quality	☐	Land Use/Planning	☐	Mineral Resources
■	Noise	☐	Population/Housing	☐	Public Services
☐	Recreation	☐	Transportation	☐	Tribal Cultural Resources
☐	Utilities/Service Systems	☐	Wildfire	■	Mandatory Findings of Significance

Determination

Based on this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

■ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions to the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "less than significant with mitigation incorporated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potential significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Anne Wells
Signature

1-23-19
Date

Anne Wells
Printed Name

Advance Planning Manager
Title

Environmental Checklist

1 Aesthetics

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☐	■
b. Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?	☐	☐	☐	■
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	■	☐	☐
d. Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	☐	☐	☐	■

Existing Setting

The Coverage Area is located in Ellwood Mesa Open Space, an undeveloped open space area categorized in the General Plan as "Open Space/Passive Recreation" where "significant environmental values or resources, wildlife habitats, significant views, and other open space value" exists (City of Goleta 2006a). The visual character of the Coverage Area is dominated by existing eucalyptus groves, creating a forested landscape. The generally evergreen nature of eucalyptus trees creates a patchy- to fully-shaded setting in the Coverage Area, with hanging bark, leaves, and vegetated understory protruding between tree trunks. Parts of the Coverage Area have views of the Pacific Ocean. Hollister Avenue borders the Coverage Area to the north; this road is designated a local scenic corridor in the Visual and Historic Resources Element of the General Plan. U.S. Highway 101 (US-101) is State-eligible for listing as a scenic highway (California Department of Transportation 2018); US-101 parallels and is north of Hollister Avenue near the Coverage Area. The nearest State-designated scenic highway is State Route 154 (SR-154)/San Marcos Pass, located approximately 14

miles away from the Coverage Area. From within its confines, the Coverage Area provides views to the Pacific Ocean and the Santa Barbara Channel Islands in the distance. The General Plan contains policies to safeguard these views by various means. These include restoring and enhancing visual quality in visually degraded areas, such as those created by the dead and dying trees in the Coverage Area. Furthermore, the Santa Ynez Mountains are visible north of the Ellwood Mesa Open Space and are considered a visual resource, along with riparian areas in the Devereux Slough. As with the other scenic resources described here, these views are from the Coverage Area looking outward and, as the images in Figure 5 demonstrate, they are limited by existing dead and fallen tree material throughout the Coverage Area.

Thresholds of Significance

A significant aesthetic impact would occur if the MBHMP would result in any of the impacts noted in the checklist. The City's Environmental Thresholds and Guidelines Manual instructs the project evaluator to assess visual/aesthetic impacts through a two-step process. First, the visual resources of the Coverage Area must be evaluated, including the physical attributes, visual uniqueness, and relative visibility from public viewing areas. Visibility from coastal and mountain areas, as well as visibility from the urban fringe and travel corridors, are of particular concern. Second, the potential impact on visual resources in the Coverage Area and on views in the vicinity that may be partially or wholly obstructed by implementation of the MBHMP must be determined. This step includes an evaluation of the MBHMP's consistency with State and City policies on the protection of visual resources.

Project-Specific Impacts

a. Would the project have a substantial adverse effect on a scenic vista?

b. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?

Implementation of the MBHMP would not involve construction of any structures that would block protected views. The nearest State-designated scenic highway is SR-154/San Marcos Pass, located approximately 14 miles away from the Coverage Area. The Coverage Area is visible from points along SR-154, but none of the covered activities or changes proposed in the MBHMP would be visible from that distance. US-101 is approximately 0.2 mile north of the Coverage Area and is State-eligible for listing as a scenic highway. However, trees along the US-101 corridor and structures north of Hollister Avenue obstruct views of the Coverage Area from the freeway. The General Plan designates Hollister Avenue as a local scenic corridor and provides for protection of the "general character of significant natural features" (City of Goleta 2006a). The MBHMP calls for resource preservation measures involving the removal of dead and diseased trees that pose risk to life, prevent General Plan-mandated trail access, and contribute fuel to potentially catastrophic wildfire. Figure 5 includes images of some of the dead and diseased vegetation in the Coverage Area. The implementation of the MBHMP would not substantially damage a scenic resource and would instead improve the eucalyptus grove as a scenic resource, preserving views from Hollister Avenue and SR-154. MBHMP implementation would, therefore, have no adverse effect on a scenic vista and no impact would occur under threshold a. Although the Coverage Area is near a locally-designated scenic corridor and a State-eligible scenic highway, no substantial damage to scenic resources in these areas would occur. Therefore, no impact to scenic resources in a State scenic highway would occur.

NO IMPACT

Figure 5 Site Photographs



Photograph 1. Example of some of the dead/down material in Ellwood North that would be removed as part of the CWPP to reduce the risk of wildfire



Photograph 2. Example of some of the dead/down material in Ellwood Main that would be removed as part of the CWPP to reduce the risk of wildfire

c. Would the project, in non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

Implementation of the MBHMP would not involve any changes in land use in the Coverage Area, and resource management in Ellwood Mesa Open Space would be in keeping with the approved policies in the City's General Plan and CWPP. This would involve resource management activities in the eucalyptus grove in Ellwood Mesa Open Space consistent with General Plan policies for Open Space/Passive Recreation land use designations (City of Goleta 2006a). The incremental removal of dead and diseased trees would contribute to grove health, improving its appearance and making it more accessible to passive public use, including public viewing areas. Furthermore, the resource management activities support the MBHMP's intent to provide consistent stewardship of the Coverage Area and would help protect the grove and adjacent neighborhoods from imminent wildfire threat, which would be consistent with the approved CWPP (City of Goleta 2012).

The MBHMP states "portions of Ellwood Mesa eucalyptus groves suffer from … senescence, drought, pests, disease, or lack of formal management efforts that can negatively affect the aesthetic value of that area." Checklist item 4, Biological Resources, includes the requirement to implement Mitigation Measure BIO-7, which requires monitoring and, if necessary, replacement of trees to ensure the groves remain viable habitat for monarch butterflies and retain visual character. The removal of dead and diseased trees or deadfall would not be considered removal of any scenic resources on the Coverage Area as it would benefit the overall health of the groves. The MBHMP Tree Management Program calls for reforestation along with removal of dead and diseased specimens with covered activities that include "plant new eucalyptus trees, native and/or fire-resistant understory species, and native nectar sources" for migrating butterflies. These new plantings would be subject to the replacement tree guidelines detailed in Mitigation Measure BIO-7 and would be consistent with existing open space conservation practices. Therefore, the MBHMP would result in a less than significant impact to the existing visual character with implementation of mitigation.

The MBHMP Aesthetic Resources Program identifies the signs and fencing associated with monarch butterfly habitat on Ellwood Mesa as part of the stewardship program, and intends to ensure the signs and fencing are aesthetically compatible with the natural conditions of the Coverage Area. Designs for signage and other facilities would be subject to review by the City for consistency with the natural conditions of the Coverage Area prior to installation. Adherence to this review process would ensure improvements to the quality of aesthetic resources in the Coverage Area would not result in an impact to scenic visual resources.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

d. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Implementation of the MBHMP involves no development that would add new sources of light or glare. Therefore, no impact would occur.

NO IMPACT

Mitigation Measures

No additional mitigation beyond Mitigation Measure BIO-7 is required or recommended.

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2 Agriculture and Forestry Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Convert Prime Farmland, Unique Farmland, Farmland of Statewide Importance (Farmland), as shown on maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	■
b. Conflict with existing zoning for agricultural use or a Williamson Act contract?	☐	☐	☐	■
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)); timberland (as defined by Public Resources Code Section 4526); or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	■
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	■
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	■

Existing Setting

The Coverage Area is undeveloped open space and surrounded by residential and recreational uses to the north, east, and west and the Pacific Ocean to the south. The Coverage Area is not on or adjacent to land currently under agricultural operation and is not designated for agricultural use in the City's General Plan. Based on the Farmland Mapping and Monitoring Program for the California Resources Agency, no portion of the Coverage Area is designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (California Department of Conservation 2018a). In addition, no portion of the Coverage Area is zoned for forestland, timberland, or timber production.

Thresholds of Significance

A significant impact to agricultural resources would be expected to occur if the MBHMP would result in any of the impacts noted in the above checklist. Additionally, the MBHMP may pose a significant environmental effect on agricultural resources if it conflicts with adopted environmental plans and goals of the City, converts Prime agricultural land to non-agricultural use, or impairs the agricultural productivity of Prime agricultural land.

Project-Specific Impacts

a. Would the project convert Prime Farmland, Unique Farmland, Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

b. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

e. Would the project involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?

The Coverage Area is currently undeveloped open space and is not in agricultural use. Implementation of the MBHMP would not impact farmland designated as Prime, Unique, or of Statewide Importance (California Department of Conservation 2018). In addition, the City's General Plan does not designate any portion of the Coverage Area for agricultural use (City of Goleta 2017a). Implementation of the MBHMP would not result in the displacement of existing farmland or occur adjacent to any existing farmland or agricultural resources. The MBHMP would not affect any lands designated by the City for agricultural purposes, nor would it affect any parcels zoned for agricultural use or parcels under a Williamson Act Contract (City of Goleta 2017a). The MBHMP would not involve any other changes to the existing environment that could result in conversion of farmland to non-agricultural uses. Because implementation of the MBHMP would not conflict with adopted environmental plans and goals of the City, nor would it convert prime agricultural and to non-agricultural use or impair the agricultural productivity of prime agricultural land, no impact would occur.

NO IMPACT

c. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

As discussed in Section 10, *Land Use and Planning*, the Coverage Area is zoned Recreation (Rec) and has a General Plan land use designation of Open Space/Passive Recreation. According to the City of Goleta Coastal Zoning Ordinance, the intent of the Recreation district is to encourage outdoor recreational uses that will protect and enhance areas that have both active and passive recreation potential because of their beauty and natural features (City of Goleta 1998). No portion of the Coverage Area is zoned for forestland, timberland, or timber production, and timber production is not a permitted use in the Recreation zone. Therefore, no impact would occur.

NO IMPACT

d. Would the project result in the loss of forest land or conversion of forest land to non-forest use?

The Coverage Area in an open space preserve and contains several tree species, including groves of eucalyptus. Implementation of the MBHMP would remove selected dead, dying, or hazardous trees under the Catastrophic Event Response Program and Tree Management Program. Following tree removal, new tree plantings would be installed to enhance habitat conditions for the monarch butterfly. The trees that would be removed during implementation of the MBHMP are dead, dying, or otherwise hazardous trees that are a risk for recreational users in the Coverage Area because they have the potential to fall down. The MBHMP would have a beneficial effect on the eucalyptus groves in the Coverage Area because it would result in replacement of dead, dying, or otherwise hazardous eucalyptus trees, which generally have reduced canopy and provide minimal forest habitat value, with healthy, young trees.

The City amended and approved the Goleta Urban Forest Management Plan (GUFMP) in February 2017 to outline a policy framework for the restoration, enhancement, and management of the urban forest in Goleta. The tree removal strategy proposed by the MBHMP is consistent with Policy 4.12.4 of the GUFMP, which recognizes tree removal may be necessary, at City staff's discretion, for the protection, public health, and safety of citizens in considering dead, dying, or hazardous trees (City of Goleta 2017b). No other trees would be removed because the Coverage Area in an open space preserve and not zoned for timber harvest. Additionally, eucalyptus trees are not used as timber. Given that the MBHMP would be consistent with the GUFMP and would improve the health of the eucalyptus groves, there would be no impact.

NO IMPACT

Mitigation Measures

No mitigation is required or recommended.

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3 Air Quality

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	■	☐	☐
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	■	☐	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	☐	■	☐	☐
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☐	■

This section addresses the impacts of the MBHMP on air quality and the exposure of people, especially sensitive individuals, to unhealthful pollutant concentrations. The analysis of emissions focuses on whether the MBHMP would cause an exceedance of a State or national ambient air quality standard or an exceedance of a threshold recommended by the local air quality agency.

Local Climate

The climate in and around Goleta, as well as most of southern California, is controlled largely by the strength and position of the subtropical high-pressure cell over the Pacific Ocean. This high-pressure cell typically produces a Mediterranean climate with warm summers, mild winters, and moderate rainfall. This pattern is interrupted occasionally by periods of extremely hot weather brought in by sundowner winds. Almost all precipitation occurs between November and April, although during these months, the weather is sunny or partly sunny the majority of the time. Cyclic land and sea breezes are the primary factors affecting the region's mild climate. The daytime winds are normally sea breezes, predominantly from the west, which flow at relatively low velocities. Additionally, cool, humid, marine air causes frequent fog and low clouds along the coast, generally during the night and morning hours in late spring and early summer.

Surface temperature inversions (0 to 500 feet) are most frequent during the winter, and subsidence inversions (1,000 to 2,000 feet) are most frequent during the summer. Inversions are an increase in temperature with height and directly relate to the stability of the atmosphere. Inversions act as a cap to the pollutants emitted below or within them. The subsidence inversion is common during the summer along the California coast, and is one of the principal causes of air stagnation. Poor air quality is usually associated with air stagnation (high stability/restricted air movement).

Air Quality Standards – Criteria Pollutants

The federal government and the State of California have established air quality standards and emergency episode criteria for various pollutants. Generally, State regulations have stricter standards than those at the federal level. Air quality standards are set at concentrations that provide a sufficient margin of safety to protect public health and welfare. Air quality at a given location can be described by the concentration of various pollutants in the atmosphere. The significance of a pollutant concentration is determined by comparing the concentration to an appropriate federal and/or State ambient air quality standard.

The United States Environmental Protection Agency (USEPA) establishes federal standards, termed the National Ambient Air Quality Standards. The California Air Resources Board (CARB) establishes the State standards, called the California Ambient Air Quality Standards. The region generally has good air quality, as it attains or is considered in maintenance status for most ambient air quality standards. The Coverage Area is in the South Central Coast Air Basin, which encompasses all of Santa Barbara and San Luis Obispo counties. Santa Barbara County Air Pollution Control District (SBCAPCD) is required to monitor air pollutant levels in the South Central Coast Air Basin to ensure federal and State air quality standards are met.

Criteria Pollutants

Criteria pollutants of primary concern include ozone, carbon monoxide (CO), nitrogen oxide (NO_2), particulate matter less than 10 microns in diameter (PM_{10}), and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). Although there are no ambient standards for volatile organic compounds/reactive organic compounds (VOCs/ROCs) or nitrogen oxides (NO_X), they are important as precursors to ozone.

Ozone air pollution is formed when NO_X and ROCs react in the presence of sunlight. According to the SBCAPCD, the major sources of ozone precursor emissions in Santa Barbara County are motor vehicles, the petroleum industry, and solvent usage (paints, consumer products, and certain industrial processes). Sources of PM_{10} include grading, demolition, agricultural tilling, road dust, mineral quarries, and vehicle exhaust.

The County currently violates the State 8-hour ozone and PM_{10} standards, but it is in attainment of the federal 8-hour ozone standard and the State 1-hour ozone standard. The SBCAPCD adopted a Clean Air Plan in 2013 demonstrating how the County will maintain and/or meet State and federal air quality standards, including ozone and particulate matter standards.

Thresholds of Significance

A significant air quality impact could occur if the MBHMP resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines.

In addition, per the City's Environmental Thresholds and Guidelines Manual, a significant adverse air quality impact may occur when a project, individually or cumulatively:

- Interferes with progress toward the attainment of the ozone standard by releasing emissions which equal or exceed the established long-term quantitative thresholds for NO_X and reactive organic gases
- Equals or exceeds the State or federal ambient air quality standards for any criteria pollutant (as determined by modeling)

A project has a significant impact on regional air quality if emissions related to project operation exceed the significance threshold established by SBCAPCD, currently set at 25 pounds per day for NO_X and ROC emissions for motor vehicle trips. Furthermore, if a project's emissions exceed these thresholds, that project's contribution to cumulative impacts would be considered significant.

The City's thresholds also include criteria for conducting CO emission modeling. However, due to the relatively low background ambient CO levels in Santa Barbara County, localized CO impacts associated with traffic at congested intersections are not expected to exceed the CO health-related air quality standards. Therefore, CO "hotspot" analyses are no longer required.

The SBCAPCD does not have quantitative emission significance thresholds for short-term construction activities because of their temporary nature. Nevertheless, because Santa Barbara County is not compliant with State standards for PM_{10}, construction-generated fugitive dust (50 percent of total dust) is subject to the SBCAPCD's standard dust mitigation requirements.

Project-Specific Impacts

a. Would the project conflict with or obstruct implementation of the applicable air quality plan?

b. Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard?

c. Would the project expose sensitive receptors to substantial pollutant concentrations?

Temporary emissions associated with implementation of the MBHMP would be minimal, as the MBHMP would not involve demolition of existing structures or construction of any new structures. The MBHMP would involve programs and activities to improve monarch butterfly habitat such as waste reduction, pest management, trail maintenance, and habitat restoration. Most of these activities would not involve the use of heavy diesel equipment resulting in substantial criteria pollutant emissions. Trail and tree maintenance activities would involve tools such as chainsaws and hand tools. Emissions from such equipment would be minimal, as well as temporary and intermittent.

Certain covered activities, such as drainage clearing following flood events, trail relocations, culvert installations, and tree removals may involve limited ground disturbance and require the intermittent use of heavy construction equipment. Additionally, tree maintenance, vegetation removal, habitat restoration, and trail maintenance and relocation activities could require driving trucks on unpaved roads and trails in the Coverage Area, which may generate fugitive dust emissions.

The trail improvement and educational programs associated with the MBHMP would improve the quality of the experience for visitors to the butterfly habitat, which may lead to an incremental increase in visitors to the Coverage Area. However, the MBHMP would not expand the capacity of Ellwood Mesa Open Space to accommodate additional vehicle trips to the open space through additional parking or site access. Therefore, the MBHMP would not substantially increase operational emissions associated with vehicle trips to and from the Coverage Area above current conditions. The MBHMP would not result in human population growth, and therefore, would be consistent with the population growth assumptions contained in the County's 2013 Clean Air Plan and 2016 Ozone Plan. As a result, the MBHMP would not conflict with or obstruct implementation of an applicable air quality plan.

Implementation of the MBHMP would not result in substantial, long-term, operational air quality emissions. However, smaller ground-disturbing activities would have the potential to temporarily and intermittently generate fugitive dust in the Coverage Area. Because the MBHMP would not involve construction of structures, it would not be subject to SBCAPCD Rule 345, which includes various fugitive dust mitigation requirements for construction activities in the County. Nevertheless, the SBCAPCD recommends standard fugitive dust control measures for construction and demolition activities in its jurisdiction. Mitigation Measure AQ-1 features such measures, the incorporation of which would minimize potential fugitive dust emissions resulting from covered activities that require ground disturbance or from vehicles driven on unpaved roads and trails in the Coverage Area. With adherence to dust control measures contained in Mitigation Measure AQ-1, air quality impacts would be less than significant with mitigation incorporated.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

d. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Operational activities associated with the MBHMP would not create objectionable odors for nearby residences or visitors to the Ellwood Mesa Open Space because the MBHMP would not involve new facilities other than signage and improved trails. Covered activities, such as tree pruning, trail maintenance, and habitat restoration, would generally not require heavy diesel equipment and would not produce objectionable odors. Therefore, no impact would occur.

NO IMPACT

Mitigation Measures

AQ-1 Dust Control

All covered activities shall incorporate the following dust control measures to reduce potential PM_{10} emissions during implementation of the MBHMP:

- Covered activities shall minimize the amount of disturbed area to the extent feasible
- On-site vehicle speeds shall be limited to 5 miles per hour or less
- The City or City-approved contractor shall install gravel pads at the access points to Ellwood Mesa Open Space to prevent tracking of dirt/mud onto public roads
- After a ground-disturbing activity is completed, the City or City-approved contractor shall treat the disturbed area by watering, revegetating, or spreading soil binders

4 Biological Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	■	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	■	☐	☐
c. Have a substantial adverse effect on State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	■	☐	☐
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	■	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	■
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?	☐	☐	☐	■

Existing Setting

Regional Setting

The Coverage Area is in the South Coast region of Santa Barbara County on a coastal plain, along the south edge of the western Transverse Range. The Coverage Area is in the South Coast subregion as described in the Jepson ecoregion system (Baldwin et al. 2012), which extends from Point Conception to the west southward to Mexico, along the immediate coast in Santa Barbara County, but also extends inland to the San Gabriel and San Bernardino mountains farther east and south. More specifically, the Coverage Area is in the Santa Ynez – Sulphur Mountains subsection of the Southern California Coast, according to the United States Forest Service (USFS) ecoregion system (USFS 2014). This ecological sub-unit extends from the Santa Ynez River mouth in northern Santa Barbara County, south and east into the Sulphur Mountains just west of the Ventura River in northern Ventura County. The ecological unit is defined by its mountainous topography inland, with coastal plains along the coastline. The Santa Ynez Mountains to the north of the Coverage Area form relatively steep hillsides vegetated by with chaparral and scrub vegetation types, drained by incised streams. Some streams in Goleta are lined with narrow bands of oak, while others support riparian shrubs and woodlands. The Coverage Area is on the coastal plain between the southern foot of the mountains and the Pacific Ocean.

The climate in Goleta is influenced by the city's proximity to the Santa Ynez Mountains, whose elevations surpass 4,000 feet. When moist coastal air is pushed up by the mountains, an orographic effect forces the air upward and causes increased precipitation along the South Coastal plain. Annual precipitation in Goleta is typically about 16.3 inches, with the majority of rainfall received between November and April in typical years (Western Region Climate Center 2018). Mean annual temperatures range from 48 to 69 degrees Fahrenheit (°F). Morning fog and sea breezes often moderate summer daytime temperatures. The growing season lasts 340 to 360 days per year (United States Department of Agriculture 2018).

In Goleta, much of the coastal plain between the Santa Ynez Mountains and Pacific Ocean is developed or has been disturbed by historical agriculture or ranching uses. Native vegetation in Goleta is fragmented, but includes riparian and upland woodlands, coastal scrub, native and non-native grasslands, wetlands, and vernal pools. Relatively undisturbed habitats are present along narrow riparian corridors, in scattered undeveloped lands of varying sizes, and in protected open space areas. The Coverage Area in Ellwood Mesa Open Space is one such open space, though vegetation in this area has been disturbed historically for oil development, wood lots, and ranching uses (City of Goleta et al 2004; Campbell Geo 2010).

Coverage Area Setting

The Coverage Area is in the Ellwood Mesa Open Space, situated on Ellwood Mesa, on gentle slopes and terraces immediately north of the Ellwood bluffs. The Coverage Area consists of a series of eucalyptus groves, which were planted on the site beginning in the 1870s, and the immediately adjacent areas. The Coverage Area was selected based on the biology of the monarch butterfly, the focal species of the MBHMP, which is dependent on dense stands of eucalyptus trees for overwintering habitat. Devereux Creek, an intermittent coastal stream, flows through the center of the Coverage Area and likely helps to sustain some of the eucalyptus groves. Two unnamed tributaries to Devereux Creek also occur in the Coverage Area, and flow southward through the eucalyptus forest until joining Devereux Creek.

The Coverage Area is bounded to the north by Hollister Avenue and residential development, to the west by Sandpiper Golf Club, to the east by the City of Goleta/County of Santa Barbara boundary along an undeveloped parcel managed by UCSB, and to the south by Ellwood Mesa Open Space and the Pacific Ocean. The northwest corner of the Coverage Area wraps around the western, southern, and eastern perimeters of the "The Bluffs" residential development. Existing residential development also abuts the northeastern perimeter of the Coverage Area. The majority of MBHMP activities would occur within 150 to 200 feet of existing residential developments along the northern portion of Ellwood Mesa Open Space. Most of the southern coastal plain and bluff habitats on Ellwood Mesa are outside the Coverage Area, and would not be directly affected.

The Coverage Area is on a coastal mesa, within which eucalyptus woodlands form dense canopies with native and non-native grasslands and coyote brush scrub habitats occur in the areas immediately adjacent to the eucalyptus groves. In areas outside the eucalyptus groves, the Devereux Creek corridor supports native riparian and transitional vegetation. Two vernal pools are documented along the southern boundary of the Coverage Area. The Coverage Area also includes a parking lot and numerous trails that are open to the public and used for visiting the monarch butterfly aggregation sites, walking and jogging on Ellwood Mesa, and accessing the beach to the south of Ellwood Mesa. An unpaved fire road along the northern edge of Devereux Creek in the Coverage Area can accommodate vehicle traffic, but is used for emergency purposes only and is not normally open to vehicles. Under normal conditions, this road is used by the public as a walking route through the eucalyptus groves and functions as part of the trail system.

The City's General Plan identifies and maps several Environmentally Sensitive Habitat Areas (ESHA) in the Ellwood Mesa Open Space, including riparian habitat, vernal pools, native grassland, sage scrub, and bluff scrub (City of Goleta 2018). Monarch butterfly aggregation sites and raptor roosting/nesting sites at Ellwood are identified as ESHA in the General Plan. Several of the mapped ESHAs in Ellwood Mesa Open Space are in the Coverage Area (Figure 6). Unmapped ESHA may also be present where native grassland and riparian restoration efforts have expanded these sensitive vegetation types.

Existing Habitat Conditions

Ellwood Mesa Open Space supports both native and non-native communities, as well as non-native ornamental and invasive plants in some areas. Eucalyptus groves (*Eucalyptus [globulus, camaldulensis]* Semi-Natural Woodland Stands) are the dominant vegetation type in the Coverage Area due to their importance for the monarch butterfly. Additional vegetation types in the Coverage Area include:

NON-NATIVE GRASSLANDS

- Wild oats grassland (*Avena [barbata, fatua]* Semi-Natural Herbaceous Stands)
- Annual brome grasslands (*Bromus [diandrus, hordeaceus]-Brachypodium distachyon* Semi-Natural Herbaceous Stands)

NATIVE GRASSLANDS

- Native bunchgrass grassland (*Stipa [=Nassella] pulchra* Grassland Alliance)

COASTAL SCRUB COMMUNITIES

- Coyote brush scrub (*Baccharis pilularis* Shrubland Alliance)
- California sagebrush scrub (*Artemisia californica* Shrubland Alliance)

BLUFF SCRUB COMMUNITIES

- Quail bush scrub (*Atriplex lentiformis* Shrubland Alliance)

RIPARIAN COMMUNITIES

- Arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance)

A field reconnaissance-level biological survey conducted by Rincon Consultants in February 2018 confirmed that previous habitat mapping and identification of ESHAs in the Coverage Area and vicinity (e.g., City of Goleta 2013, City of Goleta 2014c; Storrer 2011, Campbell Geo 2010) are largely consistent with current existing conditions. Plant communities observed during the 2018 survey were identified based on A Manual of California Vegetation, Second Edition (MCV2, Sawyer et al. 2009), the currently accepted standard for vegetation classification in California. Because many of the previous biological studies conducted in the Coverage Area and vicinity are dated and did not use this system, the mapped vegetation types have been cross-referenced to previous systems utilized during the prior studies as appropriate (Table 3). Updates to habitat nomenclature are addressed on an individual basis below.

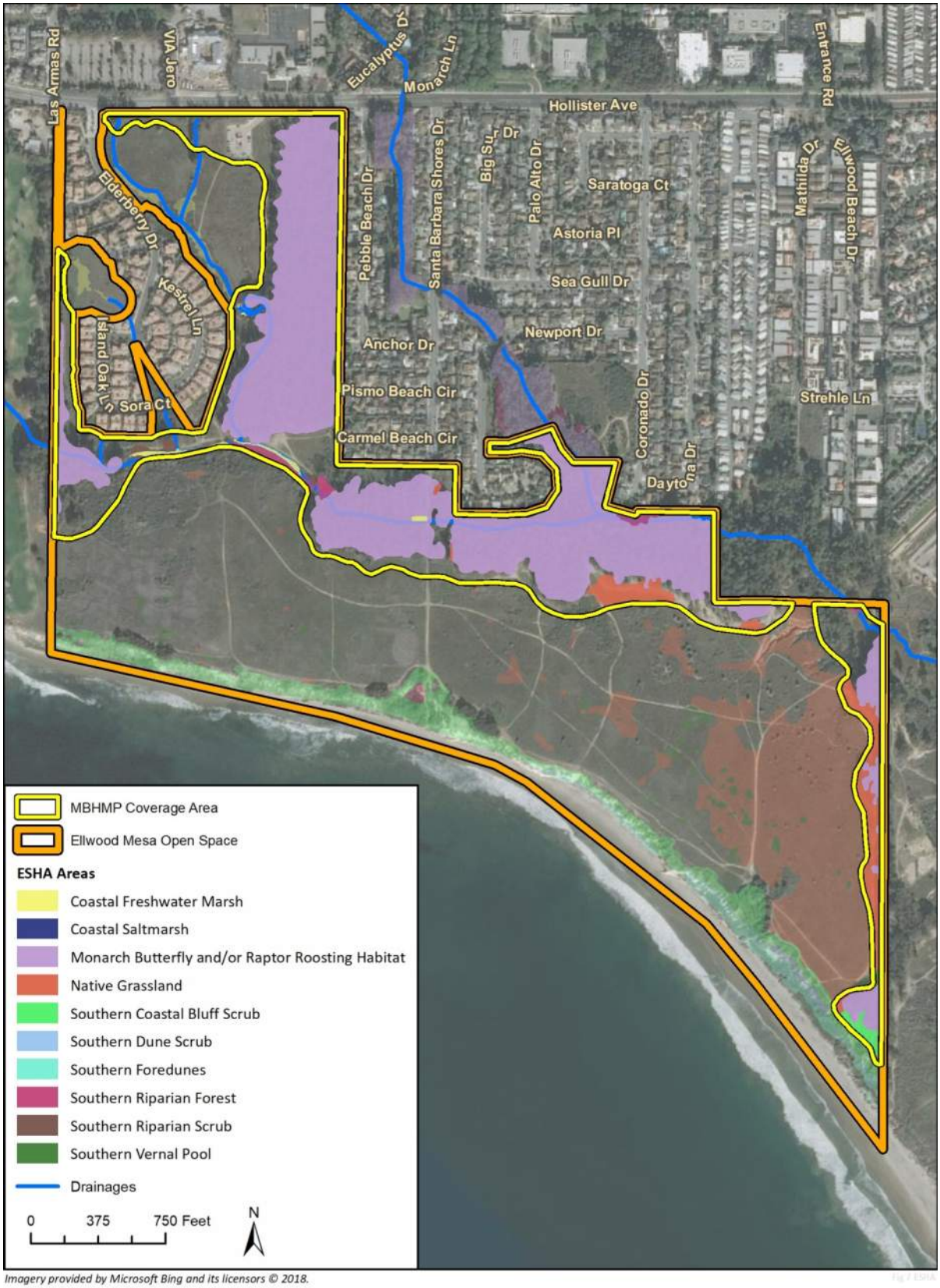
Table 3 Habitat Types in the Coverage Area with Current Classification

General Habitat Type	MCV2 Vegetation Alliances	Global Rank/ State Rank	CDFW Sensitive Community?
Non-native grassland	Avena *[barbata, fatua]* Semi-natural Herbaceous Stands	not ranked	No
	Bromus [diandrus, hordeaceus]-Brachypodium distachyon Semi-Natural Herbaceous Stands	not ranked	No
Native grassland	Stipa *[=Nassella] pulchra* Grassland Alliance	G4/S3?	Yes
Eucalyptus groves	Eucalyptus [*globulus, camaldulensis*] Semi-natural Woodland Stands	not ranked	No
Coyote brush scrub	*Baccharis pilularis.* Shrubland Alliance	G5/S5	No
California Sagebrush scrub	*Artemisia californica* Shrubland Alliance	G5/S5	No
Bluff scrub	*Artemisia californica* Shrubland Alliance	G5/S5	No
	intermixed with *Atriplex lentiformis* Shrubland Alliance	G4/S4	No
Arroyo willow thickets	*Salix lasiolepis* Shrubland Alliance	G4/S4	Yes

Source: CDFW 2018b, 2018d

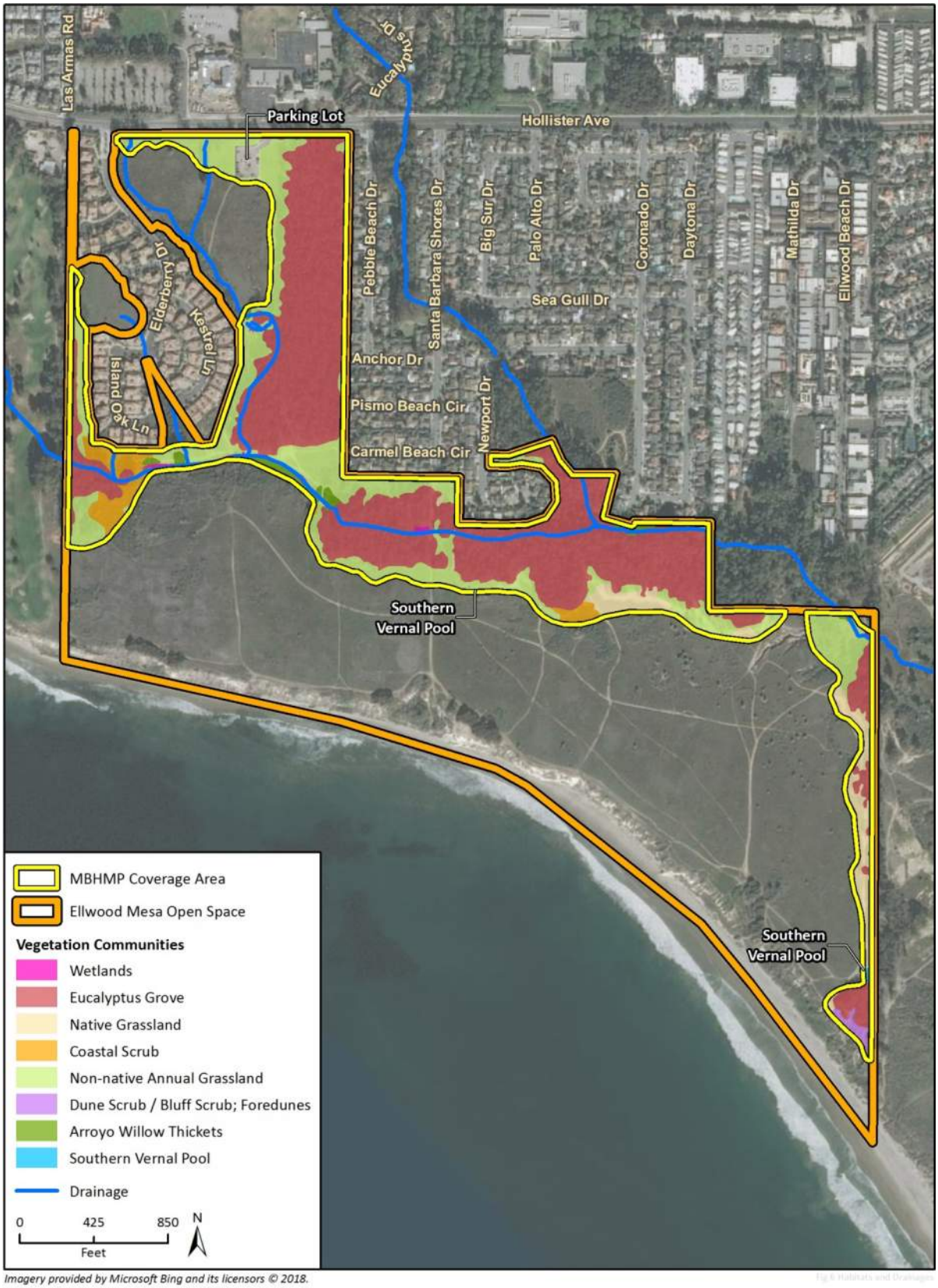
The approximate distribution of these habitats in the Coverage Area, based on the February 2018 survey and review of previous habitat mapping, is shown in Figure 7. The current condition of habitats in the Coverage Area is described below and depicted in site photographs presented as Photographs 3 through 6 in Figure 8.

Figure 6 Environmentally Sensitive Habitat Areas



Imagery provided by Microsoft Bing and its licensors © 2018.

Figure 7 Drainages and Vegetation Communities



Imagery provided by Microsoft Bing and its licensors © 2018.

Figure 8 Site Photographs



Photograph 3. Ellwood North. September 2018.



Photograph 4. Understory Condition in Ellwood North grove, with downed wood, litter buildup, and non-native understory species. September 2018.



Photograph 5. Non-native grassland adjacent to Ellwood Main. September 2018.



Photograph 6. Ellwood Main understory. September 2018.

EUCALYPTUS GROVES

Eucalyptus groves, consistent with *Eucalyptus (globulus, camaldulensis*) Semi-Natural Woodland Stands in MCV2 (Sawyer et al. 2009), form dense canopies throughout the Coverage Area. The tree overstory is almost entirely eucalyptus species, though occasional coast live oak (*Quercus agrifolia*), arroyo willow, and other trees are present in low numbers. Understory in eucalyptus groves is predominantly non-native. Duff layers are thick, and herbaceous vegetation is sparse, with occasional veldt grass (*Ehrharta erecta*), oats, ripgut brome (*Bromus diandrus*), red brome (*Bromus rubens*), and foxtail barely. Shrubs are also present, including non-native Myoporum (*Myoporum laetum*), pittosporum (*Pittosporum undulatum*), blackwood acacia (*Acacia melanoxylon*), cotoneaster (*Cotoneaster lacteus*). A few native shrub and woody vine species are also present, with poison oak (*Toxicodendron diversilobum*) and toyon (*Heteromeles arbutifolia*) most common. Many of the eucalyptus groves are infested with invasive vines, including Algerian ivy (*Hedera canariensis*). Where Devereux Creek and its tributaries flow through eucalyptus groves, additional weedy perennial plants are present, including cape ivy (*Delairea odorata*), garden nasturtium (*Tropaeolum majus*), and firethorn (*Pyracantha* sp.). However, native species are also more common along the drainage bed and banks than elsewhere in eucalyptus groves, including poison oak, rushes (*Juncus* spp.), elderberry (*Sambucus nigra* ssp. *caerulea*), and blackberry (*Rubus ursinus*), particularly near the Ellwood Main and Sandpiper aggregation sites.

As noted above, five monarch butterfly aggregation areas, referred to as the Ellwood North, Ellwood West, Ellwood Main, Sandpiper, and Ocean Meadows sites, are present in eucalyptus groves in the Coverage Area. As described in Section 7, *Background Information*, eucalyptus trees were introduced in the 1870s to provide a source of lumber. In recent years, the ongoing drought and pest infestations have resulted in the degradation and death of eucalyptus trees. According to a field study performed by Althouse and Meade, Inc. in July 2017, over 1,200 trees in the eucalyptus forest are dead, with hundreds more that are highly degraded and dying. Historically these aggregation sites hosted tens of thousands of monarch butterflies during some years, making Ellwood Mesa one of the most important sites for monarch butterflies in California (Pelton et al. 2016). As shown in Figure 4, overwintering monarch populations on Ellwood Mesa have declined drastically in recent years from 47,510 monarchs at a recent peak in 2011 to an all-time low of 230 monarchs counted in 2018.

Grove and windrow areas between aggregation sites have not been recorded to support monarch butterfly aggregations. Eucalyptus groves in the Coverage Area are predominantly blue gum groves, but some areas of red ironbark (*E. sideroxylon*) and red gum (*E. camaldulensis*) are present, particularly in the areas south of the Ellwood North aggregation site, and occasionally in the Ellwood West, Main, and East sites.

Small stands of eucalyptus are also present on the immediate edge of the Ellwood Mesa Open Space outside the Coverage Area. These include small patches of ironwood, blue gum, and lemon-scented gum (*Corymbia citriodora*). Eucalyptus trees are present in a utility easement near the eastern boundary of the Coverage Area. Monarch aggregations have not been reported and are not expected in these small, exposed stands of trees.

NON-NATIVE GRASSLANDS

The dominant plant community in areas without tree canopy consists of non-native annual grasslands. This vegetation type is most consistent with the *Avena [barbata, fatua]* Semi-Natural Herbaceous Stands alliance and the *Bromus [diandrus, hordeaceus]-Brachypodium distachyon* Semi-Natural Herbaceous Stands alliance in the MCV2 classification system (Sawyer et al. 2009). These

communities are not assigned a rarity rank by the CDFW (2018b), and are not considered sensitive. Typical composition consists of abundant wild oats (*Avena barbata, A. fatua*), with hare barley (*Hordeum murinum*) and a variety of non-native herbaceous plants, including prickly lettuce (*Lactuca serriola*), bristly ox tongue (*Helminthotheca echioides*), cheeseweed (*Malva* sp.), knotweed (*Polygonum aviculare*), and black mustard (*Brassica nigra*). Aggressive weeds such as fennel (*Foeniculum vulgare*) and castor bean (*Ricinus communis*) are common to abundant in patches. Australian saltbush (*Atriplex semibaccata*) is present in many areas. Some native species are also present in non-native grasslands, including tarweed (*Deinandra fasciculata*), horseweed (*Conyza canadensis*), western ragweed (*Ambrosia psilostachya*) and dove weed (*Croton setigerus*). Occasional purple needlegrass (*Stipa pulchra*) plants are present in some areas of non-native annual grassland. Patches and larger areas with at least 10 percent cover of native grasses are classified separately as native grassland. Some ruderal areas consisting of predominantly non-native herbaceous weeds are also present, intermixed with annual grasslands. Patches of ice plant (*Carpobrotus edulis*) are occasional, including several patches near The Bluffs residential development. Non-native annual grasslands occur in the Coverage Area along the margins of the Ellwood North, Sandpiper, Ellwood West, and Ellwood Main aggregation sites, north of the Ocean Meadows site, and areas in between groves.

NATIVE GRASSLANDS

Native grassland in the Coverage Area are present south of the Ellwood Main and Ellwood East aggregation sites, and west of the Ocean Meadows aggregation site and windrow. These areas contain at least 10 percent cover of native grassland species, particularly purple needlegrass, and are consistent with the *Stipa [=Nassella] pulchra* Herbaceous Alliance in MCV2 (Sawyer et al. 2009). These areas are designated ESHA in the General Plan and included on the 2018 CDFW Sensitive Natural Communities list. Restoration of native grasslands in the vicinity of the Coverage Area has been ongoing, beginning with drill seeding over most of the non-native grassland habitats at Ellwood Mesa Open Space in 2008 (City of Goleta 2011a).

COASTAL SCRUB

In the Coverage Area, coastal scrub vegetation is primarily coyote brush scrub habitat consistent with the *Baccharis pilularis* Shrubland Alliance, with small areas of California sagebrush scrub consistent with the *Artemisia californica* Shrubland Alliance in MCV2 (Sawyer et al. 2009). Intermixed with coyote brush are other native shrubs common to coastal scrub habitats, particularly saw-tooth golden bush (*Hazardia squarrosa*) and coastal goldenbush (*Isocoma menziesii*). Non-native weedy species are also present along margins and between shrubs, including annual grasses, fennel, and Italian thistle (*Carduus pycnocephalus*). In the Coverage Area, coyote brush scrub is common adjacent to the Ellwood North, Sandpiper, and Ellwood West groves, as well as along Devereux Creek. This community is not identified as sensitive by the CDFW (2018b).

California sagebrush scrub occurs in small patches on banks of a tributary to Devereux Creek adjacent to The Bluffs development. These patches consist of a mixture of sagebrush (*Artemisia californica*) with toyon, coyote brush, and coast live oak (*Quercus agrifolia*) seedlings. Coast morning glory (*Calystegia macrostegia cyclostegia*) is also present. These patches are not extensive and the majority of coastal scrub on the mesa consists of coyote brush scrub. This community is not identified as sensitive by the CDFW (2018b).

Coastal scrub in the Coverage Area is designated as ESHA as illustrated on Figure 3.4-2 of the Goleta General Plan and shown on Figure 6.

BLUFF SCRUB

Bluff scrub is present in the southeast tip of the Coverage Area adjacent to a patch of eucalyptus grove. Vegetation is primarily California sagebrush scrub (*Artemisia californica* Shrubland Alliance) and quail bush scrub (*Atriplex lentiformis* shrubland alliance). Bluff scrub areas are designated as ESHA in the General Plan; however, neither of these vegetation alliances is considered sensitive by CDFW (2018b). Coastal bluff scrub is restricted to steep slopes and faces of coastal bluffs, and has limited range.

ARROYO WILLOW THICKETS

Portions of Devereux Creek and two unnamed tributaries flow through the Coverage Area. These creeks support some arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance), with scattered young sycamore (*Platanus racemosa*), cottonwood (*Populus trichocarpa*), coast live oak (*Quercus agrifolia*), and box elder (*Acer negundo*) trees, some of which were planted as part of restoration efforts in the past. Arroyo willow thickets occur intermittently along Devereux Creek and one of the unnamed tributaries in the Coverage Area, in areas outside the eucalyptus canopy. Arroyo willow thickets are designated as ESHA in the General Plan, and are included on the 2018 CDFW Sensitive Natural Communities list (CDFW 2018b).

Sensitive Habitats

Sensitive habitats include sensitive natural communities tracked by CDFW, designated critical habitats for species listed under the federal ESA, and other locally designated ESHAs. Sensitive habitats in the Coverage Area include vernal pools (ESHA), riparian habitat adjacent to Devereux Creek (ESHA), arroyo willow thickets (CDFW sensitive), bluff scrub (ESHA), coastal scrub (ESHA), native grasslands (ESHA and CDFW sensitive) and eucalyptus groves (ESHA due to monarch and raptor habitat value).

US FISH AND WILDLIFE SERVICE CRITICAL HABITATS

No designated critical habitat for threatened or endangered species occurs in the Coverage Area. The nearest federally designated critical habitat is for Western snowy plover (*Charadrius alexandrinus nivosus*) on Devereux Beach (Unit CA 34); it extends along the beach at the foot of Ellwood Mesa bluffs outside of the Coverage Area (USFWS 2018a).

LOCALLY DESIGNATED ENVIRONMENTALLY SENSITIVE HABITATS

In the Conservation Element of the General Plan, coastal bluff scrub, native grassland, vernal pools, riparian habitat habitats, and monarch aggregation/raptor roost and nest sites in the Coverage Area are identified as ESHAs (City of Goleta 2017a). Figure 4-1 of the Goleta General Plan Conservation Element identifies and maps these ESHAs. Figure 6 shows these areas in the Coverage Area. Unmapped ESHAs may also be present where native grassland and riparian restoration efforts have expanded presence of these sensitive vegetation types. Due to the MBHMP's focus on monarch butterfly habitat, the vast majority of the Coverage Area is designated ESHA and therefore considered a sensitive habitat.

Special-status Species

For the purposes of this document, special-status species are those plants and animals listed, proposed for listing, or candidates for listing as threatened or endangered by the USFWS under the federal Endangered Species Act (7 U.S.C. § 136, 16 U.S.C. § 1531 et seq.); those listed or candidates

for listing as rare, threatened, or endangered by the CDFW under the California Endangered Species Act or Native Plant Protection Act; animals designated at the State level as "Fully Protected," "Species of Special Concern," "Special Animals" or "Watch List"; those species on the Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2018c), and species included in the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants of California, Eighth Edition (CNPS 2018). Section 15125(a) of the State CEQA Guidelines, also directs that special emphasis should be placed on resources that are rare or unique to the region. For example, plants listed by the Santa Barbara Botanic Garden (SBBG) or the Goleta Slough Ecosystem Management Plan may be considered locally sensitive.

The potential for each special status species to occur in the Coverage Area was evaluated according to the following criteria:

- **None.** Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime), or the species is conspicuous and would have been identifiable on site if present (e.g., oak trees).
- **Low Potential.** The species is not likely to be found on the site. Either few of the habitat components meeting the species requirements are present, the majority of habitat on and adjacent to the site is unsuitable or of very poor quality, or protocol surveys were conducted and did not detect the species.
- **Moderate Potential**. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
- **High Potential.** All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.
- **Present.** The species was observed on the site or has been recorded (e.g., California Natural Diversity Database [CNDDB], other reports) on the site recently (within the last 5 years).

SPECIAL-STATUS PLANTS

A five-mile radius search of CNDDB and a six U.S. Geological Survey (USGS) 1:24,000 7.5-minute quadrangle search of the CNPS Online Inventory records identified 21 special-status plant species that have been previously documented in the Coverage Area. Of these, 11 special-status plant species are present or have a high or moderate potential to occur in the Coverage Area based on habitat suitability. One special-status plant species, Santa Barbara honeysuckle (*Lonicera subspicata*), was previously identified in existing biological surveys for this site and is shown on Figure 4-1 of the General Plan Conservation Element, though this location is not currently included in the CNDDB. Table 4 shows the status and habitat requirements for each of these species, with an assessment of their potential to occur in the Coverage Area.

Table 4 Special-status Plant Species in the Vicinity of the Coverage Area

Scientific Name	Status: Fed/State ESA; CRPR; G-Rank/S-Rank	Habitat Requirements	Potential to Occur/Coverage Area Suitability Observations
Amsinckia douglasiana Douglas' fiddleneck	–/– CRPR 4.2 G4/S4	Annual herb. Blooms Mar.-May. Valley and foothill grassland, oak woodland. 0-1950 m (0-6400 ft.)	**Moderate.** Suitable habitat is present in native grassland in the Coverage Area. Could occur.
Arctostaphylos refugioensis Refugio manzanita	–/– CRPR 1B.2 G3/S3	Perennial evergreen shrub. Blooms Dec.-May. Chaparral. On sandstone. 300-820m (985-2690 ft.)	**None.** Appropriate chaparral habitat and sandstone substrates are not present in the Coverage Area. Not expected to occur.
Atriplex coulteri Coulter's saltbush	–/– CRPR 1B.2 G3/S1S2	Perennial herb. Blooms Mar.-Oct. Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland. Ocean bluffs, ridgetops, as well as alkaline low places. 10-440m (30-1445 ft.)	**Moderate.** Suitable habitat is present in bluff scrub and native grassland in the Coverage Area. Could occur.
Atriplex serenana var. davidsonii Davidson's saltscale	–/– CRPR 1B.2 G5T1/S1	Annual herb. Blooms Apr.-Oct. Coastal bluff scrub, coastal scrub. Alkaline soil. 3-250m (10-820 ft.)	**Low.** Suitable habitat is present in bluff scrub on Ellwood Mesa. Not expected to occur in Coverage Area.
Calandrinia breweri Brewer's calandrinia	–/– CRPR 4.2 G4/S4	Annual herb. Blooms Mar.-Jun. Chaparral, coastal scrub. Sandy or loamy soils. Disturbed sites, burns. 150-1200m (490-3940 ft.)	**High.** Suitable habitat is present in coastal scrub and disturbed areas in the Coverage Area. Could occur.
Calochortus catalinae Catalina mariposa lily	–/– CRPR 4.2 G3G4/S3S4	Perennial bulbiferous herb. Blooms Feb.-Jun. Valley and foothill grassland, chaparral, coastal scrub, cismontane woodland. In heavy soils, open slopes, openings in brush. 30-700m (100-2295 ft.)	**High.** Appropriate fine-textured soils are present in some areas, associated with coastal scrub and grassland habitats. Could occur.
Calochortus fimbriatus Late-flowered mariposa-lily	–/– CRPR 1B.3 G3/S3	Perennial bulbiferous herb. Blooms June-Aug. Chaparral, cismontane woodland, riparian woodland. Dry, open coastal woodland, chaparral; on serpentine. 275-1905 m (900-6250 ft.)	**None.** Appropriate serpentinitic soils are not present. Not expected to occur.
Centromadia parryi ssp. australis Southern tarplant	–/– CRPR 1B.1 G3T2/S2	Annual herb. Blooms May-Nov. Marshes and swamps (margins), valley and foothill grassland. Often in disturbed sites near the coast at marsh edges; also in alkaline soils sometimes with saltgrass. Sometimes on vernal pool margins. 0-425m (0-1395 ft.)	**High.** Suitable habitat is present in mesic sites in grassland, along drainage edges and vernal pool margins in the Coverage Area. Could occur.
Chorizanthe palmeri Palmer's spineflower	–/– CRPR 4.2 G4/S4	Annual herb. Blooms April-Aug. Occurs on rocky serpentinite-influence sites in chaparral, valley and foothill grassland, and woodland. 60-700 m.	**None.** Appropriate serpentinitic sites and rocky areas are not present. Not expected to occur.

Scientific Name	Status: Fed/State ESA; CRPR; G-Rank/S-Rank	Habitat Requirements	Potential to Occur/Coverage Area Suitability Observations
Horkelia cuneata var. puberula mesa horkelia	–/– CRPR 1B.1 G4T1/S1	Perennial herb. Blooms Feb.-Sept. Chaparral, cismontane woodland, coastal scrub. Sandy or gravelly sites. 70-810m (230-2655ft).	**None.** Appropriately sandy soils are not present. Not expected to occur.
Juncus luciensis Santa Lucia dwarf rush	–/– CRPR 1B.2 G3/S3	Annual herb. Blooms Apr.-Jul. Vernal pools, meadows, lower montane coniferous forest, chaparral, Great Basin scrub. Vernal pools, ephemeral drainages, wet meadow habitats and streamsides. 300-2040m (985-6690ft).	**Low.** Suitable habitat is present in mesic sites along drainage edges and vernal pool margins in Ellwood Mesa Open Space. The Coverage Area is slightly below reported elevation range, but species could potentially occur.
Lasthenia conjugens Contra Costa goldfields	Endangered/– CRPR 1B.1 G1/S1	Annual herb. Blooms Mar.-Jun. Valley and foothill grassland, vernal pools, alkaline playas, cismontane woodland. Vernal pools, swales, low depressions, in open grassy areas. 1-470m (3-1540ft).	**High.** Suitable habitat is present in mesic sites in grassland habitat and vernal pool margins in the Coverage Area. Could occur.
Lasthenia glabrata ssp. coulteri Coulter's goldfields	–/– CRPR 1B.1 G4T2/S2	Annual herb. Blooms Feb.-Jun. Coastal salt marshes, playas, valley and foothill grassland, vernal pools. Usually found on alkaline soils in playas, sinks, and grasslands. 1-1400m (3-4595ft).	**High.** Suitable habitat is present in mesic sites in grassland habitat and vernal pool margins in the Coverage Area. Could occur.
Layia heterotricha pale-yellow layia	–/– CRPR 1B.1 G2/S2	Annual herb. Blooms Mar.-Jun. Cismontane woodland, pinyon-juniper woodland, valley and foothill grassland. Alkaline or clay soils; open areas. 270-1365m (885-4480ft).	**Moderate.** Moderately suitable habitat is present in grassland habitat. Could occur.
Lonicera subspicata var. subspicata Santa Barbara honeysuckle	–/– CRPR 1B.2 G5T2?/S2?	Perennial evergreen shrub. Blooms May-Feb. Chaparral, cismontane woodland, coastal scrub. 35-1000m (115-3280ft).	**Present.** Previously reported in the Coverage Area. Coastal scrub in the Coverage Area is suitable; the CNDDB and General Plan report this species in the Coverage Area.
Monardella sinuata ssp. sinuata southern curly-leaved monardella	–/– G3T2/S2 1B.2	Coastal dunes, coastal scrub, chaparral, cismontane woodland. Sandy soils. 20-305 m. annual herb. Blooms Apr-Sep	**Moderate.** Sandy soils and coastal scrub present in Coverage Area. Could occur.
Phacelia hubbyi Hubby's phacelia	–/– CRPR 4.2 G4/S4	Perennial herb. Blooms Feb.–May, occurs in sandy sites with chaparral, coastal scrub near the coast between 60 - 500 meters elevation.	**None.** Appropriately sandy soils and chaparral are not present. Not expected to occur.
Phacelia ramosissima var. austrolitoralis south coast branching phacelia	–/– CRPR 3.2 G5?T3Q/S3	Perennial herb. Blooms Mar.-Aug. Sandy, sometimes rocky substrate. Chaparral, coastal dunes, coastal scrub, and coastal salt marshes and swamps. 5-300 m	**None.** Appropriate sandy or gravelly substrates are not present. Not expected to occur.

Scientific Name	Status: Fed/State ESA; CRPR; G-Rank/S-Rank	Habitat Requirements	Potential to Occur/Coverage Area Suitability Observations
Scrophularia atrata black-flowered figwort	–/– CRPR 1B.2 G2?/S2?	Perennial herb. Blooms Mar.-Jul. Closed-cone coniferous forest, chaparral, coastal dunes, coastal scrub, riparian scrub. Sand, diatomaceous shale, and soils derived from other parent material; around swales and in sand dunes. 10-250m (30-820ft).	**None.** Appropriate sandy soils or soils derived from diatomaceous shales are not present. Not expected to occur.
Suaeda esteroa estuary seablite	–/– CRPR 1B.2 G3/S2	Perennial herb. Blooms May-Jan. Marshes and swamps. Coastal salt marshes in clay, silt, and sand substrates. 0-5m (0-15ft).	**None.** Coastal salt marsh habitat is not present in the Coverage Area. Not expected to occur.
Thelypteris puberula var. sonorensis Sonoran maiden fern	–/– CRPR 2B.2 G5T3/S2	Perennial rhizomatous herb. Blooms Jan.-Sep. Meadows and seeps. Along streams, seepage areas. 50-550m (165-1805ft).	**Moderate.** Moderately appropriate habitat is present in riparian woodland. Could occur.

FC = Federal Candidate Species
FE = Federally Endangered
FS=Federally Sensitive
ST = State Threatened
SR = State Rare
SS=State Sensitive
G-Rank/S-Rank = Global Rank and State Rank as per NatureServe and CDFW's CNDDB RareFind3.
SSC = CDFW Species of Special Concern
SA = CDFW Special Animal
FP = Fully Protected
WL = Watch List
Source: CNDDB 2018, CNPS 2018

Special status plants could occur in the Coverage Area, mainly in native habitats along the margins. However, special-status plants are not expected to occur in eucalyptus groves due to lack of suitable habitat. Eucalyptus groves typically have deep accumulations of leaf litter and shed bark, which are not conducive to native plant growth (Cal-IPC 2018, Strathman 2004), and substantial accumulations of leaf litter and debris have been documented in the groves on Ellwood Mesa. Additionally, many other invasive, non-native species documented as understory to the eucalyptus groves out-compete native vegetation, including rare native plants (CNPS 1996).

Based on the analysis in Table 4, one special-status plant species, Santa Barbara honeysuckle, is known to be present with the Coverage Area in coastal scrub habitat. In addition, the nine special-status plant species listed below have a moderate or high potential to occur in native grasslands, coastal scrub, bluff scrub or vernal pools in the Coverage Area:

- Douglas' fiddleneck
- Catalina mariposa lily
- Southern tarplant
- Contra Costa goldfields
- Coulter's goldfields
- Pale-yellow layia
- Sonoran maiden fern

- Coulter's saltbush
- Brewer's calandrinia

The majority of these species are not formally protected by laws or regulations, but are identified as rare plants by the CNPS. The Contra Costa goldfields, however, is a federally listed endangered plant. Activities associated with implementation of the MBHMP are focused primarily on areas with a high degree of disturbance and non-native vegetation (eucalyptus groves), and special status plants are not expected to occur in these areas due to the highly disturbed nature of the area. However, special status plants may occur in native habitats adjacent to eucalyptus groves in the Coverage Area.

SPECIAL-STATUS WILDLIFE

A search of CNDDB records identified 28 special-status wildlife species in a five-mile radius of the Coverage Area (Table 5). Four of the identified special-status wildlife species are present or have a high or moderate potential to occur in the Coverage Area. The potential to occur for each special-status species in or near the Coverage Area is discussed following Table 5.

Table 5 Special-status Animal Species in the Vicinity of the Coverage Area

Scientific Name Common Name	Status Fed/State ESA CDFW G-Rank/S-Rank	Habitat Requirements	Coverage Area Suitability Observations
Invertebrates			
Bombus crotchii Crotch bumble bee	None/None G3G4/S1S2	Coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum.	**Low.** Plant food genera are not known to occur.
Cicindela hirticollis gravida sandy beach tiger beetle	None/None G5T2/S2	Inhabits areas adjacent to non-brackish water along the coast of California from San Francisco Bay to northern Mexico. Clean, dry, light-colored sand in the upper zone. Subterranean larvae prefer moist sand not affected by wave action.	**Low.** Suitable habitat is limited to the beach, outside the Coverage Area.
Coelus globosus globose dune beetle	None/None G1G2/S1S2	Inhabitant of coastal sand dune habitat; erratically distributed from Ten Mile Creek in Mendocino County south to Ensenada, Mexico. Inhabits foredunes and sand hummocks; it burrows beneath the sand surface and is most common beneath dune vegetation.	**Low.** Suitable habitat is limited to the beach, outside the Coverage Area.
Danaus plexippus monarch butterfly	None*/None SA G4T2T3/S2S3	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	**Present.** Species is present.
Tryonia imitator mimic tryonia (=California brackishwater snail)	None/None G2/S2	Inhabits coastal lagoons, estuaries and salt marshes, from Sonoma County south to San Diego County. Found only in permanently submerged areas in a variety of sediment types; able to withstand a wide range of salinities.	**Low.** Appropriate lagoon/ perennial stream mouth with perennial water is not present in the Coverage Area.

Scientific Name Common Name	Status Fed/State ESA CDFW G-Rank/S-Rank	Habitat Requirements	Coverage Area Suitability Observations
Amphibians			
Rana draytonii California red-legged frog	Threatened/ None SSC G2G3/S2S3	Lowlands & foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. must have access to estivation habitat.	**Moderate.** Suitable seasonal breeding pools are not present in the Coverage Area; however, Devereux Creek could serve are a movement corridor.
Taricha torosa Coast range newt	None/None SSC G4/S4	Coastal drainages from Mendocino County to San Diego County.	**None.** Appropriate deep streams with seasonal pools are not present in the Coverage Area.
Reptiles			
Emys marmorata western pond turtle	None/None SSC G3G4/S3	A thoroughly aquatic turtle of ponds, marshes, rivers, streams & irrigation ditches, usually with aquatic vegetation, below 6,000 ft elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	**None.** Appropriate deep streams with seasonal pools are not present in the Coverage Area.
Fish			
Eucyclogobius newberryi tidewater goby	Endangered/ None SSC G3/S3	Brackish water habitats along the Calif coast from Agua Hedionda Lagoon, San Diego Co. to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water & high oxygen levels.	**None.** Appropriate lagoon/perennial stream mouth with perennial water are not present in Coverage Area.
Birds			
Accipiter cooperii Cooper's hawk	None/None WL G5/S4	Woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	**Present.** Species is present, and one documented nest is known from Ellwood Mesa.
Agelaius tricolor tricolored blackbird	None/ Threatened SSC G2G3/S1S2	Freshwater marsh, swamp, wetlands. Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California.	**None.** Appropriate freshwater marsh habitat is not present in Coverage Area.
Aimophila ruficeps canescens Southern California rufous-crowned sparrow	None/None WL G5T3/S3	Resident in Southern California coastal sage scrub and sparse mixed chaparral.	**Moderate.** Appropriate habitat in Coverage Area is limited.
Ammodramus savannarum grasshoper sparrow	None/None SSC G5/S3	Valley and foothill grassland. Dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes.	**Low.** Appropriate grassland habitat is limited in areas in Coverage Area.

Scientific Name Common Name	Status Fed/State ESA CDFW G-Rank/S-Rank	Habitat Requirements	Coverage Area Suitability Observations
Ardea alba great egret	None/None G5/S4	Colonial nester in large trees. Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.	**Low (breeding).** Flyover or roosting individuals could be present, but low potential to nest in the Coverage Area. Suitable nesting habitat present on adjacent property at the Devereux Slough.
Ardea herodias great blue heron	None/None G5/S4	Colonial nester in tall trees, cliffsides, and sequestered spots on marshes. Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.	**Low (breeding).** Flyover or roosting individuals could be present, but low potential to nest in the Coverage Area. Suitable nesting habitat present on adjacent property at the Devereux Slough.
Athene Cunicularia Burrowing Owl	None/None SSC G4/S3	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation.	**Low.** Appropriate grassland habitat is limited in the Coverage Area.
Buteo regalis ferruginous hawk	None/None WL G4/S3S4	Open grasslands, sagebrush flats, desert scrub, low foothills & fringes of pinyon-juniper habitats. Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	**Low.** Ferruginous hawk may winter in open areas on the Ellwood Mesa, outside the Coverage Area, but Goleta is not in the breeding range.
Charadrius alexandrinus nivosus western snowy plover	Threatened/ None SSC G3T3/S2S3	Sandy beaches, salt pond levees & shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**Low.** Documented plover habitat is present along the shore, at the base of Ellwood Mesa to the south; suitable nesting habitat is not present on Ellwood Mesa or in the Coverage Area.
Elanus leucurus white-tailed kite	None/None FP G5/S3S4	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	**Present.** Species is present. Several nests have been documented on the Ellwood Mesa in eucalyptus groves.
Eremophila alpestris actia California horned lark	None/None WL G5T4Q/S4	Bare dry ground and areas of short sparse vegetation. Prairies, deserts, tundra, beaches, dunes, and heavily grazed pastures..	**Low.** Limited suitable bare ground habitat in the Coverage Area.

Scientific Name Common Name	Status Fed/State ESA CDFW G-Rank/S-Rank	Habitat Requirements	Coverage Area Suitability Observations
Passerculus sandwichensis beldingi Belding's savannah sparrow	None/ Endangered G5T3/S3	Inhabits coastal salt marshes, from Santa Barbara south through San Diego County. Nests in Salicornia on and about margins of tidal flats.	**None.** Appropriate salt marsh habitat is not present at Ellwood Mesa, including the Coverage Area; however salt marsh is present along Devereux Slough on the adjacent open space property.
Pelecanus occidentalis californicus California brown pelican	Delisted/ Delisted FP G4T3T4/S3	Colonial nester on coastal islands just outside the surf line.	**Low.** Appropriate foraging habitat is present at the beach on the southern boundary of Ellwood Mesa outside the Coverage Area. May fly past the site.
Phalacrocorax auritus double-crested cormorant	None/None WL G5/S4	Colonial nester on coastal cliffs, offshore islands, and along lake margins in the interior of the state.	**Low.** Appropriate foraging and roosting habitat is present at the beach outside the Coverage Area. May fly past the site.
Rallus longirostris levipes light-footed clapper rail	Endangered/ Endangered FP G5T1T2/S1	Found in salt marshes traversed by tidal sloughs, where cordgrass and pickleweed are the dominant vegetation. Requires dense growth of either pickleweed or cordgrass for nesting or escape cover; feeds on molluscs and crustaceans.	**None.** Appropriate salt marsh habitat is not present at Ellwood Mesa, including the Coverage Area; however salt marsh is present along Devereux Slough on the adjacent open space property.
Stemula antillarum browni *California least tern*	Endangered/ Endangered FP G4T2T3Q/S2	Coastline. Nests along the coast from San Francisco Bay south to northern Baja California.	**Low.** Appropriate foraging habitat is present at the beach, south of the southern boundary of the Coverage Area.
Mammals			
Antrozous pallidus pallid bat	None/None SSC G5/S3	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting.	**None (roosting).** Appropriate rocky areas for roosting are not present in the Coverage Area. Foraging habitat is present.
Corynorhinus townsendii Townsend's big-eared bat	None/None SSC G3G4/S2	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls & ceilings. Roosting sites limiting. extremely sensitive to human disturbance.	**None (roosting).** Foraging habitat is present, but suitable roosts are not present.
Lasiurus blossevilii Western red bat	None/None SSC G5/S3	Many open, semi-arid to arid habitats, including conifer & deciduous woodlands, coastal scrub, grasslands, chaparral, etc.	**None (roosting).** Foraging habitat is present, but suitable roosts are not present.

Scientific Name Common Name	Status Fed/State ESA CDFW G-Rank/S-Rank	Habitat Requirements	Coverage Area Suitability Observations

Regional Vicinity refers to occurrence in the quadrangle containing the Coverage Area and/or in the surrounding 5 quadrangles.

FT = Federally Threatened SE = State Endangered

FC = Federal Candidate Species ST = State Threatened

FE = Federally Endangered SR = State Rare

FP = Fully Protected SSC = CDFW Species of Special Concern

WL = Watch List SA = CDFW Special Animal

G-Rank/S-Rank = Global Rank and State Rank as per NatureServe and CDFW's CNDDB RareFind3.

*Monarch butterfly is currently under review for potential federal ESA listing

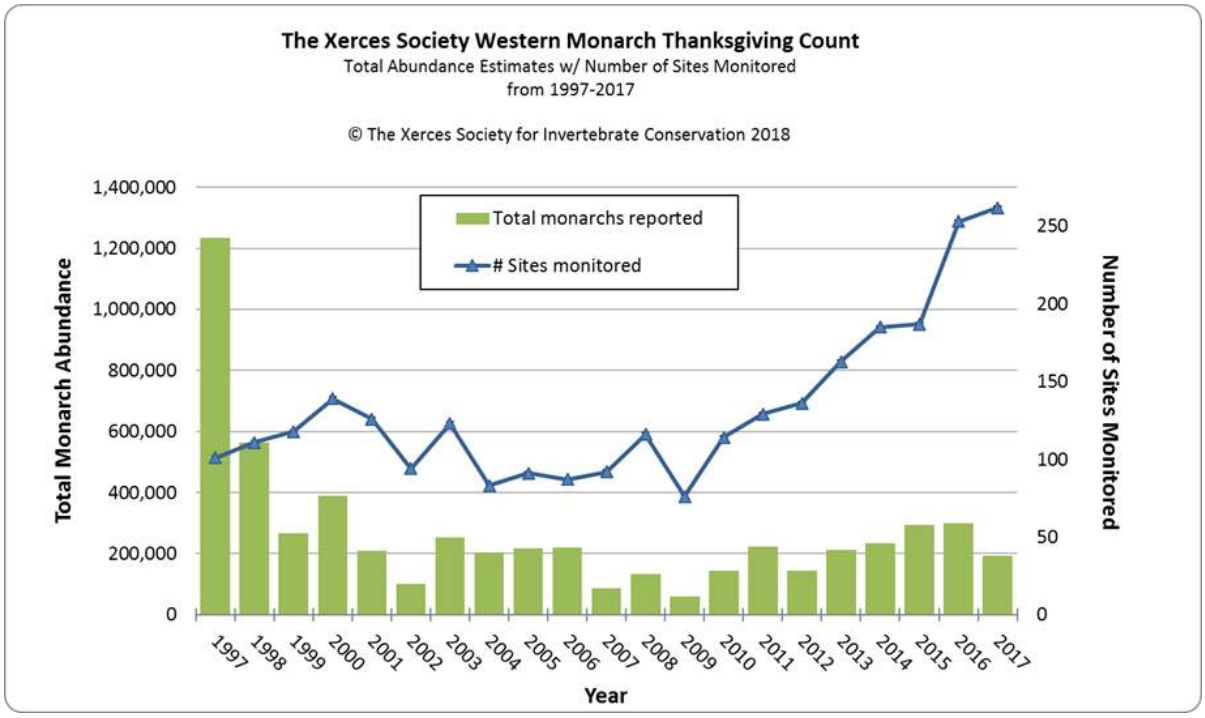
Monarch Butterfly

The monarch butterfly (*Danaus plexippus*) is a conspicuous black and orange butterfly that occurs in the United States, Mexico, northern South America, southwestern Europe, and Oceania. In the United States the species occurs as two populations, separated by the Rocky Mountains. Both of these populations are migratory, and most of the butterflies in the western population (which overlaps the Coverage Area) spend the summer months distributed across habitats between the Rocky Mountains and the coast, and migrate to sheltered sites along the California coast to aggregate and pass the winter. Overwintering sites are predominately in dense eucalyptus groves, and breeding sites are variable but characterized by the presence of milkweed (*Asclepias* spp.), the larval host plant. The migratory phenomenon causes butterflies to become concentrated at suitable overwintering sites, making overwintering habitat the single most valuable resource needed to complete the monarch's life cycle. The Ellwood Mesa complex of eucalyptus trees is the largest contiguous area of preserved monarch aggregation habitat in Southern California, and the aggregation sites in the Coverage Area provide significant habitat value to the monarch butterfly population. Monarchs typically arrive in the Coverage Area in October and depart between late February and April, depending on conditions. (Warmer temperatures lead to earlier departures).

The monarch butterfly population in California has declined at least 74 percent since the 1990s (Pelton et al. 2016) and by over 95 percent since the 1980s, and the migratory population is at a high risk of extinction (The Xerces Society 2017). The monarch butterfly is listed on the CDFW's Special Animals List, with aggregation roosts designated as imperiled to vulnerable in the state (CDFW 2018c). Currently, the species is under federal review for potential listing under the federal ESA, and the USFWS plans to make its determination of whether this species warrants federal ESA listing by June 30, 2019. Monarch butterfly aggregation sites, including historic aggregation sites that are no longer used, are designated as ESHA in the City's General Plan.

Consistent with the range-wide trend, the western monarch butterfly population has declined throughout its overwintering range in California. This decline is statistically significant despite the fact that the size of the western migrating monarch population fluctuates annually based on a number of environmental factors, including rainfall and milkweed availability. Figure 9 shows the western monarch population trends along with the number of sites counted during the Thanksgiving Count, a yearly effort of volunteer citizen monitors to collect data on the status of monarch populations overwintering along the California coast. These data show that in recent years, the number of sites monitored has increased dramatically while the number of monarchs encountered has remained relatively constant. This marked decrease in observations per unit effort indicates that monarch butterfly abundance has been reduced.

Figure 9 Western Monarch Population, 1997-2017



The long-term decline of the monarch population in California may be attributed to the loss of milkweed and nectar plants (caused by herbicides, drought, and removal), loss and degradation of overwintering groves (removal and aging) and other factors including use of insecticides, disease, and fluctuations in weather and temperatures associated with climate change (The Xerces Society 2017). Scientists, wildlife agencies, and conservation advocates are calling for the protection of this species through the conservation and management of breeding, nectar, and overwintering habitat.

In 2016, The Xerces Society evaluated the overwintering sites in California and created a list of the top 50 priority sites (Pelton et al. 2016). This list prioritizes sites for protection and active management. The highest rank is for sites with the greatest declines that still host the largest proportion of the remaining western overwintering population. These sites have suffered population decline but still hold potential for recovery to support the monarch population. The Xerces Society states that these sites demand the most urgent attention. Ellwood Main is #4 on the list with a decline of 58 percent from the 1997-2001 average, and Ellwood North is #45 on the list with a decline of 98.3 percent. Having two of Ellwood Mesa's five overwintering locations included in this list of 50 shows the importance of this area for the recovery of the migratory monarch butterfly population.

Consistent with the pattern of declining monarch populations statewide, the population at Ellwood Main is in decline, but also fluctuates greatly. Figure 4 shows the annual peak population at Ellwood Main between 1989 and 2018. The overwintering population at Ellwood Mesa between 2013 and 2018 has shown the lowest recorded population numbers for six consecutive years since 1989. Additionally, recent data collected during the 2018 winter season showed an all-time low peak population of 230 monarch butterflies observed. Despite recent population declines, the Ellwood Mesa aggregation sites remain important for the western population of the monarch butterfly and accordingly, agencies and resource experts maintain that management of the eucalyptus trees that support the butterflies are paramount to continued overwintering by the species.

California Red-legged Frog

California red-legged frog (CRLF; *Rana draytonii*) is a federally listed threatened amphibian that requires aquatic habitat for breeding, and typically occurs in or near permanent sources of deep water with emergent vegetation. Recent reports of CRLF from the vicinity include sightings in Bell Canyon and Winchester Canyon, Eagle Canyon Creek, and Tecolote Creek. Sandpiper Golf Course, which contains perennial pools, separates the Bacara resort site from the Ellwood Mesa. CRLF are known to move overland for distances up to one mile, and could move from Tecolote Creek to golf course ponds, and subsequently through Devereux Creek at Ellwood Mesa. CRLF are not reported from Devereux Creek currently, and perennial water is not present on Ellwood Mesa most years, but the creek corridor could serve as a movement corridor for CRLF during the rainy season.

Raptors and Vulture

Nesting and roosting habitat for raptors and vultures, including white-tailed kite, Cooper's hawk, and turkey vulture, are protected as ESHA under Policy CE 8 of the General Plan (City of Goleta 2017a). Small vulture roosts occur in the eucalyptus groves on Ellwood Mesa, particularly Ellwood Main. Foraging territories typically encompass several miles. Turkey vultures (*Cathartes aura*) are frequently observed foraging and/or roosting throughout the Coverage Area. Cooper's hawks (*Accipeter cooperii*) are reported to breed at Ellwood Mesa occasionally, with a documented nest in the Sandpiper grove.

White-tailed kite (*Elanus leucurus*) is a State "Fully Protected" species, and their nest sites are thus protected year-round, even when not in use. The species occurs as a year-round resident breeder at Ellwood Mesa. Seven nest sites were previously documented at Ellwood Mesa. Observations suggest that the Ellwood Mesa Open Space Plan Area serves as a primary foraging territory for kites nesting in the vicinity (City of Goleta 2014c, Storrer 2011). Kites have been recorded nesting in the eucalyptus trees in and surrounding the Coverage Area (City of Goleta 2017a, Santa Barbara Audubon Society 2018). A kite nest was observed in the vicinity of Ellwood North during monarch butterfly population surveys in January and February 2018 by a Rincon biologist. Great horned owls are known to breed in the Ellwood Mesa and are regularly observed by visitors.

Nesting Birds

The Coverage Area contains habitat that can support other nesting birds, including raptors, protected under the California Fish and Game Code Section 3503. Native and non-native trees and woody shrubs are present in and adjacent to the Coverage Area that could provide suitable nesting habitat. As previously stated, known raptor nests are documented in eucalyptus groves at Ellwood Mesa Open Space, and nests of passerine birds are expected in grasslands, scrub, and riparian habitats.

Wildlife Movement Corridors

Wildlife movement corridors, or habitat linkages, are defined generally as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Such linkages may serve a local purpose, such as providing a linkage between foraging areas, or they may be regional in nature. The Ellwood Mesa Open Space is situated between open space managed by the University of California, Santa Barbara, to the east, and a golf course to the west. It provides an important linkage in a movement corridor between the eastern natural area and undeveloped lands north and west of the City limits. Devereux Creek and its northern tributaries are the last remaining physical linkages between the Ellwood Mesa Open Space Area and

relatively undisturbed and intact habitats in the foothills to the north. However, these linkages are tenuous and may serve only as semi-permeable movement corridors for many species (City of Goleta 2004). The adjacent golf course, which has large areas of vegetation and a relatively low proportion of hardscape and structures, may also serve as a movement corridor for wildlife that cross the Ellwood Mesa Open Space, particularly during night hours.

Although bird flyways are not traditionally considered wildlife movement corridors, Devereux Slough, located southeast of the Coverage Area, is an important habitat for bird species during migration along the Pacific Flyway. Many bird species use this area as an annual stopover location for several days of rest and feeding prior to continuing migration to their seasonal destinations (City of Goleta 2004). Ellwood Mesa Open Space, including the Devereux Creek riparian corridor within the Coverage Area, is also part of the Goleta Coast Important Bird Area, designated by the National Audubon Society. It is considered to be globally important due to its location on the Pacific Flyway.

Jurisdictional Drainages and Wetlands

As described in Policy CE 3.1 in the City's General Plan, wetlands are any area that meets the definition of a wetland as defined by the California Coastal Commission, CDFW, and the USFWS using presence of a single indicator (hydrophytic vegetation, hydric soils, or wetland hydrology). Drainages and wetlands occur in the Coverage Area, and have been mapped during previous biological studies. Based on those studies, potentially jurisdictional areas in the Coverage Area consist of Devereux Creek, which crosses the Coverage Area from east the west, its tributaries, and associated riparian vegetation. Additionally, the limited vernal pools that have been previously mapped in the Coverage Area are likely wetlands as defined by the City. These features are illustrated on Figure 7.

Local Policies

Policies in the Conservation Element of the City's General Plan reinforce State and federal regulations that protect aquatic habitats and listed species, and apply additional local restrictions to identify, preserve, and protect the City's biological resources. Protected resources include ESHAs, creeks and riparian Stream Protection Areas, wetlands, monarch butterfly aggregation habitat, certain terrestrial habitat areas, marine habitat areas, beach and shoreline habitats, special-status species, native woodlands, and the urban forest, among others. Below is a discussion of the biological resource policies in the Conservation Element that apply to the MBHMP.

ENVIRONMENTALLY SENSITIVE HABITAT AREA

The objective of General Plan Policy CE 1: Environmentally Sensitive Habitat Area Designations and Policy, is to "identify, preserve, and protect the city's natural heritage by preventing disturbance of ESHAs." Policy CE 1.2 designates ESHA in the City of Goleta, which are shown on Figure 4-1 of the General Plan and include the following located in the Coverage Area (Figure 6): creek and riparian areas; wetland, such as vernal pools; coastal bluff scrub; coastal sage scrub; native grassland; monarch butterfly aggregation sites; and nesting and roosting sites of various species of raptors. Policy 1.6 establishes restrictions for development in ESHAs and their buffers. The policy restricts all development inside ESHA with a number of exceptions including resource protection and enhancement projects. Lastly, Policy CE 1.10, prohibits the use of insecticides, herbicides, artificial fertilizers, and other toxic substances in an ESHA except where necessary to protect or enhance the ESHA itself.

As illustrated in Figure 6, a large portion of the Coverage Area is designated as ESHA for monarch butterfly aggregation. In addition, native grassland, vernal pool, bluff scrub, and riparian EHSAs are in the Coverage Area.

RIPARIAN/WETLANDS/VERNAL POOLS

The objective of General Plan Policy CE 2: Protection of Creeks and Riparian Areas is to "Enhance, maintain, and restore the biological integrity of creek courses and their associated wetlands and riparian habitats as important natural features of Goleta's landscape." Policy CE 2.1 designates certain creeks in Goleta, including the portion of Devereux Creek in the Coverage Area, as an ESHA. Policy CE 2.2 establishes a 100-foot wide Streamside Protection Area around all creeks, although the width can be reduced to 25 feet on a case-by-case basis, if certain criteria are met. Policy CE 2.3 establishes a list of allowable uses and activities in streamside protection areas, including fencing, existing roads, driveways, utilities, structures, drainage improvements, foot trails, resource restoration and enhancement, low impact interpretive and public access signage, and nature education and research activities. Policy CE 2.6 specifies restoration activities for improving degraded creek resources. Policy CE2.6(d) specifically states "restoration of native riparian vegetation and removal of exotic plant species shall be implemented, unless such plants provide critical habitat for monarch butterflies, raptors, or other protected animals".

The objective of General Plan Policy CE 3: Protection of Wetlands is to "preserve, protect, and enhance the functions and values of Goleta's wetlands." Policy CE 3.2 designates all wetlands as ESHA and Policy 3.4 sets protection standards for wetlands prohibiting filling, diking, and dredging unless certain criteria can be demonstrated and sets a wetland buffer of 100 ft. which can be reduced to 50 ft. in certain circumstances. Policy 3.8 states that vernal pools shall be protected and preserved.

MONARCH BUTTERFLIES

General Plan Policy CE 4: Protection of Monarch Butterfly Habitat Areas is intended to "preserve, protect, and enhance habitats for monarch butterflies in Goleta, including existing and historical autumnal and winter roost or aggregation sites, and promote the long-term stability of over-wintering butterfly populations." Policy CE 4.2 designates monarch butterfly ESHAs, which include the eucalyptus groves in the Coverage Area (referred to as the "Ellwood Complex" in the General Plan). Policy CE 4.4 restricts development in monarch butterfly ESHA, sets forth development standards adjacent to monarch butterfly ESHA. Subsection "c" of Policy CE 4.4 specifically states "removal of vegetation within monarch ESHAs shall be prohibited, except for minor pruning of trees or removal of dead trees and debris that are a threat to public safety." Policy CE 4.5 defines a protective buffer (100 feet wide in most cases) around active and historic aggregation sites, and restricts the activities that may occur in the butterfly ESHA buffer.

PROTECTED TREES

The City of Goleta does not have a specific tree protection plan or ordinance, but the General Plan Conservation Element and the GUFMP (City of Goleta 2017b), regulate protection of trees in the city. The objective of General Plan Policy CE 9: Protection of Native Woodlands is "to maintain and protect existing native trees and woodlands as a valuable resource needed to support wildlife and provide visual amenities." Protected trees for areas of new development are defined (Policy CE 9.1) as native oaks (*Quercus* spp.), walnut (*Juglans californica*), sycamore (*Platanus racemosa*),

cottonwood (*Populus* spp.), willows (*Salix* spp.), or other native trees not otherwise protected in ESHAs.

The objective of General Plan Policy CE 14: Preservation and Enhancement of Urban Forest is to "protect, preserve, and enhance Goleta's urban forest for its aesthetic, visual, and environmental benefits to the community." Trees on public lands are considered valuable resources to be conserved as part of the Goleta urban forest. Policy CE 14.7 identifies a City effort to consider an Urban Forest Ordinance. The GUFMP refers to open spaces as potential planting sites for trees, but does not specifically discuss management of the Ellwood eucalyptus groves.

In 2017, a tree inventory in the eucalyptus groves was completed to investigate safety concerns over the catastrophic die off of eucalyptus trees in the Coverage Area. The survey identified over 1,200 trees in the eucalyptus groves which are dead, with hundreds more that were highly degraded and dying (Althouse and Meade, Inc. 2017). Following this study in 2017, 27 trees which posed a public safety risk were removed, and two were pruned, under an emergency permit from the California Coastal Commission. However, the majority of the dead trees were not addressed or abated, and remain on site.

The MBHMP Coverage Area is focused on eucalyptus groves dominated by three species of non-native tree: blue gum (*Eucalyptus globulus*), red gum (*Eucalyptus camaldulensis*), and red iron bark (*Eucalyptus sideroxylon*), and these areas have a low percentage of native vegetation. However, limited numbers of native trees are also present in the Coverage Area, including coast live oak (*Quercus agrifolia*), black cottonwood (*Populus trichocarpa*), sycamore (*Platanus racemosa*), and willow (*Salix* spp.). Native trees occur outside the eucalyptus groves, primarily in riparian areas, and have not been inventoried fully.

Habitat Conservation Plans

The Coverage Area is not subject to any approved federal, State, or local Habitat Conservation Plan.

Thresholds of Significance

A significant impact on biological resources would be expected to occur if the MBHMP resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. Additionally, per the City's Environmental Thresholds and Guidelines Manual (City of Goleta 2003), a project would pose a significant environmental impact(s) on biological resources if any of the following would result:

a. A conflict with adopted environmental plans and goals of the community in which it is located
b. Substantial effect on a rare or endangered plant or animal species
c. Substantial interference with the movement of any migratory or resident fish or wildlife species
d. Substantial diminishment of habitat for fish, wildlife, or plants

Project-Specific Impacts

a. Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as candidate, sensitive, or special status in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?

Special-status Plants

The majority of plant species documented in the Coverage Area are non-native, and those native species that do occur are mostly common and located in areas outside of eucalyptus groves, as reported in the tree inventory as well as in field observations made during a February 2018 reconnaissance-level site survey. However, as described above, some special-status plants have potential to occur in suitable habitat in the Coverage Area, outside the eucalyptus groves.

Impacts to special-status plant species could occur if their habitats are altered or individuals are removed during implementation of the MBHMP. Implementation of the MBHMP would occur primarily in eucalyptus groves and outside suitable habitat for special-status plants. However, activities could occur outside existing eucalyptus groves and in suitable habitat for special-status plant species including Santa Barbara honeysuckle (known to be present), Douglas' fiddleneck, Catalina mariposa lily, southern tarplant, Contra Costa goldfields, Coulter's goldfields, pale-yellow layia, Sonoran maiden fern, Coulter's saltbush, and Brewer's calandrinia, all of which have a moderate or high potential to occur in the Coverage Area.

Taking down dead or dying eucalyptus trees could involve the staging or placement of debris piles, equipment, or personnel in areas where special-status plant species have a potential to occur and would impact these species, if present. Impacts could occur to special-status plant species if the installation of physical structures or features, such as irrigation, interpretive signs, and fencing, occurred in habitats where special-status plant species were present. Further, the Habitat Enhancement and Restoration Program includes plantings of native species to enhance habitat values in portions of the Coverage Area outside the eucalyptus groves, and these activities could occur in native grasslands or coastal scrub habitat. Personnel, equipment, and ground disturbance in these areas could impact special-status plant species during the revegetation process. Supplemental irrigation and changes in overall plant density in restoration areas could indirectly impact special-status plants, if present.

Special-status plant species in the Coverage Area could be impacted by implementation of the MBHMP if covered activities occur in habitats such as native grasslands, coastal scrub, bluff scrub, wetlands, arroyo thickets, or vernal pools. Because the covered activities would primarily occur in eucalyptus groves, impacts to special-status plant species would be minor. Nonetheless, these impacts could be potentially significant absent mitigation, considering that the proposed activities would occur over a long period of time and that one of the potentially occurring plants is an endangered species. Impacts would be reduced to a less than significant level with implementation of mitigation measure BIO-4, which requires periodic surveys for rare plants during the course of the MBHMP's implementation and avoidance of all special status plants detected. In addition, mitigation measures BIO-1, BIO-2, and BIO-3 would further reduce impacts by ensuring site housekeeping, presence of a biological monitor, and worker environmental awareness.

In addition, given that the MBHMP is a long-term program implemented for the purpose of enhancing habitat, it is reasonable to expect that in the long term, the Habitat Enhancement and Restoration Program would improve habitat in the Coverage Area and could create additional

suitable habitat for special-status plant species. Special-status plants could recruit in the future to native habitats in the Coverage Area, consistent with the MBHMP's objective of increasing biological diversity outside the eucalyptus groves.

Special-status Wildlife Species

Special-status wildlife species with the potential to occur or known to be present in the Coverage Area, include monarch butterfly, nesting white-tailed kite, nesting Cooper's hawk, and California red-legged frog. Other raptor and turkey vulture nest sites are documented in the Coverage Area (City of Goleta 2017a; CNDDB 2018).

Monarch Butterfly

Monarch butterflies aggregate in the on-site eucalyptus groves during winter months to "overwinter" or pass the winter season. The Coverage Area includes five monarch butterfly aggregation areas, referred to as the Ellwood North, Ellwood West, Ellwood Main, Sandpiper, and Ocean Meadows aggregation sites (see Figure 4). Historically, tens of thousands of monarch butterflies have converged on Ellwood Mesa, making this area one of the most important sites for monarch butterflies in California. The overwintering population at Ellwood Mesa between 2013 and 2019 has shown the lowest recorded population numbers for six consecutive years since 1989. In addition, 2018 was the lowest recorded population at 230. However, these aggregation sites remain important for the western population of the monarch butterfly and accordingly, management of the eucalyptus trees that support the butterflies is paramount to continued overwintering by the species.

The MBHMP Natural Resources Program identifies programs with goals, policies, and actions to sustain and enhance suitable habitat for monarch butterflies. The MBHMP also includes Administrative Programs, Outreach Programs, and Monitoring, Research, and Adaptive Management Programs. These include actions that could impact monarch butterfly habitat or individuals, if they are present in the Coverage Area. Examples include dead tree removals, trail management, fencing installation, irrigation and interpretive sign implementation, and revegetation and non-native species eradication that creates ground disturbance. A list of the goals, policies, and actions for the Coverage Area can be found in Table 2.

Implementation of the MBHMP could create short-term impacts to monarch butterfly through disturbance of suitable habitat through actions such as tree trimming and removal; application of pesticides, herbicides, and insecticides; and disturbance created by restoration activities and trail management. Unless authorized by a qualified biologist, Action 10-4.1 of the Monarch Butterfly Management Program requires all potentially invasive activities to be conducted during April 1 to September 30 of each year which would ensure there are no direct impacts to monarch butterfly by the covered activities as they would not be present during this time. In addition, mitigation measure HWQ-2, Chemical Application Control Plan, found in Section 9, *Hydrology and Water Quality*, would place restrictions on chemical applications in the Coverage Area which would further reduce potential impacts to monarch butterflies. Less than significant indirect impacts could occur to monarch butterflies if their habitat is altered in a manner that decreases its suitability for the species. However, implementation of the Natural Resource Program in the MBHMP would maintain and enhance suitable habitat for the monarch butterfly. Replanting habitats where dead or dying eucalyptus trees are removed will help sustain the long-term viability of the eucalyptus groves as monarch butterfly habitat. Planting native species and eradication of non-native species (excluding eucalyptus), along with integrated pest management to reduce pests that stress monarch butterflies

or their habitat, would further enhance suitable habitat for the species in the Coverage Area. Therefore, the MBHMP would have a beneficial impact for the species over the long term. Impact to monarch butterfly would be less than significant, and would be further reduced through implementation of the pesticide restrictions in mitigation measure HWQ-2 and the site housekeeping, biological monitoring, and worker awareness provided by Mitigation Measures BIO-1, BIO-2, and BIO-3. No additional mitigation measures would be required.

California Red-legged Frog

CRLF is known to occur in drainages to the northwest and west of the Coverage Area and could occur in the riparian and wetland areas associated with Devereux Creek. This species could be impacted by vegetation management, if conducted adjacent to riparian and wetland vegetation. Impacts to CRLF would less than significant with implementation of mitigation measure BIO-1, BIO-2, BIO-3, and BIO-5, which would avoid take of CRLF by requiring work be performed when CRLF are not present or requiring an on-site biological monitor to ensure CRLF are avoided during work.

White-tailed Kite and Other Raptors

White-tailed kites are fully protected and proposed habitat management actions could result in significant impacts to white-tailed kites. Impacts could occur directly, if a nest site is impacted by tree pruning or removal, regardless of time of year; or indirectly, by altering grove conditions or disturbing active nests through management actions taken on surrounding vegetation. Kites typically select nest sites that are hidden from view by dense foliage, and removal of vegetation around the nest tree that results in substantially reduced cover for the nest could impact re-use of existing nest sites. However, the MHBMP does not call for the removal of healthy trees, and removing standing dead eucalyptus trees (which lack leaves) is not likely to reduce visual screening of nests.

Cooper's hawks typically occur as a wintering species throughout Santa Barbara County but occasional nests are reported, including one in the Ellwood Open Space adjacent to Sandpiper Golf Course (City of Goleta 2017a). This species prefers wooded habitats such as oak, riparian, and urban woodlands for foraging and roosting purposes. Other raptors documented to nest on or near the Coverage Area include red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), and great horned owl (*Bubo virginianus*). A turkey vulture roost is known in the Ellwood East grove. If conducted near nesting sites in the nesting season, covered activities could disrupt existing nesting activities in the Coverage Area or in the vicinity and cause nesting raptor pairs to abandon their nests. In addition, the removal of standing dead trees could reduce the availability of nesting and roosting sites for raptors. However, this effect would be minor because the forest in the Coverage Area contains several thousand trees, and removal of dead trees on a large scale over a short time period is not proposed. Further, removed trees would be replaced through the MBHMP's restoration and habitat enhancement efforts.

Because of the potential to cause nest abandonment, impacts on raptor nesting activity would be considered potentially significant absent mitigation. However, Mitigation Measures BIO-1, BIO-2, BIO-3, and BIO-6 would reduce impacts to a less-than-significant level by requiring pre-activity surveys and nest avoidance, biological monitoring, and worker education.

Other Nesting Birds

The Coverage Area contains suitable habitat for other nesting birds, including ground-nesting and shrub-nesting species. Covered activities including dead tree removal, trimming or other

disturbance to trees and woody vegetation may affect bird species during the typical nesting season from March 15 to August 15. Additionally, other covered activities such as mowing could affect nesting birds if present on the ground or in non-native herbaceous vegetation. The MBHMP clarifies these activities should be avoided during the nesting bird season to the maximum extent feasible.

As covered activities could occur during the nesting bird season, the covered activities could result in potentially significant impacts to nesting birds. These impacts would be reduced to a less than significant level with implementation of Mitigation Measures BIO-1, BIO-2, BIO-3, and BIO-6, which require pre-activity surveys and nest avoidance, biological monitoring, and worker education.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

c. Would the project have a substantial adverse effect on State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Sensitive vegetation types and ESHAs occur in the Coverage Area. These include native grassland, riparian/wetland habitats, vernal pools, coastal scrub, and bluff scrub. Habitat management activities would focus primarily on existing eucalyptus groves. These groves are mapped as an ESHA in the General Plan due to documented use of these groves as monarch aggregation/raptor roost and nest sites. The MBHMP identifies threats to the eucalyptus groves and offers actions in response, including removing dead and dying trees, removing downed trees and debris, watering, planting eucalyptus trees and understory plants, and pruning trees. The MBMHP calls for the replacement of the removed trees and enhancement of the groves with planting of eucalyptus in the historical grove footprint only, and the planting of native species in other portions of the Coverage Area. No expansion of eucalyptus groves beyond historical footprints would occur under the MBHMP, although gaps or reductions in the grove caused by tree die off would be replenished. Proposed habitat management activities, if successful, would have a beneficial impact on monarch butterfly ESHA by maintaining and enhancing suitable aggregation habitat. Mitigation measure BIO-7 would ensure the long-term success replacement trees and the viability of the designated ESHA.

Negative effects to native grasslands, coastal scrub, riparian/wetland areas or vernal pools could occur if temporary stockpiling or staging dead trees, tree trimmings, other brush material, vegetation maintenance equipment, or other MBHMP materials were to occur in these sensitive habitats. These impacts would be less than significant with mitigation measure BIO-8, which requires MBHMP activities such as staging and stockpiling avoid sensitive habitats.

Program 14, Habitat Enhancement and Management, would include activities outside of the eucalyptus groves including planting of native species, eradiation of non-native herbaceous cover, and restoration of riparian areas along Devereux Creek. These activities would have a beneficial impact on the sensitive communities through habitat enhancement and restoration.

The General Plan and the 2004 Open Space Plan (City of Goleta et al., 2004) identify riparian and marsh habitat associated with some portions of Devereux Creek. A reconnaissance-level biological survey conducted in February of 2018 (Rincon Consultants, Inc.) verified the presence of wetland vegetation in the bed and on lower banks of Devereux Creek in portions of the Coverage Area. Mexican rush (*Juncus mexicanus*), alkali heath (*Frankenia salina*), and salt grass (*Distichlis spicata*) were common, and spikerush (*Eleocharis* sp.) was present. Bed and bank of the creek also

supported willow, occasional cottonwood, and sycamore riparian vegetation. Some of these areas are expected to meet all three criteria of the U.S. Army Corps of Engineers' jurisdictional wetland definition (hydric soil, wetland hydrology, and wetland vegetation), and would meet the Central Coast RWQCB, CDFW, California Coastal Commission, and City of Goleta criteria for wetlands, because at least one of the parameters was present.

Habitat management activities proposed under the MBHMP would not require significant placement of fill or permanent removal of vegetation in riparian or wetland areas, though trimming, mowing, and non-native invasive plant removal activities may occur for restoration purposes. However, if any dead eucalyptus trees are identified in riparian areas and therefore removed, they would be replaced in the same place they were removed from. In addition, covered activities in the Trail Management Program include "Construct and maintain crossings over drainages and other sensitive features." Impacts to jurisdictional areas would occur if the footprint of such activities were located in riparian areas, in the bed and bank of Devereux Creek, or in another jurisdictional area such as a wetland. Additionally, riparian and wetland vegetation associated with Devereux Creek could be impacted by vegetation management or through removal and replanting of dead or dying trees as described above. Thus, activities proposed under the MBHMP could have a potentially significant impact on wetland and riparian vegetation. Impacts would be less than significant with incorporation of mitigation measure BIO-9, which requires the City to avoid impacts to streams and wetlands where feasible, secure all applicable resource agency permits prior to conducting regulated activities in a jurisdictional stream or wetland, and adhere to all permit conditions, including any required compensatory mitigation.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

d. Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Implementation of the covered activities in the MBHMP would not interfere with wildlife movement. The Coverage Area is located in the Ellwood Open Space Mesa with is an important wildlife open space area. The MBHMP would not place any new structures or features, such as buildings, walls, or other permanent structures that would limit the travel of wildlife through the site. Fencing would be placed in the Coverage Area as part of the Aesthetic Resources Management Program, but would be constructed in a manner that would not restrict the movement of wildlife. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

ESHA

ESHAs are designated throughout the Coverage Area. The primary activities to occur under the MBHMP would involve the restoration and enhancement of eucalyptus groves; these are allowed under General Plan Policy CE 1. Restoration and habitat enhancement may occur in other designated ESHA areas, such as native grasslands, also consistent with General Plan Policy CE 1. Other covered activities in the MBHMP include the installation of interpretive signs, fencing, and trail management. General Plan Policy CE 1 prohibits development in the ESHA but makes exceptions for public trails, limited fencing, and signage as these uses are resource-dependent uses

that may be located in or adjacent to ESHA. Policy CE 1 restricts the use of insecticides, herbicides or other chemical in ESHA. The use of these substances is included in the Integrated Pest Management Program with the objective of protecting ESHA from pests contributing to the die off of the eucalyptus groves. Therefore, implementation of the MBHMP would not conflict with the General Plan ESHA policies and no impact would occur.

Riparian/Wetlands/Vernal Pools

Implementation of the covered activities in the MBHMP would include restoration and habitat enhancement and could occur in riparian, wetland or vernal pool habitats present in the Coverage Area. General Plan Policy CE 2, restricts activities than can occur in Streamside Protection Areas. The covered activities included in the MBHMP, such as fencing, foot trails, resource enhancement and restoration, signage, and nature education and research activities, are allowable uses in these areas. Further, dead or dying eucalyptus trees which are removed and replaced could occur in riparian areas along Devereux Creek. While General Plan Policy CE 2 generally prohibits the planting of non-native species in riparian areas, non-natives species are allowed to occur where they provide critical habitat for monarch butterflies, raptors, or other protected animals. As the eucalyptus groves are critically important aggregation sites for monarch butterflies and designated as ESHA, the planting of eucalyptus trees would be consistent with Policy CE 2. In addition, eucalyptus trees are not located in vernal pools or wetlands in the Coverage Area and therefore would not be replanted in these locations. The proposed MBHMP would restore monarch butterfly ESHA in areas historically occupied by monarch butterfly ESHA, and other ESHA types in areas either historically occupied by those types or occupied by non-ESHA. The MBHMP would not convert one type of ESHA to another, or replace ESHA with any other vegetation or use.

If equipment or downed trees were stored or staged in ESHA or signage was installed in a vernal pool or other sensitive habitat, implementation of the MBHMP would conflict with General Plan Conservation Element policies. However, this sort of conduct would be prevented by mitigation measures BIO-2, BIO-3, BIO-8 and BIO-9, which would ensure only appropriate activities are allowed in riparian areas, and would reduce this potential impact to a less than significant level.

Monarch Butterflies

General Plan Policy CE 4 prohibits the removal of vegetation in monarch ESHA, with the exception of dead trees and debris that are a threat to public safety. Aside from habitat restoration activities, trees removed or pruned under implementation of the MBHMP would only include dead or dying trees that pose a public safety risk. In addition, these trees would be replaced with the objective of monarch butterfly habitat restoration and enhancement. Therefore, implementation of the MBHMP would not conflict with General Plan Policy CE 4.

Protected Trees

The City of Goleta does not have a specific tree protection plan or ordinance. The General Plan Conservation Element and the GUFMP regulate tree protection in Goleta (City of Goleta 2017a). The GUFMP provides a five-year policy framework for how trees in public areas will be managed (City of Goleta 2011b). Section 4.12 of the GUFMP contains guidelines regarding tree risk management and removal. The risk management program in the GUFMP ensures proper management of trees to allow for healthy attractive communities while reducing risks. Implementation of the MBHMP would result in the removal of eucalyptus trees that pose an unacceptable risk to residents and recreational users ~~on~~ within and adjacent to the Coverage Area. The GUFMP Guideline 4.12.4 states

that tree removal may be necessary at the City Staff's discretion for the protection, public health, and safety of citizens in considering if trees are dead, dying, or hazardous.

The MBHMP includes tree protection programs and policies including Program 12, specific to tree management. The MBHMP identifies threats to the eucalyptus trees and offers responses, including removing dead and dying trees, removing downed trees and debris, watering, planting eucalyptus trees and understory plants, and pruning trees. The Tree Assessment Survey (Althouse & Meade, Inc. 2017) found over 1,200 dead and dying eucalyptus trees in the forest on Ellwood Mesa. These trees may be determined to threaten the well-being and health of living trees or to be a hazard to recreational users in the forest and may be recommended for removal by the City during implementation of the MBHMP.

The MBHMP allows replacement and habitat enhancement plantings to be eucalyptus in the historical grove footprint only, and requires native species to be used in other parts of the Coverage Area. No expansion of eucalyptus groves beyond historical footprints would occur under the MBHMP. All other trees in the Coverage Area would be preserved under the MBHMP unless in the future they are determined to be hazardous to the public. The removal and replacement of dead and dying trees would result in a long-term benefit to the health of the forest and the continued use of the groves by monarch butterflies and other wildlife species. The MBHMP would not conflict with the GUFMP, as it would result in an increase in forested area in the City.

Considering the information presented above, the MBHMP would not conflict with any local policies or implementing ordinances and there would be no impact.

NO IMPACT

f. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?

There are no adopted Habitat Conservation Plans or Natural Community Conservation Plans applicable to the Coverage Area. Other approved local, regional, or State habitat conservation plans relevant to the area include the Coronado Butterfly Preserve Management & Enhancement Plan (2000) and Open Space Plan (2004). The MBHMP would build on many of the recommendations in the 2004 Open Space Plan. The MBHMP identifies actions to implement recommendations of the need to resolve conflicts between the needs of special-status and common native species and habitat types through balanced management. As such, implementation of the MBHMP would not conflict with existing local conservation plans in place in the area. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

Mitigation Measures

BIO-1 General Housekeeping

General requirements that shall be followed by all personnel are listed below.

- MBHMP-related vehicles shall observe a 5-mile-per-hour speed limit in the Coverage Area at all times
- MBHMP-related vehicles and equipment shall restrict off-road travel to approved routes, which shall be sited by the City to minimize environmental impacts

- All food-related trash items, such as wrappers, cans, bottles, and food scraps, generated during implementation of the MBHMP shall be removed from the site daily
- No deliberate feeding of wildlife shall be allowed
- No pets shall be allowed on in the Coverage Area
- No firearms shall be allowed in the Coverage Area
- If vehicle or equipment maintenance is necessary including refueling of equipment, it shall be performed outside the buffers of ESHAs, bird nests, and monarch aggregation sites
- Any worker who inadvertently injures or kills a special status species or finds one dead, injured, or entrapped shall immediately report the incident to the biological monitor. The monitor shall immediately notify City of Goleta staff. The City of Goleta shall follow up with written notification to USFWS and CDFW as appropriate, depending on the species. The biological monitor shall also independently notify USFWS of any unanticipated harm to any federally listed endangered species associated with implementation of the MBHMP. All observations of federally or State-listed threatened or endangered species shall be recorded on CNDDB field sheets and sent to CDFW by City of Goleta or the biological monitor.

BIO-2 Qualified Biological Monitor

A qualified biological monitor shall be present during all vegetation removal and ground disturbing activities to ensure compliance with all mitigation measures, applicable permit conditions, and any conditions required by federal and State agencies. The monitor shall be responsible for:

- Ensuring that procedures for verifying compliance with environmental mitigation measures are followed.
- Lines of communication and reporting methods.
- Daily and weekly reporting of compliance.
- MBHMP crew training regarding environmentally sensitive areas.
- Authority to stop work.
- Action to be taken in the event of non-compliance.

BIO-3 Biological Resources Awareness Training

Before any ground-disturbing work or vegetation removal/trimming occurs in the Coverage Area, a qualified biologist shall conduct a mandatory biological resources awareness training for all MBHMP personnel about federally and State listed species that could occur on site. The training shall include the natural history, representative photographs, and legal status of each federally listed species. Proof of personnel attendance shall be kept on file. If new MBHMP personnel are added to the crew, the contractor shall ensure that the new personnel receive the mandatory training before starting work. The subsequent training of personnel can include videotape of the initial training and/or the use of written materials rather than in-person training by a biologist.

BIO-4 Special-status Plants

To avoid impacts to special-status plants, periodic rare plant surveys the Coverage Area must occur at least once every five years during a normal rainfall year, following current standard practice for botanical surveys (CDFW 2018), which may require multiple passes to detect or rule out all potential species. If special-status plants remain absent from work areas, no further action is required. If special-status plants are detected in work areas, locations must be mapped and the plants must be

avoided during MBHMP activities. A pre-work training must be provided to the contractor(s) conducting vegetation maintenance activities that identifies special-status plants in and near the work area and locations to be avoided. If weed control is required in areas supporting special-status plants, this work must be conducted with hand tools. Vegetation control in these areas must emphasize control of non-native species, avoid flowering and fruiting seasons of the identified special-status plants to the maximum extent possible, and ensure that activities do not remove special-status plant individuals.

BIO-5 California Red-legged Frog

Any ground disturbing activities in riparian and wetland habitats shall be conducted when the channel is dry to the maximum extent feasible. Additionally, within seven days prior to start of work, a biologist must conduct a survey prior to any ground disturbance to verify that riparian and wetland areas do not contain ponded water and that no California red-legged frogs are present. If ponded water is present, no work may occur within 50 feet of pools. If suitable resident frog habitat is present or frogs are noted during the surveys, a biological monitor must be present during vegetation clearing and removal activities in riparian and wetland habitats. The biologist will have the authority to stop work and identify areas that must be avoided. Listed species must be fully avoided unless take permits are obtained from the USFWS and/or CDFW. Only handheld tools shall be used. Removal of native vegetation shall be limited to dead, damaged, and diseased material.

BIO-6 Nesting Bird Survey

To the maximum extent feasible, tree trimming activities must occur in September to ensure that raptor nests and monarchs are not active in the work area. Surveys for nesting birds and raptors are required prior to any ground disturbance or vegetation removal work conducted in the nesting season, defined to be February 1 to September 15.

If ground-disturbing or vegetation removal work does occur during the nesting season, then not more than three (3) days before ground disturbance and/or vegetation removal commences, a bird and raptor survey must be conducted by a City-approved biologist in the disturbance footprint plus a 300-foot buffer, as feasible. If the MBHMP activity is phased, a subsequent nesting bird and raptor survey is required in the Coverage Area before each phase of the activity. If no raptor or other bird nests are observed no further mitigation is required.

Nesting bird and raptor surveys must be conducted during the time of day when bird species are active and be of sufficient duration to reliably conclude presence/absence of nesting birds and raptors in the 300-foot buffer.

If active nests of species protected by CFG Code 3503 or the MBTA Migratory Bird Treaty Act are found within 300 feet of the Coverage Area, their locations must be flagged and then mapped onto an aerial photograph of the Coverage Area at a scale no less than 1”=200’ and/or recorded with the use of a GPS unit. If active raptor nests are detected, the map will include topographic lines, parcel boundaries, adjacent roads, known historical nests for protected nesting species, and known roosting or foraging areas, as required by Conservation Element Policy 8.3 of the Goleta General Plan. If feasible, the buffer must be 300 feet in compliance with Conservation Element Policy CE 8.4 of the Goleta General Plan. If the 300-foot buffer is infeasible, the City approved biologist may reduce the buffer distance as appropriate, dependent on the species and the proposed work activities. If any active *non-raptor* bird nests are found, a suitable buffer area (varying from 25-300 feet), depending on the species, must be established by the City-approved biologist. No ground disturbance can occur in the buffer until the City-approved biologist confirms that the

breeding/nesting is completed and all the young have fledged. Alternately, a City-approved biologist must monitor the active nest full-time during MBHMP activities in the buffer to ensure MBHMP activities are not indirectly impacting protected nesting birds and raptors.

BIO-7 Tree Replacement

All replacement trees planted in the Coverage Area must be monitored annually for a minimum period of 5 years. At the end of the 5-year monitoring period, replacement trees shall be inspected by a City approved arborist to determine the successful establishment of the trees. The arborist may extend the monitoring period as deemed necessary. If a replacement tree dies during the monitoring period, it shall be replaced and monitored as required by this mitigation measure.

BIO-8 Native Habitats

Staging and stockpiling of debris associated with covered activities shall be temporary in nature, the duration of which shall be specified in the annual Implementation Plan prior to commencement of the covered activity. All staging and temporary stockpiling shall be limited to areas outside of riparian habitats, wetlands, vernal pools, native grasslands, and active nest buffers on site. Absolutely no staging and/or stockpiling of any materials shall be allowed in these buffers at any time. Locations to be avoided must be clearly identified with fencing, flagging, rope, or other conspicuous material, and the contractor(s) conducting vegetation maintenance activities must be trained on the limits of work prior to commencing work. Placement of chipped woody materials must avoid impacting native grasslands, riparian, and wetland vegetation. The biological monitor would ensure avoidance for the duration of activities near these areas.

BIO-9 Riparian/Wetland Areas

Impacts to vernal pools, wetlands, and streambeds shall be avoided to the maximum extent practicable, unless they are affected for the purpose of habitat enhancement. If avoidance is not feasible, the City shall acquire and comply with regulatory permits for any vegetation trimming, removal, or ground disturbing activities to be completed in potentially jurisdictional areas including in the vicinity of Devereux Creek or other riparian/wetland habitats in the Coverage Area. The CDFW shall be notified and a Streambed Alteration Agreement shall be obtained for any activities that will result in impacts to a streambed or riparian vegetation. In addition, authorizations from the U.S. Army Corps of Engineers and Central Coast Regional Water Quality Control Board (RWCB) will be secured for any activities involving discharges of fill material into a wetland or streambed.

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5 Cultural Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	■	☐	☐
b. Cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?	☐	■	☐	☐
c. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	■	☐

Existing Setting

The Goleta area is situated in the traditional tribal territory of the Chumash. The Goleta Valley changed during the Mission Period of the late 1700s when oak forests were cut down for cattle grazing and farming to support the Santa Barbara Mission and Presidio. The area remained primarily under agricultural production until the construction of US 101 in 1947 and the relocation of UCSB to Goleta Point in 1950 (City of Goleta 2006a). In the 1870s, Ellwood Cooper introduced eucalyptus trees to Ellwood Mesa and by the mid-1870s had successfully planted approximately 50,000 trees of more than 50 varieties. The groves have matured and become useful for windbreaks. Today the eucalyptus groves present on Ellwood Mesa are a remnant of Cooper's early attempt at eucalyptus forestry. The Coverage Area is undeveloped open space previously used for oil development. Remnants of the oil facilities are still present on site. There are no known locally significant historic buildings or structures present in the Coverage Area (see Figure 3.5-1 of the General Plan Final Environmental Impact Report, City of Goleta 2006b).

Rincon conducted a records search of the Ellwood Mesa Open Space and a 0.5-mile radius. The records search was conducted at the Central Coast Information Center (CCIC) on January 16, 2019. The records search identified a total of 16 cultural resources (2 historic archaeological sites and 14 prehistoric archaeological sites) within the search radius. Of those resources, two are located directly in the Ellwood Mesa Open Space (SBA-1321 and SBA-38644). Resource SBA-1321 is located along the bluff above the beach and was recorded in 1974. It consists of a shell midden and ground stone artifact scatter. The site was substantially disturbed by oil infrastructure. In 1997, archaeological testing on a portion of the site recommended it ineligible for listing in the California Register of Historical Resources due to a lack of integrity (Onken 1997).

Resource SBA-38644 is an isolated biface fragment recorded on the southern edge of the Coverage Area. The isolate was identified during archaeological monitoring conducted for the remediation of Devereux Creek. No other artifacts were identified with the isolate at the time of monitoring. However, the isolate was identified in the vicinity of resource LRW-90-53, a site that was not

formally recorded but is described in report SR-04937 on file with the CCIC. Site LRW-90-53 was subject to archaeological testing in 1997 on the southern border of the Coverage Area on the banks of Devereux Creek.

In addition to the resources in the Ellwood Mesa Open Space, a total of four previously recorded resources are located directly adjacent to the eastern border of the open space and Coverage Area. The results of the records search indicate a high archaeological sensitivity for the Coverage Area and vicinity.

Thresholds of Significance

A significant impact to cultural resources would occur if the MBHMP resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. Additional thresholds are contained in the City's Environmental Thresholds and Guidelines Manual. The City's adopted thresholds indicate that a project would result in a significant impact to a cultural resource if it results in the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a cultural resource would be materially impaired.

Project-Specific Impacts

a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

b. Would the project cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?

No known significant historic buildings or structures are located on the Coverage Area. Implementation of the MBHMP would not involve construction of any structures, and therefore, would not require substantial excavation. However, the Coverage Area is in an area known to be archaeologically sensitive. Minimal grading may occur in association with development of new trails or trail maintenance that may uncover archaeological resources. Additionally, tree removal under the Catastrophic Event Response Program or Tree Management Program would result in ground disturbance with the potential to unearth unknown archaeological resources. With implementation of Mitigation Measure CUL-1 during ground disturbance, potential impacts to archaeological or historic resources would be less than significant.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

c. Would the project disturb any human remains, including those interred outside of formal cemeteries?

The discovery of human remains could potentially occur during ground-disturbing activities. If human remains are found, the State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the County Coroner must be notified immediately. If the human remains are determined to be prehistoric, the Coroner would notify the Native American Heritage Commission, which would determine and notify the most likely descendant. The most likely descendant must complete the inspection of the discovery and provide recommendations for

treatment to the landowner within 48 hours of being granted access. With adherence to existing regulations, impacts to human remains would be less than significant.

LESS THAN SIGNIFICANT IMPACT

Mitigation Measures

CUL-1 Archaeological and Native American Monitoring

Ground-disturbing activities associated with the MBHMP, including but not limited to trail modification and vegetation and tree removal, shall be observed by a qualified archaeological monitor under the direction of an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for prehistoric archaeology (National Park Service 1983) and a local Native American monitor. If archaeological resources are encountered during ground-disturbing activities, work in the immediate area shall halt and the find evaluated for significance. Archaeological and/or Native American monitoring may be reduced or halted at the discretion of the monitors as warranted by conditions including, but not limited to, negative findings during the first 60 percent of ground disturbance. If monitoring is reduced to spot-checking, spot-checking shall occur when ground-disturbing activities occur in a new location in the Coverage Area or when ground disturbance would extend to depths not previously reached (unless those depths are within bedrock).

If archaeological resources are identified during ground disturbance, they shall be left in place and avoided when feasible. If avoidance is infeasible, a Phase II testing and evaluation program shall be implemented. If resources are determined significant or unique through Phase II testing and site avoidance is not possible, appropriate site-specific measures shall be identified in the Phase II evaluation. These measures may include, but would not be limited to, a Phase III data recovery program, capping, or other appropriate actions to be determined by a qualified archaeologist in consultation with the Native American monitor.

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6 Energy

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☐	■
b. Conflict with or obstruct a State or local plan for renewable energy or energy efficiency?	☐	☐	☐	■

Existing Setting

California consumed 7,830 trillion British thermal units (Btu) of energy in 2016. While the state ranked second in the nation for total energy consumption, this is due almost entirely to the state's large population. At 199 Btu per person, the state's per capita energy consumption ranks 48th in the nation. Transportation is the largest consumer of energy in the state, accounting for approximately 39.8 percent of all energy consumption (United States Energy Information Administration 2018).

Energy production in California totaled 2,431 trillion Btu in 2016 (United States Energy Information Administration 2018). According to the California Energy Commission (CEC), total in-state electricity generation in 2017 was 206,328 gigawatt hours (GWh) (CEC 2018). Electricity consumption in Santa Barbara County totaled 2,799 GWh in 2017, with residential consumption accounting for approximately 27.6 percent (CEC n.d.). Statewide, natural gas accounted for more electricity generation than any other fuel type at 43.4 percent (CEC 2018).

California's Renewables Portfolio Standard (RPS) was established in 2002 under Senate Bill (SB) 1078 and sets power generation mix goals for the state. Specifically, the RPS specifies minimum renewable energy-sourced power generation goals, with a goal of 100 percent carbon-free energy generation by 2045. Interim RPS goals include a 33 percent renewable standard by 2020, and 60 percent by 2030 (California Public Utilities Commission 2019, CEC 2019).

On July 15, 2014, the City of Goleta adopted a Climate Action Plan (CAP). While targeted toward reducing citywide greenhouse gas (GHG) emissions, the CAP includes energy efficiency measures to reach emissions reduction targets. Energy-related measures described in the CAP include building energy efficiency strategies, conducting outreach programs to encourage renewable energy installation, and encouraging the use of alternatively fueled construction and landscape equipment (City of Goleta 2014a).

The nearest energy infrastructure facility to the Coverage Area is NRG California South LP's Ellwood natural gas power plant, approximately 0.7 mile west of the Coverage Area.

Thresholds of Significance

A significant energy impact would occur if the MBHMP resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. The City's Environmental Thresholds and Guidelines Manual does not contain City-specific energy thresholds.

Project-Specific Impacts

a. Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

The Coverage Area is currently recreational open space area and, as a result, consumes minimal energy. The MBHMP would not involve construction of structures, installation of lighting, or otherwise increase operational energy consumption associated with land uses in the Coverage Area.

Covered activities, including, but not limited to, tree pruning, removals, and maintenance; trail maintenance; habitat restoration; and drainage clearing following flood events may require the use of hand tools, trucks, or construction equipment. It is reasonable to assume the City or City-authorized contractors would avoid wasteful, inefficient, and unnecessary fuel consumption during covered activities to reduce costs of MBHMP activities. Should the use of heavy equipment be necessary, the City or City-authorized contractor would comply with the CARB In-Use Off-Road Diesel-Fueled Fleets Regulation, which imposes limits on idling and restricts the use of older vehicles. Such compliance would reduce fuel consumption and lead to the use of fuel-efficient vehicles during covered activities. Equipment would be maintained to applicable standards, and associated fuel consumption and energy use would be temporary. Therefore, the MBHMP would not involve the inefficient, wasteful, and unnecessary use of energy during implementation, and no impact would occur.

NO IMPACT

b. Would the project conflict with or obstruct a State or local plan for renewable energy or energy efficiency?

As previously discussed, the City's CAP contains emissions-reduction measures the City may implement, several of which are energy-related in nature. The CAP is a voluntary planning study undertaken by the City to quantify emissions through an inventory analysis and forecast and to generate possible measures the City could take in the future. However, the CAP does not contain any mandatory measures or amendments to the City's General Plan or Municipal Code (City of Goleta 2014b). Therefore, the measures contained in the CAP are voluntary by nature and have not been formally adopted as City policy.

The MBHMP would not include construction of any buildings, structures, or facilities, nor would it substantially increase visitors to the Coverage Area. As a result, CAP measures related to building energy efficiency, renewable energy programs for new development, and on-road vehicles are not relevant to the MBHMP. Measure OR-1, Encourage Alternatively Fueled Construction and Landscape Equipment, from the CAP would be relevant to covered activities under the MBHMP. Measure OR-1 encourages the City to provide information to the public regarding financial incentives available to electrify off-road vehicles and equipment. As discussed in Section 3, Air Quality, covered activities would generally not require diesel-powered equipment. Implementation of the MBHMP would not

conflict with or obstruct implementation of this voluntary outreach measure described in the City's CAP. No impact would occur.

NO IMPACT

Mitigation Measures

No mitigation is required or recommended.

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7 Geology and Soils

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Directly or indirectly cause potential adverse effects, including the risk of loss, injury, or death involving:				
1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?	☐	☐	☐	■
2. Strong seismic ground shaking?	☐	☐	☐	■
3. Seismic-related ground failure, including liquefaction?	☐	☐	☐	■
4. Landslides?	☐	☐	☐	■
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	■	☐
c. Be located on a geologic unit or soil that is made unstable as a result of the project, and potentially result in on or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☐	■
d. Be located on expansive soil, as defined in Table 1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☐	■
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	■
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	■	☐	☐

Existing Setting

Goleta occupies a portion of the eight-mile long and three-mile wide flat alluvial plain known as the Goleta Valley (City of Goleta 2006a). The Goleta Valley is bordered on the south by the bluffs of the Pacific coastline and on the north by foothills and terraces of the foreland of the Santa Ynez Mountain Range.

The Coverage Area is generally characterized by gentle slopes and terraces. Similar to much of California, the Coverage Area is located in a seismically active region. The Transverse Ranges are characterized by east-west trending structural features in contrast to the dominant northwest-southeast structural trend of California. According to Figure 5-1 of the General Plan Safety Element, the More Ranch Fault runs through the Coverage Area (City of Goleta 2006a). However, this fault is not considered active by the State Division of Mines and Geology nor is it subject to an Alquist-Priolo Special Studies Zone (City of Goleta 2006a; California Department of Conservation 2018b). However, the More Ranch Fault is considered active by the Santa Barbara County Seismic and Safety Element due to geologically recent movement suggested by a north-facing scarp near the coast at the west end of the fault (County of Santa Barbara 2015). The nearest confirmed seismically active fault to the Coverage Area is the North Channel Slope Fault located four miles offshore. The closest Alquist-Priolo mapped earthquake fault is over 20 miles to the southeast (Pitas Point/Red Mountain Faults).

In addition, according to Figure 5-1 of the General Plan Safety Element, the portion of the Coverage Area that contains bluffs adjacent to the Pacific Ocean is identified as having a high landslide potential (City of Goleta 2006a). The remainder of the Coverage Area is not identified as having any landslide potential.

Prominent geological features are present on the Coverage Area. There are quaternary older alluvial geological formations on the western portion of Goleta, including the Coverage Area, and Pliocene Sisquoc and Miocene Monterey formations present on the Ellwood Mesa area (see Table 3.5-1 of the General Plan Final Environmental Impact Report, City of Goleta 2006b). These geologic formations have the potential for paleontological resources to be present.

Thresholds of Significance

A significant impact on geology/soils would occur if the MBHMP resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. The City's Environmental Thresholds and Guidelines Manual assumes that a project would result in a potentially significant impact on geological processes if the project and/or implementation of required mitigation measures could result in increased erosion, landslides, soil creep, mudslides, and/or unstable slopes. In addition, impacts are considered significant if a project would expose people and/or structures to major geological hazards such as earthquakes, seismic-related ground failure, or expansive soils capable of creating a significant risk to life and property.

Project-Specific Impacts

a.1. Directly or indirectly cause potential adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

a.2. Directly or indirectly cause potential adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

a.3. Directly or indirectly cause potential adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

a.4. Directly or indirectly cause potential adverse effects, including the risk of loss, injury, or death involving landslides?

No Alquist-Priolo mapped earthquake faults or fault zones occur in Goleta. The More Ranch Fault traverses the Coverage Area and may be potentially active. However, implementation of the MBHMP would not involve construction of any buildings or structures or change in land use that would expose people or structures to fault rupture, ground shaking, ground failure, or landslides. No impact would occur.

NO IMPACT

b. Would the project result in substantial soil erosion or the loss of topsoil?

The MBHMP includes habitat restoration activities involving removal of non-native plant species and planting of native species. Additionally, the Tree Management Program of the MBHMP includes selective removal of downed, dead, dying, or hazardous trees and debris to ensure public safety and manage the risk of wildfire. The program would also allow for recontouring or grading of drainage channels following flood events to protect trees. These activities would involve the movement of soil and potential loss of topsoil. The Tree Management Program would use the removed downed or hazardous trees to provide slope stability and erosion control, where feasible, and would require soil contours and disturbed plantings to be replaced following management actions. Implementation of the MBHMP would not involve construction of any new facilities exposing soils or leading to erosion. A component of the Trail Management Program involves implementation of stormwater Best Management Practices (BMP) to reduce erosion and sedimentation from trails and viewing areas. Therefore, impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project be located on a geologic unit or soil that is made unstable as a result of the project, and potentially result in on or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?

Implementation of the MBHMP would not involve construction of any structures. Therefore, the soil and geologic conditions in the Coverage Area would not become unstable as a result of the MBHMP or result in off-site landslides, lateral spreading, subsidence, liquefaction, or collapse. No habitable structures are proposed as part of the MBHMP. No impact would occur.

NO IMPACT

d. Would the project be located on expansive soil, as defined in Table 1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

No habitable structures are proposed as part of the MBHMP. No impact related to expansive soils would occur.

NO IMPACT

e. Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

The MBHMP would not involve the construction of a septic system or alternative wastewater disposal systems. Therefore, no impact would occur.

NO IMPACT

f. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Implementation of the MBHMP would not involve construction of any structures, and therefore, would not require excavation. Minimal grading may occur in association with development of new trails or trail maintenance that may uncover previously unidentified paleontological resources. Additionally, tree removal under the Catastrophic Event Response Program or Tree Management Program would result in ground disturbance that has the potential to unearth and potentially destroy unknown paleontological resources. With incorporation of Mitigation Measure GEO-1 during ground disturbance, potential impacts to paleontological resources would be less than significant.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Mitigation Measures

GEO-1 Unanticipated Discovery of Paleontological Resources

In the event of an unanticipated discovery of a paleontological resource during ground disturbance from the implementation of the MBHMP, work in the immediate area shall be temporarily halted and a qualified paleontologist (per Society of Vertebrate Paleontology standards 2010) shall be contacted to evaluate the find. If the discovery proves to be significant and cannot be avoided, additional work, such as salvage excavation, may be required to address any significant impacts.

8 Greenhouse Gas Emissions

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	■	☐
b. Conflict with any applicable plan, policy, or regulation adopted for the purposes of reducing the emissions of greenhouse gases?	☐	☐	■	☐

Existing Setting

Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period of time. The term "climate change" is often used interchangeably with the term "global warming," but "climate change" is preferred to "global warming" because it helps convey that there are other changes in addition to rising temperatures.

Project implementation would generate GHG emissions through the burning of fossil fuels or other emissions of GHGs, thus potentially contributing to cumulative impacts related to climate change. In response to an increase in human-made GHG concentrations over the past 150 years, California has implemented AB 32, the "California Global Warming Solutions Act of 2006." AB 32 codifies the Statewide goal of reducing emissions to 1990 levels by 2020 (essentially a 15 percent reduction below 2005 emission levels) and the adoption of regulations to require reporting and verification of statewide GHG emissions. Furthermore, on September 8, 2016, the governor signed SB 32 into law, which requires the State to further reduce GHG emissions to 40 percent below 1990 levels by 2030. SB 32 extends AB 32, directing the CARB to ensure that GHG emissions are reduced to 40 percent below the 1990 level by 2030.

On December 14, 2017, CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 target. The 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally-appropriate quantitative thresholds consistent with a statewide per capita goal of six metric tons (MT) of carbon dioxide equivalent (CO_2e) by 2030 and two MT CO_2e by 2050 (CARB 2017). As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (city, county, subregional, or regional level), but not for specific individual projects because these goals include all emissions sectors in the State.

The vast majority of individual projects do not generate sufficient GHG emissions to directly influence climate change. However, physical changes caused by a project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a

project are limited. The issue of climate change typically involves an analysis of whether a project's contribution towards an impact would be cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15064[h][1]).

As discussed in Section 6, *Energy*, the City adopted a CAP on July 15, 2014. The CAP contains an emissions inventory and forecast, as well as voluntary measures to improve building energy efficiency, reduce vehicle miles traveled, reduce water consumption, improve equipment efficiency, and reduce solid waste transport to serve as tools for the community (City of Goleta 2014a, 2014b). The CAP is a planning study and does not adopt any policy or contain any mandatory measures or amendments to the City's General Plan and/or Municipal Code. Because the CAP contains only voluntary measures and does not contain City policies, the City's CAP is not a qualified CAP for purposes of CEQA analysis.

Thresholds of Significance

A significant impact with regard to GHG emissions could occur if the MBHMP resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. In addition, on June 10, 2010, the County of Santa Barbara Planning & Development Department produced a memorandum titled *Support for Use of Bay Area Air Quality Management District Greenhouse Gas Emissions Standards*, which states, "While Santa Barbara County land use patterns differ from those in the Bay Area as a whole, Santa Barbara County is similar to certain Bay Area counties (in particular, Sonoma, Solano, and Marin) in terms of population growth, land use patterns, General Plan policies, and average commute patterns and times. Because of these similarities, the methodology used by [the Bay Area Air Quality Management District (BAAQMD)] to develop its GHG emission significance thresholds, as well as the thresholds themselves, have applicability to Santa Barbara County and represent the best available interim standards for Santa Barbara County" (County of Santa Barbara 2010). In accordance with CEQA Guidelines §§15064.4(b)(2) and 15064.7(c), the City has consistently relied upon the County of Santa Barbara's *Support for Use of Bay Area Air Quality Management District Greenhouse Gas Emissions Standards* as the expert-recommended threshold for establishing GHG impacts of a project. In addition, the City relies upon the SBCAPCD as a commenting agency to review the GHG analysis, and these thresholds represent a consistent approach and facilitate uniformity for impact determinations for City and County projects under the SBCAPCD's review.

The BAAQMD's GHG emissions thresholds are summarized in Table 6. This analysis uses the BAAQMD/Santa Barbara County Interim Thresholds of Significance to determine the significance of operational GHG emissions related to the MBHMP, based on the 1,100 MT CO_2e per year or 4.6 MT CO_2e per service population per year threshold for commercial and residential land uses (BAAQMD 2017). There is no BAAQMD threshold of significance for construction emissions.

Table 6 BAAQMD/Santa Barbara County Interim Thresholds of Significance

GHG Emission Source Category	Operational Emissions
Commercial and Residential (land use projects)	1,100 MT of CO_2e per year or 4.6 MT CO_2e per SP per yr[1]
Stationary Sources[2]	10,000 MT of CO_2e per year

MT = metric tons

CO_2e = carbon dioxide equivalent

[1] SP = Service Population (residents + employees)

[2] Stationary Sources include stationary combustion sources (industrial-type uses) regulated by the APCD.

Source: Santa Barbara County Planning & Development Department, Support for Use of Bay Area Air Quality Management District Greenhouse Gas Emissions Standards. Interim GHG Emissions – Evidentiary Support, June 10, 2010

Project-Specific Impacts

a. Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

b. Would the project conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Temporary GHG emissions associated with implementation of the MBHMP would be minimal, as the MBHMP would not involve construction of any new structures or facilities. Most covered activities, such as those associated with waste reduction and pest management programs, would not require the use of heavy equipment. Some covered activities, such as tree removal and pruning, trail maintenance, drainage clearing, invasive species eradication, and planting of native species, would generally be conducted using hand tools but may occasionally require the use of heavy diesel equipment. Consequently, these activities could result in temporary GHG emissions.

While covered activities under the MBHMP may result in minimal temporary GHG emissions, implementation of the MBHMP would also result in substantial GHG reductions. Tree removals conducted under the MBHMP would be limited to dead or dying trees which pose a threat to public safety. These trees function as carbon sources, releasing carbon to the atmosphere as they decay. Covered activities would remove these trees and replace them with living eucalyptus trees, native species, or fire-resistant understory species, in turn increasing the carbon sequestration potential of the Coverage Area. Additionally, covered activities like removal of dead or dying trees and planting of fire-resistant understory species would reduce wildfire risk in the Coverage Area, minimizing the potential for landscape-level carbon emissions associated with a wildfire event. Such impacts would be beneficial.

The trail improvement and educational programs associated with the MBHMP would improve the quality of the experience for visitors to the butterfly habitat, but would not directly increase the number of visitors to the Coverage Area. Furthermore, the MBHMP would not involve expansion of facilities to accommodate or encourage increased vehicle trips, such as additional parking lots or site access points. Therefore, the MBHMP would not substantially increase operational GHG emissions associated with vehicle trips to and from the Coverage Area.

The MBHMP would not involve any change in land use or construction of any structures. Therefore, it would not result in emissions exceeding the BAAQMD thresholds shown in Table 6 or conflict with a plan adopted for the purpose of reducing GHG emissions. Given that the MBHMP would result in

minimal temporary GHG emissions associated with covered activities, no substantial increase in operational GHG emissions associated with vehicle trips, and beneficial impacts by increasing sequestration and reducing wildfire potential in the Coverage Area, overall impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

Mitigation Measures

No mitigation is recommended or required.

9 Hazards and Hazardous Materials

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	■	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	■	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?	☐	☐	■	☐
d. Be located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	■	☐
e. For a project located in an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	■
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	■

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☐	■

Existing Setting

In the 1970s-1980s, the Ellwood Mesa area was used for oil production activities. The Coverage Area contains three closed State Water Resources Control Board (SWRCB) GeoTracker sites (SWRCB 2015a, SWRCB 2015b, SWRCB 2015c).

The Coverage Area is subject to fire risk. Some species of eucalyptus trees found in the Coverage Area have deciduous bark, which is shed annually and presents a fire hazard. The bark catches fire readily and streamers from the loose bark tend to carry fire into the canopy and cast firebrands ahead of the main fire front. The leaf litter, which is the accumulation of dead, dry, and oily leaves, is also a fire hazard as it is extremely flammable. Additionally, the dead eucalyptus trees in the Coverage Area pose an exacerbated fire risk.

Thresholds of Significance

A significant impact with regard to hazards and hazardous materials would be expected to occur if the MBHMP resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. In addition, the City's Environmental Thresholds and Guidelines Manual addresses public safety impacts resulting from involuntary exposure to hazardous materials. These thresholds focus on activities involving the installation of or modification to facilities that handle hazardous materials, transportation of hazardous materials, or non-hazardous land uses in proximity to hazardous facilities. Since the MBHMP would not include a hazardous materials facility, the City's risk-based thresholds are not applicable.

Project-Specific Impacts

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

b. Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

The MBHMP includes an Integrated Pest Management Program to control plant, animal, fungal, and other pests affecting monarch butterflies or their habitat. The MBHMP recommends the use of biological control methods such as birds, lady beetles, spiders, and other predators, as the use of chemical control such as pesticides and herbicides may be dangerous to butterflies. Nevertheless, application, handling, and transport of chemical pesticides, herbicides, and fertilizers may be necessary to ensure the long-term viability of new plantings or eradication of invasive species. Chemical applications have the potential to create the unintended release of a hazardous material.

Application of chemicals would be required to follow all local, State, and federal regulations to reduce the potential for creation of hazardous conditions and would be administered per manufacturer's specifications by a person certified for application. Therefore, implementation of the MBHMP would not create a significant hazard due to routine transport, use, or disposal of hazardous materials or pose a significant potential for the accidental release of hazardous materials into the environment. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?

The school closest to the Coverage Area is Ellwood Elementary School, located immediately north of the Coverage Area across Hollister Avenue. Covered activities under the MBHMP would generally not involve hazardous emissions or use of hazardous materials. However, application, handling, and transport of chemical pesticides, herbicides, and fertilizers may occur. The use of chemicals in this area would have the potential to affect students and staff present at the school during application. Application of chemicals would be required to follow all local, State, and federal regulations, including regulations pertaining to pesticide application near schools, to reduce the potential for creation of hazardous conditions and would be administered per manufacturer's specifications by a person certified for application. With adherence to existing regulations, potential impacts on the school resulting from emissions of hazardous chemicals and/or materials in the Coverage Area would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project be located on a site included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

The following databases were checked, pursuant to Government Code Section 65962.5, on December 21, 2018 for known hazardous materials contamination in the vicinity of the Coverage Area:

- **USEPA**
  - Comprehensive Environmental Response, Compensation, and Liability Information System/ Superfund Enterprise Management System/Envirofacts database search
- **SWRCB**
  - GeoTracker search for leaking underground storage tanks and other cleanup sites
- **California Department of Toxic Substances Control**
  - EnviroStor search for hazardous facilities or known contamination sites
  - Cortese List of Hazardous Waste and Substances Sites
  - Cleanup Site and Hazardous Waste Facilities Database

The Coverage Area is not included on a list compiled pursuant to Section 65962.5 of the Government Code. A search of the GeoTracker database identified three closed sites in the Coverage Area: Ali d'Oro Lot 67, Southwest Diversified Property, and S.B. Shores County Park/Arco; all three sites were closed by 2014 (SWRCB 2015a; SWRCB 2015b, SWRCB 2015c).

Given the closed status of the listings and the fact that the MBHMP would not involve construction of any new buildings or structures, the MBHMP would not create a significant hazard to the public or the environment due to the presence of a listed hazardous materials site. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

The Coverage Area is not located near a private airstrip but is located approximately two miles from the Santa Barbara Municipal Airport. The Coverage Area is not located in any of the airport's approach or clear zones and is not subject to review by the Airport Land Use Commission. In addition, the MBHMP would not involve construction of any buildings or other occupied facilities. Therefore, the MBHMP would not create any significant airport safety hazards and no impact would occur.

NO IMPACT

f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Implementation of the MBHMP would involve fuel management activities under the Community Wildfire Protection Program. These activities would not involve construction of any new facilities or change in land use that would interfere with an adopted emergency response plan. No impact would occur.

NO IMPACT

g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

The MBHMP includes the Community Wildfire Protection Program to be consistent with the intent of the City's CWPP and ensure fire safety and habitat protection are balanced. This program includes actions supporting the implementation of the CWPP's 100-foot-wide fire buffer around homes and structures in the Ellwood Mesa eucalyptus groves. The Program would also coordinate with City-approved wildland fire experts during the planning and implementation of any fuel treatments. The Tree Management Program would reduce fire hazard, improve public safety, and eliminate trees that are threatening the sustainability of the butterfly aggregation sites, including dead, diseased, and dying trees. Removal of hazardous trees, in combination with the maintenance of fire buffers and understory clearing, would reduce the risk of fire in the Coverage Area. Therefore, implementation of the MBHMP would have the beneficial effect of reducing exposure of people or structures to risk of loss, injury, or death involving wildland fires. No impact would occur.

NO IMPACT

Mitigation Measures

No mitigation is required or recommended.

10 Hydrology and Water Quality

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	■	☐	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	■	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
(i) Result in substantial erosion or siltation on- or off-site;	☐	☐	■	☐
(ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☐	■	☐
(iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	■	☐
(iv) Impede or redirect flood flows?	☐	☐	■	☐
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	■

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	■	☐	☐

Existing Setting

Devereux Creek and a tributary run through the Coverage Area, and portions of the Coverage Area overlay the western portion of the Goleta Groundwater Basin (Basin 3-016). The Coverage Area includes areas in the 100-year flood zone, as mapped by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FEMA 2018). Portions of the Coverage Area are also in the Potential Tsunami Runup Area as shown in Figure 5-2 of the General Plan Safety Element (City of Goleta 2006a).

Thresholds of Significance

A significant impact on hydrology and water quality would occur if the MBHMP resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. In addition, the City's Environmental Thresholds and Guidelines Manual assumes a significant impact on hydrology and water resources would occur if the MBHMP would:

- Be located in an urbanized area of Santa Barbara County and the project construction or redevelopment individually or as a part of a larger common plan of development or sale would disturb one or more acres of land
- Increase the amount of impervious surfaces on the project site by 25 percent or more
- Result in channelization or relocation of a natural drainage channel
- Result in removal or reduction of riparian vegetation or other vegetation (excluding non-native vegetation removed for restoration projects) from the buffer zone of any streams, creeks, or wetlands
- Be an industrial facility that falls under one or more categories of industrial facility regulated under the National Pollutant Discharge Elimination System (NPDES) Phase I industrial storm water regulations
- Discharge pollutants that exceed the water quality standards set forth in the applicable NPDES permit, the Central Coast RWQCB Basin Plan, or otherwise impair the beneficial uses of a receiving waterbody
- Result in a discharge of pollutants into an "impaired" waterbody that has been designated as such by the SWRCB or the Central Coast RWQCB under Section 303 (d) of the Federal Water Pollution Prevention and Control Act (i.e., the Clean Water Act)
- Result in a discharge of pollutants of concern to a receiving waterbody as identified in by the Central Coast RWQCB

Project-Specific Impacts

a. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

e. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Surface Water

The Coverage Area is under the jurisdiction of the Central Coast RWQCB. The Central Coast RWQCB released an update to the Water Quality Control Plan for the Central Coast Basin on September 27, 2017 (2017 Basin Plan; Central Coast RWQCB 2017). The 2017 Basin Plan describes beneficial uses and water quality objectives for surface waters in the basin, monitoring and assessment protocols and policies, and management principles relating to the protection and improvement of surface water quality.

Devereux Creek runs through the Coverage Area. Per the 2017 Basin Plan, Devereux Creek has designated beneficial uses of Municipal and Domestic Supply, Groundwater Recharge, Freshwater Replenishment, Water Contact Recreation, Non-Contact Water Recreation, Commercial and Sport Fishing, Warm Freshwater Habitat, and Wildlife Habitat (Central Coast RWQCB 2017). Devereux Creek is listed as impaired on the SWRCB's 2014-2016 303(d) list due to high levels of fecal coliform and low dissolved oxygen concentrations (SWRCB 2018). Implementation of the MBHMP would not involve construction of new facilities that could substantially degrade water quality and would not increase impervious surface cover generating increased polluted runoff. Covered activities under the MBHMP could involve limited ground disturbance in the Coverage Area, in turn generating temporary runoff of sediment and other pollutants to nearby waterbodies, including Devereux Creek. Application of herbicides, pesticides, and fertilizers associated with native planting, eucalyptus restoration, and invasive species eradication activities could result in runoff of chemical pollutants into adjacent waterbodies.

Ground-disturbing activities greater than one acre are subject to the requirements of the NPDES Construction General Permit (Order 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-0006-DWQ). Pursuant to the requirements of the NPDES Construction General Permit, these activities would prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) to minimize construction-related pollutant discharge. Common BMPs required in SWPPPs include installation of silt fences, post-grading revegetation, and regular stormwater quality monitoring. However, given the nature of covered activities under the MBHMP, most, if not all, activities would be smaller in scale and involve less than one acre of ground disturbance. Such activities include adjustments to trail locations, installation of culverts or water bars, construction of drainage crossings, installation of irrigation systems, or small-scale drainage channel clearing following flood events. These activities would have the potential to result in temporary sediment erosion and water quality impacts. Individually, these covered activities would not be subject to the requirements of the NPDES Construction General Permit. Furthermore, application of fertilizers, herbicides, and pesticides could result in runoff into nearby waterbodies, including the impaired Devereux Creek. Increased nutrient loading associated with fertilizer runoff to Devereux Creek could increase eutrophication, ultimately reducing dissolved oxygen and exacerbating the waterbody's existing impairment. These impacts would be potentially significant unless mitigation is incorporated.

Groundwater

Portions of the Coverage Area overlie the western portion of the Goleta Groundwater Basin. In May 2010, GWD and La Cumbre Mutual Water Company published the Final Groundwater Management Plan for the Goleta Groundwater Basin (GWD and La Cumbre Mutual Water Company 2010). The plan contains basin management objectives, basin yield and storage, and recommended future strategies. As the basin is adjudicated under the 1989 Wright Judgment, it has a "Very Low" basin priority under the California Department of Water Resources Final 2018 Basin Prioritization (California Department of Water Resources 2019) and is not required to prepare a Groundwater Sustainability Plan under the Sustainable Groundwater Management Act.

The MBHMP would not include any groundwater pumping or injection which would conflict with the Groundwater Management Plan for the Goleta Groundwater Basin. Similar to surface water impacts, application of chemical fertilizers, herbicides, or pesticides associated with covered activities would have the potential to result in leaching of pollutants to underlying groundwater. This impact would be potentially significant unless mitigation is incorporated.

Overall, impacts related to surface water and groundwater quality would be potentially significant. Incorporation of Mitigation Measures HWQ-1 and HWQ-2 would reduce water quality impacts to a less than significant level by minimizing erosion during ground-disturbing activities and reducing application and migration of chemical fertilizers, pesticides, and herbicides used during covered activities. These mitigation measures would minimize the potential for degradation of surface water or groundwater resources, and therefore, would ensure the MBHMP would not conflict with or obstruct implementation of a water quality plan or sustainable groundwater management plan. As a result, impacts would be less than significant with mitigation incorporated.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

No impervious surfaces are proposed under the MBHMP, and the majority of the Coverage Area includes pervious surfaces allowing for groundwater infiltration. The MBHMP would not involve on-site pumping of groundwater. Irrigation may occur in the Coverage Area to support native plantings or eucalyptus restoration. Irrigation water would provide additional recharge benefits to the underlying aquifer, with water supplied from reclaimed water or existing potable supplies. Any potable water would be provided by GWD, which has adjudicated, appropriative groundwater extraction rights based on the Goleta Groundwater Basin's safe yield. GWD does not pump water from the West sub-basin of the Goleta Groundwater Basin, which the Coverage Area overlies. Therefore, the MBHMP would not deplete groundwater supplies or interfere with groundwater recharge. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c.(i) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or situation on- or off-site?

c.(ii) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

c.(iii) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

c.(iv) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would impede or redirect flood flows?

The MBHMP would not involve construction of any new facilities or change in land use that would substantially alter drainage patterns of the area. No new impervious surfaces are proposed, and therefore, runoff patterns would not be substantially altered, nor would any conditions contributing to an exceedance of the area stormwater drainage system be created. The natural drainage of the Coverage Area would result in passive detention and natural filtration of stormwater runoff. The MBHMP would not result in flooding, erosion, or siltation.

Clearing and re-contouring of drainage ways may occur as covered activities under the Tree Management Program. Such activities would repair drainage ways following flood events to protect trees. Impacts associated with alteration of the Coverage Area's drainage pattern would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

According to Figure 5.20 of the 2017 Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan, the Coverage Area is not located in a dam inundation zone (County of Santa Barbara 2017). Portions of the Coverage Area along Devereux Creek are in a FEMA-designated flood hazard zone and other portions of the Coverage Area are subject to flooding by a tsunami. Implementation of the MBHMP would not involve construction or installation of any structures or facilities that would use, process, or store pollutants that could be released in the event of inundation. Therefore, no impact would occur.

NO IMPACT

Mitigation Measures

HWQ-1 Erosion Control Best Management Practices

Prior to commencement of any ground-disturbing activities not covered by a SWPPP prepared in compliance with the requirements of the NPDES Construction General Permit, the City or City-authorized contractor shall implement the following erosion control BMPs:

- Ground-disturbing activities shall occur between April 1 and September 30 to coincide with the dry season and avoid impacts to overwintering monarch butterflies.
- Silt fencing, straw bales composed of rice straw (that are certified to be free of weed seed), fiber rolls, gravel bags, mulching erosion control blankets, soil stabilizers, and storm drain filters shall be used, in conjunction with other methods, to prevent erosion throughout the Coverage Area and siltation of stream channels and detention basins.
- Temporary berms and sediment basins shall be constructed to avoid unnecessary siltation into local waterways during ground-disturbing activities.
- Erosion controls which protect and stabilize exposed soils shall be used to prevent movement of materials. Potential erosion control devices include plastic sheeting held down with rocks or sandbags over exposed soils and use of silt fences or berms of hay bales.
- Frequency of sediment removal from detention basins, locations and types of erosion and sediment control structures, and materials that would be used in the Coverage Area during MBHMP activities shall be specified.
- All exposed soils present in and around the disturbed area shall be stabilized within seven days of ground disturbance using mulch, geotextile binding fabrics, and/or native, drought-tolerant revegetation, as necessary.

HWQ-2 Chemical Application Control Plan

Prior to commencement of native planting, eucalyptus grove restoration, invasive species eradication, and pest control activities, the City shall prepare and implement a Chemical Application Control Plan to be approved by the City Biologist. The plan shall identify thresholds to determine when fertilizer, herbicide, or pesticide application is necessary, the chemical to be used, and the rate, timing, and placement of application. Pesticides or insecticides shall be used only when necessary to cure a problem and in positively identified pre-emergent situations, not as a preventive measure or as a regular, periodic application.

When pesticide or herbicide application is deemed necessary, use of chemical forms that are the least toxic to non-target organisms shall be employed. Only slow release organic fertilizers shall be used in the Coverage Area to minimize the potential for eutrophication in Devereux Creek. The application of fertilizers, herbicides, or pesticides shall be minimized during winter months when the greatest precipitation is likely to occur.

11 Land Use and Planning

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Physically divide an established community?	☐	☐	☐	■
b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	■

Existing Setting

The Coverage Area is an undeveloped area zoned Recreation (Rec) and with a General Plan land use designation of Open Space/Passive Recreation.

Thresholds of Significance

A significant land use and planning impact would occur if the MBHMP resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. The City's Environmental Thresholds and Guidelines Manual does not contain City-specific land use and planning thresholds.

Project-Specific Impacts

a. Would the project physically divide an established community?

b. Would the project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Implementation of the MBHMP would not divide an established community because the MBHMP would not change the existing land use or result in any new structures in the Coverage Area. Therefore, implementation of the MBHMP would not conflict with the City's Zoning Ordinance or General Plan. The covered activities are allowed under the City's Zoning Ordinance and General Plan for open space and passive recreation because the MBHMP would preserve habitat for butterflies and promote visitors at the preserve through the outreach programs. The Open Space Element of the City's General Plan includes several goals, policies, and actions intended to achieve the City's vision for open space, parks, and recreation facilities that are accessible to all members of the community. The MBHMP would be consistent with several guiding principles of the Open Space Element, including:

- Provide and maintain, in coordination with other agencies, a system of parks, open spaces, and recreation facilities that are accessible to and will meet the needs of present and future users of all age groups.
- Manage, operate, and maintain park, recreation, and open space facilities (including trails) in a manner that is responsive to the site and adjacent neighborhoods and balances the needs of the community with available funding.
- Preserve Goleta's existing open space areas, including its beaches and Pacific shoreline, sensitive habitat areas, and agricultural lands, and increase the amount of permanently protected open space as opportunities for acquisition arise.
- Provide for convenient public access to Goleta's beach and shoreline areas and protect these areas for coastal-dependent and coastal-related recreation use.
- Manage open space areas in a manner that provides for public access, passive and active recreational use, and enjoyment, consistent with protection of natural and scenic resource values.
- Provide and maintain a system of trails that will connect major parks and open space areas with each other, neighborhoods, the regional trail system, and Los Padres National Forest.

Additionally, the MBHMP would be consistent goals and supporting policies contained in the Open Space Plan, particularly those related to monarch butterfly and habitat protection, including the following (City of Goleta 2004):

- Protect, enhance, and, where feasible, restore ESHAs in the Open Space Plan Area.
    - Focus high priority habitat enhancement and restoration initial improvements and opportunities on invasive exotic species control in wetlands, enhancement and restoration of riparian and non-riparian wetlands, ensuring the long-term vitality of the monarch groves, and enhancement and restoration of native habitats that are under-represented in the Open Space Plan Area.
- Protect and maintain existing monarch butterfly populations in the Open Space Plan Area, and manage the habitats to be self-sustaining.
    - Manage public access to protect butterflies and their habitat, while promoting public enjoyment, education, and scientific research.
    - Conduct scientifically sound studies using appropriate and cautious methods to maintain and improve habitat conditions to ensure long-term viability of the population.

Figure 3-2, Park and Recreation Plan Map, of the Open Space Element shows the Coverage Area is classified as Regional Open Space. This designation in the General Plan indicates the area is contiguous to or encompasses significant natural resources and may include areas of historical, environmental, or ecological value. These areas may contain special amenities or features that attract people from throughout Goleta and the surrounding region. The MBHMP, including its goals and programs, is consistent with the preservation and protection of natural values and passive recreation in the Regional Open Space designation in the General Plan.

The MBHMP would also implement Policy OS-5 of the General Plan by protecting and enhancing the Coverage Area's ESHAs. The Coverage Area is not included in any adopted Habitat Conservation Plans or natural community conservation plans. No impact would occur.

NO IMPACT

Mitigation Measures

No mitigation is required or recommended.

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12 Mineral Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	■
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	■
c. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	■

Existing Setting

Although oil extraction activities took place on Ellwood Mesa in the 1970s-1980s, according to the mineral yearbook produced by the California Geological Survey and the USGS (2003), no major nonfuel mineral–producing areas are located in Goleta. In addition, the mineral land classification maps for Santa Barbara County (California Division of Mines and Geology 1989) show no known areas of significant aggregate resources in Goleta. According to the General Plan, most of Goleta is mapped as containing mineral deposits of unknown significance, and a small portion of the city is mapped as having no significant deposits (City of Goleta 2006a).

Thresholds of Significance

A significant impact on mineral resources would occur if the MBHMP resulted in any of the impacts noted in the checklist above, pursuant to Appendix G of the CEQA Guidelines. The City's Environmental Thresholds and Guidelines Manual does not contain City-specific mineral resources thresholds.

Project-Specific Impacts

a. Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

b. Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

The MBHMP would not result in the loss of availability of any known mineral resource or identified mineral resource recovery site. No impact would occur.

NO IMPACT

Mitigation Measures

No mitigation is required or recommended.

13 Noise

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project result in:				
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	■	☐	☐
b. Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	■	☐
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	■	☐

Noise Background

Noise is unwanted sound resulting in a disturbance of human activity. Environmental noise levels typically fluctuate over time, and different types of noise descriptors are used to account for this variability. Noise level measurements include intensity, frequency, and duration, as well as time of occurrence. Noise level (or volume) is generally measured in decibels using the A-weighted sound pressure level (dBA). Because of the way the human ear interprets sound level, a sound must be approximately 10 dBA greater than the reference sound to be judged as twice as loud. In general, a 3 dBA change in community noise levels is noticeable, while 1 to 2 dBA changes are typically not perceived. Quiet suburban areas generally have noise levels in the range of 40 to 50 dBA, while arterial streets are in the 50 to 60+ dBA range. Normal conversational levels are in the 60 to 65 dBA range, and ambient noise levels greater than 65 dBA can interrupt conversations.

Noise levels typically attenuate (or drop off) at a rate of approximately 6 dBA per doubling of distance from point sources (such as construction equipment). Noise from lightly traveled roads typically attenuates at a rate of approximately 4.5 dBA per doubling of distance, while noise from heavily traveled roads typically attenuates at approximately 3 dBA per doubling of distance. Noise levels may also be reduced by intervening structures. For example, a single row of buildings between the receptor and the noise source reduces the noise level by approximately 5 dBA, while a solid wall or berm breaking the line-of-sight reduces noise levels by 5 to 10 dBA (Federal Transit Administration 2018). The manner in which homes in California are constructed generally provides a

reduction of exterior-to-interior noise levels of about 20 to 35 dBA with closed windows (Federal Highway Administration 2011).

In addition to the instantaneous measurement of sound levels, the duration of sound is important since sounds occurring over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. The equivalent noise level (Leq) is one of the most frequently used noise metrics and considers both duration and sound power level. The Leq is defined as the single steady A-weighted level equal to the same amount of energy contained in the actual fluctuating levels over a period of time (essentially, the average noise level). Typically, Leq is summed over a one-hour period. The highest root mean squared (RMS) sound pressure level in the measuring period is the Lmax. The lowest RMS sound pressure level in the measuring period is the Lmin.

The time period in which noise occurs is also important since noise that occurs at night tends to be more disturbing than during the day. Community noise is usually measured using Day-Night Average Level (Ldn), which is the 24-hour average noise level with a 10 dBA penalty for noise occurring during nighttime hours (10:00 p.m. to 7:00 a.m.), or Community Noise Equivalent Level (CNEL), which is the 24-hour average noise level with a 5 dBA penalty for noise occurring from 7:00 p.m. to 10:00 p.m. and a 10 dBA penalty for noise occurring from 10:00 p.m. to 7:00 a.m. Noise levels described by Ldn and CNEL usually do not differ by more than 1 dBA. In practice, CNEL and Ldn are used interchangeably.

Vibration Background

Vibration is a unique form of noise because its energy is carried through buildings, structures, and the ground, whereas noise is simply carried through the air. Thus, vibration is generally felt rather than heard. Some vibration effects can be caused by noise (e.g., the rattling of windows from passing trucks). This phenomenon is caused by the coupling of the acoustic energy at frequencies close to the resonant frequency of the material being vibrated. Typically, groundborne vibration generated by human-made activities attenuates rapidly as distance from the source of the vibration increases. The ground motion caused by vibration is measured as particle velocity in inches per second and is referenced as vibration decibels (VdB).

The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Most perceptible indoor vibration is caused by sources inside buildings such as the operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads.

Coverage Area Setting

The Coverage Area is an open space preserve; therefore, dominant noise levels in the Coverage Area are from conversations of recreational users and visitors. A small portion of the northern boundary of the Coverage Area adjacent to Hollister Avenue is in the roadway's existing and future 60 dBA CNEL noise contour (see Figures 9-1 and 9-3, General Plan Noise Element, City of Goleta 2006a). The Coverage Area is not in the existing or future 60 dBA CNEL noise contour for the Santa Barbara Municipal Airport (Figures 9-2 and 9-4, General Plan Noise Element, City of Goleta 2006a). Sensitive receptors closest to the Coverage Area include residences adjacent to the northern and western boundaries of the Coverage Area, as well as Ellwood Elementary School and the Mariposa at Ellwood Shores assisted living facility north of the Coverage Area across Hollister Avenue.

Regulatory Setting

City of Goleta General Plan/Coastal Land Use Plan Noise Element

The General Plan Noise Element identifies noise sources in Goleta and land use compatibility standards for proposed development to minimize exposure of residents to excessive noise levels (City of Goleta 2006a). Additionally, the Noise Element contains policies and programs pertaining to noise generation and exposure in Goleta that are relevant to the MBHMP:

POLICY NE 6.2 ENFORCEMENT OF RESTRICTIONS IN OPEN SPACE AREAS

The City shall enforce restrictions or prohibitions on motorized vehicles in City-owned open-space areas unless such operation is allowed by permit. Signage stating such restrictions or prohibitions shall be provided and maintained in good order, and the need for additional signage shall be considered periodically.

POLICY NE 6.4 RESTRICTIONS ON CONSTRUCTION HOURS

The City shall require, as a condition of approval for any land use permit or other planning permit, restrictions on construction hours. Noise-generating construction activities for projects near or adjacent to residential buildings and neighborhoods or other sensitive receptors shall be limited to Monday through Friday, 8:00 a.m. to 5:00 p.m. Construction in nonresidential areas away from sensitive receivers shall be limited to Monday through Friday, 7:00 a.m. to 4:00 p.m. Construction shall generally not be allowed on weekends and State holidays. Exceptions to these restrictions may be made in extenuating circumstances (in the event of an emergency, for example) on a case by case basis at the discretion of the Director of Planning and Environmental Services. All construction sites subject to such restrictions shall post the allowed hours of operation near the entrance to the site, so that workers on site are aware of this limitation. City staff shall closely monitor compliance with restrictions on construction hours, and shall promptly investigate and respond to all noncompliance complaints.

POLICY NE 6.5 OTHER MEASURES TO REDUCE CONSTRUCTION NOISE

The following measures shall be incorporated into grading and building plan specifications to reduce the impact of construction noise:

- All construction equipment shall have properly maintained sound-control devices, and no equipment shall have an unmuffled exhaust system.
- Contractors shall implement appropriate additional noise mitigation measures including but not limited to changing the location of stationary construction equipment, shutting off idling equipment, and installing acoustic barriers around significant sources of stationary construction noise.
- To the extent practicable, adequate buffers shall be maintained between noise-generating machinery or equipment and any sensitive receivers. The buffer should ensure that noise at the receiver site does not exceed 65 dBA CNEL. For equipment that produces a noise level of 95 dBA at 50 feet, a buffer of 1,600 feet is required for attenuation of sound levels to 65 dBA.

City of Goleta Municipal Code

Chapter 9.09 of the Goleta Municipal Code contains the City's noise ordinance. The ordinance broadly prohibits any unnecessary noises or sounds that are physically annoying to persons of ordinary sensitiveness or which are harsh, prolonged, unnatural, or unusual in their use, time or place as to occasion physical discomfort to the inhabitants of Goleta. The ordinance also restricts loud or unreasonable noise, music, percussion, or other sounds amplified by any musical instrument, drum, radio, loudspeaker, or other sound amplifying device during specified hours.

Thresholds of Significance

A significant noise impact would occur if the MBHMP resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. Additional thresholds are contained in the City's Environmental Thresholds and Guidelines Manual. The City's adopted thresholds state that exterior CNEL noise levels in excess of 65 dBA would result in a significant noise impact on sensitive receptors. Additionally, noise from grading and construction activity within 1,600 feet of sensitive receptors would be presumed to result in a potentially significant impact. The manual recommends mitigating such impacts by limiting construction within 1,600 feet of sensitive receptors to weekdays between 8:00 a.m. and 5:00 p.m.

Project-Specific Impacts

a. Would the project result generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Existing noise sources in the Coverage Area include cars in the parking area and conversations from people walking through the Coverage Area. Motorized transportation is limited to the parking area adjacent to Hollister Avenue. As shown in Table 9-1 of the General Plan, existing ambient noise level at the residences near the Coverage Area is approximately 58 dBA Leq. Therefore, ambient noise levels are below the City's adopted threshold for residential uses of 65 dBA CNEL.

Permanent Noise Impacts

While trail improvements and educational programs may improve the visitor experience at the Coverage Area, implementation of the MBHMP would not involve construction of new uses in the Coverage Area or expand the existing parking lot facilities, and therefore, would not substantially increase the number of visitors. Accordingly, the MBHMP would not result in a permanent increase in ambient noises above the City's standards.

Temporary Noise Impacts

Implementation of the MBHMP would involve habitat restoration, trail maintenance, and other activities under the Natural Resources Management Programs. These types of activities would mostly involve hand tools, but may involve mowers or other mechanical equipment, such as chainsaws. Tree removals and pruning may require the use of trucks and lifts. Additionally, culvert installation, drainage clearing following flood events, and trail maintenance activities may require occasional use of heavy construction equipment, including backhoes and bulldozers. Table 7 summarizes typical noise levels associated with construction equipment that may be used during covered activities.

Table 7 Typical Construction Equipment Noise Levels

Equipment On-site	Typical Level (dBA) 25 Feet from the Source	Typical Level (dBA) 50 Feet from the Source	Typical Level (dBA) 100 Feet from the Source
Backhoe	86	80	74
Dozer	91	85	79
Loader	86	80	74
Saw	82	76	70
Shovel	88	82	76
Truck	90	84	78

Noise levels assume a noise attenuation rate of 6 dBA per doubling of distance.

Source: Federal Transit Administration 2018.

While temporary in nature, covered activities—including tree removal and pruning, trail maintenance, and drainage clearing—would occur within 1,600 feet of residences located adjacent to the Coverage Area. Given the proximity of these activities to sensitive receptors, they would be presumed to result in a potentially significant impact unless mitigation is incorporated, according to the City's Environmental Thresholds and Guidelines Manual.

Mitigation Measure N-1 restricts noise-generating MBHMP activities to hours recommended in the City's Environmental Thresholds and Guidelines Manual. The measure would further reduce potential construction noise associated with covered activities by requiring sound-control devices on construction equipment, consistent with Policy NE 6.5 of the General Plan Noise Element. Because the MBHMP would implement the City's recommended construction noise mitigation and would further reduce construction noise through installation of sound-control devices, impacts related to temporary noise associated with MBHMP activities would be less than significant with mitigation incorporated.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. Would the project result in generation of excessive ground-borne vibration or ground-borne noise levels?

Implementation of the MBHMP would not involve construction of new facilities, and therefore, use of heavy construction equipment would be limited. During implementation of the Natural Resources Management Programs, trail and tree maintenance activities would involve equipment such as chainsaws and hand tools. However, these types of equipment are not associated with high vibration levels. Drainage clearing and re-contouring, trail relocation, and culvert installation activities may require the occasional use of heavy equipment. Such activities would not require pile-driving or other construction methods capable of generating substantial ground-borne vibration. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

There are no private airports or airstrips in the vicinity of the Coverage Area. The Coverage Area is approximately 1.7 miles west of the Santa Barbara Municipal Airport but outside the Santa Barbara Municipal Airport's 60 dBA noise contour. Although there may be occasional aircraft overflights, these would occur at high altitudes where noise generation would be expected to be less than 60 dBA. Therefore, impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

Mitigation Measures

N-1 Noise Management

Consistent with mitigation recommended in the City's Environmental Thresholds and Guidelines Manual, all noise-generating MBHMP activities, including, but not limited to, tree removal, pruning, trail maintenance, and riparian restoration, shall be limited to between 8:00 a.m. and 5:00 p.m. on weekdays. Noise-generating MBHMP activities shall not occur on weekends or State holidays.

If diesel-powered construction equipment is necessary, all such equipment shall have properly maintained sound-control devices, and no equipment shall have an unmuffled exhaust system. Equipment shall not be left to idle while not in use.

14 Population and Housing

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	■
b. Displace substantial amounts of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	■

Existing Setting

According to the California Department of Finance (DOF), Goleta's population is 31,949 people (DOF 2018). The estimated average household size is 2.78 persons and there are 12,021 housing units (DOF 2018). Upon buildout of the General Plan (anticipated to occur by the year 2030), Goleta's population is expected to reach 38,100 (City of Goleta 2006a).

The Coverage Area is undeveloped and does not include any dwelling units.

Thresholds of Significance

A significant impact on population and housing would occur if the MBHMP resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. The City's Environmental Thresholds and Guidelines Manual does not contain City-specific population and housing thresholds.

Project-Specific Impacts

a. Would the project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

b. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

Implementation of the MBHMP would not involve construction of any residential units which would increase Goleta's population. The MBHMP would occur at Ellwood Mesa, and therefore, would not displace any existing housing or require the displacement of any people, as no housing is present in the Coverage Area. No impact would occur.

NO IMPACT

Mitigation Measures

No mitigation is required or recommended.

15 Public Services

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a.	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
	1 Fire protection?	☐	☐	☐	■
	2 Police protection?	☐	☐	☐	■
	3 Schools?	☐	☐	☐	■
	4 Parks?	☐	☐	☐	■
	5 Other public facilities?	☐	☐	☐	■

Existing Setting

Fire protection/Emergency services for the Coverage Area are provided by the Santa Barbara County Fire Department. The fire station closest to the Coverage Area is Station #11 located at 6901 Frey Way, just off of Storke Road and south of Hollister Avenue and the Camino Real Marketplace (approximately two miles driving distance). During long-term implementation of the MBHMP, Fire Station #10, which has been approved by the City but not yet constructed, will provide additional coverage. This station will be located on the north side of Hollister Avenue west of Cathedral Oaks Road, approximately 0.5 mile from the Ellwood Mesa parking lot. The City's General Plan identifies three standards with respect to the provision of fire protection services, which include:

- A firefighter-to-population ratio of one firefighter on duty 24 hours a day for every 2,000 persons is the ideal goal, however, one firefighter for every 4,000 persons is the absolute maximum population that can be adequately served
- A ratio of one engine company per 16,000 persons, assuming four firefighters per station, represents the maximum population that the Santa Barbara County Fire Department determined can be adequately served by a four-person crew
- A five-minute response time in urban areas

Police services are provided by the County Sheriff's Department under contract to the City. Law enforcement services include 24-hour police patrol for traffic enforcement, accident investigation, vehicle abatement, and parking control, as well as detective services for special investigations. Specialized functions through the Santa Barbara County Sheriff's Department are provided as needed. Services are also available for special events and/or natural disaster response.

Public schools in the vicinity of the project site include the Ellwood Elementary School, located north of the Coverage Area across Hollister Avenue.

The project site includes the Ellwood Mesa Open Space, which is considered a "regional open space" according to the City's General Plan (see Figure 3-2 and Table 3-1 of the Open Space Element).

Thresholds of Significance

A significant impact on public services would occur if the MBHMP would resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. In addition, the City's Environmental Thresholds and Guidelines Manual includes thresholds of significance for potential impacts on area schools. Specifically, under these thresholds any project that would generate enough students to generate the need for an additional classroom using current State standards, would result in a significant impact on area schools. Current State standards for classroom size are as follows:

- Grades K – 2: 20 students/classroom
- Grades 3 – 8: 29 students/classroom
- Grades 9 – 12: 28 students/classroom

Project-Specific Impacts

a.1. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

a.2. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered police protection facilities, or the need for new or physically altered police protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

a.3. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered schools, or the need for new or physically altered schools, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

a.4. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered parks, or the need for new or physically altered parks, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives?

a.5. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered

governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for other public facilities?

The MBHMP includes the Community Wildfire Protection Program, which provides practices to manage the eucalyptus groves and ensure consistency with the City's CWPP to reduce the ignitability of homes and structures. The risk of potential wildfires in the Coverage Area would be reduced by the CWPP and its policies and actions, as well as the Tree Management Program. The Tree Management Program would reduce fire hazards, improve public safety, and eliminate trees threatening the sustainability of the eucalyptus groves. The MBHMP would not involve construction of new residential uses; therefore, the MBHMP would not increase population nor increase demand for fire protection, police protection, schools, parks, or other facilities. No impact would occur.

NO IMPACT

Mitigation Measures

No mitigation is required or recommended.

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16 Recreation

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	■
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	■	☐

Existing Setting

Goleta has ~~six City~~16 public parks, 4 private parks, and ~~eight~~18 public open spaces, totaling approximately ~~482~~526 acres (City of Goleta 200618a). This equates to approximately ~~15~~16.4 acres per 1,000 residents (based on a current [2018] population of 31,949 [DOF 2018]). Approximately 40 percent of Goleta's two-mile Pacific shoreline is held in City ownership (City of Goleta 2017a). The City's parks and open space areas provide many opportunities for passive recreation and enjoyment of natural areas. Areas specifically developed for active recreational uses are less abundant, with approximately three acres of developed park land per 1,000 residents.

The Coverage Area encompasses the Sperling Preserve/Ellwood Mesa, a City-owned regional open space preserve. The preserve includes opportunities for recreation with extensive trails linking to a series of regional trails and access to Ellwood Beach. Following the July 2017 field study, which indicated over 1,200 trees in the eucalyptus forest were dead and hundreds more degraded or dying, numerous trails through the Coverage Area were closed indefinitely due to public safety hazards posed by the possibility of dead or dying trees falling.

Thresholds of Significance

A significant impact on recreation would occur if the MBHMP resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. The City's Environmental Thresholds and Guidelines Manual does not contain City-specific recreation thresholds.

Project-Specific Impacts

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

The Coverage Area is located in Ellwood Mesa Open Space and includes passive recreation opportunities, including hiking and wildlife viewing. The MBHMP is designed to preserve and

enhance butterfly habitat with specific programs related to natural resources management and monitoring, research, and adaptive management. Implementation of the MBHMP would also improve safety by allowing for the removal of dead trees that present a risk to recreational users in the Coverage Area. These programs, combined with the MBHMP's outreach programs, would improve conditions in the Coverage Area, thereby improving the visitor experience and possibly increasing recreational use.

Recreational use of the Coverage Area has been temporarily inhibited due to the closure of trails following the discovery of over 1,200 dead trees in July 2017. Since that time, recreational use of the Coverage Area has been diminished below its historical use. Although implementation of the MBHMP may increase recreational use in the Coverage Area, this increase would not be substantial and is not expected to exceed historical use of the Coverage Area prior to trail closures. Furthermore, the MBHMP would not expand the capacity of the Coverage Area because it would not accommodate additional vehicle trips to the area through additional parking or site access. Implementation of the MBHMP would not involve construction of any new residences and would not result in a population increase that would increase demand for recreational facilities.

The Trail Management Program would maintain and enhance the quality and safety of trails in the Coverage Area, thereby avoiding potential long-term degradation and trail closures. Maintaining the quality of and access to passive recreation opportunities in the Coverage Area would ensure that the Ellwood Mesa Open Space, including the Coverage Area, would continue to accommodate existing visitors. If these trails were not maintained, recreational users may choose to visit alternative facilities, resulting in increased demand at the City's other recreational facilities. Therefore, implementation of the MBHMP would have the beneficial impact of preventing increased demand at other recreational facilities by improving and maintaining amenities in the Coverage Area. Given that implementation of the MBHMP would not increase demand for recreational facilities or substantially increase the use of existing neighborhood and regional parks, it would not result in substantial physical deterioration of existing neighborhood and regional parks or other recreational facilities. Therefore, no impact would occur.

NO IMPACT

b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Various trail management activities, including but not limited to removal of safety hazards, installation of trail boundary posts, and trail relocations, are covered activities under the MBHMP's Trail Management Program. These covered activities could result in adverse physical effects on the environment, which are documented throughout this IS-MND. All impacts associated with implementation of the MBHMP, including trail management activities, would be less than significant or less than significant with incorporation of applicable mitigation measures contained in this document. As a result, impacts related to recreational facilities would be less than significant.

LESS THAN SIGNIFICANT IMPACT

Mitigation Measures

No mitigation is required or recommended.

17 Transportation

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	■	☐
b. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	■	☐
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)?	☐	☐	☐	■
d. Result in inadequate emergency access?	☐	☐	☐	■

Existing Setting

The major highways and arterial streets that serve the Coverage Area include US 101 and Hollister Avenue. US 101, located north of the Coverage Area, is a multi-lane interstate freeway serving the Pacific Coast between Los Angeles and the state of Washington. The freeway is the principal route between Goleta and the cities of Santa Barbara, Carpinteria, and Ventura to the south as well as the cities of Buellton and Santa Maria to the north. Access to US 101 from the Coverage Area is via Hollister Avenue to Storke Road to the east or Cathedral Oaks Road to the west.

Hollister Avenue, located immediately north of the Coverage Area, is an arterial roadway which serves as the primary east-west surface street through Goleta south of the freeway. Hollister Avenue is a four-lane, divided arterial with on-street bike lanes. Improvements to the Hollister Road corridor completed in 2018 include separate, off-street bike and pedestrian lanes along the portion of Hollister Avenue north of the Coverage Area and the adjacent residential neighborhood to the east.

Thresholds of Significance

A significant, project-generated traffic impact would occur if the MBHMP resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. Additional thresholds of significance are set forth in the City's Environmental Thresholds and Guidelines Manual. According to the manual, a potentially significant traffic impact would occur if:

1. The addition of project traffic to an intersection increases the volume to capacity ratio or number of trips by the values provided below.

Level of Services (including the project)	Increase in Volume to Capacity Ratio (greater than)
A	0.20
B	0.15
C	0.10
Or the addition of:	**Number of Trips**
D	15
E	10
F	5

2. Project access to a major road or arterial road would require a driveway that would create an unsafe situation or a new traffic signal or major revisions to an existing traffic signal.
3. The project adds traffic to a roadway that has design features (e.g., narrow width, road side ditches, sharp curves, poor sight distance, inadequate pavement structure) or receives use which would be incompatible with a substantial increase in traffic (e.g., rural roads with use by farm equipment, livestock, horseback riding, or residential roads with heavy pedestrian or recreational use, etc.) that will result in potential safety problems with the addition of project or cumulative traffic.
4. Project traffic would utilize a substantial portion of an intersection(s) capacity where the intersection is currently operating at acceptable levels of service (A-C) but with cumulative traffic would degrade to or approach LOS D (volume to capacity ration of 0.81) or lower. Substantial is defined as a minimum change of 0.03 for intersections which would operate from 0.80 to 0.85 and a change of 0.02 for intersections which would operate from 0.86 to 0.90, and 0.01 for intersections operating at anything lower.

Project-Specific Impacts

a. Would the project conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

While trail maintenance and outreach programs may improve the visitor experience, implementation of the MBHMP would not involve construction of new facilities, expansion of existing facilities, or a change in land use in the Coverage Area. As a result, the MBHMP would not substantially increase the number of visitors to the Coverage Area. Therefore, the number of trips to and from the Coverage Area would remain similar to historical conditions and would not contribute to an exceedance of intersection capacity at nearby intersections.

Covered activities, such as tree removal and pruning, revegetation, habitat restoration, and trail maintenance, may require occasional truck trips to the Coverage Area. Additionally, drainage clearing, trail maintenance, and culvert installation activities would require truck trips by maintenance workers performing these activities. These activities would not require large quantities of soil import or export generating substantial truck trips. Trips associated with covered activities would be temporary and intermittent, adding a nominal number of trips to area roadways. This impact would be less than significant.

The Coverage Area is accessible via the Santa Barbara Metropolitan Transit District bus lines 25, 2630, 2660, and 2740, which stop on Hollister Avenue. The MBHMP would not substantially increase the number of visitors to the Coverage Area or otherwise affect public transit.

The Coverage Area is accessible and would remain accessible via bicycle and pedestrian facilities along Hollister Avenue. Tree removal and pruning, revegetation, trail maintenance, and habitat restoration activities may require temporary closure of trails in the Coverage Area. Many trails in the Coverage Area have been closed indefinitely since July 2017 due to safety hazards posed by dead or dying trees. Implementation of the MBHMP would remove these hazards, in turn restoring access to trails and improving active transportation opportunities and safety in the Coverage Area. Therefore, no impact would occur.

LESS THAN SIGNIFICANT IMPACT

b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

CEQA Guidelines Section 15064.3(b) identifies criteria for evaluating transportation impacts. Specifically, the guidelines state that vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. As discussed above, the MBHMP would not substantially increase visitors to the Coverage Area and would not involve construction or expansion of facilities to accommodate additional vehicle trips (e.g., expanded parking facilities). Furthermore, the MBHMP would enhance active transportation opportunities by improving the quality and safety of trails in the Coverage Area.

According to Section 15064.3(b)(1) of the CEQA Guidelines, land use projects within 0.5 mile of either an existing major transit stop or a stop along an existing high-quality transit corridor are presumed to have a less than significant impact with respect to transportation. The Coverage Area is located less than 0.1 mile from the Hollister/Viajero bus stop, served by the 25, 2660, and 2740 bus lines. These lines connect to the Hollister Avenue Transit Corridor, which begins east of the Coverage Area at Pacific Oaks Road. Because the MBHMP would not substantially increase visitors to the Coverage Area, the Coverage Area is served by existing transit and active transportation facilities, and the MBHMP would enhance active transportation opportunities in the Coverage Area, implementation of the MBHMP would not substantially increase vehicle miles traveled. The MBHMP would not conflict or be inconsistent with CEQA Guidelines Section 15064.3(b), and this impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)?

The Coverage Area is accessed by vehicle via Hollister Avenue and residential streets to the north. Implementation of the MBHMP would not change access to the Coverage Area. These roadways do not have design features or receive uses that would be incompatible with the nominal number of truck trips that would occur in conjunction with covered activities under the MBHMP. The MBHMP would not install any driveways along a major or arterial roadway, and does not involve any other features that would create or increase hazards. No impact would occur.

NO IMPACT

d. Would the project result in inadequate emergency access?

Implementation of the MBHMP does not involve construction of any new structures impeding emergency access. The MBHMP includes the Trail Management Program, which would involve trail maintenance improving trails and access in the Coverage Area. No impact would occur.

NO IMPACT

Mitigation Measures

No mitigation is required or recommended.

18 Tribal Cultural Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in a Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☐	■
b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 2024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significant of the resource to a California Native American tribe.	☐	☐	☐	■

Existing Setting

As of July 1, 2015, Assembly Bill 52 (AB 52) of 2014 was enacted and expanded CEQA by defining a new resource category, "tribal cultural resources." AB 52 establishes that "[a] project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" (Public Resources Code [PRC] Section 21084.2). It further states the lead agency shall establish measures to avoid impacts that would alter the significant characteristics of a tribal cultural resource, when feasible (PRC Section 21084.3).

PRC Section 21074 (a)(1)(A) and (B) defines tribal cultural resources as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" and is:

1. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying these criteria, the lead agency shall consider the significance of the resource to a California Native American tribe.

AB 52 also establishes a formal consultation process for California tribes regarding those resources. The consultation process must be completed before a CEQA document may be adopted or certified. Under AB 52, lead agencies are required to "begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project." Native American tribes to be included in the process are those that have requested notice of projects proposed in the jurisdiction of the lead agency.

a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074 that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?

b. Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074 that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 2024.1?

Tribal cultural resources are defined in PRC Section 21074 as sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either:

- Included or determined to be eligible for inclusion in the California Register of Historical Resources
- Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1

To date, no tribal cultural resources have been identified in the Coverage Area and no tribal representatives have requested consultation regarding potential resources in the Coverage Area. The City prepared and mailed letters to local Native Americans on December 21, 2018. Under AB 52, tribes have 30 days to respond and request consultation, giving tribes until January 21, 2019 to provide a response. As of the date of this draft document, the 30-day response period has ended and no tribal representatives requested formal consultation with the City.

NO IMPACT

Mitigation Measures

No mitigation is required or recommended.

19 Utilities and Service Systems

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	■	☐
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	■	☐
c. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	■
d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	■	☐
e. Comply with federal, State, and local management and reduction statutes and regulations related to solid waste?	☐	☐	■	☐

Existing Setting

Wastewater Treatment

The Goleta West Sanitary District (GWSD) provides sewer service in the project area via its system of sewer mains which ultimately connect to the Goleta Sanitary District's (GSD) main treatment plant at 1 William Moffett Place adjacent to the Santa Barbara Municipal Airport. Treatment of wastewater collected by GWSD is provided through a contract with GSD. The GSD treatment plant has a capacity of 9.7 million gallons per day (based on average daily flow), but is currently limited to a permitted discharge of 7.64 million gallons per day pursuant to a NPDES permit issued by the USEPA in concurrence with the State's Central Coast RWQCB. The GWSD is allocated 40.78 percent

of the capacity at the sewage treatment plant, which equates to about 3.12 million gallons per day (City of Goleta 2006a).

Water Supply

GWD is the water purveyor for Goleta. GWD operates under the *Wright Judgment,* which prohibits overdrafting of the Goleta Groundwater Basin. GWD draws its water supply from surface water from Lake Cachuma, groundwater from the Goleta Groundwater Basin, recycled water from GSD, and imported water from the State Water Project. In December 2015 GWD acquired 2,500 acre feet of supplemental water from another State Water Project contractor through the Central Coast Water Authority Supplemental Water Purchase Program to augment existing supplies in response to a fourth consecutive year of drought. In the last 10 years, GWD has obtained approximately 60 percent of its water supplies from Lake Cachuma, 15 percent from the State Water Project, 7 percent from recycled water, 17 percent from groundwater, and 1 percent from supplemental water purchases (GWD 2017a).

Landfill Capacity and Solid Waste

All nonhazardous solid waste in Goleta is handled at the Tajiguas Landfill and South Coast Recycling and Transfer Station, both of which are owned and operated by the Santa Barbara County Public Works Department. The management of solid waste by the Santa Barbara County Public Works Department includes collection, recycling, disposal, and mitigation for illegal dumping. Marborg Industries provides collection services in Goleta. Waste generated in Goleta is handled at the South Coast Recycling and Transfer Station where recyclable and organic materials are sorted for recycling and composting. The remaining solid waste is transported to and disposed of at the Tajiguas Landfill. Santa Barbara County Environmental Health Services permits Tajiguas to accept up to 1,500 tons of municipal solid waste and yard waste per day. Tajiguas has a remaining capacity of approximately 4.3 million cubic yards as of March 2016. The South Coast Recycling and Transfer Station processes 550 tons of waste per day and has a maximum permitted capacity of 595 tons per day (City of Goleta 2006a; CalRecycle 2018).

Electrical Service

Electrical service to Goleta and the South Coast region is provided by Southern California Edison Company. Southern California Edison Company maintains substations in Goleta, including the Hollister Avenue and Glen Annie substations, as well as electrical distribution lines (City of Goleta 2004).

Natural Gas

SoCalGas provides natural gas service to approximately six million residential and business customers across 20,000 square miles of southern California, including Goleta (SoCalGas 2019a). Goleta, including the Coverage Area, is located in SoCalGas' Coastal Zone. SoCalGas operates the La Goleta Natural Gas Storage Field, a naturally occurring underground storage reservoir in the porous sandstone of the Vaqueros Formation located approximately 3.4 miles east of the Coverage Area (SoCalGas 2019b). La Goleta is one of four SoCalGas storage facilities in southern California, interconnected by regional transmission lines.

Thresholds of Significance

A significant impact on utilities and service systems would occur if the MBHMP would result in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. In addition, under the City's Environmental Thresholds and Guidelines Manual, a project generating 196 tons of solid waste/year, after receiving a 50 percent credit for source reduction, recycling, and composting, would result in a project-specific, significant impact on Goleta's solid waste stream. Any project generating 40 tons/year, after receiving a 50 percent credit for source reduction, recycling, and composting, would make an adverse contribution to cumulative impacts to Goleta's solid waste stream.

Project-Specific Impacts

a. Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

The Coverage Area includes existing restroom facilities at the parking lot along Hollister Avenue and would not involve construction of any new restroom facilities. Implementation of the MBHMP would not result in a substantial increase in the number of visitors to the Coverage Area. Therefore, implementation of the MBHMP would not increase wastewater generation.

Trail improvements and new trails developed under the MBHMP would be unpaved. Therefore, the MBHMP would not increase the extent of impervious surface cover in the Coverage Area. Consequently, the MBHMP would not increase stormwater runoff or result in the need for new or expanded storm water drainage control facilities. No new electric power, natural gas, or telecommunications facilities would be constructed to serve the Coverage Area.

The MBHMP would not involve new development or an increase in population requiring expansion of water treatment or distribution facilities. However, installation of irrigation drip lines and storage tanks is a covered activity under the Tree Management Program. This covered activity may require limited soil disturbance and vegetation removal. Storage tanks would be located above ground to avoid existing eucalyptus trees, and drip lines would be installed a maximum of six inches below ground surface. Following installation of driplines, soil would be replaced to existing contours and irrigation would support new and existing vegetation in the Coverage Area. Other potential environmental impacts of MBHMP covered activities, including installation of irrigation facilities, are assessed throughout this document and were found not to cause any significant environmental effects. Therefore, this impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Implementation of the MBHMP would not involve any change in land use or new development that would increase water demand. The MBHMP would not result in construction of new or expanded facilities but would maintain existing facilities in the Coverage Area. Irrigation in the Coverage Area is a covered activity under the Tree Management Program. Irrigation water would be provided via water trucks or on-site water tanks as needed using existing potable or reclaimed water supplies. Assuming an average water tank size of 3,600 gallons (McLellan Industries 2014) and twice weekly

filling of the tank to accommodate water application during the region's approximately 26-week dry season, irrigation water application would total approximately 0.6 acre feet per year. According to the GWD 2015 Urban Water Management Plan, this amounts to less than 0.01 percent of GWD's projected 2020 water supply (GWD 2017b). As discussed in Section 10, *Hydrology and Water Quality*, irrigation water would also provide additional recharge benefits to the underlying aquifer if supplied from reclaimed water. This impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

As discussed under threshold a, the MBHMP would involve no increase in wastewater generation. No impact would occur.

NO IMPACT

d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

e. Would the project comply with federal, State, and local management and reduction statutes and regulations related to solid waste?

Implementation of the MBHMP would not involve any change in land use or expansion of the open space area which would lead to a permanent increase in solid waste generation. Additionally, implementation of the MBHMP would not result in a substantial influx of additional visitors to the Coverage Area. The MBHMP includes a Waste Management Program to remove waste from the Coverage Area. The Waste Management Program includes posting signs to prevent dumping in the butterfly habitat areas and educate visitors about the importance of removing trash from the butterfly habitat. Finally, the program would place trash cans in the parking lot for waste disposal. Therefore, the MBHMP would reduce illegal dumping and disposal of waste.

Tree removals and pruning may generate greenwaste, such as leaf litter and woody biomass. Downed trees would generally remain onsite, either in place in the groves or repurposed along trails as barriers or benches. Downed trees and other greenwaste may occasionally require off-site disposal, particularly tree trunks that cannot be mulched. Greenwaste generated by covered activities would be transported to the South Coast Recycling and Transfer Station, approximately 7.3 miles east of the Coverage Area. The South Coast Recycling and Transfer Station has a permitted capacity of 550 tons per day (County of Santa Barbara 2018). Assuming a eucalyptus tree is 150 feet tall with an average diameter of 3 feet, it would have a mass of approximately 27 tons (Meier 2019). This amount of material would amount to approximately five percent of the facility's daily permitted capacity. Given that off-site disposal of greenwaste would occur infrequently and only when on-site repurposing of downed trees is infeasible, the MBHMP would not generate waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. Additionally, the MBHMP would comply with federal, State, and local management and reduction statutes and regulations related to solid waste. Therefore, impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

Mitigation Measures

No mitigation is required or recommended.

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20 Wildfire

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
If located in or near State responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	■
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	■
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	■
d. Expose people or structures to significant risks, including downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	■

Existing Setting

The entire South Coast region, including Goleta, is prone to large wildfires due to its hot, dry climate and expansive coverage of ignitable vegetation. During the summer and autumn months, strong off-shore "sundowner" winds can create fast-moving fires that spread rapidly from the sparsely-populated Santa Ynez Mountains downslope to developed communities along the coast. Recent wildfires in the vicinity of the Coverage Area include the 1990 Painted Cave Fire, 1997 Eagle Canyon Fire, 2008 Gap Fire, 2009 Jesusita Fire, 2016 Sherpa Fire, 2017 Whittier Fire, and 2017/2018 Thomas Fire.

While a natural ecological process in coastal chaparral systems, wildfire return intervals have decreased throughout southern California, resulting in more frequent ecological disturbance, loss of biodiversity, and colonization by non-native grass species (USFS 2018). Furthermore, post-fire conditions leave exposed mountain slopes and hillsides vulnerable to surface erosion and runoff. Debris flows during post-fire rainy seasons can pose a risk to life and property and occur with little

warning. In southern California, as little as 0.3 inch of rain in 30 minutes can produce debris flows on post-fire landscapes (USGS 2018).

In March 2012, the City adopted the CWPP, which identifies key hazard treatments which are in balance with sustainable ecological management and fiscal resources (City of Goleta 2012). Treatments described in the CWPP serve as general prescriptions intended to guide site-specific fuel reduction strategies.

Given the region's susceptibility to large wildfires, the City of Goleta and County of Santa Barbara have developed "reverse 911" emergency notification systems to deliver fire-related updates, including weather forecasts and evacuation orders. The Santa Barbara County Sheriff's Office's Aware and Prepare notification system alerts residents via text message to impending emergency situations throughout the county. In summer of 2008, the City implemented the Goleta City Alert system, capable of sending two million 60-second voice messages or hundreds of thousands of e-mails and text messages in an hour during fire or other emergency situations (City of Goleta 2019).

Thresholds of Significance

A significant wildfire impact would occur if the MBHMP resulted in any of the impacts noted in the above checklist, pursuant to Appendix G of the CEQA Guidelines. The City's Environmental Thresholds and Guidelines Manual does not contain City-specific wildfire significance thresholds.

Project-Specific Impacts

a. If located in or near State responsibility areas or lands classified as very high fire hazard severity zones, would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

b. If located in or near State responsibility areas or lands classified as very high fire hazard severity zones, would the project due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

c. If located in or near State responsibility areas or lands classified as very high fire hazard severity zones, would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

d. If located in or near State responsibility areas or lands classified as very high fire hazard severity zones, would the project expose people or structures to significant risks, including downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

According to the Santa Barbara County Fire Hazard Severity Zone Map, the Coverage Area is located entirely within a moderate fire hazard severity zone (California Department of Forestry and Fire Protection [CAL FIRE] 2012). The nearest very high fire hazard severity zone is located northwest of the Cathedral Oaks Road/US-101 interchange, approximately 0.5 mile from the Coverage Area. The MBHMP pledges support for the policies and activities contained in the CWPP, which includes policies intended to reduce fire hazards from fuel loads in the Coverage Area. The MBHMP also supports these efforts by calling for the maintenance and revegetation of the understory in and around aggregation sites with fire-resistant, native plant species. Furthermore, covered activities under the Tree Management Program and Catastrophic Event Response Program, including tree

removals, would reduce wildfire risk in the Coverage Area by removing dead or dying trees that would serve as fuel, thereby providing a beneficial effect. Mitigation measure BIO-8 would require any stockpiling of potentially ignitable debris or greenwaste to be temporary in nature, with the duration of debris stockpiling specified in the annual Implementation Plan prior to commencement of covered activities. Removed dead or dying trees would be replaced with healthy trees, which are less fire-prone, and which, pursuant to mitigation measure BIO-7, would be monitored annually for a period of five years to ensure they remain healthy. Both of these measures would further address community concerns about wildfire impacts associated with implementation of the MBHMP. No expansion of the existing eucalyptus groves would occur.

The MBHMP does not propose construction or maintenance of any new infrastructure which may pose a fire risk. The Coverage Area contains existing power lines owned and operated by SCE. SCE has previously conducted vegetation removal efforts to reduce fuel loads and hazardous trees in the vicinity of these lines. These vegetation removal efforts would continue, subject to SCE's own permits and easement rights.

The MBHMP would not involve construction of any structures, and therefore would not expose any additional people or structures to risk of wildfire. As noted in Section 9, *Hazards and Hazardous Materials*, the project would not interfere with an adopted emergency response or evacuation plan. Given its gentle sloping topography, the Coverage Area would not be susceptible to post-fire flooding, landslides, or slope instability. There would be no impact.

NO IMPACT

Mitigation Measures

No mitigation is required or recommended.

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21 Mandatory Findings of Significance

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Does the project:				
a. Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	■	☐	☐
b. Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	■	☐
c. Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	■	☐	☐

a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

As discussed in Section 4, *Biological Resources*, impacts to special-status species would be less than significant with implementation of Mitigation Measures BIO-1 through BIO-9 and HWQ-2. With adherence to these measures, the MBHMP would not have the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, eliminate a plant or animal community, or reduce the number or restrict the range of a rare or endangered plant or animal.

As discussed in Section 5, *Cultural Resources*, the Coverage Area is located in an area known to be archaeologically sensitive and, therefore, ground-disturbing activities would have the potential to unearth artifacts exemplifying major periods of California history or pre-history, if present. Mitigation Measure CUL-1 would reduce this impact such that it would be less than significant. Overall, impacts would be less than significant with mitigation incorporated.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Cumulative impacts could occur as a result of planned and pending development in the vicinity of the Coverage Area in combination with MBHMP activities. Certain environmental impacts are generally site-specific, such as impacts related to cultural resources, geology and soils, and hazards and hazardous materials. Consequently, planned and pending projects in the vicinity of the Coverage Area in combination with MBHMP activities are unlikely to result in cumulative impacts related to these resource areas.

Other environmental impacts, such air quality, GHG emissions, biological resources, hydrology and water quality, noise, and transportation, are cumulative in nature. Planned, pending, and approved projects in the City of Goleta within two miles of the Coverage Area include the Old Line 96 Abandonment project, Arco Habitat Restoration project, Citrus Village residential project, NRG Battery Storage project, Rancho Estates Mobile Home Park Fire Improvements, Pacific Beverage warehouse at Cabrillo Business Park project, the Cortona Apartments project, and the Fire Station 10 project. In total, these projects would add approximately 186 residential units, 98,780 square feet of warehouse/office space, an 11,600-square foot fire station, and a 500 KW battery storage facility (City of Goleta 2018b). Cumulative impacts as a result of construction and operation of these projects in concert with implementation of the MBHMP could be potentially significant.

As described in the discussion of environmental checklist Sections 1 through 20, with respect to all environmental issues, the MBHMP would have no impact, a less than significant impact, or a less than significant impact with mitigation incorporated. Additionally, the Coverage Area is adjacent to the existing 9.3-acre Coronado Butterfly Preserve, owned and maintained by the Land Trust for Santa Barbara County. As a result, implementation of the MBHMP would result in potentially beneficial cumulative impacts by restoring and enhancing monarch habitat near an existing preserve. Based on the minor and temporary nature of the activities that would occur under the MBHMP, with incorporated mitigation measures, and considering the impacts associated with other past, current, or probable future development in the area, the potential contribution to cumulative impacts for all issue areas would not be cumulatively considerable. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Effects to human beings are generally associated with impacts related to air quality, hazards, and noise. Short-term air-quality impacts would be minimal and less than significant with implementation of AQ-1 to reduce fugitive dust generation during covered activities. As discussed in

Section 9, *Hazards and Hazardous Materials*, the MBHMP would result in a less than significant impact related to hazards and hazardous materials. Adverse effects on human beings would result mainly from noise generated during fuel management activities such as vegetation clearing and tree trimming near the adjacent residences. However, as stated in the Section 12, *Noise*, this impact would be less than significant with adherence to Mitigation Measure N-1. Implementation of the MBHMP would have the beneficial impact to humans of reducing the risk of falling trees, trail hazards, and wildfires in the Coverage Area. Overall, this impact would be less than significant with mitigation incorporated.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Mitigation Measures

Mitigation Measures AQ-1, BIO-1 through BIO-9, CUL-1, HWQ-2, and N-1 would apply to this environmental resource area.

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Attachment 4 - Appendix A

Draft
Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan

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TABLE OF CONTENTS

Section **Page**

EXECUTIVE SUMMARY V

INTRODUCTION 1

BACKGROUND 1

POLICY 4

Goleta General Plan/Coastal Land Use Plan – Conservation Element 4

Ellwood Mesa Open Space Plan 5

Community Wildfire Protection Plan 6

Goleta Urban Forest Management Plan 6

PURPOSE 6

METHODS 7

THE HABITAT MANAGEMENT PLAN 9

A. ADMINISTRATIVE PROGRAMS 9

1. Municipal Management Program 9
2. Fiscal Program 11
3. Interagency Cooperative Program 12
4. Community Wildfire Protection Program 13
5. Trail Management Program 19
6. Waste Management Program 20
7. Aesthetic Resources Management Program 21
8. MBHMP Review, Update, and Amendment Program 22
9. Catastrophic Event Response Program 23

B. NATURAL RESOURCES MANAGEMENT PROGRAMS 26

10. Monarch Butterfly Management Program 26
11. Wildlife Habitat Management Program 27
12. Tree Management Program 28

13. Integrated Pest Management Program....34
14. Habitat Enhancement and Restoration Program....35
15. Invasive Plant Management Program....38
16. Ecosystem-wide Management Coordination Program....41
C. OUTREACH PROGRAMS....43
17. Community Advisory and Docent Program....43
18. Interpretive Program....44
19. Education Program....45
D. MONITORING, RESEARCH, AND ADAPTIVE MANAGEMENT PROGRAMS....47
20. Biological Monitoring Program....47
21. Monarch Research Program....48
22. Adaptive Management Program....49
E. CONCLUSION....51
F. REFERENCES....52
G. LIST OF PREPARERS....53
City of Goleta....53
Althouse and Meade, Inc....53
Rincon Consultants, Inc....53
Agri-Turf Supplies, Inc....53

APPENDICES

Appendix A. Implementation Priorities, Schedule, and Estimated Costs.... A-1
Appendix B. Spectral Imaging and Analysis for Assessing Tree Health.... B-1
Appendix C. Native Plants to be Included in Habitat Restoration Efforts.... C-1

LIST OF TABLES

Table 1. CWPP Prescription Guidance for Butterfly Aggregation Areas Adjacent to Structures 16

Table 2. Identified Threats and Potential Response Actions 30

Table A1. Implementation Priorities and Cost Estimates A-1

Table A2. Cost Estimates by Action A-3

LIST OF FIGURES

Figure 1. Vicinity Map 2

Figure 2. Monarch Butterfly Aggregation Sites 3

Figure 3. CWPP Related Fuel Reduction Zones within the MBHMP Area 15

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EXECUTIVE SUMMARY

This Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan (MBHMP) outlines the programmatic approach and methods for the City of Goleta (City) to manage and improve the Ellwood Mesa eucalyptus forest for the benefit of the overwintering behavior of the monarch butterfly (*Danaus plexippus*), other wildlife, and the public's use and enjoyment.

Two key local policy documents drive the protection of the monarch butterfly: the Goleta General Plan/Coastal Land Use Plan (General Plan; City of Goleta 2006) and The Ellwood-Devereux Coast Open Space and Habitat Management Plan (Open Space Plan; City of Goleta et al. 2004). The Coastal Land Use Plan is not yet certified. These policy documents provide an important context for this MBHMP.

The 22 programs detailed in this MBHMP organize and integrate the many diverse aspects of habitat management into an overall plan that can be implemented in a clear and concise manner. Each specific program identifies individual goals, policies, and actions to establish a well-organized and efficient process leading to a management strategy for the sustainability of monarch habitat at Ellwood Mesa. The programs are followed by implementation priorities, schedules, needs, and contacts for those responsible for the implementation.

The 22 programs are organized into four categories: Administrative Programs; Natural Resources Management Programs; Outreach Programs; and Monitoring, Research, and Adaptive Management Programs.

- The nine Administrative Programs are designed to assist the City with and inform the many MBHMP stakeholders of the details regarding implementation of the MBHMP.
- The seven Natural Resources Management Programs articulate the goals, policies, and actions necessary to maintain and improve the many important natural resources, including biological diversity and ecosystem functions associated with the Ellwood Mesa eucalyptus groves and the monarch butterfly aggregation sites they support.
- The three Outreach Programs are designed to provide information for visitors, educators, and students to help develop a broad appreciation for natural resources and local natural heritage, with a focus on monarch butterflies.
- The three Monitoring, Research, and Adaptive Management Programs provide a mechanism for assessing environmental conditions and conducting original studies to help understand the ecology of monarch butterflies, particularly at Ellwood Mesa. Information obtained from these programs and other sources can be used to adapt the MBHMP in response to additional information or changing conditions.

With adoption and implementation of this MBHMP, the City will fulfill a major commitment to the natural resources of Ellwood Mesa and its residents, and to all those committed to the conservation of monarch butterflies.

Funding for implementation of the MBHMP will be drawn from a variety of sources, which may include grants, donations, mitigation fees, and City funds. An implementation budget estimate is included in Appendix 1. On June 29, 2018, the California state budget for the 2018–2019 fiscal year was approved and included a provision allocating 3.9 million dollars to the City for management and restoration of the monarch butterfly habitats on Ellwood Mesa. The state funds will be maintained in an account separate from other City funds and will be used only for actions to restore, enhance, manage, and monitor butterfly habitats on Ellwood Mesa. In the near-term, this funding will be instrumental in getting the MBHMP's programs operational and in addressing some of the imminent habitat issues that presently face the grove.

INTRODUCTION

BACKGROUND

Monarch butterfly (*Danaus plexippus*) use of the eucalyptus groves on Ellwood Mesa in the City of Goleta (City), California has inspired many residents and visitors over the years to help in the preservation and conservation of this important natural phenomenon. These eucalyptus groves occur in the City-owned Ellwood Mesa/Sperling Preserve Open Space (Ellwood Mesa Open Space or Ellwood Mesa) (Figure 1).

Over-wintering monarch butterfly aggregations in Ellwood Mesa groves have numbered in the tens of thousands during some years, making Ellwood Mesa one of the most important sites for monarch butterflies in California (Pelton et al. 2016). Each fall, monarch butterflies in the western United States migrate to the coast of California from various locations throughout western North America. The butterflies arrive at Ellwood Mesa in mid-September and, as winter approaches, cluster into aggregation roosts, often called overwintering or wintering colonies. The butterflies remain until about mid-February, when they generally disperse inland.

The eucalyptus groves at Ellwood Mesa are called the Ellwood Complex. As shown on Figure 2, six monarch butterfly over-wintering sites occur in the complex: Sandpiper, Ellwood North, Ellwood West, Ellwood Main, Ellwood East, and Ocean Meadows. The Ellwood East site is on private property and not within the Ellwood Mesa Open Space and is therefore outside the scope of this Monarch Butterfly Habitat Management Plan (MBHMP); however, it is included for context. The Ellwood Main site is located along Devereux Creek and is the primary aggregation site for over-wintering butterflies in Ellwood Mesa.

Information and data regarding the condition of the butterfly population and groves—as well as trends in butterfly health, number, and behavior—were compiled over the last several years through a collaborative effort between City staff and the City's consultants—Althouse and Meade, Rincon Consultants, and Agri-Turf Supplies. Tracking butterfly numbers at Ellwood aggregation sites has been an ongoing effort that began in 1989 and has been maintained by the City since the City's incorporation in 2002. A Habitat Assessment was completed for Ellwood Mesa in 2013 to document the habitat conditions and health of the eucalyptus groves on the mesa (Althouse and Meade, Inc. 2013). In 2017, during the 5-year drought, the condition of the eucalyptus trees was assessed at the aggregation sites, and tree mortality was determined throughout Ellwood Mesa. The development of management priorities was an expanded effort between City staff, the consultant team, the City's monarch butterfly docents, and members of the public.

The monarch butterfly populations at Ellwood Mesa and in California statewide have declined at least 74% since the 1990's (Pelton et al. 2016). The monarch butterfly is listed on the California Department of Fish and Wildlife's (CDFW) Special Animals List with overwintering roosts designated as imperiled to vulnerable in the state (CDFW 2017). Currently, the species is under federal review for potential listing under the Endangered Species Act (ESA), and the U.S. Fish and Wildlife Service (USFWS) plans to make its determination of whether this species warrants ESA listing by June 30, 2019.

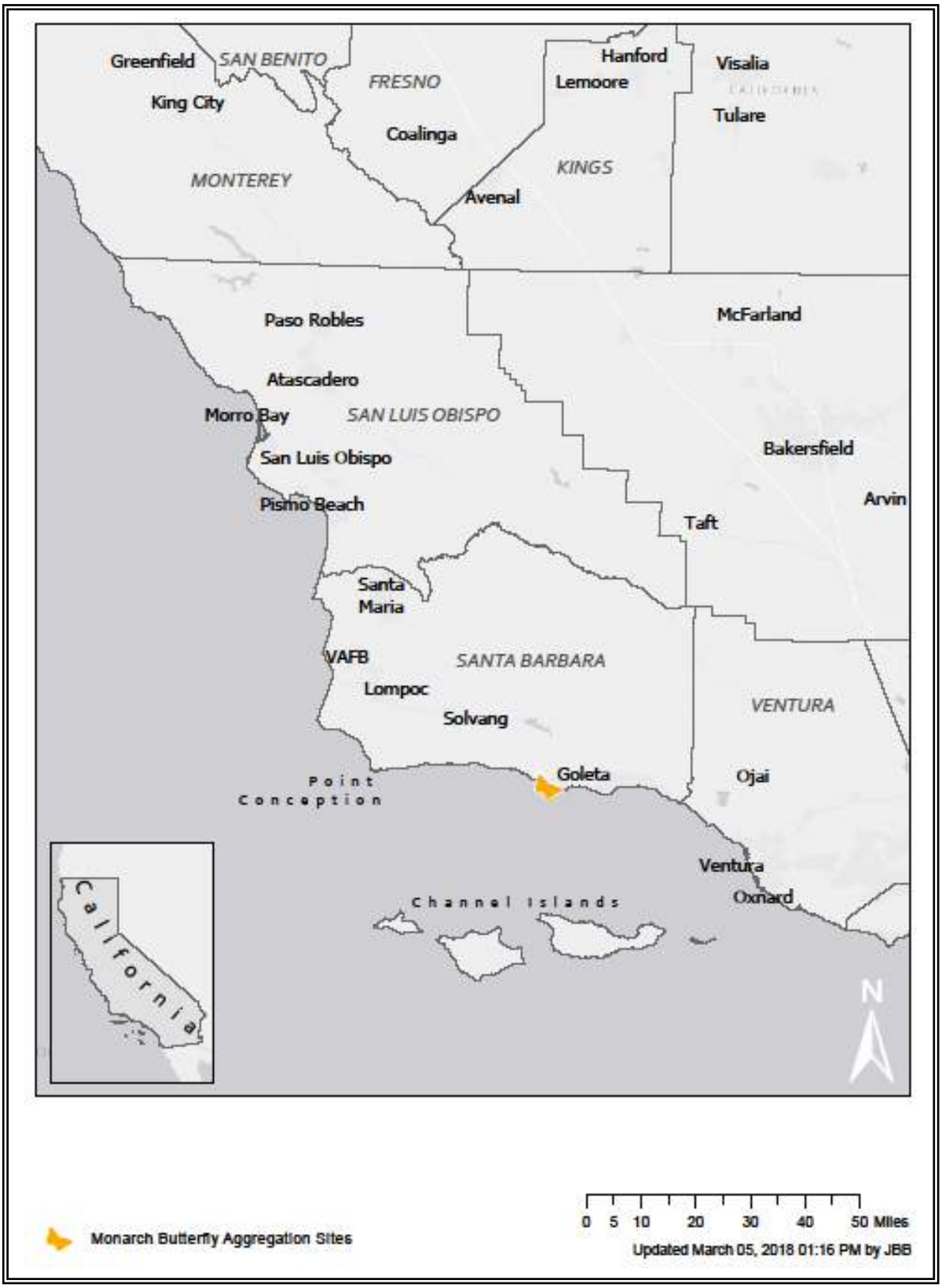


Figure 1. Vicinity Map



Figure 2. Monarch Butterfly Aggregation Sites



Photo 1. Monarch Butterfly (*Danaus plexippus*) Aggregation on Blue Gum (*Eucalyptus globulus*)

POLICY

Two key local policy documents drive the protection of the monarch butterfly: the Goleta General Plan/Coastal Land Use Plan (General Plan; City of Goleta 2006) and The Ellwood-Devereux Coast Open Space and Habitat Management Plan (Open Space Plan; City of Goleta et al. 2004). These policy documents provide an important context for this MBHMP. Additionally, the City's Community Wildfire Protection Plan (CWPP) was used as a key reference. The Goleta Urban Forest Management Plan (as amended and approved February 21, 2017) was also used to guide management recommendations. A summary of related policies and/or actions is provided below.

Goleta General Plan/Coastal Land Use Plan – Conservation Element

Monarch butterfly overwintering sites are considered Environmentally Sensitive Habitat Areas (ESHAs) under the Coastal Act because the occupied groves meet the definition of an ESHA in Section 30107.5 of the California Coastal Act. An ESHA is defined as follows:

> Any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

As such, autumnal and overwintering sites are protected by the Coastal Act and the General Plan. Specifically, the General Plan protects monarch butterflies and associated habitat via General Plan Conservation Element Policy 4, Protection of Monarch Butterfly Habitat Areas. The objective of the policy is as follows:

> To preserve, protect, and enhance habitats for monarch butterflies in Goleta, including existing and historical autumnal and winter roost or aggregation sites, and promote the long-term stability of over-wintering butterfly populations.

The definition of butterfly habitat is stated in subpolicy CE 4.1, Definition of Habitat Area, as follows:

> Sites that provide the key elements essential for successful monarch butterfly aggregation areas and are locations where monarchs have been historically present shall be considered ESHAs. These elements include stands of eucalyptus or other suitable trees that offer shelter from strong winds and storms, provide a microclimate with adequate sunlight, are situated near a source of water or moisture, and that provide a source of nectar to nourish the butterflies.

Additional subpolicies pertaining to the protection of this important local resource are provided in Policy CE 4 of the General Plan Conservation Element and were used to guide the preparation of this MBHMP.

Ellwood Mesa Open Space Plan

The 230-acre Ellwood Mesa is part of a 652-acre contiguous open space along the Ellwood-Devereux Coast that is managed by the City, the County of Santa Barbara, and the University of California, Santa Barbara (UCSB). In March 2004, these three agencies released The Ellwood-Devereux Coast Open Space and Habitat Management Plan (City of Goleta et al. 2004). The sections of the plan applying to the Goleta properties (referred to as the Ellwood Mesa Open Space Plan) were adopted by the Goleta City Council on June 24, 2004.

The Ellwood Mesa Open Space Plan establishes the following goal and policies that guide the management actions related to the monarch butterfly and supporting habitat:

> **Monarch Goal 1.** Protect and maintain existing monarch butterfly populations in the Open Space Plan Area, and manage the habitats to be self-sustaining.
>
> > **Monarch Policy 1.** Manage public access to protect butterflies and their habitat, while promoting public enjoyment, education, and scientific research.
> >
> > **Monarch Policy 2.** Conduct scientifically sound studies using appropriate and cautious methods to maintain and improve habitat conditions to ensure long-term viability of the population.
> >
> > **Monarch Policy 3.** Implement phased habitat improvements using pilot programs, small-scale projects, and adaptive management.

Additional overarching management goals and policies are provided in the Ellwood Mesa Open Space Plan and were used to guide the preparation of this MBHMP.

Community Wildfire Protection Plan

The City's CWPP was adopted by the City Council on March 20, 2012. The purpose of the CWPP is to enhance community wildfire protection by identifying fire hazard treatments that are in balance with sustainable ecological management and fiscal resources. The CWPP presents design standard recommendations for fuel treatments specific to areas near butterfly aggregation sites that are intended to minimize adverse effects on adjacent habitat while reducing hazardous fuels. Key recommendations focus on the coordination between butterfly and wildland fire experts during planning and implementation of fuel treatment strategy prescriptions. The CWPP was used during the preparation of this MBHMP, and this MBHMP is intended to support implementation of the CWPP, which is further discussed in detail in Program 4 (City of Goleta 2012).

Goleta Urban Forest Management Plan

The Goleta Urban Forest Management Plan (GUFMP) (as amended and approved February 21, 2017) was also used to guide management recommendations. The GUFMP provides a guide for the long-term preservation and enhancement of the urban forest within the City's jurisdiction. The urban forest is defined as all public and private trees including the street tree system, trees in parks and other public lands, and trees on private properties throughout the City. The vision statement of the GUFMP is:

> Goleta's urban forest is a thriving and sustainable mix of tree species and ages that creates a contiguous and healthy ecosystem that is valued and cared for by the City and all of its citizens as an essential environmental, economic and community benefit.

The GUFMP Section 4.7 Very Mature Tree Care calls to establish a regular maintenance program for trees located in parks, open spaces, and median islands to ensure very mature tree health. Mulching, fertilization, and pruning are three major practices used to tend to mature trees. The MBHMP fulfills this section for a tree maintenance program for Ellwood Mesa eucalyptus groves.

PURPOSE

The purpose of the MBHMP is to provide a programmatic approach to management of the habitats that support the monarch butterfly seasonal aggregation areas at the Ellwood Mesa Open Space, as well as a variety of other plant and animal species and coastal access and recreation. The intent of the management approach is to maintain and improve habitat conditions to ensure long-term viability of the monarch butterfly population, while allowing for coastal access, education and compatible recreational opportunities. The 22 programs detailed in this MBHMP organize and integrate the many diverse aspects of habitat management into an overall plan that can be implemented in a clear and concise manner.

METHODS

This MBHMP is the result of careful consideration of existing information, site surveys, inventory, and assessment of tree health within the groves, consultation with a broad array of professionals and interested public, and discussions with City staff. The City collaborated with Althouse and Meade, Inc. and Rincon Consultants, Inc. in the preparation of this MBHMP. This MBHMP is composed of 22 programs, each of which contains a goal, one or more policies, and one or more actions associated with each policy. Information on program status, needs, and contacts are also included, as well as general priority and schedule information and an annual cost estimate (Appendix 1). A main focus of each program is to establish an implementation structure with targets and actions to achieve present and future goals. . The scope of this MBHMP includes monarch butterfly habitat in the City's Ellwood Mesa Open Space, including aggregation sites, forest areas, and nectaring locations (refer to Figure 1 for a vicinity map and Figure 2 for a map of the butterfly aggregation sites and Habitat Management Area).

For the purposes of this MBHMP, the following definitions apply:

Program: a planned series of activities.

Goal: a broad statement of program intentions.

Policy: a set of plans or actions agreed upon by the interested parties.

Action: the process of doing something to achieve a goal.

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THE HABITAT MANAGEMENT PLAN

This MBHMP for the Ellwood Mesa Open Space is organized into four categories: Administrative Programs; Natural Resource Management Programs; Outreach Programs; and Monitoring, Research, and Adaptive Management Programs. These programs—including their goals, policies, actions, implementation priorities, and schedules—are described in the sections that follow.

A. ADMINISTRATIVE PROGRAMS

Administrative programs are designed to assist the City and inform the many MBHMP stakeholders of the details regarding implementation of the MBHMP. Identifying specific programs and their goals, policies, and actions enables a well-organized and efficient process to be established that leads to a management strategy for the sustainability of monarch habitat at Ellwood Mesa.

It is the City's intent that the goals and policies of this MBHMP should be considered and incorporated into future land use planning and policy documents, such as General Plan amendments and a Local Coastal Program, as appropriate, as these documents are developed.

1. Municipal Management Program

Overview: This program focuses on the role of the City as manager of the Ellwood Mesa Open Space and, in particular, the role of the City in the implementation of this MBHMP. Habitats included in this MBHMP include primarily the eucalyptus groves and windrows used by monarch butterflies for winter aggregations at Ellwood Mesa, covering approximately 230 acres from Hollister Avenue south to the ocean bluffs and from UCSB west to the Sandpiper Golf Course. The eucalyptus groves and windrows occur in the context of coastal mesa grasslands, coastal scrub, riparian habitats, and residential development. Therefore, they are part of a larger coastal ecosystem and neighborhood, with management priorities for which the MBHMP is designed to be compatible.

Goal 1. To implement the MBHMP, with the City providing the administrative structure to oversee the programs and scheduling, and to interface with the community at large.

Policy 1-1. The City shall review, and revise as necessary, the MBHMP to reflect current data, butterfly conservation science, and management techniques that apply to the local monarch population.

Action 1-1.1. Conduct a public workshop to inform the community regarding the content and implementation of this MBHMP.

Action 1-1.2. Conduct environmental review of this MBHMP, including a public hearing.

Action 1-1.3. Prepare any necessary revisions to this MBHMP to resolve any issues identified during public review.

Action 1-1.4. Submit this MBHMP to the Goleta City Council for review and discussion, followed by adoption and implementation.

Policy 1-2. During implementation of the programs, goals, policies, and actions described in this MBHMP, and during the planning and implementation of other projects that may affect monarch butterfly habitat within the Ellwood Mesa Open Space, protection of the environment and specifically of monarch butterfly habitat shall be given the utmost consideration.

Action 1-2.1. Whenever vegetation removal, ground disturbance, construction, or other activities with the potential to significantly disrupt habitat values are proposed within the MBHMP coverage area by the City or any other agency or utility, environmental protection measures shall be implemented. These measures shall be determined in coordination with a qualified biologist, and ~~should normally~~ shall include at a minimum pre-activity surveys for nesting birds or other wildlife, pre-activity surveys for monarch butterfly aggregations, presence of an environmental monitor during construction, and other protections, as deemed appropriate. The City will monitor these activities to ensure that environmental protection measures are used and that activities are limited to those permitted.

Policy 1-3. Because many of the MBHMP actions are related to trail improvements, tree work, and related project implementation monitoring and reporting, the City's Public Works Department shall oversee the implementation of this MBHMP. Public Works personnel overseeing implementation will have specific knowledge and experience to properly follow directives of this MBHMP.

Action 1-3.1. The City's Public Works Department, Neighborhood Services and Public Safety Department, and Planning and Environmental Review Department will coordinate regularly regarding MBHMP implementation.

Policy 1-4. The MBHMP is an overarching, long-term conservation strategy, setting forth the broad objectives, desired outcomes, and management policies for the Ellwood Mesa monarch butterfly habitat. Periodic Implementation Plans shall identify and describe short-term actions needed to further the goals and objectives of the MBHMP, taking into consideration current conditions and funding levels at the time each Implementation Plan is prepared.

Action 1-4.1. On an annual basis, or as warranted based on habitat conditions as determined by the City's Public Works Department, prepare an Implementation Plan identifying the actions planned to implement the MBHMP's programs, goals, policies, and actions during the coming year.

Action 1-4.2. The City's Public Works Department ~~staff~~ shall present each annual Implementation Plan at a public hearing for stakeholder input and City Council approval.

Program Status: This MBHMP has been completed and is in the process of undergoing environmental review.

Program Needs: A public workshop, MBHMP review and revision as needed, and a public hearing—followed by adoption by City Council—are to be achieved.

Program Contact: Public Works Department

2. Fiscal Program

Overview: Successful implementation of this MBHMP and related conservation of the Ellwood Mesa Open Space depend in part on the ability to provide funding for the various programs contained in this MBHMP. Funding will come from a variety of sources as identified herein.

Goal 2. To provide short-term (annual), long-term (endowment), and special project (grant) funding for the implementation of this MBHMP.

Policy 2-1. The City shall consider providing annual funding to support MBHMP implementation.

Action 2-1.1. Consider appropriating General Fund, Special Revenue Fund, or Grant Fund monies, as available, during the bi-annual and mid-cycle budget processes.

Action 2-1.2. Consider including the implementation of MBHMP as a project sheet in the Capital Improvement Program annual budget.

Action 2-1.3. Develop an annual needs list from which the annual operating budget can be determined. This list should be included in the annual Implementation Plan (see Policy 1-3).

Policy 2-2. The City shall manage and use the City's Ellwood Mesa Butterfly Fund (Butterfly Fund) (226-5-9800-706) to pay for the implementation of the MBHMP and special projects consistent with the requirements of the fund. The Butterfly Fund shall be supplemented by grant funds and compensatory mitigation fees, as available.

Action 2-2.1. Manage the Butterfly Fund such that the fund may serve as an implementation funding source. Continue to identify grant funds to supplement the Butterfly Fund. Accept donations specific to the Butterfly Fund.

Action 2-2.2. Allow payments of compensatory mitigation fees into the Butterfly Fund, as deemed appropriate during CEQA analysis for projects with limited impacts on monarch butterfly habitat.

Program Status: The City provides annual funds in support of planning initiatives and general management needs at the Ellwood Mesa Open Space. With adoption of this MBHMP, funds can be

earmarked annually for implementation of programs and specific actions within this MBHMP. Furthermore, grants and other fundraising opportunities will exist for which City funds can be used as a local match to new funds raised from external sources. In the near term, the $3.9 million allocated in the State Budget will provide a vital funding source.

Program Needs: Adoption of this MBHMP so the Fiscal Program can be implemented.

Program Contact: Public Works Department

3. Interagency Cooperative Program

Overview: In today's complex regulatory environment, important sites for natural resource conservation can be subject to conflicting regulatory goals at the federal, state, county, and municipal levels. Management of threatened or endangered species that may occur in the future—and rare species and sensitive habitats at Ellwood Mesa—require careful coordination among regulatory partners so that conflicts are minimized.

Goal 3. To develop cooperative relationships with federal, state, county, and municipal agencies toward the implementation of integrated management practices favorable to the conservation of the monarch butterfly habitats at Ellwood Mesa Open Space.

Policy 3-1. The City shall pursue cooperative relationships with other agencies regarding regulatory goals and policies that the partners have in common concerning the Ellwood Mesa Open Space, in particular, goals and policies that have an impact on the management of the monarch butterfly aggregation sites.

Action 3-1.1. As appropriate and productive, pursue cooperative relationships with federal agencies such as the USFWS and the U.S. Army Corps of Engineers to obtain potential permits, identify funding opportunities, and identify/pursue other potentially shared interests regarding the natural resources at Ellwood Mesa, with a focus on sustaining monarch butterfly aggregation sites.

Action 3-1.2. As appropriate and productive, pursue cooperative relationships with state entities such as the CDFW, Regional Water Quality Control Board (RWQCB), UCSB, and California Coastal Commission (CCC) to obtain potential permits, identify funding opportunities, and identify/pursue other potentially shared interests regarding the natural resources at Ellwood Mesa, with a focus on sustaining monarch butterfly aggregation sites.

Action 3-1.3. As appropriate and productive, pursue cooperative relationships with Santa Barbara County departments (such as Agricultural Commissioner, Fire, Parks, Planning and Development, Flood Control, and Public Works) to obtain potential permits, identify funding opportunities, solve problems, and identify/pursue other potentially shared interests regarding the natural resources at Ellwood Mesa and adjacent properties, with a focus on sustaining monarch butterfly aggregation sites.

Program Status: City staff regularly coordinates with the County of Santa Barbara and UCSB. Additionally, City staff has formed a functioning interdepartmental working relationship among the Public Works Department, Neighborhood Services and Public Safety Department, and Planning and Environmental Review Department regarding the management of Ellwood Mesa. Many additional productive relationships can be pursued related to the conservation of monarch and other butterflies.

Program Needs: Adoption of this MBHMP and implementation of its programs.

Program Contacts: Public Works Department, Neighborhood Services and Public Safety Department, and Planning and Environmental Review Department

4. Community Wildfire Protection Program

Overview: One of the most important efforts regarding coordination of potentially competing management goals is the identification and resolution of conflicts between the actions to protect the adjacent communities from the threat of wildfires while also providing protection of the habitats for seasonal aggregation of monarch butterflies at the Ellwood Mesa Open Space. The groves and windrows, composed primarily of blue gum eucalyptus (*Eucalyptus globulus*), are fire-prone and can present a threat to residential communities adjacent to the butterfly habitats. The CWPP was produced in coordination with this MBHMP to provide management practices compatible with monarch butterfly aggregation site protection. The City's adopted CWPP provides important context for the management of these resources.

Ellwood North, Main, and West sites are the aggregation locations within the groves on Ellwood Mesa that are directly adjacent to residences along eucalyptus grove boundaries (Figure 2). The Sandpiper site is not directly adjacent to structures, but it is adjacent to the Sandpiper Golf Course (Figure 2). In habitat areas that are not adjacent to structures, fuel treatments consist of mowing along the outside edge of the grove.

The Monarch Butterfly Aggregation Area Treatment Strategy section of the CWPP states that fuel treatments in areas near human developments are critical measures in the wildfire protection strategy for both residences and butterfly aggregations and habitat. Trees along grove edges provide wind and weather protection for aggregation sites. Therefore, it is important to maintain adequate tree density inside these edges (The Xerces Society 2017). Larger trees are not the primary fuel of concern in the spread of wildfire; rather, the greater hazard and threat are understory vegetation, dead/downed trees, and fuels that could create fire ladders. The CWPP describes the prescription guidance for butterfly aggregation areas adjacent to structures and outlines approved actions to be taken within 100 ft. of structures to reduce the ignitability of those structures. Figure 3 shows the CWPP fuel reduction zones within the MBHMP area.

In butterfly aggregation areas within 100 ft. of homes, the fuel treatment strategy prescribed by the CWPP includes removal of understory, ladder fuel, and dead/downed fuel. Careful thinning of smaller or unhealthy trees within 30 feet of the grove edge is recommended while considering the wind buffering needs of the aggregation site. Fuel reduction implementation and subsequent monitoring should involve input by City-approved monarch butterfly and wildfire professionals.

Goal 4. To provide management practices within the eucalyptus groves and windrows that support healthy monarch butterfly habitat and are compatible with the City's CWPP.

Policy 4-1. The goals, policies, and actions of this MBHMP shall be consistent with the intent of the CWPP to reduce the ignitability of homes and structures.



Figure 3. CWPP-related fuel reduction zones within the MBHMP area

Action 4-1.1. Support implementation of Goleta's CWPP in the 100-ft. buffer from homes and structures as the 100 ft. extends into the Ellwood Mesa eucalyptus groves with actions outlined in below in Table 1 (as seen in Table 14 of the CWPP).

Table 1. CWPP Prescription Guidance for Butterfly Aggregation Areas Adjacent to Structures

Location	Primary Defense Zone (A)*** (0 – 30')	Fuel Reduction Zone (B*** (30' – 100')
Fuel Type	Based on Defensible Space PRC – 4291 and Firefighter Safety	
Grass/ Forbs	Reduce fuel depth to 4 inches; methods include mowing, masticating, weed-whacking, biological browsing	Same treatment as (A); longer grass in isolated open areas is acceptable.
Surface dead/ down material	Clear dead/down flammable materials; methods include raking, hand-piling/ removal, masticating chipping/ dispersal on site	Reduce dead/down flammable material to < 3" depth; methods same as (A).
Brush/ Shrub fuel	Remove to a spacing (between edges of brush) generally 2x brush height on <20% slopes; methods include masticating or hand-cutting, biological browsing	Same Treatment as (A); a pocket or clump of brush can be treated as one large shrub in more open site conditions.
Trees Overstory without brush understory	Trim or thin only trees that do not provide protection to monarch butterfly aggregation sites* Thin smaller or unhealthy trees at 10 – 20 ft crown spacing (as determined by slope, tree size and type); Leave larger trees unless toppling hazard.** Reduce ladder fuels by pruning lower branches 6-15 ft up, or lower 1/3 of tree height on trees smaller than 18 ft.	Trim or thin only trees that do not provide protection to monarch butterfly aggregation sites* Thin smaller or unhealthy trees at approximately 10 ft crown spacing (as determined by slope, tree size and type);. Leave larger trees unless toppling hazard.** Reduce ladder fuels by pruning lower branches approximately 6 ft up, or lower 1/3 of tree height on trees smaller than 18 ft.

Location	Primary Defense Zone (A)*** (0 – 30')	Fuel Reduction Zone (B*** (30' – 100')
Fuel Type	Based on Defensible Space PRC – 4291 and Firefighter Safety	
Trees Overstory with brush understory	Trim or thin only vegetation that does not provide protection to monarch butterfly aggregation sites* Thin small or unhealthy trees at 10-20 ft crown spacing (based on slope, tree size and type). Leave larger trees at 10 ft. crown spacing unless toppling hazard.**(Reduce ladder fuels by pruning lower branches 6-15 ft up, or lower 1/3 of tree height on smaller trees In understory: remove brush ladder fuel. Methods include masticating or hand-cutting.	Trim or thin only vegetation that does not provide protection to monarch butterfly aggregation sites* Thin small or unhealthy trees to approximately 10 ft. crown spacing. Leave larger trees unless toppling hazard.** Reduce ladder fuels by pruning lower branches approximately 6 ft up, or lower 1/3 of tree height on smaller trees. In understory remove brush ladder fuel. In non-canopied areas, non-continuous patches of shrubs or small trees in openings is acceptable. Methods include masticating or hand-cutting.

*As determined by the Goleta City Project Manager overseeing mitigation work in consultation with a City-approved monarch butterfly specialist and a City-approved wildland fire specialist.
**As determined by the Goleta City Project Manager and Goleta City arborist.
***For further information specific to homeowner/structure mitigation measures see CWPP Section 6.2.1.

Action 4-1.2. Support implementation of Goleta's CWPP, specifically in regard to guidelines that are not in potential conflict with the management of the groves that support monarch butterfly aggregation sites, as noted below.

Action 4-1.3. Maintain and revegetate moderate cover of understory in and around aggregation sites with fire-resistant, native plant species (The Xerces Society 2017) (Appendix 3).

Action 4-1.4. Conduct all wildfire protection work within 300 feet of butterfly aggregations areas between April 1 and September 15, outside of monarch butterfly overwintering season.

Action 4-1.5. Coordinate with City-approved butterfly and wildland fire experts during planning and implementation of any fuel treatments since conditions within groves can change and aggregation locations may shift.

Action 4-1.6. Install a large, bilingual "NO PARKING-FIRE LANE" sign at Santa Barbara Shores access gate.

Policy 4-2. Trees in the groves containing monarch butterfly aggregation sites shall be managed, as feasible, to ensure their health and longevity in the context of a high fire hazard environment.

Action 4-2.1. Implement Program 12, Tree Management Program, to reduce fire hazard, improve public safety, and eliminate trees that are threatening the sustainability of the aggregation sites, including dead, diseased, and dying trees.



Photo 2. Evidence of Wildfire (Charred Trunks) at Main Grove – East, Ellwood Mesa Open Space

Program Status: The CWPP was adopted with the passage of Resolution No. 12-21 by the Goleta City Council on March 20, 2012. ~~The Ellwood Mesa Implementation Plan is in environmental review.~~

Program Needs: Adoption and implementation of CWPP and the MBHMP will result in a reduction of wildfire hazards associated with eucalyptus groves.

Program Contact: Public Works Department

5. Trail Management Program

Overview: Public access trails are located through or adjacent to most of the monarch butterfly aggregation sites on Ellwood Mesa. These localized trails link together a series of regional trails, adjacent residential neighborhoods, and other preserves, such as the Coronado Butterfly Preserve managed by the Santa Barbara Land Trust and open space lands managed by the University of California system. Public access, including organized field trips to see the seasonal aggregations of monarch butterflies, is an important part of the Ellwood Mesa experience. However, repeated and increasing access along the semi-formal trails can result in negative impacts on the habitats and overall site aesthetics. Additionally, the trees constituting the butterfly habitat do occasionally die, fall, and shed limbs, creating hazardous conditions for recreationalists at certain locations.

Goal 5. To develop and maintain public access trails that provide a safe and meaningful experience for visitors while also limiting impacts on habitats and wildlife, in particular, monarch butterflies and their seasonal aggregation sites.

Policy 5-1. The City shall maintain existing public access trails that provide a safe experience for visitors to the eucalyptus groves supporting seasonal monarch butterfly aggregation sites.

Action 5-1.1. Maintain existing public access trails through the eucalyptus groves supporting monarch butterfly aggregation sites by reducing threats of trips, slips, and falls. May use Trails Council and CCC to help with maintenance.

Action 5-1.2. Implement Program 12, Tree Management Program, to reduce the threats from falling tree limbs and trunks.

Action 5-1.3. Repair damage to trial boundary ropes and posts, as needed.

Action 5-1.4. Prevent damage to seasonal monarch habitat by installing additional trail boundary posts, ropes, and signs, as necessary, consistent with those at the Ellwood Main monarch aggregation area.

Action 5-1.5. Use wood chips on trails to reduce soil compaction and decrease erosion during wet months.

Action 5-1.6. Retain and maintain Ellwood Main visitor viewing area boundary signs and rails.

Action 5-1.7. Review locations of trail and viewing area delineations and adjust if needed to protect trees or butterflies, annually.

Action 5-1.8. Review trail conditions on an annual basis and provide recommendations on improvements and modifications regarding human safety, trail maintenance, and ecosystem health, including conservation of monarch butterfly habitat in relationship to location,

condition, use of trails, and number of visitors. Include recommendations for any tree trimming, removal recommendations, or other tree safety issues in the annual Implementation Plan.

Action 5-1.9. Long-term closure of official trails is undesirable and should not be used as a management approach. It is preferable to remedy trail hazards promptly, or to allow trails to remain open with appropriate signage alerting users to the risks present.

Policy 5-2. Maintain and improve existing links between trails associated with eucalyptus groves that support monarch butterfly aggregation sites at Ellwood Mesa with the adjacent Coronado Butterfly Preserve.

Action 5-2.1. Coordinate trail improvement activities with the Santa Barbara Land Trust and UCSB staff to ensure that improvements are compatible.

Action 5-2.2. Coordinate trail improvements with proposals for the Coastal and Juan Bautista De Anza trails that traverse Ellwood Mesa, which also link to trails within the eucalyptus groves that support monarch butterfly aggregation sites, to ensure protection measures are addressed for the aggregation sites.

Program Status: Public access trails already exist within the majority of the aggregation sites, but human safety issues exist because of the poor condition of many eucalyptus trees along the trails and eroded trail conditions. Impacts on eucalyptus groves supporting monarch butterfly aggregation sites also exist as a result of public access.

Program Needs: Dead and dying trees along trails and viewing areas present a public safety risk and risk to habitat stability. The Implementation Plan should detail work to be accomplished on an annual basis to maintain access and protect the public and sensitive habitat. Eroded trail conditions and overhanging trees can be public safety issues as well as tree health issues, necessitating trail improvements.

Program Contact: Public Works Department

6. Waste Management Program

Overview: Although the City's Public Works Department staff conducts inspections and removes easily visible waste and trash, unauthorized off-trail use, homeless encampments, and related trash dumping periodically occur in the Ellwood Mesa's eucalyptus groves. The City's butterfly docents also remove trash and alert the Public Works Department staff when there are new accumulations of trash and/or other debris that are too large or abundant for hand removal.

Goal 6. To maintain a waste-, trash-, and debris-free butterfly habitat management area.

Policy 6-1. The City shall collect, remove, and appropriately dispose of all waste, trash, and debris that accumulate in habitat on Ellwood Mesa.

Action 6-1.1. Continue to remove existing accumulations of waste, trash, and debris from monarch butterfly habitat and dispose of them in an appropriate manner. Coordinate with Sheriff's Office for removal of homeless encampments, if necessary.

Policy 6-2. The City shall inform visitors of the monarch butterfly habitat of rules relating to trash and debris policies associated with monarch butterfly habitat.

Action 6-2.1. Post signs at appropriate locations stating open space user rules; for example, "Please take out your trash" and, "Day Use Only – Camping Prohibited."

Action 6-2.2. Educate the public through seasonal, on-site presence by the City's butterfly docents about the importance of maintaining the groves free of trash.

Action 6-2.3. Place trash cans in the parking lot. Inspect annually and replace as needed.

Program Status: Despite trash removal attempts by Public Works Department staff and the City's butterfly docents, various sites throughout the monarch butterfly habitat at Ellwood Mesa accumulate trash and other debris from human activity.

Program Needs: Trash and debris should be removed, where feasible, from the Ellwood Mesa habitat that support monarch butterfly aggregation sites.

Program Contact: Public Works Department, Neighborhood Services and Public Safety Department

7. Aesthetic Resources Management Program

Overview: Portions of Ellwood Mesa eucalyptus groves suffer from grove senescence, drought, pests, disease, or lack of formal management efforts that maintain consistent aesthetic values. Fencing and signs are irregularly installed and inconsistently maintained. They also lack a consistent theme. This MBHMP would provide a consistent management structure.

Goal 7. To integrate this MBHMP's programs into an effort to improve the quality of aesthetic resources of the Ellwood Mesa, in particular, the eucalyptus groves and windrows supporting monarch butterfly aggregation sites.

Policy 7.1. The City shall provide stewardship and management oversight of the eucalyptus groves, in particular, those areas supporting monarch butterfly aggregation sites.

Action 7-1.1. Adopt and implement this MBHMP, including its 22 management programs.

Action 7-1.2. Provide integration of program goals, policies, and actions to improve the overall aesthetics of the various groves, including installation of a consistently designed

interpretive program and strategically placed fencing, as more specifically outlined in Program 18, Interpretive Program.

Policy 7.2. Signs, fencing, and restoration efforts associated with monarch butterfly habitat on Ellwood Mesa shall be aesthetically compatible with natural conditions.

Action 7-2.1. Review signage and fencing design for compatibility with the Ellwood Mesa natural areas.

Action 7-2.2. Review restoration plantings and activities for appropriate aesthetic compatibility.

Program Status: Adoption and implementation of this MBHMP will result in a more sustainable and visually pleasant user experience because of the improved aesthetic value of the Ellwood Mesa eucalyptus groves and monarch butterfly aggregation sites.

Program Needs: Adopt and implement this MBHMP.

Program Contact: Public Works Department

8. MBHMP Review, Update, and Amendment Program

Overview: Reviewing and updating key planning documents would ensure that the management goals and actions are working as intended. Updating and amending programs, when needed, would ensure that the planning document is responsive to the changing needs of the community and the resource.

Goal 8. To maintain the relevance of this MBHMP with periodic reviews, updates, and amendments.

Policy 8-1. The City shall review this MBHMP as the need for updates and amendments arises (e.g., changes in physical conditions, regulations, or expansion of habitat management knowledge or strategies) or at least every 5 years.

Action 8-1.1. Conduct internal and public review of this MBHMP, as conditions warrant.

Action 8-1.2. Update information in this MBHMP, as conditions warrant.

Action 8-1.3. Amend programs, goals, polices, and actions in this MBHMP to reflect the results of the review and update process.

Action 8-1.4. Seek public input on amendments to programs, goals, polices, and actions in this MBHMP.

Action 8-1.5. Conduct environmental review, if necessary (new or modified policies and actions pose new impacts).

Action 8-1.6. Obtain approval by the Goleta City Council and adopt amended MBHMP.

Program Status: Adoption of this MBHMP by the City will provide the mechanism for review, update, and amendment.

Program Needs: Commitment to update this MBHMP to ensure that it is meeting the demands of the existing conditions.

Program Contacts: Planning and Environmental Review Department and Public Works Department

9. Catastrophic Event Response Program

Overview: The eucalyptus groves at Ellwood Mesa are at risk of catastrophic environmental events. For example, trees falling during powerful storms could cause collapse of additional trees, excessive fuel loads can spread wildfires, and infestations of insect pests can weaken or kill trees. Because such potential catastrophic events are likely to occur within the monarch butterfly aggregation sites, Program 9, Catastrophic Event Response Program, would put in place a preliminary plan of action to address the consequences of loss of trees or entire groves containing monarch butterfly aggregation sites.

For the purpose of this MBHMP, a catastrophic environmental event is defined as an event causing great ecological distress and damage, either sudden or gradual, across a significant portion of the monarch butterfly habitat within the Ellwood Mesa plan area. This is distinct from an emergency, which may involve emergency responders such as the fire department and would involve immediate actions under their direction to protect life and property. A qualifying catastrophic event could negatively affect a large portion of the eucalyptus groves within the Ellwood Mesa, or could cause substantial damage to single monarch butterfly overwintering site.

The response actions for catastrophic events would primarily involve restoration activities, would not necessarily be funded in the annual budget for this MBHMP and would likely require supplemental funding with approval from the City Council. Funding approved by the City Council should include a finding that the condition is a qualifying catastrophic event. If such a finding is made, funding received through the State Budget or other sources may be also used to address catastrophic events.

As of this writing, the 5-year drought in Goleta from 2012 to 2016 has created dire conditions for the eucalyptus trees at Ellwood Mesa (County of Santa Barbara 2018). Arborists estimate that over 1,200 trees are dead or dying due to drought, drought stress, and infestation by pests across the Ellwood Mesa. The monarch overwintering sites are suffering from the die-back of trees with the loss of canopy and wind protection and loss of roosting branches. The last similar 5-year drought on record for the Goleta area was in 1947–1951 and was not as severe, with 58.05 consecutive rainfall inches, compared with 50.83 inches during the 2012–2016 drought years (County of Santa Barbara

2018). Timing of rainfall since 2012 has also been more concentrated than in prior years, with the annual rainfall occurring in a small number of intense storm events rather than a larger number of small or gentle events. This concentration has come with an increased rainfall intensity, which leads to increased runoff, excess erosion and sediment transport, and decreased groundwater recharge. The ultimate result has been less available water for uptake by trees.

The 5-year drought and the death of over 1,200 trees may qualify as a catastrophic event, if so determined by the City Council.

Goal 9. To prepare for possible catastrophic environmental events within the monarch butterfly aggregation sites by adopting a set of actions that potentially minimize the impacts and plan for a response should such events affect the groves in which aggregation sites are located.

Policy 9-1. The City shall adopt a set of protocols that could minimize the impacts from potential catastrophic environmental events.

Action 9-1.1. Implement Program 12, Tree Management Program, to reduce potential impacts on eucalyptus groves that support monarch butterfly aggregation sites.

Action 9-1.2. Implement Program 4, Community Wildfire Protection Program, to reduce potential impacts on monarch butterfly aggregation sites from wildfire.

Action 9-1.3. Implement Program 13, Integrated Pest Management Program, to reduce the potential impacts from pest infestations.

Policy 9-2. The City shall assess the damage of catastrophic events as they occur and respond with corrective action to restore damaged monarch butterfly habitat.

Action 9-2.1. Measure the extent and assess the magnitude of the damage to the monarch butterfly overwintering habitat.

Action 9-2.2. Design and implement a response strategy with actions to correct and restore the habitat after the catastrophic event and include them in the annual Implementation Plan (Policy 1-3), if practical. When feasible, employ phased approaches with consistent monitoring to evaluate success or need for changes in strategy or actions. Assign priorities, including sources of materials, constraints, and methods for debris management.

Steps for Response Strategy:

1. Define the extent of the damage to the monarch butterfly habitat within the plan area.
2. Divide affected area into sections for a phased approach, based on level of damage and importance of overwintering site compared to other areas.
3. Assign priorities to the divided sections of the damaged area.

4. Implement guidance from Programs 4, 12, and 13 for specifics in those areas.

Example Response Strategy for a catastrophic event that causes the die-back of 25% of the trees in the MBHMP area. The catastrophic event for this example could be fire, drought, pest, disease, wind storm, etc.

1. Consider whether the catastrophic event presents an imminent danger to the public, and install warning signage and/or closures as appropriate.
2. Assess and analyze the extent of the dead/dying trees in the forest at Ellwood Mesa in relation to the monarch butterfly aggregation areas.
3. Establish a phased approach for restoration activities, starting with the most affected areas. Tag and map the trees that are dead, dying, diseased, burnt, hazardous, or otherwise affected by the catastrophic event. Confer with arborists, biologists, and/or other relevant specialist to select trees for removal to benefit the forest on a whole and facilitate restoration. Remove selected trees in the first phase area. The removed trees may be disposed of off=site or chipped for use on site as ground cover. Install new trees and native understory species with irrigation.
4. Monitor the success of the plantings and irrigation over a set time (e.g., 1–2 years). Replace plantings, as needed.
5. Adjust restoration methods if necessary and implement phased approach at the next priority phase area for restoration.
6. Repeat steps 2 through 5 until every area has been attended to and restored.
7. Continue to monitor for the presence of monarch butterflies during the aggregation season and other wildlife.

Action 9-2.3. Request City Council approval for supplemental funding, with a finding that the condition is a catastrophic event. Use funding received from the State Budget, apply for grants, and/or accept private donations for the dedicated mission of monarch butterfly overwintering habitat restoration.

Program Status: Tree condition surveys that have been completed for Ellwood Mesa eucalyptus trees have identified the number of dead trees. Cause of tree mortality has been identified as drought and pest infestations. Ellwood Main and Ellwood North monarch butterfly aggregation sites contain many dead trees. In-depth planning for management and recovery of a living eucalyptus forest will be detailed in an annual Implementation Plan. Similar events have occurred in the past and are likely to be part of the future.

Program Needs: Development of an Implementation Plan addressing the significant die-off of eucalyptus trees on Ellwood Mesa is underway. The City should have an ongoing response program in place so that careful and measured decisions following a catastrophic event can be implemented.

Program Contact: Public Works Department

B. NATURAL RESOURCES MANAGEMENT PROGRAMS

Seven natural resources management programs are provided that articulate the goals, policies, and actions necessary to maintain and improve the many important natural resources, including biological diversity and ecosystem functions, associated with the Ellwood Mesa eucalyptus groves and the monarch butterfly aggregation sites they support.

10. Monarch Butterfly Management Program

Overview: The City's General Plan includes a policy specific to the protection of monarch butterfly habitat areas, including the habitat on Ellwood Mesa. The City's Ellwood Mesa Open Space Plan further specifies the need to protect and maintain the eucalyptus habitat to be self-sustaining and identifies the need for managed public access, scientifically sound existing conditions studies, phased habitat improvements, and adaptive management. The primary focus of the Habitat Management Plan described below is to implement the directives of the General Plan and Ellwood Mesa Open Space Plan.

Goal 10. To ensure the ongoing use of Ellwood Mesa by the monarch butterfly.

Policy 10-1. The City shall implement management strategies that facilitate the use of Ellwood Mesa by monarch butterflies.

Action 10-1.1. Implement Program 12, Tree Management Program, to help facilitate the conservation of the monarch butterfly aggregation sites.

Action 10-1.2. Implement Program 20, Biological Monitoring Program, and Program 21, Monarch Research Program, to expand the body of knowledge and further the understanding of the monarch butterflies' use of the resources at Ellwood Mesa.

Policy 10-2. Preservation of aggregation sites on Ellwood Mesa shall be the focus of management activities, as feasible, and in coordination with Program 9, Catastrophic Event Response Program.

Action 10-2.1. Should one or more catastrophic events result in impacts on the sustainability of monarch butterfly aggregation sites, consider alternative management and recovery strategies that incorporate goals for sustaining aggregation sites at Ellwood Mesa.

Policy 10-3. Ecosystem functions proposed for habitat restoration projects at Ellwood Mesa shall consider inclusion of native plant species.

Action 10-3.1. Implement Program 14, Habitat Enhancement and Restoration Program, as feasible, to improve conditions for native plants and animals and the ecosystem functions

they provide in and adjacent to the eucalyptus groves containing monarch butterfly aggregation sites.

Policy 10-4. To avoid impacts on monarch butterflies while they are present at the Ellwood aggregation sites, no maintenance or restoration work shall be conducted in the aggregation sites from October 1 through March 31 of each year, unless authorized by a qualified biologist.

Action 10-4.1. Unless authorized by a qualified biologist, conduct all site maintenance, tree trimming and removal, habitat restoration, exotic plant removal, and other potentially invasive activities between April 1 and September 30 of each year, when there would not likely be direct impacts on monarch butterflies.

Program Status: Monarch butterflies are important to the ecosystem of Ellwood Mesa and to the City's sense of community. Development and implementation of this MBHMP is an important step in the active conservation of the monarch butterflies and their habitat at Ellwood Mesa.

Program Needs: New information about monarch butterflies regularly emerges from the scientific community, and the Ellwood Main site is an important site for the sustainability of monarchs. The more monarch butterfly biology is understood, the better Ellwood Mesa can be managed.

Program Contact: Public Works Department

11. Wildlife Habitat Management Program

Overview: Eucalyptus groves supporting seasonal aggregation sites for monarch butterflies also provide habitat for other wildlife species. Examples include or have included perches for red-shouldered hawks, roosting sites for turkey vultures, and nesting sites for white-tailed kites, Cooper's hawks, great horned owls, and acorn woodpeckers. This MBHMP identifies management strategies for conserving habitat for monarch butterflies that are intended to be consistent, where feasible, with management of habitat for other wildlife species.

Goal 11. Manage eucalyptus groves at Ellwood Mesa for monarch butterflies in a manner consistent with ecosystem functions for other wildlife species that use the groves as habitat.

Policy 11-1. The eucalyptus groves at Ellwood Mesa that support monarch butterfly aggregation sites shall be managed in a manner consistent with ecosystem functions supporting other wildlife species, where feasible.

Action 11-1.1. All personnel associated with the implementation of this MBHMP will receive educational information regarding the presence of monarch butterfly and other native wildlife species and the need to protect all native wildlife species.

Action 11-1.2. Preserve some trees with cavities to provide opportunities for cavity-nesting birds, such as acorn woodpeckers.

Action 11-1.3. Avoid removal of or disturbance to trees or other woody vegetation during nesting bird season (March 15 to August 15), when feasible. If not feasible, a biological monitor will survey for nesting birds in the area of proposed vegetation removal and ensure no active nests are present prior to removal or disturbance.

Action 11-1.4. Limit vegetation removal and ground disturbance activities to the dry season. Avoid areas with open water in Devereux Creek and tributaries.

Policy 11-2. Program 14, Habitat Enhancement and Restoration Program, shall complement the Wildlife Habitat Management Program.

Action 11-2.1. Include native plant species that are important for wildlife habitat and food in enhancement and restoration projects (Appendix 3).

Action 11-2.2. Require a Planting Plan for any proposed enhancement plantings near the groves containing aggregation sites.

Action 11-2.3. Consider increasing mid-canopy and low-stature or groundcover native plant species to enhance wildlife habitat complexity and increase potential use of eucalyptus groves by a variety of wildlife species.

Action 11-2.4. Implement restoration for the Devereux Creek riparian corridor to improve functions for wildlife, consistent with the goals of this MBHMP for monarch butterflies.

Program Status: A variety of management actions have occurred in the Ellwood Mesa eucalyptus groves, including monitoring the butterfly populations, evaluating the health of the eucalyptus grove and individual trees, and educating the public regarding the sensitivity of the aggregation sites. However, a comprehensive approach to managing and educating the public as to the importance of all native wildlife species that inhabit the Ellwood Mesa eucalyptus groves will benefit both the visitors and the natural resources of the open space area.

Program Needs: Adoption and implementation of this MBHMP will include programs to improve the health of the habitats and their ecosystem functions for wildlife species in general, and monarch butterflies in particular.

Program Contact: Public Works Department

12. Tree Management Program

Overview: One of the most important aspects of this MBHMP is the set of management practices that would result in a sustainable eucalyptus forest that supports aggregation sites for monarch butterflies. Health of the individual eucalyptus trees, structure of the aggregation sites, and long-term sustainability of the groves supporting the sites are of primary importance. In response to these management needs, as well as concern for public safety within the groves and concern for wildfire

hazards, City staff continues to work with professional biologists and arborists to develop protocols for managing the eucalyptus groves supporting monarch butterfly aggregation sites. The information obtained during inventories and assessments, and coordination with the development of the CWPP, resulted in the management recommendations as presented in this MBHMP.

Goal 12. To manage the eucalyptus groves within monarch butterfly aggregation sites at Ellwood Mesa in a manner that provides for (1) healthy trees, (2) suitable aggregation site structure, (3) sustainable butterfly aggregation sites, (4) public safety while visitors are on trails within the groves, and (5) sensitivity to wildfire hazards.

Policy 12-1. Eucalyptus trees in the groves within the MBHMP coverage area ~~containing monarch butterfly aggregation sites~~ shall be managed, as feasible, to ensure tree health and longevity.

Action 12-1.1. Include guidance for necessary tree work in the annual Implementation Plan (Action 1-4.1). Tree work will take place in the month of September each year. The Implementation Plan should specify responsible parties, work locations, individual trees addressed, work to be accomplished, restoration measures, and methods and procedures for managing tree health. An annual plan is recommended but may be prepared on an as-needed basis based on conditions and progress of the previous Implementation Plan.

Action 12-1.2. Preliminarily identify potential threats to aggregation sites that may occur over time and develop a framework for mitigating the threats and maintaining/recovering suitable overwintering habitat. Threats may include, but are not limited to, the following:

- Drought
- Pests
- Disease
- Fire
- Flood/erosion
- Vandalism
- Invasion by non-native plants (not including eucalyptus)

These threats, as well as others, may arise and impair the function of Ellwood Mesa as habitat for overwintering monarch butterflies. When threats are encountered, a specific plan of action should be undertaken to address the needs of the situation. However, for planning purposes, the City should be prepared to undertake the response measures outlined in Table 2 below. Although not exhaustive, these measures represent a prudent suite of response tools to address future conditions. Measures listed below may prevent or rectify impacts from multiple types of threats, as the intent of the measures is to restore and encourage healthy habitat.

Table 2. Identified Threats and Potential Response Actions

Potential Actions/Tools for Management	Purpose/Goal/Target	Threat/Cause
Selective removal of standing dead trees	To protect the living trees from being taken out if a dead tree falls, and to provide space for growth of young trees.	Drought, disease, pests, fire
Selective removal of downed trees/debris	To open up space in the grove for younger trees to grow and replace dead trees. To reduce fuel load.	Drought, disease, pests, fire
Watering/irrigation	To prevent trees (established and newly planted) from declining in health because of insufficient water, or attempt to recover drought-stressed trees. Provide water to establish replacement trees. Use of reclaimed water should be explored.	Drought
Planting trees	To correct habitat deficiencies such as: ▪ The overstory has become too sparse. ▪ Wind speeds in the grove are too strong. ▪ A tree died, fell over, or was removed.	Death of one or more trees, insufficient canopy, or aggregation site protection.
Planting understory species	To add or create a diverse understory. To add nectar sources. To create variable edge barrier.	Non-native plants, poor/homogeneous understory
Planting nectar sources within and near groves	To make nectar sources for adult monarchs available near the overwintering sites.	Non-native plants, understory lacking nectar species
Selective pruning	To prune or remove understory plants when they reduce monarch butterfly flight space or aggregation areas. To protect/maintain the open interior of the grove.	Understory becomes too dense
Re-contouring/grading	In the case of a flood, to correct erosion and reshape the drainage channel to protect trees.	Flood/erosion
Installation of erosion control best management practices (BMPs)	To prevent future erosion and direct flows away from erosion-sensitive areas (exposed roots, etc.).	Flood/erosion

Action 12-1.3. Thresholds should be established to direct professional review and potential action to address conditions in the groves. Ultimately, it is envisioned that quantitative thresholds will be established based on the results of monitoring and scientific study within the groves (Programs 20, 21, and 22). However, until adequate reference data are available, action thresholds will be determined qualitatively by the City in consultation with a qualified monarch butterfly biologist.

Factors for Consideration:

- Did a major tree fall down in or adjacent to a known overwintering site?
- Is a butterfly expert recommending that action be taken?
- Has the butterfly overwintering population at a specific site decreased dramatically in a way that does not follow the populations at other sites in the vicinity?
- Is there erosion or threat of exposed roots of trees in or adjacent to a known overwintering site?
- Has the tree canopy decreased noticeably and dramatically?
- Has a certified arborist identified a high-risk tree that could degrade the aggregation site?

Steps for Taking Action:

1. Identify the threat (persistent or temporary, site-specific or large-scale).
2. Consult with a qualified monarch butterfly biologist, guided by the goals for a sustainable overwintering habitat.
3. Develop a plan of action.
    - If the problem is large-scale, a prescribed action may be taken in phases and the effect will be evaluated to assess success before any large-scale implementation of the action.
    - Manipulative experiments may occur in coordination with adaptive management, such as pilot studies, to inform decisions.
4. Obtain approvals. Depending on the plan of action, authorization from the City Council, CCC, and/or resource agencies may be needed. Environmental review may also be required, depending on the scope.
5. Implement the plan of action.
6. Monitor and document results.
    - Areas affected by response actions, especially major ones, should be included in the monitoring program conducted under Program 20, Biological Monitoring Program.

Action 12-1.4. Implement Program 13, Integrated Pest Management Program, to help maintain tree health and control infestation in the eucalyptus groves supporting monarch butterfly aggregation sites.

Action 12-1.5. Cut down or prune trees identified as a threat to butterfly aggregation sites because they may fall and cause injury or collapse on other trees important to sustaining aggregation sites.

Action 12-1.6. Maintain a living forest within the outline of pre-drought forest extent as determined with historic aerial photographs. Restore sections of the forest where dead zones occur due to multiple tree die-offs.

Action 12-1.7. Implement Program 14, Invasive Plant Management Program, particularly regarding non-native vines that could affect the quality of monarch butterfly habitat, following recommendations for eradication consistent with the California Invasive Plant Council (Cal-IPC) and conservation priorities of monarch butterflies and their habitat.

Action 12-1.8. Implement Program 20, Biological Monitoring Program, to provide information regarding management of eucalyptus groves to ensure their health and longevity.

Action 12-1.9. Annually, identify conditions that threaten trees at aggregation sites and include recommended actions in the Implementation Plan to reduce perceived threats.

Action 12-1.10. Plant trees as needed to maintain grove density and improve monarch butterfly habitat. Plant in locations that improve aggregation site conditions as per the best available scientific analysis, and replant areas within historic eucalyptus grove extent where gaps have occurred from drought die-back.

Action 12-1.11 Following evaluation of compatibility with existing habitat and functionality with respect to butterfly habitat, conduct a pilot planting for any eucalyptus species considered for tree restoration that is not present in the MBHMP area as of 2018.

Policy 12-2. Eucalyptus trees in the groves containing monarch butterfly aggregation sites shall be managed, as feasible, to provide sustainable habitat for butterfly aggregation sites.

Action 12-2.1. When considering eucalyptus or other tree replacement actions, consider tree configurations that retain open areas for monarch butterfly patrolling and monarch overwintering preferences.

Action 12-2.2. Investigate potential enhancement to monarch butterfly patrolling habitat by reducing tree tangles and fallen debris.

Action 12-2.3. Remove hazard trees as necessary to protect monarch butterfly cluster locations, as consistent with goals for public safety.

Action 12-2.4. Implement, as feasible, Program 10, Monarch Butterfly Management Program, to facilitate improvements in eucalyptus groves that help sustain aggregation sites.

Action 12-2.5. Protect blue gum saplings as necessary to encourage natural recruitment of trees in the eucalyptus forest.

Policy 12-3. Eucalyptus trees within the groves containing monarch butterfly aggregation sites shall be managed, as feasible and consistent with conservation of monarch habitat, to provide safe conditions for the visiting public.

Action 12-3.1. Prune and remove dead, dying, or particularly vulnerable tree trunks and branches that overhang trails and seating areas, or lay across trails, inside and near monarch butterfly aggregation sites to reduce the threat of injury from falling trunks and branches, debris on trails (trip hazards), or low-hanging material across trails that visitors could bump heads on.

Action 12-3.2. As recommended by the City arborist and detailed in the annual Implementation Plan, conduct work designed to protect and improve the structure of aggregation sites.

Action 12-3.3. As recommended by the City arborist and detailed in the annual Implementation Plan, remove or prune dead standing, dead suspended, dead on the ground, or thick understory trees both to improve grove tree health and monarch butterfly habitat and to correct hazard conditions for human safety along trails and at observation sites.

Action 12-3.4. Consider using downed, dead trees for seating along trails, or to add to slope stability or help control erosion, for preservation rather than removal, as feasible, considering human safety or wildfire threat.

Action 12-3.5. Remove ground debris, such as accumulations of branches and leaves, at trailheads in particular to reduce threat from wildfires, to reduce threat to human safety from obscured views, and to increase aesthetic appeal.

Action 12-3.6. In consultation with the City arborist, conduct an annual review of tree health in April and May at aggregation sites. Develop and implement an annual Implementation Plan to address issues identified during the review, including potential need for tree removal or pruning, treatment of diseases or pests, and other potential recommendations.

Policy 12-4. Eucalyptus trees within the groves containing monarch butterfly aggregation sites shall be managed, as feasible, to provide for low wildfire hazards.

Action 12-4.1. Implement Program 4, Community Wildfire Protection Plan, to provide wildfire protection consistent with the City's adopted CWPP.

Action 12-4.2. Reduce accumulations of dead, dry, and loose organic and other flammable material within eucalyptus groves to decrease potential for ground-level fires becoming canopy fires as a result of ladder effect of fire hazard materials. Sufficient downed wood, debris, and ground cover will be left in place to provide substrate and shelter for monarchs dislodged from clusters.

Action 12-4.3. Remove accumulations of dead plant material along southern grassland margins of eucalyptus groves and at southern trailheads to reduce threat of grassland fires becoming eucalyptus grove fires as a result of fire hazards at the boundary between grasslands and groves via mowing or selective weed-whacking. Herbicides shall not be used.

Action 12-4.4. Replace removed understory plants as recommended by the City monarch butterfly biologist with fire-resistant native shrubs to restore and improve habitat structure for monarch butterflies (Appendix 3).

Action 12-4.5. Coordinate (1) butterfly habitat management, (2) public access and safety needs, (3) fire management requirements, and (4) wildlife habitat restoration proposals to ensure management priorities and implementation of procedures that provide the most compatible result for the conservation of monarch butterflies, while also respecting the goals of the other MBHMP programs, as feasible.

Program Status: Although eucalyptus trees in some groves with monarch butterfly aggregation sites are in good health (e.g., Sandpiper and Ocean Meadows, both of which are more windrow-like than grove-like), others are of average health (Ellwood West), and some are rated poor (Ellwood East, Ellwood North, and the important Ellwood Main). As of July 2017, a significant die-off of trees occurred from drought and pest infestation, resulting in over 1,200 dead trees on Ellwood Mesa.

Program Needs: Quantitative habitat condition standards based on best available science that establishes thresholds for action. With adoption of this MBHMP and implementation of the 22 programs—in particular, Program 12, Tree Management Program—the health of the eucalyptus groves supporting monarch butterfly aggregation sites is anticipated to improve and become a more sustainable resource.

Program Contact: Public Works Department

13. Integrated Pest Management Program

Overview: Eucalyptus trees are subject to a variety of pests and diseases that can injure or kill trees. When trees occur in groves, the spread of pests and disease is facilitated by proximity to infected trees, resulting in the potential of widespread loses. Current and past infestations at Ellwood Mesa of blue gum and river red gum (*Eucalyptus camaldulensis*) include lerp psyllids on leaves, tortoise beetles, longhorned borer beetles, and orange sulfur fungus. Insect pests are often present in equilibrium with their predators and do not need further control. However, new threats to trees on Ellwood Mesa may occur that require pest control measures. Invasive non-native species such as English ivy and cape ivy also can be problematic, smothering entire trees and changing or destroying wildlife habitat (Refer to Program 15, Invasive Plant Management Program). Various approaches to pest management will be necessary to try experimentally to determine which approach works best for each pest without affecting native plant and animal species, including birds, and monarch butterflies and their seasonal aggregation sites.

Goal 13. Control or eradicate, as feasible, plant, animal, fungal, and other pests that would result in detectable impacts on monarch butterflies or degrade monarch butterfly habitat.

Policy 13-1. To maintain current knowledge of pests and diseases, the City shall conduct an annual inventory of organisms negatively affecting trees in the groves at Ellwood Mesa.

Action 13-1.1. Conduct an inventory of pests and diseases throughout the groves and windrows at Ellwood Mesa.

Action 13-1.2. Conduct an inventory of pests and diseases within the monarch butterfly aggregation sites in the Ellwood North, Ellwood West, Ellwood Main, Ellwood East, Sandpiper, and Ocean Meadows groves.

Policy 13-2. The City shall consider using a variety of approaches to pest management to prevent pests and diseases from affecting eucalyptus groves, particularly those supporting seasonal aggregation sites for monarch butterflies.

Action 13-2.1. As feasible, experiment with different integrated pest management (IPM) approaches for different pests and diseases to determine which approach best suits the conditions in eucalyptus groves at Ellwood Mesa.

Action 13-2.2. Implement wise management practices in the eucalyptus groves at Ellwood Mesa that do not facilitate the spread of pests and diseases in groves.

Action 13-2.3. Identify current problems that require immediate treatment and implement appropriate treatment protocols.

Action 13-2.4. Implement a pest and disease monitoring program, as feasible, to determine success of treatments and any new infestations requiring treatment.

Program Status: Currently, no IPM approaches are implemented for eucalyptus trees at Ellwood Mesa. A tree inventory was conducted in 2017 that found over 1,200 dead eucalyptus trees on Ellwood Mesa City property. An Implementation Plan is in preparation to address tree health issues.

Program Needs: Adopt the MBHMP and implement the 22 MBHMP programs—including Program 13, Integrated Pest Management Program—to reduce the threat of impacts on tree health and sustainability and the potential for degradation of habitat supporting monarch butterfly aggregation sites.

Program Contact: Public Works Department

14. Habitat Enhancement and Restoration Program

Overview: This program focuses on the enhancement of the eucalyptus groves from a native plant and wildlife habitat perspective and on the restoration of the Devereux Creek corridor along the

northern margin of Ellwood West, Ellwood Main, and Ellwood East groves. The mid-canopy vegetation and understory of the eucalyptus groves is generally lacking or in some situations is composed of non-native invasive plant species. Enhancement of groves with native plant species would benefit native wildlife. Various native plants are present but scattered within the groves. Most of these plant species have fleshy fruits and are bird-dispersed. Restoration of portions of Devereux Creek associated with eucalyptus groves, as feasible, is consistent with the goal to restore Devereux Creek. This restoration would provide important habitat for native plant and animal species and would potentially improve water quality flowing downstream to Devereux Slough and the Pacific Ocean.

Goal 14. To provide for the enhancement of native plant and animal habitats in the context of preserving the monarch butterfly habitat associated with established eucalyptus groves.

Policy 14-1. Establishment of appropriate native plants—in particular, ground cover, shrub, and mid-canopy species—shall be encouraged in the eucalyptus groves and along the Devereux Creek corridor outside of the eucalyptus groves.

Action 14-1.1. Plant experimental plots of native ground cover species to determine which species may result in sustainable populations.

Action 14-1.2. Focus enhancement efforts on native plants existing in the eucalyptus groves, such as toyon (*Heteromeles arbutifolia*), and native plants with nectar sources for monarchs (Appendix 3).

Action 14-1.3. Coordinate with Program 13, Integrated Pest Management Program, and Program 15, Invasive Exotic Plant Management Program.

Policy 14-2. Areas between eucalyptus groves shall be considered for habitat enhancement and restoration alternatives.

Action 14.2.1. Implement priority native plant restoration activities along Devereux Creek in areas outside of eucalyptus groves.

Action 14-2.2. Eradicate non-native herbaceous cover, seedlings, and saplings (not including eucalyptus saplings) in areas between eucalyptus groves to encourage or actively plant local natives.

Policy 14.3. Restoration of Devereux Creek shall include appropriate actions to improve the habitat structure, ecological functions and processes, and native biodiversity of the existing native riparian areas.

Action 14-3.1. Restoration activities include establishment of a riparian area along the banks of Devereux Creek composed of native riparian tree species.

Action 14-3.2. Ensure that no restoration activities along Devereux Creek shall result in increased flooding.

Action 14-3.3. Coordinate to align efforts with other restoration projects under separate permits or mitigation plans for Devereux Creek.

Policy 14-4. Native plant species are considered to be local genotypes of plants occurring naturally within the Ellwood Mesa/Devereux Creek Ecosystem.

Action 14-4.1. Collect all plant materials for use in restoration projects from existing native plant populations in the Ellwood Mesa/Devereux Creek Ecosystem, where feasible.

Action 14-4.2. Collect plant material from the nearest existing populations for re-introduction of extirpated species.

Action 14-4.3. Obtain native plants for use in restoration from local nurseries or growers within the Santa Barbara area, emphasizing contract-grown material of local genotypes.

Policy 14-5. No enhancement or restoration actions shall result in negative impacts on the quality of the eucalyptus groves that provide monarch butterfly habitat.

Action 14-5.1. Coordinate with Program 10, Monarch Butterfly Management Program; Program 11, Wildlife Habitat Management Program; and Program 12, Tree Management Program.

Policy 14-6. No enhancement or restoration actions shall conflict with the goals and policies of the CWPP.

Action 14-6.1. Coordinate all enhancement and restoration activities with the guidelines and recommendations of the CWPP.

Program Status: An Implementation Plan that describes work activities to occur each year will accompany this MBHMP.

Program Needs: Adoption of this MBHMP and implementation of Program 14, Habitat Enhancement and Restoration Program, and fund-raising necessary to design, permit, implement, and maintain the projects.

Program Contacts: Public Works Department and Planning and Environmental Review Department



Photo 3. Toyon (*Heteromeles arbutifolia*), a Native Shrub or Small Tree in the Ellwood Main Grove

15. Invasive Plant Management Program

Overview: Cal-IPC has established a list of invasive, non-native plant species of concern regarding conservation of California natural heritage (www.cal-ipc.org/ip/inventory/index.php). Invasive non-native plants are defined by Cal-IPC (2006) as "plants that 1) are not native to, yet can spread into, wildland ecosystems, and that also 2) displace native species, hybridize with native species, alter biological communities, or alter ecosystem processes." Non-native invasive plants have been given High, Moderate, or Limited ratings by Cal-IPC, depending on the severity of their potential for resulting in impacts on wildland ecosystems.

The monarch butterfly aggregation sites at Ellwood Mesa are themselves characterized and dominated by non-native and potentially invasive plants species—most importantly blue gum, given a "Moderate" rating, and to a lesser degree river red gum, given a "Limited" rating. However, these stands of introduced trees are designated as an ESHA in the General Plan because of their importance to monarch butterflies as fall and winter aggregation sites. Several other aggressively invasive non-native plant species have prominent visual and habitat impacts within the monarch aggregation sites at Ellwood Mesa. These are mostly vines that climb butterfly habitat trees, and herbaceous ground cover, which potentially endanger the character and sustainability of the

aggregation sites. Examples of these deleterious invasive species at Ellwood Mesa and their ratings are listed below:

- "High" rating:
  - Canary Islands ivy (*Hedera canariensis*)
  - English ivy (*Hedera helix*)
  - Cape ivy (*Delairea odorata*)
  - Victorian box or mock orange (*Pittosporum undulatum*)
- "Moderate" rating:
  - Panic veltgrass (*Ehrharta erecta*)
  - Myoporum (*Myoporum laetum*)
- "Limited" rating:
  - Kikuyu grass (*Pennisetum clandestinum*)
  - New Zealand spinach (*Tetragonia tetragonioides*)

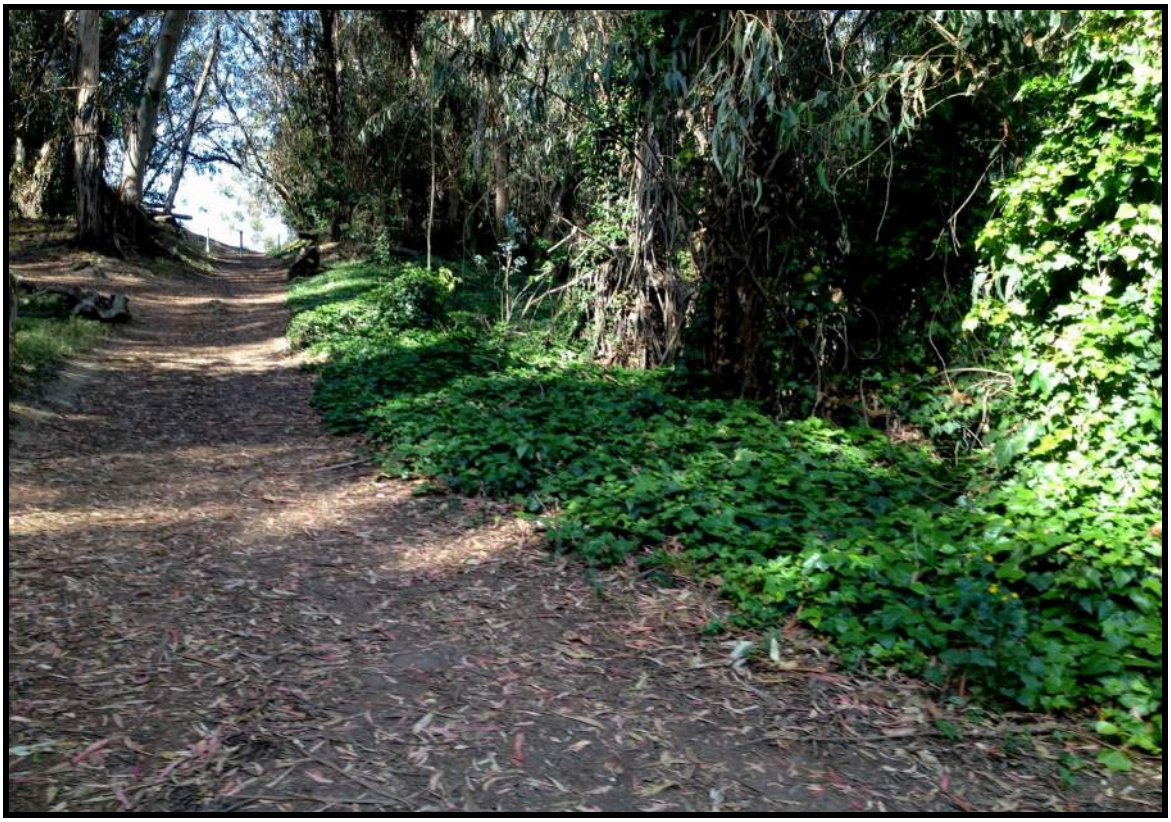


Photo 4. Canary Islands Ivy (*Hedera canariensis*) along Trail and Growing up Trees at Ellwood Main

Goal 15. To eradicate existing stands of invasive non-native species and prevent or control new occurrences of invasive non-native plant species within the monarch butterfly habitat at Ellwood Mesa.

Policy 15-1. The City shall undertake an inventory and generalized mapping program to identify, locate, and prioritize for eradication or control all invasive non-native plant species within the butterfly habitat at Ellwood Mesa.

Action 15-1.1. Identify and map all invasive non-native species identified by Cal-IPC as "High" priority species.

Action 15-1.2. Identify and map all invasive non-native species identified by Cal-IPC as "Moderate" priority species.

Action 15-1.3. Identify all invasive non-native species identified by Cal-IPC as "Limited" or unrated priority species and map any medium to large populations.

Policy 15-2. The City shall control all "High," "Moderate," and "Limited" priority invasive plant species within the monarch butterfly habitat, except those species for which monarch butterflies are dependent, as feasible.

Action 15-2.1. Control all "High" priority invasive non-native invasive plant species.

Action 15-2.2. Control all "Moderate" priority, non-native invasive plant species.

Action 15-2.3. Eradicate or control all medium or large stands of "Limited" or unrated priority non-native invasive plant species.

Policy 15-3. The City shall undertake annual monitoring as feasible to identify and eradicate or control new occurrences of "High" or "Moderate" priority invasive non-native plant species.

Action 15-3.1. Implement monitoring of eradication efforts and potential new occurrences as part of Program 20, Biological Monitoring Program.

Action 15-3.2. Coordinate with other programs in this MBHMP, including Program 14, Habitat Enhancement and Restoration Program.

Program Status: Currently, no non-native invasive plants species control or detection program is in place for the eucalyptus groves at Ellwood Mesa.

Program Needs: Adoption of this MBHMP and implementation of the MBHMP programs, including Program 15, Invasive Plant Management Program.

Program Contacts: Public Works Department and Planning and Environmental Review Department

16. Ecosystem-wide Management Coordination Program

Overview: The eucalyptus groves, including those areas where seasonal monarch butterfly aggregation sites occur, do not exist as island ecosystems but in fact are part of a broader ecosystem of the Ellwood Mesa and Devereux Creek Watershed, including UCSB's North Campus Open Space (Upper Devereux Slough) and Coal Oil Point Reserve. This MBHMP primarily addresses monarch butterfly eucalyptus tree habitat in the Ellwood Mesa Open Space.

Goal 16. To manage the eucalyptus trees supporting seasonal monarch butterfly aggregation sites by coordinating among the 22 programs directed toward the management of monarch butterfly habitat and to consider management of eucalyptus groves in the context of managing the entire Ellwood Mesa Open Space.

Policy 16-1. The City shall manage eucalyptus trees in the context of all eucalyptus habitat supporting monarch butterfly aggregation sites at Ellwood Mesa.

Action 16-1.1. When considering implementation of actions for each program, consider their relationships to other actions in the same program.

Action 16-1.2. When considering implementation of actions for each program, consider their relationships to actions in related programs.

Policy 16-2. The City shall manage eucalyptus trees supporting monarch butterfly aggregation sites in the context of all eucalyptus habitat at Ellwood Mesa.

Action 16-2.1. Through results of Program 20, Biological Monitoring Program, consider potential changes in monarch butterfly use of other aggregation locations at Ellwood Mesa, impacts of pests and diseases throughout the eucalyptus groves, or other relevant factors that can potentially affect monarch butterflies and their habitats at Ellwood Mesa.

Policy 16-3. The City shall manage eucalyptus trees supporting monarch butterfly aggregation sites in the context of all habitats at Ellwood Mesa.

Action 16-3.1. When considering implementation of management actions for eucalyptus trees, consider their relationships to management actions for other habitats and programs for all of Ellwood Mesa.

Program Status: The City regularly coordinates the management of Ellwood Mesa with adjoining public agency land managers, including UCSB and Santa Barbara County. The focus of these management meetings is to ensure that trails are connected, grant applications are coordinated, and general issues such as illegal encampments and police enforcement are discussed and collectively addressed.

Program Needs: Adopt this MBHMP and implement its 22 programs considering the potential interaction of the program actions and results. Examples include eradication of exotic plant species

(Program 15, Invasive Plant Management Program) and removal of trash and debris (Program 6, Waste Management Program), followed by habitat enhancement efforts (Program 14, Habitat Enhancement and Restoration Program) within the affected sites in eucalyptus groves, in particular along affected trails (Program 5, Trail Management Program) with potential for additional erosion.

Program Contacts: Public Works Department and Planning and Environmental Review Department

C. OUTREACH PROGRAMS

Outreach programs are designed to provide information to visitors, educators, and students to help develop a broad appreciation for natural resources and local natural heritage, with a focus on monarch butterflies.

17. Community Advisory and Docent Program

Overview: The residents of Goleta have been actively involved in the protection and acquisition of Ellwood Mesa over many decades, with a focus on the conservation of the monarch butterfly aggregation sites. The long-term sustainability of the eucalyptus groves and the aggregation sites they support will depend in part on the continuing public involvement in the process.

Goal 17. To provide a formal vehicle to involve public participation, the City shall engage with the City's butterfly docents to provide recommendations to the Public Works Department.

Policy 17-1. The City shall engage with the City's butterfly docents to review MBHMP implementation work plans and make recommendations to the Public Works Department.

Action 17-1.1. Identify a point of contact with the City's butterfly docents, referred to the as the Butterfly Docent Coordinator, who will coordinate with and speak on behalf of the docents with the Public Works Department, Planning and Environmental Review Department, and Neighborhood Services and Public Safety Department.

Action 17-1.2. Set up regular meetings between the Butterfly Docent Coordinator and City staff.

Policy 17-2. As needed, the City shall continue to support the City's Butterfly Docent Program, the Butterfly Docent Coordinator, and ongoing training for the docents to ensure that educational opportunities for the public are maintained and to demonstrate the City's stewardship of the eucalyptus groves.

Action 17-2.1. Continue to support the Butterfly Docent Program and the Butterfly Docent Coordinator.

Action 17-2.2. Continue to support and update the City of Goleta's monarch butterfly website at www.goletabutterflygrove.com.

Action 17-2.3. Continue to support development of educational materials to be used by docents during scheduled public tours of the monarch butterfly aggregation sites.

Action 17-2.4. Train docents in the details of this MBHMP.

Action 17-2.5. Expand the pool of trained docents and encourage docent assistance with the implementation of this MBHMP.

Program Status: An active Butterfly Docent Program, including a Butterfly Docent Coordinator, has been in operation since 2007.

Program Needs: With adoption and implementation of this MBHMP, the existing docent program becomes part of the structure of this MBHMP. No formal volunteer program exists to assist in the implementation of this MBHMP.

Program Contacts: Neighborhood Services and Public Safety Department, Public Works Department, and Planning and Environmental Review Department.

18. Interpretive Program

Overview: Although there are a few signs identifying the Ellwood Main grove and several behavioral signs regarding trails, there are no interpretive signs that provide information regarding the biology of monarch butterflies, general aspects of Ellwood Mesa, and the importance of the aggregation sites. There is an interpretive sign program at the nearby Coronado Butterfly Preserve. City butterfly docents at Ellwood Mesa provide an important role, and the City's monarch website has important information and links to the National Geographic monarch web information. However, for the casual visitor without web access and without the presence of a docent, there is no interpretive information to assist in understanding this significant biological phenomenon.

Goal 18. To establish a useful and informative interpretive signage program at Ellwood Mesa monarch butterfly aggregation sites that is environmentally sensitive and creates a minimum of intrusion into the habitats.

Policy 18-1. The City shall design and install an interpretive signage program that provides important information on the biology of monarch butterflies, the significance of the aggregation sites, and general information on Ellwood Mesa and the eucalyptus groves, when feasible.

Action 18-1.1. Apply for grant funding to design, construct, and install the interpretive signage program.

Action 18-1.2. Design, construct, and install an interpretive signage program that is sensitive to the environment.

Action 18-1.3. Locate the interpretive signage program in key locations minimally intrusive to the sensitive habitats of Ellwood Mesa.

Policy 18-2. The Butterfly Docent Coordinator shall provide input during design, review the draft interpretive program, and make recommendations to the City's Public Works Department.

Action 18-2.1. Involve the butterfly docents, as feasible, in ~~all phases of~~ development and review of the content and design of signs for the interpretive signage program.

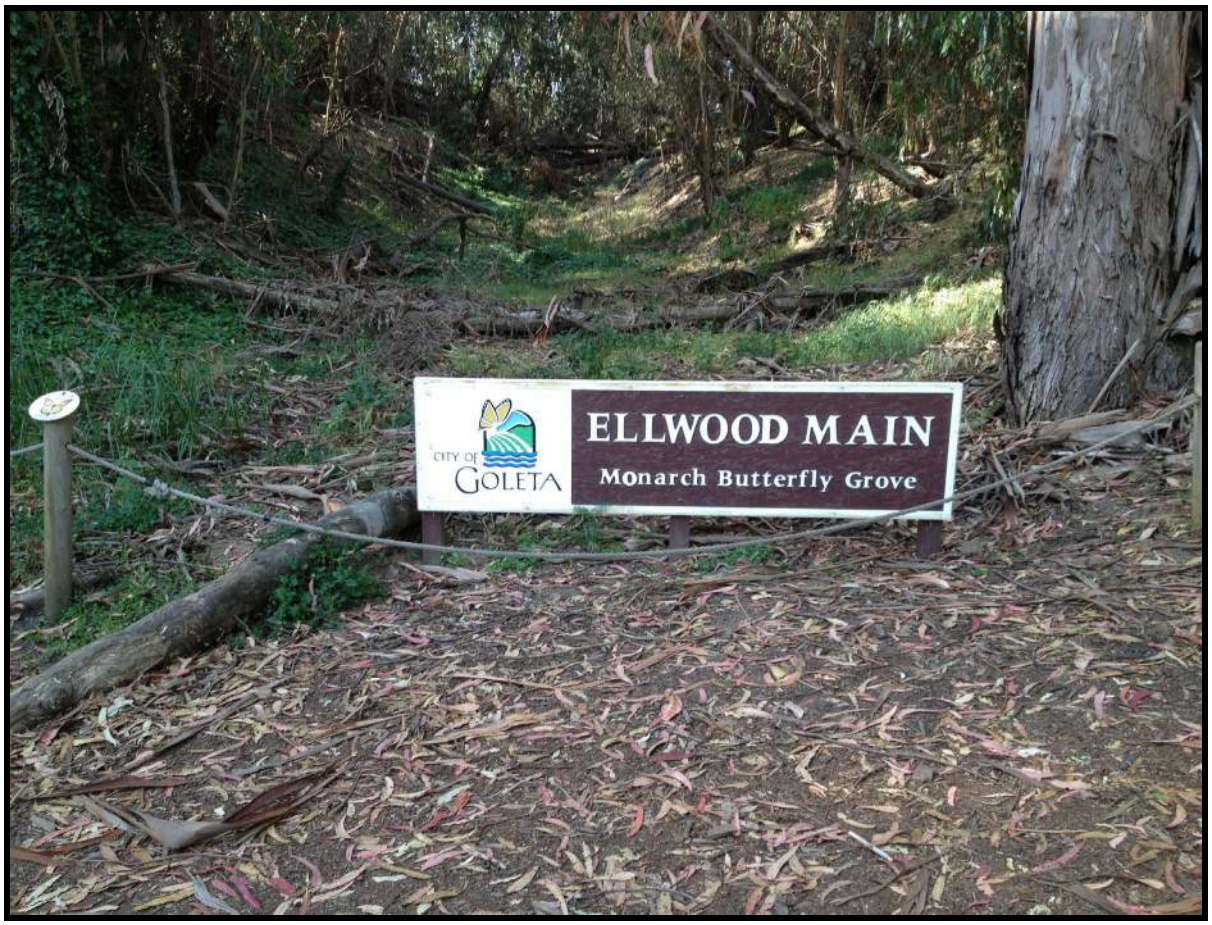


Photo 5. Ellwood Main Grove Entrance Sign at Trailhead along Devereux Creek

Program Status: No on-site interpretive program currently exists for the eucalyptus groves supporting monarch butterfly aggregation sites.

Program Needs: Adopt this MBHMP—including Program 18, Interpretive Program—and include links to the city's existing website and docent program.

Program Contact: Neighborhood Services and Public Safety Department and the Public Works Department.

19. Education Program

Overview: Education has always been an important part of the Ellwood Mesa monarch butterfly enthusiasm expressed by the residents of the area. Local and regional schools participate on a

regular basis, especially when monarch butterflies are using the seasonal aggregation sites. Also, the National Geographic educational information is available through the City's website: www.goletabutterflygrove.com. Therefore, it is important that education is a part of this MBHMP.

Goal 19. To provide educational experiences and information for K–12 students.

Policy 19-1. The City shall continue to work with K–12 students and their schools to explore educational experiences regarding Ellwood Mesa and the eucalyptus groves supporting monarch butterfly aggregation sites.

Action 19-1.1. Continue to support the educational opportunities provided by the Ellwood Mesa eucalyptus groves and their monarch butterfly aggregation sites.

Action 19-1.2. Create educational materials regarding biology of monarch butterflies and their habitats.

Action 19-1.3. Continue to support the position of Butterfly Docent Coordinator.

Policy 19-2. The City shall continue to support its website containing educational materials regarding monarch butterflies.

Action 19-2.1. Support, expand, and revise as necessary the City's website www.goletabutterflygrove.com.

Program Status: The City has active participation in K–12 education programs, including scheduled docent-led tours of the aggregation sites when monarchs are present and presentations at local area schools during science fairs. The City's website also includes a link to the Monarch Teachers' Network.

Program Needs: Adoption of this MBHMP—including Program 19, Education Program—will formalize the city's contributions to K–12 students as part of this MBHMP for Ellwood Mesa.

Program Contact: Neighborhood Services and Public Safety Department

D. MONITORING, RESEARCH, AND ADAPTIVE MANAGEMENT PROGRAMS

Monitoring and research programs provide the mechanism for assessing environmental conditions and conducting original studies to help understand the ecology of monarch butterflies, particularly at Ellwood Mesa. Information obtained from these programs and other sources can be used to adapt the MBHMP to improved or additional information or changing conditions.

20. Biological Monitoring Program

Overview: Background studies of monarch butterfly number, aggregation locations, environmental conditions, tree health, wildlife, botanical resources, and climate have been conducted at Ellwood Mesa over many years. However, more detailed studies are warranted regarding tree health and failure risk, aggregation site canopy cover and light intensity, wind patterns, microclimate, soil moisture and water demand, viable forest density, pest control, wildlife species, invasive non-native plants, eucalyptus tree health (including pest and diseases), enhancement and restoration projects within the groves, impacts from access trails, and other important aspects of the biological and physical resources related to monarch butterfly aggregation sites.

Goal 20: To develop and implement a monitoring program integrating various components of the biological resources and impacts related to the eucalyptus groves that support seasonal monarch butterfly aggregation sites.

Policy 20-1. The City shall maintain annual counts of the butterfly population at the various aggregation sites on Ellwood Mesa.

Action 20-1.1. Count and document monarch butterfly population number and cluster locations within the six Ellwood Mesa aggregation sites every year. The counts shall be conducted every 2 weeks through the overwintering season (October 1 through March 15) using the counting protocol established by Xerces Society, as funding allows. Where possible, record the tree tag numbers of trees with clustering monarchs to establish habitat use patterns (Althouse and Meade 2018).

Policy 20-2. The City shall conduct an annual assessment of ecosystem-wide tree and vegetation health on Ellwood Mesa, as funding allows.

Action 20-2.1. Track ecosystem-wide tree and vegetation health on Ellwood Mesa using high resolution multispectral and hyperspectral imaging and analysis, or similar appropriate means (Appendix 2).

Action 20-2.2. Coordinate results of the ecosystem-wide tree health assessment with Program 12, Tree Management Program, as feasible, to determine necessary and applicable management actions.

Policy 20-3. Create a Monitoring Report, updated annually, resulting from the information obtained during the implementation of the various policies and actions called for in this MBHMP.

Action 20-3.1. Track the implementation of this MBHMP in the form of a Monitoring Report.

Action 20-3.2. Conduct a Visitor Impact Assessment as part of the monitoring program to determine use patterns and potential impacts on trails, changes in erosion of trails, and potential impacts on aggregation sites through which trails are located.

Action 20-3.3. Coordinate results of the monitoring reports with Program 22, Adaptive Management Program, as feasible, to determine if changes in management actions are necessary.

Program Status: Various studies and butterfly counts have been gathered on a somewhat irregular basis. The City recently conducted a Tree Inventory and Health Analysis. However, no formal regular monitoring program has been developed or implemented at eucalyptus groves, in particular those areas that support monarch butterfly aggregation sites.

Program Needs: Adopt and implement this MBHMP, including Program 20, Biological Monitoring Program.

Program Contact: Public Works Department

21. Monarch Research Program

Overview: Although the City has conducted field studies as part of the preparation of this MBHMP, the City has not actively encouraged scientific studies using appropriate and cautious methods to maintain and improve habitat of the Ellwood Mesa habitats.

Goal 21. Encourage research projects and identify funding for research associated with monarch butterflies and their habitats at Ellwood Mesa.

Policy 21-1. The City shall allow for certain research projects that investigate the biology of monarch butterflies and their habitats at Ellwood Mesa and that provide information helpful to this MBHMP management programs.

Action 21-1.1. Evaluate requests for research and, where approved, issue Scientific Research Permits to regulate the research efforts.

Action 21-1.2. Ensure that scientists use non-invasive research projects at Ellwood Mesa, in particular those that focus on monarch butterflies and their habitats, and require that the

results of the research are provided to the City and posted on the City's website at www.goletabutterflygrove.com.

Action 21-1.3. Encourage research of the plants native to Santa Barbara County with regard to their ability to provide suitable monarch butterfly overwintering habitat and their applications for the restoration of the Ellwood Mesa.

Program Status: No formal, ongoing research projects are conducted at the Ellwood Mesa eucalyptus groves that support monarch butterfly aggregation sites.

Program Needs: Adopt and implement this MBHMP, including Program 21, Monarch Research Program.

Program Contact: Public Works Department

22. Adaptive Management Program

Overview: Management plans with ongoing maintenance, restoration, monitoring, and research programs generally develop an information base that helps provide insight into those portions of the implemented management plan that are performing well and those that could be performing better or differently with changing situations. In addition to the update and amendment process provided in Program 8, MBHMP Review, Update, and Amendment Program, the Adaptive Management Program provides a vehicle for the management authority to make adjustments in management approaches on an as-needed basis, especially as new information provides new opportunities for improved management practices and resource stewardship.

Goal 22. To establish an adaptive management approach to resource management at the eucalyptus groves that supports monarch butterfly aggregation sites and their surrounding environment at Ellwood Mesa.

Policy 22-1. The City shall use an adaptive management approach to resource management at the eucalyptus groves that supports monarch butterfly aggregation sites and their surrounding environment at Ellwood Mesa.

Action 22-1.1. Implement adaptive management procedures associated with all relevant programs of this MBHMP for Ellwood Mesa.

Action 22-1.2. Include a description of adaptive management actions in the Monitoring Report (Action 20.3-1).

Action 22-1.3. Conduct a review of management policies and actions every fifth year, as feasible, to determine possible patterns in change regarding monarch butterfly use of the aggregation sites and overall ecosystem health of the monarch butterfly habitat at Ellwood Mesa.

Program Status: Currently, there are no adaptive management procedures associated with the management of the eucalyptus groves at Ellwood Mesa.

Program Needs: Adopt and implement this MBHMP, including Program 22, Adaptive Management Program.

Program Contact: Public Works Department

E. CONCLUSION

This MBHMP for the Ellwood Mesa/Sperling Preserve Open Space provides a fully functional programmatic plan for the management of natural resources, focusing on habitat that supports the phenomenal occurrence of seasonal aggregations of thousands of monarch butterflies at six aggregation sites at Ellwood Mesa. With adoption and implementation of this MBHMP, the City of Goleta will fulfill a major commitment to the natural resources of Ellwood Mesa and its residents, and all those committed to the conservation of monarch butterflies.

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G. LIST OF PREPARERS

This MBHMP was collaborative effort. Consultants and City staff involved in the preparation of this plan are listed below.

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APPENDIX A. IMPLEMENTATION PRIORITIES, SCHEDULE, AND ESTIMATED COSTS

For the purposes of this MBHMP, implementation priorities, scheduling, and cost estimates are provided on a general programmatic basis. Programs are ranked as **Urgent**, **High**, and **Moderate** priority. They also are given an **Ongoing** and **Long-term** (+/- 5-year) scheduling estimate. Cost estimates are on an annual basis, with staff time listed as such and some first-year estimates in brackets.

Table A1. Implementation Priorities and Cost Estimates

	Cost ($)		City Labor Cost (hours)				Depart-ment
Program	**Annual**	**One-Time**	**Annual**	**One-Time**	**Priority**	**Schedule**	**Respon-sible**
A. Administrative Programs							
1. Municipal Management Program	$16,000	$13,000	$26,000 (260)	$9,600 (96)	High	ASAP	PW
2. Fiscal Program	$1,000	—	$19,600 (196)	—	High	ASAP	PW
3. Interagency Cooperative Program	$3,000	—	$9,600 (96)	—	High	ASAP	PW, NSPS, PER
4. Community Wildfire Protection Program	$8,000	—	$7,800 (78)	—	Moderate	Annually	PW
5. Trail Management Program	$10,000	$10,000	$45,600 (456)	$24,000 (240)	Moderate	Annually	PW
6. Waste Management Program	$1,500	—	$10,400 (104)	$1,600 (16)	Moderate	Annually	PW/NSPS
7. Aesthetic Resources Management Program	—	—	$7,000 (70)	—	Low	Annually	PW
8. MBHMP Review, Update, and Amendment Program	$10,000	—	$12,400 (124)	—	Moderate	Annually	PW, PER
9. Catastrophic Event Response Program	$75,000	—	$20,400 (204)	—	Moderate	Annually	PW
B Natural Resources Management Programs							
10. Monarch Butterfly Management Program	$2,000	—	$6,000 (60)	—	High	Annually	PW
11. Wildlife Habitat Management Program	$2,750	—	$5,600 (56)	—	Moderate	Annually	PW

Program	Cost ($) Annual	Cost ($) One-Time	City Labor Cost (hours) Annual	City Labor Cost (hours) One-Time	Priority	Schedule	Department Responsible
12. Tree Management Program	$49,600	—	$99,200 (992)	—	High	ASAP	PW
13. Integrated Pest Management Program	$11,500	$5,000	$11,600 (116)	—	Moderate	As funding is available	PW
14. Habitat Enhancement and Restoration Program	$30,000	$40,000	$29,600 (296)	$16,000 (160)	High	ASAP	PW, PER
15. Invasive Plant Management Program	$5,500	$27,500	$14,800 (148)	—	Moderate	As funding is available	PW, PER
16. Ecosystem-wide Management Coordination Program	—	—	$5,000 (50)	—	Low	Annually	PW, PER
C. Outreach Programs							
17. Community Advisory and Docent Program	$5,000	—	$77,200 (772)	—	High	Annually	PW, NSPS, PER
18. Interpretive Program	$500	$3,000	$8,800 (88)	$6,000 (60)	Moderate	As needed	PW, NSPS
19. Education Program	—	—	$12,400 (124)	$2,000 (20)	Moderate	Annually	NSPS
D. Monitoring, Research, and Adaptive Management Programs							
20. Biological Monitoring Program	$20,000	—	$8,000 (80)	—	High	Annually	PW
21. Monarch Research Program	$34,000	$40,000	$4,000 (40)	$4,000 (40)	Low	As needed	PW
22. Adaptive Management Program	$5,000	—	$8,000 (80)	—	Low	Every 5 years	PW
Totals	$290,350	$138,500	$449,000 (4,490)	$63,200 (632)			
Grand Total Over 5 Years	**$1,590,250**		**$2,308,200 (23,082)**		***TOTAL: $3,898,450***		

PW = Public Works Department
NSPS = Neighborhood Services and Public Safety Department
PER = Planning and Environmental Review Department

Table A2. Cost Estimates by Action

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
A. ADMINISTRATIVE PROGRAMS					
1. Municipal Management Program					
Action 1-1.1	$4,000	—	—	24	Prepare and conduct public workshop, 40 consultant hours
Action 1-1.2	—	$8,000	—	—	IS/MND
Action 1-1.3	—	$5,000	—	40	Depends on quantity and scope of revisions
Action 1-1.4	—	—	—	32	4 hours for the review by 8 people
Action 1-2.1	—	—	200	—	City coordination
Action 1-3.1	$10,000	—	40	—	Prepare annual Implementation Plan
Action 1-3.2	$2,000	—	20	—	Prepare and conduct City Council presentation, 20 consultant hours
2. Fiscal Program					
Action 2-1.1	—	—	24	—	Accounting staff, 12 hours bi-annually
Action 2-1.2	—	—	8	—	Accounting staff
Action 2-1.3	$1,000	—	8	—	Annual needs list to be included into Implementation Plan, accounting staff to determine operating budget
Action 2-2.1	—	—	136	—	8 hrs/month + 40 hours grant application coordinating
Action 2-2.2	—	—	20	—	As compensatory mitigation fees are paid
3. Interagency Cooperative Program					
Action 3-1.1	$1,000	—	24	—	2 hr/month for coordination meetings/calls with City staff and consultants
Action 3-1.2	$1,000	—	48	—	2 hr/month for coordination meetings/calls with City staff and consultants
Action 3-1.3	$1,000	—	24	—	2 hr/month for coordination meetings/calls with City staff and consultants

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
4. Community Wildfire Protection Program (CWPP)					
Action 4-1.1	—	—	12	—	CWPP
Action 4-1.2	$2,000	—	40	—	PW's site maintenance. the majority of this cost is included in Program 14
Action 4-1.3	—	—	—	—	Restrictions on timing of work
Action 4-1.4	$6,000	—	24	—	Coordination with butterfly and fire experts 2hr/mo prior to work activates. Expert time for consultation/surveys/ inspections monthly as necessary
Action 4-2.1	—	—	2	—	Cost incorporated into Program 12
5. Trail Management Program					
Action 5-1.1	—	—	192	—	2 days/month for trail maintenance
Action 5-1.2	—	—	—	—	Cost incorporated into Program 12
Action 5-1.3	$1,000	—	—	—	Staff time in Action 5-1.1
Action 5-1.4	$5,000	$10,000	96	240	Installation cost & 2 wks x 3 staff; maintenance 1 day/mo
Action 5-1.5	—	—	64	—	2 day effort x 2 staff x twice during wet season
Action 5-1.6	—	—	16	—	2 day effort once annually
Action 5-1.7	—	—	8	—	Annual review of trails boundaries
Action 5-1.8	$4,000	—	40	—	5 days x 1 staff and risk assessor, trails, arborist, butterfly biologist
Action 5-2.1	—	—	20	—	Staff coordination time and meetings
Action 5-2.2	—	—	20	—	Staff coordination time and meetings
6. Waste Management Program					
Action 6-1.1	—	—	96	—	1 day/mo
Action 6-2.1	$1,500	—	—	16	2 days staff time and signs
Action 6-2.2	—	—	4	—	Cost incorporated into Program 17

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
Action 6-2.3	—	—	4	—	Inspection of trash cans annually
7. Aesthetic Resources Management Program					
Action 7-1.1	—	—	10	—	Read and adopt all programs
Action 7-1.2	—	—	20	—	Program 18
Action 7-2.1	—	—	20	—	Review signage and fencing. Cost included in Program 5
Action 7-2.2	—	—	20	—	Staff time to review restoration plans
8. MBHMP Review, Update and Amendment Program					
Action 8-1.1	$1,000	—	32	—	Staff and consultant time for review
Action 8-1.2	$2,000	—	24	—	City staff and consultant's' time for updates
Action 8-1.3	$2,000	—	24	—	City staff and consultants' time for updates
Action 8-1.4	$2,000	—	24	—	City staff and consultants' time for response to public comments
Action 8-1.5	$3,000	—	12	—	Update IS/MND, if necessary. Consultant time
Action 8-1.6	—	—	8	—	City Council approval/meeting
9. Catastrophic Event Response Program					
Action 9-1.1	—	—	4	—	Cost included in Program 12
Action 9-1.2	—	—	4	—	Cost included in Program 4
Action 9-1.3	—	—	4	—	Cost included in Program 13
Action 9-2.1	$25,000	—	80	—	Expert/arborist/risk/biologist consultant time, plus materials to assess
Action 9-2.2	$50,000	—	80	—	Expert/arborist/risk/biologist consultant time, plus materials to design and implement strategy
Action 9-2.3	—	—	32	—	City staff time
B. NATURAL RESOURCES MANAGEMENT PROGRAMS					
10. Monarch Butterfly Management Program					
Action 10-1.1	—	—	8	—	Program 12
Action 10-1.2	—	—	8	—	Program 20 and 21
Action 10-2.1	—	—	8	—	Program 9
Action 10-2.2	$1,000	—	20	—	Staying current with research, staff time, and consultant time to inform staff.

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
Action 10-3.1	—	—	8	—	Program 14
Action 10-4.1	$1,000	—	8	—	Guidance to staff and education
11. Wildlife Habitat Management Program					
Action 11-1.1	$1,000	—	40	—	0.5-hr training per employee
Action 11-1.2	$750	—	8	—	Arborist/biologist as needed
Action 11-1.3	$800	—	—	—	Cost of nesting bird survey if needed, NBS biologist 1 day to confirm nests $800
Action 11-1.4	$200	—	8	—	Educate City/crew to avoid water
Action 11-2.1	—	—	—	—	Program 14
Action 11-2.2	—	—	—	—	Program 14
Action 11-2.3	—	—	—	—	Program 14
Action 11-2.4	—	—	—	—	Program 14
12. Tree Management Program					
Action 12-1.1	$4,800	—	40	—	Monarch biologist (8 hrs) and arborist (16 hrs) site visits. $2400. Implementation Plan preparation 16 hrs. $2400. = $4800. Quarterly site visits 32 hrs, IP 8 hrs
Action 12-1.2	—	—	—	—	Guidance for identifying threats
Action 12-1.3	—	—	—	—	Guidance for establishing thresholds
Action 12-1.4	—	—	—	—	Program 13
Action 12-1.5	$23,800	—	20	—	Arborist for 5 days: $4000, Butterfly biologist for 1 day to confirm tree work: $800, Wildlife biologist to monitor work for 5 days: $4000, Tree crew for 5 days: 15,000. (Total = $23,800.) City staff to check work for 5 days @4 hrs. (Total = 20 hours.)
Action 12-1.6	—	—	—	—	Would be accomplished with replanting restoration.
Action 12-1.7	—	—	—	—	Program 14
Action 12-1.8	—	—	—	—	Program 20
Action 12-1.9	$1,600	—	—	—	Biologist/arborist field visit 2 days

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
Action 12-1.10	$5,000	—	60	—	Container trees and labor estimate, depends on # of trees planted.
Action 12-2.1	—	—	—	—	Direction for restoration design
Action 12-2.2	$800	—	32	—	Biologist 1 field day, City staff labor for 4 x 4 days
Action 12-2.3	—	—	—	—	Included in 12-1.5
Action 12-2.4	—	—	—	—	Program 10
Action 12-3.1	$8,800	—	768	—	Inspection of trails one per month (16 hr/mo=192hr/yr), maintenance crew to prune/remove hazard limbs and trucks every month for 2 days (3 crew, 2 d/mo = 576hr/yr). Est. 768 total staff time plus equipment. Arborist 5 days $4000, butterfly biologist 1 day to confirm tree work $800, wildlife biologist to monitor work 5 days $4000.
Action 12-3.2	—	—	—	—	Included in 12-1.5
Action 12-3.3	—	—	—	—	Included in 12-1.5
Action 12-3.4	—	—	—	—	Included in 12-1.5
Action 12-3.5	—	—	48	—	3 days x 2 staff
Action 12-3.6	$4,800	—	8	—	Implementation Plan. Arborist: 20 hours. Monarch biologist: 20 hours. Report prep: 8 hours. @ 100/ hr. City staff to review Implementation Plan
Action 12-4.1	—	—	0	—	Program 4
Action 12-4.2	—	—		—	Program 4
Action 12-4.3	—	—		—	Program 4
Action 12-4.4	—	—	8	—	To review programs annually
Action 12-4.5	—	—	8	—	Staff time to coordinate
13. Integrated Pest Management Program					
Action 13-1.1	—	—	—	—	Arborist pest assessment can be done during annual plan site visits, 12-3.6

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
Action 13-1.2	—	—	—	—	Arborist pest assessment can be done during annual plan site visits, 12-3.6
Action 13-2.1	$5,000	—	40	—	Estimate for experimental techniques
Action 13-2.2	$2,000	—	20	—	Guidance
Action 13-2.3	$3,000	—	24	—	Pest inspection by specialist with recommendations; staff time to review
Action 13-2.4	$1,500	$5,000	32	—	Pest specialist to develop and maintain pest monitoring program and materials, and staff time to implement.
14. Habitat Enhancement and Restoration Program					
Action 14-1.1	$20,000	$25,000	120	80	Container plants, planting, irrigation system, water, maintenance, and monitoring; Initial experimental plots allowance. City staff maintenance: 10 hr/month.
Action 14-1.2	—	—	—	—	Guidance
Action 14-1.3	—	—	—	—	Programs 13 and 15
Action 14-2.1	$10,000	$15,000	120	80	Container plants, planting, irrigation system, water, maintenance, and monitoring; Initial experimental plots allowance. City staff maintenance: 10 hr/month.
Action 14-2.2	—	—	—	—	Program 15
Action 14-2.3	—	—	20	—	Guidance
Action 14-3.1	—	—	12	—	Coordination activities
Action 14-3.2	—	—	12	—	Coordination activities
Action 14-3.3	—	—	12	—	Coordination activities
Action 14-4.1	—	—	—	—	Direction for collection locations
Action 14-4.2	—	—	—	—	Direction for collection locations
Action 14-4.3	—	—	—	—	Direction for collection locations
Action 14-5.1	—	—	—	—	Coordinate with Program 10, 11, 12

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
Action 14-6.1	—	—	—	—	Coordinate with Wildfire Protection Plan
15. Invasive Plant Management Program					
Action 15-1.1	$2,500	$5,000			Renew map every two years. Initial mapping for 1511.1, 1.2, and 1.3 = 40 hrs. Botanist: 10 hrs. GIS @ $100 = $5000
Action 15-1.2	—	—	—	—	Cost in 15-1.1
Action 15-1.3	—	—	—	—	Cost in 15-1.1
Action 15-2.1	$1,000	$7,500	36		Control invasive plants allowance. Hand removal, herbicide. Hand crews CCC for 5 days per year.
Action 15-2.2	$1,000	$7,500	36		Control invasive plants allowance. Hand removal, herbicide
Action 15-2.3	$1,000	$7,500	36		Control invasive plants allowance. Hand removal, herbicide
Action 15-3.1	—	—	20	—	Program 20
Action 15-3.2	—	—	20	—	Program 14
16. Ecosystem-wide Management Coordination Program					
Action 16-1.1	—	—	20	—	Guidance for staff
Action 16-1.2	—	—	10	—	Guidance for staff
Action 16-2.1	—	—	10	—	Guidance for staff
Action 16-3.1	—	—	10	—	Guidance for staff
C. OUTREACH PROGRAMS					
17. Community Advisory and Docent Program					
Action 17-1.1	—	—	4	—	Hire docent coordinator
Action 17-1.2	—	—	64	—	2 hrs/wk for 8 month (Aug–Mar)
Action 17-2.1	$5,000	—	640	—	20 hrs/wk for 8 month (Aug–mar), supplies for the program
Action 17-2.2	—	—	64	—	2 hrs/wk for 8 month (Aug–Mar)
Action 17-2.3	—	—	—	—	Incorporated in Action 17-2.1
Action 17-2.4	—	—	—	—	Incorporated in Action 17-2.1
Action 17-2.5	—	—	—	—	Incorporated in Action 17-2.1
18. Interpretive Program					
Action 18-1.1	—	—	40	40	Staff prepare grant applications
Action 18-1.2	$500	$3,000	20	20	Design and install signage

	Materials and Contractors Cost ($)		City of Goleta Staff Time (hours)		
	Annual	**One-Time**	**Annual**	**One-Time**	**Notes/Assumptions**
Action 18-1.3	—	—	20	—	Guidance for signs
Action 18-2.1	—	—	8	—	Guidance for signs
19. Education Program					
Action 19-1.1	—	—	80	—	1 hr/tour x 80 tours average, by docents
Action 19-1.2	—	—	20	20	Create education materials and keep them updated
Action 19-1.3	—	—	—	—	Incorporated in Action 17-2.1
Action 19-2.1	—	—	24	—	Monthly updates. 12 x 2 hrs. = 24 hrs
D. MONITORING, RESEARCH, AND ADAPTIVE MANAGEMENT PROGRAMS					
20. Monitoring Program					
Action 20-1.1	$4,800	—	20	—	This could be docents for 48 hours: 4 hours per survey for 12 surveys
Action 20-2.1	$4,800	—	—	—	Per year estimate. One field day with drone to cover 4 sites; camera use, analysis, and brief report
Action 20-2.2	—	—	20	—	Staff coordination
Action 20-3.1	$3,000	—	4	—	30 hrs for biologist for monitoring report, staff review
Action 20-3.2	$3,000	—	4	—	30 hrs for biologist for visitor impact assessment, staff review.
Action 20-3.3	$500	—	8	—	Coordination of programs for biologists and staff
21. Monarch Research Program					
Action 21-1.1	—	$15,000	16	40	Evaluate requests for research and issue permits as needed.
Action 21-1.2	—	—	8	—	Guidance for research permits
22. Adaptive Management Program					
Action 22-1.1	—	—	16	—	16 hours per year staff time
Action 22-1.2	—	—	8	—	8 hours per year staff time
Action 22-1.3	—	—	8	—	8 hours per year staff time
TOTALS	**$203,650**	**$63,500**	**3226**	**472**	

APPENDIX B. SPECTRAL IMAGING AND ANALYSIS FOR ASSESSING TREE HEALTH

To monitor and determine vegetation health within the aggregate sites, spectral imaging and analysis will be used. In the last few decades, high resolution multispectral and hyperspectral imaging have become more commonly used by agricultural and horticultural industries to manage soil, fertilizing, and irrigation, and to monitor the health of crops. Spectral imaging is similar to digital photography except that instead of just collecting an image of three primary colors or bands (red, green, and blue; RGB) the multispectral camera sensor (spectrometer) divides the color range into multiple discrete bands of colors (typically 5 to 15 bands for multispectral to greater than 100 for hyperspectral) across the visible and near-infrared spectrums. In addition, the image captures data about the amount of light for each band that reaches the sensor. Since most plants with chlorophyll absorb light in the red (650 to 700 nm) and blue spectrum (425 to 475 nm) and reflect green and yellow light (500 to 600 nm), changes in the ratio of light within these regions can be used to determine vegetation health over time or in comparison to known healthy vegetation. By using spectral imaging over traditional arborist techniques, small changes in vegetation health can be assessed rapidly, the data can be quantified, and management decisions can be monitored for effectiveness. In addition, very little quantifiable information about the health of vegetation and butterfly use of aggregation sites has been studied.

To monitor the health of vegetation in aggregate sites, a ground-based imaging spectrometer will be used at set locations within the study area and within known aggregates sites. The spectrometer will be placed on a tripod at a known elevation and location within a study site. A series of images (both spectral and RGB) will be taken at a predefined aspect and slope of the tree canopy and surrounding vegetation. All perennial vegetation (trees and shrubs) within each image will be identified, and a visual assessment of vegetation health will be recorded and catalogued in order to track changes over time. For at least the first 2 or 3 years of the study, images should be taken three times during the year to help determine phenotypical color differences (variation in color due to genetics) between members of the same species and to calibrate seasonal changes. Afterwards, image frequency can be reduced to twice a year (at the beginning and middle of the growing season). For each spectral image, key individuals will be identified, and multiple pixel groups will be sampled across the foliage using multispectral imaging software and statistically analyzed to determine relative chlorophyll absorbance and reflectance, to indicate vegetation health.

By comparing changes in spectral signatures of like species and individuals, and by looking for abnormal changes for all species over time, the health of vegetation can be assessed. Individual, chronic changes to perennial vegetation can help determine which individuals are stressed and have a higher potential for mortality, while overall changes to the ecosystem can indicate climate stressors (e.g., drought) or toxic conditions (e.g., pollution). Since modern cameras are small and light enough to be mounted to unmanned aerial vehicles (UAVs), this technique can be used to determine whole forest health by sampling upper canopy foliage (once yearly) along with below canopy aggregation sites. This would allow for a whole ecosystem assessment and would help determine stressed locations or individual species across the whole study area.

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APPENDIX C. NATIVE PLANTS TO BE INCLUDED IN HABITAT RESTORATION EFFORTS

The following plants are native to the Central Coast of California and are known to offer several valuable elements to enhance the quality and longevity of native coastal habitats, including: fall and winter nectar source for monarch butterflies, canopy for wind protection, food source for wildlife, drought resistance, and fire resistance. California native plants are plants that were present in California prior to the arrival of European explorers and colonists in the late 18th century. Native plant stock should be sourced from local populations.

Restoration Native Plant List	**Location**				**Purpose**				
Common Name (*Scientific Name*)	**Over-wintering Site**	**Open Area Adjacent to Overwintering Site**	**Devereux Creek**	**Understory Windbreak**	**Nectar Source**	**Wildlife Habitat and Forage**	**Fire Resistant**	**Drought Tolerant**	**Erosion Control**
Trees									
coast live oak (*Quercus agrifolia*)	X	X		X		X	X	X	
western sycamore (*Platanus racemosa*)			X			X			
toyon (*Heteromeles arbutifolia*)	X			X	X	X	X	X	X
arroyo willow (*Salix lasiolepis*)			X		X*	X			X
hollyleaf cherry (*Prunus ilicifolia*)		X			X*	X	X	X	
Shrubs									
seacliff buckwheat (*Eriogonum parvifolium* var. *parvifolium*)		X			X*	X			
California bay laurel (*Umbellularia californica*)	X			X	X*			X	
California wax myrtle (*Myrica californica*)	X			X				X	
lemonade berry (*Rhus integrifolia*)		X		X	X*	X	X	X	X
golden currant (*Ribes aureum*)		X		X	X	X	X	X	
mulefat (*Baccharis salicifolia*)			X		X*	X			
California brittlebush (*Encelia californica*)		X			X*	X		X	X
California goldenrod (*Solidago veluntina* ssp. *Californica*)		X			X*	X		X	
California goldenbush (*Ericameria ericoides*)		X			X*	X		X	
saltmarsh baccharis (*Baccharis glutinosa* [*douglasii*])			X		X	X			X
coyote bush (*Baccharis pilularis*)		X			X*	X		X	
black sage (*Salvia mellifera)*		X			X*	X		X	

Restoration Native Plant List	**Location**				**Purpose**				
Common Name (*Scientific Name*)	**Over-wintering Site**	**Open Area Adjacent to Overwintering Site**	**Devereux Creek**	**Understory Windbreak**	**Nectar Source**	**Wildlife Habitat and Forage**	**Fire Resistant**	**Drought Tolerant**	**Erosion Control**
seaside fleabane (*Erigeron glaucus*)		X			X*	X		X	
purple sage (*Salvia leucophylla)*		X			X	X		X	
blueblossom (*Ceanothus thyrsiflorus)*		X			X*	X		X	
heart-leaved Keckiella (*Keckiella cordifolia*)	X	X	X		X*	X		X	
Groundcovers									
black figwort (*Scrophularia atrata*)	X	X	X	X	X*	X		X	
purple needlegrass (*Nassella pulchra*)		X				X		X	X
blue-eyed grass (*Sisrinchium bellum*)		X			X*	X	X	X	
bluedicks (*Dichelostemma capitatum)*		X			X*	X		X	
Santa Barbara honeysuckle (*Lonicera subspicata* var. *supspicata*	X	X	X	X	X	X			
Sticky monkeyflower (*Diplacus aurantiacus*)		X	X	X	X*	X		X	

X* indicates species that bloom during the overwintering period (October – March)

Plant List References

The Theodore Payne Foundation for Wildflowers and Native Plants, Inc. Fire Resistant Native Plants with High Wildlife Value. Sun Valley, CA. Available; http://www.theodorepayne.org/plants/fire_resistant.htm.

The Xerces Society. 2017. Protecting California's Butterfly Grove: Management Guidelines for Monarch Butterfly Overwintering Habitat. 32+vi pp. Portland, OR: The Xerces Society for Invertebrate Conservation.

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No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
1	8/16/18	Public Workshop	Sharleen Marie	The parking lot is a great place for benches from fallen trees, interpretive signs, to make it more attractive for people to start their walks.	Comment noted. The MBHMP calls for this kind of use.	Aesthetics
2	8/20/18	Email	Barbara Massey	Monarch Butterfly Habitat Management Plan and Implementation Plan and the areas preservation should not be under the jurisdiction of the Public Works Department. These plans should be the responsibility of the Planning and Environmental Review Department.	Comment noted. MBHMP calls for monarch and natural resource education for the staff involved in the management activities.	Authority/ Agency
3	8/20/18	Email	Barbara Massey	The Public Works Dept. is not qualified to deal with environmentally sensitive Monarch Butterfly habitat. They don't have the necessary personnel that is environmentally trained and knowledgeable about the habitat to adequately plan and manage this important area.	Comment noted. MBHMP calls for monarch and natural resource education for the staff involved in the management activities	Authority/ Agency
4	8/16/18	Email	Alfred Smith	Page 14 Background, Third Paragraph: Recommend indicating who is responsible for Ellwood East and what if any support they are providing to the plans. (There is some mention later in the document, but it would help to mention it here as well.)	Comment noted. Parcels in this area may be incorporated into the MBHMP area as acquired by the City.	Authority/ Agency
5	8/16/18	Email	Alfred Smith	Page 21 - 58: Is it possible to indicate anticipated workload by Plan number (top level, not each sublevel)? All but one or two action items identify the Public Works Department as POC. Is it feasible for the Public Works Dept to undertake all this work? In cases where more than one POC is indicated, recommend a lead is suggested.	Comment noted. Estimates of staff hours for each program are included in Attachment 1 of the MBHMP and Public Works will be responsible for meeting those needs to implement the MBHMP.	Authority/ Agency
6	9/3/18	Letter	FOTEM	Empower Planning and Environmental Review Department with Oversight of the MBHMP	Comment noted. Public works is the department responsible for management actions. Public works personnel are expected to be hired with specific knowledge and experience to properly follow directives of the MBHMP. The Planning Department does not manage open space areas.	Authority/ Agency

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
7	9/3/18	Letter	Cynthia Brock	The MBHMP and IP should not be under the jurisdiction of the Public Works Department. These plans should be overseen by the Planning and Environmental Review Department, although Public Works and Neighborhood Services will carry out many of the actions. The Public Works Department doesn't have the necessary focus to deal with what is essentially a planning process or the personnel qualified to deal with environmentally sensitive habitat.	Comment noted. Public works is the department responsible for management actions. Public works personnel are expected to be hired with specific knowledge and experience to properly follow directives of the MBHMP. The Planning Department does not manage open space areas.	Authority/ Agency
8	9/4/18	Council Meeting	Cris Lange	Under the MBHMP, need to take a look at what other agencies are doing in the grove, like SCE. We need to have an umbrella to have everyone know what others are doing. Undergrounding powerlines is super important. Irrigation is super important.	Comment noted. Language added to Action 1-2.1 to clarify.	Authority/ Agency
9	8/16/18	Public Workshop	Tim Burges, SB Shores	The plan needs a definition of emergency – are we already there? Very concerned about anything that is cart-blanche. Concerned about what happened last year – almost lost a lot.	Comment noted. Language added in Section 9 to distinguish emergency actions.	Definitions/ Terminology
10	8/16/18	Public Workshop	Julie Gilmore	Explain Fuel Reduction Zones?	Comment noted. The City adjusted Figure 3 and added Table 1 in the MBHMP that describe the CWPP zones.	Definitions/ Terminology
11	8/16/18	Public Workshop	Julie Gilmore	Explain Fuel Reduction Zones? (discussion continued)	Comment noted. The City added additional information describing fuel reduction zones in Table 1.	Definitions/ Terminology
12	9/4/18	Council Meeting	Cris Lange	I don't like the Riparian "forest" because it sounds huge.	Comment noted. The City removed the term "forest" to describe these areas.	Definitions/ Terminology
13	9/4/18	Council Meeting	Cris Lange	Transitioning to riparian forest will impact monarch ESHA	Comment noted. The City adjusted language in section 14.3 to clarify that native planting would occur in areas already occupied by non-eucalyptus vegetation.	Restoration
14	9/3/18	Letter	Barbara Massey	The plans are weak without specific protections for the butterflies and trees. There is far too much use of the wording "managed, as feasible", which further weakens the plans. There are no protections in these plans to keep a large number of trees from being cut down at any time without the Council's or public's knowledge or approval.	Comment noted.	Definitions/ Terminology

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
15	9/3/18	Letter	Cynthia Brock	Terminology and mapping There is no clear and consistent definition of the various parcels included—or not included—in the "Ellwood Mesa Open Space Plan." The only map in the plan shows the location of center of major monarch overwintering sites, but doesn't identify the different parcels of land.	Comment noted. The MBHMP provides a map (Figure 2) that shows the Monarch Butterfly Habitat Management Plan Coverage Area. The coverage area is defined biologically by the availability of suitable monarch butterfly habitat; it is not defined by parcels.	Definitions/ Terminology
16	9/3/18	Letter	Cynthia Brock	Please map and clarify the terminology in the Plan. It should match what is in the General Plan. If you use the name Ellwood Mesa or the Ellwood Mesa Open Space Plan it should be defined in relationship to the named parcels in the General Plan, with only one definition for each name.	Comment noted. The MBHMP provides a map (Figure 2) that shows the Monarch Butterfly Habitat Management Plan Coverage Area. It is not defined by parcels.	Definitions/ Terminology
17	8/16/18	Public Workshop	Eurie, Pacific Oaks	Does the plan consider and protect the owl population at Ellwood?	Comment noted. The plan considers owls and other wildlife during management actions by including pre-activity surveys for nesting birds and incorporating management strategies for monarch butterfly habitat conservation that are intended to be consistent, where feasible, with other wildlife habitat management.	Misc. Clarification
18	8/16/18	Public Workshop	Jessie Altstatt	Overwintering season for monarchs and nesting season for birds need to be respected when there is work being done in the habitat	Comment noted. This is addressed in administrative programs, Action 1-2.1.	Restoration
19	9/3/18	Letter	Cynthia Brock	Since the purpose of the plan is to maintain and enhance the included areas as monarch butterfly habitat for migrating, overwintering butterflies, some language should be included that explains the monarch butterfly life cycle and habitat needs during their overwintering phase to those not familiar who might be reading and interpreting the plan in the future	Comment noted. The MBHMP is a working document that prescribes policies and actions for management. Information regarding monarch biology and habitat is to be reviewed and used to inform MBHMP actions into the future (Programs 20, 21, and 22.)	Misc. Clarification
20	8/16/18	Public Workshop	Wes Herman, retired fireman	Suggest not using blue gums at all. Red ironbark more drought tolerant, blue gums big fire risk.	Comment Noted. The City included both red iron bark and blue gums as species to be planed under final 2018 IP. The City will continue to consider a range of species while implementing the MBHMP.	Fire
21	8/16/18	Public Workshop	Tim Burges, SB Shores	The Fire Figure has lots of areas do not have that yellow fill. Is it property line?	Comment noted. The fire figure was revised to reflect setbacks from structures as per the CWPP.	Fire

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
22	8/16/18	Public Workshop	Jennifer Loftis	implementing fire plan is not in the IP. Will it be in the next IP?	Comment noted. The FP actions can be implemented now as maintenance.	Fire
23	8/16/18	Public Workshop	Jennifer Loftis	The Fire Plan was done in 2012. what have you done?	Comment noted. The City has done some work clearing and moving downed wood.	Misc. Clarification
24	8/16/18	Public Workshop	Cris Lange	Request for the City to do a referendum for undergrounding wires to reduce fire risk and destruction from pruning and topping trees.	Comment noted.	Fire
25	8/16/18	Public Workshop	Wes Herman, retired fireman	At end of Carmel and Pismo. 6-inch fire hydrant lines without hydrants.	Comment Noted. City goal is to provide funding to the GWD to install two new hydrants.	Fire
26	8/15/18	Email	Paul Pease, Island Oak Lane	I live in The Bluffs and absolutely love to observe the Monarchs over-wintering, especially in the area near Sandpiper as it is so serene. However, many of the non-native eucalyptus trees in that area have fallen down, taking other eucalyptus trees with them, and seem to be drying out (perhaps invaded by pests). It's not just a danger to the people walking in the area, but the dead eucalyptus trees become a rather volatile fuel source for fire. I have also seen encampments in that area with evidence of cooking campfires. Some of the recent devastating and fast-moving wildfires that have occurred in California and our community were caused by cooking campfires.	Comment Noted. Enforcement actions are conducted by the Sheriff.	Fire
27	8/15/18	Email	Paul Pease, Island Oak Lane	Has there been a re-assessment by the Fire Department regarding a potentially dangerous wildfire that would destroy the Monarch Butterfly habitat caused by a campfire and fueled by the new eucalyptus deadwood as well as live eucalyptus oil?	Comment noted. The Community Wildfire Plan addresses these risks and the City will be consulting with the County Fire Department and CalFire for specifics on Ellwood Mesa.	Fire
28	9/3/18	Letter	Cynthia Brock	To reduce threat of fire the Plan should include a feasibility study of undergrounding some or all of the power lines that are adjacent to monarch ESHA.	Comment noted.	Fire
29	9/3/18	Letter	Cynthia Brock	The extension of Santa Barbara Shores Drive that is a major access for fire-fighting equipment. The road and the culvert underneath it should be kept in good repair so that it is always passable and structurally sound.	Comment noted.	Fire

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
30	9/3/18	Letter	Cynthia Brock	Is there some comparison of the fire- resistant qualities of the recommended native plants with the fire-resistant qualities of those plants that are already there? If the non-native plants provide better fire resistance they should be allowed to remain. Removing them will reduce coverage until the new plants become established.	Comment noted. Actions 4-1.3 and 12-4.4 involve planting of fire-resistant native understory plants. Native plants to be included in habitat restoration efforts are listed in Appendix 3 of the MBHMP.	Fire
31	9/3/18	Letter	Cynthia Brock	At the public workshop a map was handed out that indicated fuel reduction zones along the groves that are close to structures, but also in the eastern windrow that contains the Ocean Meadows aggregation site where there are no structures near. The second paragraph on page 11 says, “In habitat areas that are not adjacent to structures, fuel treatment consist of mowing along the outside edge.” That seems inconsistent with the map. Please reconcile this and provide a new map if applicable	Comment noted. The fire figure has been revised to reflect setbacks from structures as per the CWPP.	Fire
32	9/3/18	Letter	Cynthia Brock	Increased patrolling of the area for people violating the “No Smoking” and “No Campfires” rules, especially at night, could reduce the risk of fire. Apparently, the City is constrained to give “homeless encampments” a 72-hour notice before taking any action. But if there is a fire or evidence that there has been one—whether it is an “urban camper” or kids—there should be a way to take immediate action to eliminate the threat.	Comment noted. Enforcement actions are conducted by the Sheriff.	Fire
33	9/3/18	Letter	Cynthia Brock	The gate at the end of Santa Barbara Shores Drive is the only way for a fire-truck to access major portions of the monarch groves. There is not appropriate signage on the gate: it says “Fire Access Lane, illegal vehicles will be towed.” This is apparently not clear enough (no one thinks their vehicle is “illegal” if it is licensed) because sometimes vehicles have been parked in front of the gate making it inaccessible. A large, bi-lingual “NO PARKING” sign might do a better job of keeping this fire lane clear.	Comment Noted. “No Parking” signs are included in the final 2018 IP.	Signs
34	8/16/18	Public Workshop	Tim Burges, SB Shores	Lots of young trees in this forest. Lots of age classes, lots of recruitment.	Comment noted.	Restoration
35	7/27/18	Email	Lara Drizd, USFWS	MBHMP Pg 63 - Appendix 3 - I noticed that you included detailed instructions for tree planting efforts in the Implementation Plan. I’d just like to add that the planting methods for natives can be quite different than they are for species we typically plant in our gardens. For instance, you usually want to avoid digging a hole much larger than your	Comment Noted. More recent methodologies have been used and cited throughout the final 2018 IP.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
				pot. I might suggest adding a sentence to this paragraph here stating something to the effect of "natives will be planted according to appropriate planting methods which may vary by species."		
36	8/22/18	PTAC Meeting	Lynn Kirby	The Sperling parking lot is a great demonstration site for a demonstration garden; planters are already there and it's close to a water source.	Comment noted.	Restoration
37	8/22/18	PTAC Meeting	Lynn Kirby	Ellwood Cooper and his colleagues planted eucalyptus throughout CA from 1870 through 1900 as a renewable wood source. It also came out as a complete failure.	Comment noted.	Misc. Clarification
38	8/30/18	Email	Lisa Stratton, UCSB CCBER	The density could also have contributed to more intense competition for water between these water-loving and high water-use trees; which likely created problems during the drought. As such, it leads me to ask, why are this year's planned tree plantings slated for Ellwood North? Will they potentially fill up the very holes or galleries that might make that area more supportive of Monarch's in the future?	Comment Noted. Monarch butterflies prefer thicker stands of tall vegetation for wind protection that surrounds an open center. The north area of Ellwood North is currently too open and the roosting monarchs are moving south into more protected areas of the grove. The City's goal is to re-establish the wind barrier in the northern area and leave a more-open center for roosting.	Restoration
39	8/16/18	Public Workshop	Tim Burges, SB Shores	Be careful when selecting the species of eucalyptus to plant. Blue gum are very different from red ironbark. Red ironbark are incredible trees	Comment Noted. The City included both red iron bark and blue gums as species to be planed under final 2018 IP. The City will continue to consider a range of species while implementing the MBHMP.	Restoration
40	7/27/18	Email	Lara Drizd, USFWS	MBHMP Pg 64 - Plant List - You might consider adding black figwort (Scrophularia atrata) to the list. Black figwort is an important local species (really only found in SB county), drought tolerant, and great for bees and butterflies. And it was recommended by our botanist. :)	Comment noted. This species has been added to the list of native plants to be included in habitat restoration efforts listed in Appendix 3 of the MBHMP.	Restoration
41	8/2/18 & 8/9/18	Stakeholder meeting	Lisa Stratton, UCSB CCERB	Native trees will be adaptive to climate change, reduce water use in creek and overall, not require pampering proposed for planted Eucs.	Comment noted.	Restoration
42	8/22/18	PTAC Meeting	Lynn Kirby	You want to use only eucalyptus trees. The Pismo Beach overwintering site uses a variety of trees to provide the necessary canopy. We already have pests and problems with eucalyptus - why are we not using a variety of trees? Street trees use a mixture/variety of tree types (not any one species) to increase resilience against pests (won't lose all at once). I want to see consideration of trees other than	Comment noted. The MBHMP would not involve expansion of the existing eucalyptus groves in the coverage area. The final 2018 IP involves planting of 63 eucalyptus trees as replacement and/or habitat enhancement trees. Within the boundaries of the existing eucalyptus	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
				eucalyptus.	groves, native plants will be limited to understory species, including shrubs, grasses, and forbs that are seen co-occurring with the eucalyptus overstory in other locations on Ellwood Mesa.	
43	8/22/18	PTAC Meeting	Phebe Mansur	I heard an unconfirmed rumor that the Coastal Commission has some goal to remove eucalyptus trees throughout the state of CA. With that in mind, I agree with Commissioner Kirby in planting a variety of butterfly-friendly trees.	Comment noted. The MBHMP seeks find a balance between natives and eucalyptus species. The MBHMP would not involve expansion of the existing eucalyptus groves in the coverage area and would involve planting native understory species.	Restoration
44	8/30/18	Email	Lisa Stratton, UCSB CCBER	I would add Lonicera subspicata var. subspicata – native honeysuckle which grows well out here and provides nectar and fruit and can be locally sourced. I would also consider adding Diplacus aurantiacus (Sticky monkey flower); Keckiela cordifolia (Heart leaf-Penstemon), which grows well in the shade and provides nectar; and Salvia spathacea (Hummingbird sage).	Comment noted. This species has been added to the list of native plants to be included in habitat restoration efforts listed in Appendix 3 of the MBHMP.	Restoration
45	9/3/18	Letter	Cynthia Brock	Consider inclusion of native plants if the plant provides a service that actually improves conditions for monarch butterflies and improves the sustainability of the groves because that is the purpose of this plan. Either native or non-native plants can provide the things that butterflies and the groves need. Adding other goals complicates the plan and makes it more expensive to execute.	Comment noted. Goal 14 and supporting policies and actions encourage the use of appropriate native species both within the eucalyptus groves and along Devereux Creek.	Restoration
46	9/4/18	Council Meeting	Mayor Paula Perotte	Going back to the 30 trees that SCE scalped, what kind of an effect does that have to the trees later on? I don't know how they resprout after that.	Comment noted.	Misc. Clarification
47	9/4/18	Council Meeting	Mayor Paula Perotte	The understory that you are considering, our native understory is typically paired with eucalyptus as an exotic. Do these species grow well together?	Comment noted. Action 14-1.1 involves planting experimental plots of native species to determine which species can support sustainable populations. Action 14-1.2 encourages the use of native plant species currently growing in the eucalyptus groves on Ellwood Mesa.	Misc. Clarification

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
48	8/2/18 & 8/9/18	Stakeholder meeting	Lisa Stratton, UCSB CCBER	Native trees reduce fire risk, give off water, not oils like Euc's. Plant native oaks and sycamores along all edges of groves by homes and down to creek as well as in all non-aggregation zones that could become fuel corridors. Native trees will better support other nectar providing species in understory.	Comment noted.	Restoration
49	9/4/18	Council Meeting	Councilmember Michael T. Bennett	The conifer forests are impacted by the drought, the fires are dense and there's not enough water to support the density. I assume we would want to go back to having a natural forest and we would want to be very careful about suggesting adding more trees. I would hope that we would do the science so the forest can be sustainable and it make sense to plant trees. If the science is behind it, then I will support it.	Comment noted. The MBHMP has provisions for continued reference to and adaptation of the Plan based on best available science. Programs 16, 20, 21, and 22.	Restoration
50	9/3/18	Letter	FOTEM	Although the MBHMP has policies that support maintaining the entire eucalyptus forest and re-planting of eucalyptus to replace removed trees, the Restoration Plant table in Appendix 3 does not include any type of eucalyptus. We request that a Restoration Plant list includes any species of eucalyptus that might be considered for planting to replace removed trees or for enhancement of the structure and function of the monarch habitat.	Comment noted. The restoration species list in Appendix 3 is named "Native Plants to be Included in Habitat Restoration Efforts". It is not a list of eucalyptus tree species proposed for use. Eucalyptus trees are designated for use "To correct habitat deficiencies such as: The overstory has become too sparse, Wind speeds in the grove are too strong, A tree died, fell over, or was removed." (Action 12-1.2, Table 1). Tree species to be planted will be stated in each IP, and may change over time with site conditions.	Restoration
51	9/3/18	Letter	Cynthia Brock	The plant list in Appendix 3 doesn't indicate when the native plants included are blooming and could provide nectar for the butterflies. There are few native plants that provide winter nectar; some that provide fall nectar. The butterflies generally begin to leave in February, so spring or summer blooming plants won't be useful for this function. It will be important to know whether native plants that are used will actually be useful to the butterflies, and provision of winter nectar is an important attribute.	Comment noted. Of the 27 native species listed 23 produce nectar usable by monarch butterflies, and 18 produce nectar during the overwintering period (Oct.- Mar.).	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
52	9/3/18	Letter	Cynthia Brock	There should be some explanation of how the non-deciduous blue gums enhance the microclimate, provide the structure, shelter, and open canopy that overwintering aggregations need. In addition to providing shelter for monarch colonies, blue gum eucalyptus serves as a source of nectar during the winter when most native plants do not bloom.	Comment noted. The MBHMP is a working document that prescribes policies and actions for management. Information regarding monarch biology, habitat, and tree form and function is to be reviewed and used to inform MBHMP actions into the future (Programs 20, 21, and 22.)	Restoration
53	9/4/18	Council Meeting	Cris Lange	Plant list needs blue gum added and whether plants are native to our specific area.	Comment noted. The plant list in Appendix 3 is of native plants from our area.	Restoration
54	8/30/18	Email	Lisa Stratton, UCSB CCBER	In my comments sent a few weeks ago, see attached pdf, I suggest some zones that might be suitable for prioritizing native tree planting. These are zones outside of the core aggregation areas and along the creek channels and adjacent to the homes where native plants will serve these purposes: 1. Help protect against wildfire; 2. Reduce water use in the creek and keep flows which will benefit diverse wildlife; 3. Be more sustainable in the face of climate change; 4. Support a higher diversity of native insects, birds, reptiles and herps; and 5. Be less vulnerable to a single pest or disease the way the current monoculture is vulnerable.	Comment noted.	Restoration
55	9/3/18	Letter	FOTEM	Finally, 2018 IP does not directly replace the blue gum eucalyptus removed in 2017 with other blue gum eucalyptus. Rather, mostly ironbark are proposed for replanting. While we understand there may be certain benefits to ironbark in terms of its relative drought resistance, it has different characteristics than blue gum which are typically taller and provide a valuable source of nectar for overwintering monarchs. We request that at a minimum 29 blue gum be replaced proximate to the removal locations, in addition to the ironbark replanting proposed	Comment noted. As has been discussed in public meetings, there is great advantage to planting red iron bark eucalyptus in the site proposed. The 2018 IP also specifies the blue gum eucalyptus will be planted. The monarch butterfly specialist will designate planting points for each tree to maximize benefit to the aggregation site, placing the drought resistant iron bark eucalyptus in a wind break configuration and the blue gums near the aggregation center. Action 1 of the 2018 Implementation Plan requires details to be included in a tree restoration planting map.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
56	9/4/18	Council Meeting	Mayor Paula Perotte	Are they at risk of disease just from the fact that they've been cut like that?	Comment noted.	Misc. Clarification
57	9/4/18	Council Meeting	Mayor Paula Perotte	But not all the trees they trimmed were dead? So they could be stressed even more.	Comment noted.	Misc. Clarification
58	8/15/18	Email	Paul Pease, Island Oak Lane	Are there considerations for removing the dead eucalyptus danger and re-planting with more native tree species, such as oaks?	Comment noted. Restoration of native plantings would occur in supporting areas	Restoration
59	8/22/18	PTAC Meeting	Lynn Kirby	The Mexican overwintering site is a fir forest and has no eucalyptus trees. If we are replanting and there is a rumor that they are going to take out the eucalyptus, I believe we should plant no eucalyptus trees. We don't want City Council 100 years from now to ask why we replanted with trees that are already failing.	Comment noted.	Restoration
60	8/30/18	Email	Lisa Stratton, UCSB CCBER	Regarding the Restoration Plant list. This is mostly good, but I would remove seaside fleabane (Erigeron glaucus), "blue blossom (Ceanothus thyrsiflorus) and dwarf coyote bush (Baccharis pilularis ssp. pilularis "pigeon point") as these are cultivars or not locally sourceable.	Comment noted.	Restoration
61	8/16/18	Public Workshop	Wes Herman, retired fireman	Asked about $3.9M – feasibility of using this, etc.	Comment noted. City is applying for funds to the Coastal Conservancy.	Funding
62	8/16/18	Email	Alfred Smith	Page 13 Executive Summary: Is the $3.9M "one-year money"? That is, does it all have to be spent in the 2018-2019 fiscal year? What is the fiscal year for this money? Has the money arrived? If not, when is it expected? The paragraph states that the money can only be spent on "restore, enhance, manage, and monitor" activities. This does not line up with the "Admin, Management, Outreach, Monitoring, Research, and Adaptive Management" plans identified earlier in the summary. Recommend words are added to clarify which part of the proposed plans are covered and which are not. For the ones that are not (if any), please identify estimated budgets necessary and potential sources.	Comment noted. City is applying for funds to the Coastal Conservancy.	Funding
63	8/22/18	PTAC Meeting	Lynn Kirby	Please describe the details/ Terms of the $3.9M grant from the State of CA. My understanding is that we cannot use this grant money to fund the current implementation plan.	Comment noted. City is applying for funds to the Coastal Conservancy.	Funding

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
64	9/4/18	Council Meeting	Mayor Pro Tempore Stuart Kasdin	The cost table in the appendix is our regular on going budget, our maintenance of effort. And the extra grant is on top of it?	Comment noted. City is applying for funds to the Coastal Conservancy.	Funding
65	9/4/18	Council Meeting	Mayor Pro Tempore Stuart Kasdin	It is not clear to me that the current time spending on this project is not included in the cost table.	Comment noted.	Funding
66	9/4/18	Council Meeting	Mayor Pro Tempore Stuart Kasdin	I would like to see a 5-year plan for how we are doing to spend the $3.9M that includes irrigation.	Comment noted.	Funding
67	9/4/18	Council Meeting	Mayor Pro Tempore Stuart Kasdin	If you take the money and put it into a butterfly fund, will people be able to bill their hours to this butterfly fund from different departments? Will this be a simplifying process? Does this make sense from an accounting perspective?	Comment noted.	Funding
68	8/31/18	Support letter	Emma Pelton, Xerces Society	We are writing to you to express our support of the Draft Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan and 2018 Implementation Plan.	Comment noted.	General Support
69	8/31/18	Support letter	Emma Pelton, Xerces Society	We also recognize the incredible expertise that Dan Meade of Althouse and Meade and Charis van der Heide of Rincon Consultants bring to monarch butterfly habitat conservation, and encourage you to continue consulting with both parties to quickly develop and implement a habitat restoration and management plan for this site, and to address hazards posed by dead trees with minimal disruption to the monarch butterflies. In addition, the Xerces Society is deeply invested in monarch butterfly conservation, and we would be happy to provide further input on the management and restoration of monarch butterfly overwintering habitat within Ellwood Mesa.	Comment noted.	General Support
70	8/31/18	Support letter	Emma Pelton, Xerces Society	We also support the proposed actions of the 2018 Implementation Plan to replant eucalyptus trees to replace the 28 trees which were removed from the grove in 2017. Replacement tree planting is critical so that the microclimatic conditions that monarchs require can be restored as soon as possible. The proposed tree planting, as well as other activities such as implementing an irrigation plan, assessing the grove for hazard trees, and monitoring monarch's use of the grove align with the Xerces Society's approach to monarch butterfly overwintering site restoration which is summarized in our recently published	Comment noted.	General Support

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
				guide for land managers: Protecting California's Butterfly Groves: Management Guidelines for Monarch Butterfly Overwintering Habitat.		
71	7/27/18	Email	Lara Drizd, USFWS	I'm in full support of what your group has put together and I don't think any major changes are needed. You all did an awesome job!	Comment noted.	General Support
72	9/4/18	Council Meeting	Cris Lange	I support the letter from attorney for FOTEM and the details that are included. Thank you for taking a detailed look at this letter.	Comment noted.	General Support
73	9/4/18	Council Meeting	Mayor Pro Tempore Stuart Kasdin	I appreciated getting this staff report and learning that we are moving this process along and it was really well written. Thank you	Comment noted.	General Support
74	9/4/18	Council Meeting	Councilmember Kyle Richards	We respect to the feedback you requested, I do support the site that was chosen. I think it makes sense for the reasons you describe.	Comment noted.	General Support
75	9/4/18	Council Meeting	Councilmember Kyle Richards	I would encourage us to consider areas where we can plant more trees. I'm sure we have plans to do that and I think we should plant as many trees sooner than later.	Comment noted.	Restoration
76	8/16/18	Public Workshop	Wes Herman, retired fireman	Do red ironbark eucs encourage monarch overwintering?	Comment noted. Yes, red iron bark does support monarch butterflies.	Misc. Clarification
77	8/16/18	Public Workshop	Lori Gastin	Coronado seep important area for birds. Urge restoration work be done in creek	Comment noted.	Restoration
78	8/2/18 & 8/9/18	Stakeholder meeting	Lisa Stratton, UCSB CCBER	The Plan focused almost solely on Monarch Butterfly and needs to think more broadly about species support, sustainability, etc. See breeding records from Breeding Bird Study showing that you get nearly double the diversity of breeding birds in oaks (57 species) than in Eucalyptus (32).	Comment noted.	Restoration
79	8/2/18 & 8/9/18	Stakeholder meeting	Lisa Stratton, UCSB CCBER	Data from USFWS status of Monarch paper and Griffith and Villablanca paper demonstrate that Butterflies do not prefer Eucalyptus and that in Central CA they prefer pines and cypress and oaks disproportionately to their low cover in the groves.	Comment noted. This paper states it should not be considered relevant in Santa Barbara County and south.	Restoration
80	8/20/18	Email	Barbara Massey	The way this document is written, it seems that it still permits the cutting down of trees, planting in inappropriate areas, planting trees other than eucalyptus trees, and the ability to do anything staff wants without review. There needs to be more oversight of the habitat.	Comment noted. The Plan calls for the appropriate review and monitors to be involved. All project specifics will be outlined in the Implementation Plans and be open for review by the public.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
81	8/20/18	Email	Barbara Massey	There are a number of things seriously wrong with the Management and Implementation Plans. Far too much emphasis is placed on public access to the detriment of the aggregation sites. It needs to be remembered that the Monarch Butterfly Habitat is an important and valuable environmental resource and not for the entertainment of the public.	Comment noted.	Human Impacts
82	8/16/18	Email	Alfred Smith	Pg. 12 Executive Summary, Last paragraph: "With adoption and implementation of this MBHMP, the City will fulfill a major commitment to the …" What major commitment? Did the City make a commitment? The sentence implies the entire MBHMP needs to be "adopted and implemented". Is that the case? Is there significant benefit by "adopting and implementing" something less?	Comment noted. The Open Space Plan monarch policies 1, 2, and 3 calls for implementing habitat improvements to benefit the butterflies. The City is committed to maintaining the overwintering habitat.	Authority/ Agency
83	8/16/18	Email	Alfred Smith	Page 14 Background, Second Paragraph: "…have numbered in the tens of thousands during some years, Making Ellwood Mesa one of the most important sites for monarch butterflies in California" Is this statement misleading? "Status of Ellwood Mesa-Related Tree Projects, Emergency Permit And Habitat Management Plan" presented to City Council 20 Feb 2018 indicates 2011 was the last time anything like these numbers have been recorded. All years since then were less than 10,000 and three were less than 3000. Recommend a population by year chart be included in the report to give proper context.	Comment noted. Regarding Ellwood Main, The Xerces Society states, " This is the premier Monarch site in Southern California……." https://xerces.org/where-to-see-monarchs-in-california/#sanluisobispo Ellwood Main is ranked at the 4th out of 50 most important monarch butterfly aggregation sites in California. "Sites in which the monarch populations have undergone the greatest declines, yet host the largest proportion of the remaining population have the highest ranking." Pelton, Jepsen, Shultz, Fallon , and Black. 2016. State of the Monarch Butterfly Overwintering Sites in California. The Xerces Society for Invertebrate Conservation.	Misc. Clarification
84	8/16/18	Email	Alfred Smith	Page 14 Background, Second Paragraph: Is there a reference to support the claim that "Ellwood Mesa <is> one of the most important sites for monarch butterflies in California."? A reference would add weight to the claim.	Comment noted. The reference is included in the MBHMP. Pelton, Jepsen, Shultz, Fallon , and Black. 2016. State of the Monarch Butterfly Overwintering Sites in California. The Xerces Society for Invertebrate Conservation.	Misc. Clarification

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
85	8/22/18	PTAC Meeting	Jessica Altstatt	Consider other wildlife uses of the area. For example, the seep at the end of Coronado is very important for birds and other wildlife as a source of fresh water.	Comment noted.	Restoration
86	8/30/18	Email	Lisa Stratton, UCSB CCERB	Ellwood North grove was likely used increasingly less by Monarchs from 1994 to 2011 because of the lack of management (e.g. regular logging or thinning), which effectively created too DENSE a woodland with a lack of open flight areas or gallery for the butterflies (page 20). This speaks to a need to do some active management of the overall woodland to keep these open areas.	Comment noted	Restoration
87	8/31/18	Support letter	Emma Pelton, Xerces Society	We are supportive of the Habitat Management Plan's programs; in particular, the Natural Resources Management Programs and Monitoring, Research, and Adaptive Management Programs which are focused on protecting monarchs and restore or enhance their overwintering habitat at Ellwood Mesa.	Comment noted	General Support
88	8/31/18	Support letter	Emma Pelton, Xerces Society	Western monarchs overwintering in coastal California have declined more than 95% since the 1980s and the migratory population faces a high risk of extinction in the next few decades. The Ellwood Main overwintering site is among the most important western monarch habitat – of the hundreds of sites in California where monarchs spend the winter, Ellwood Main is ranked as the fourth highest priority to conserve, based on the historic monarch population and overall degree of population decline. Other overwintering sites found within the Ellwood Complex are also important for monarchs and the entire forested area likely acts as a network of more and less suitable habitat which offers the butterflies' redundancy and resiliency to occupy the best habitat in a given year or within a season. Thus, management decisions at the Ellwood Complex have a greater potential to help – or harm – the overall western monarch population than management activities at most other western monarch overwintering sites.	Comment noted	Restoration
89	9/2/18	Email	Karl Rider	I would encourage the establishment of an indigenous plant community dominated by the California fan palm, Washingtonia filliformis. The fan palm is adapted to the site, provides wintering protection and has a long lifespan better than 500 years in this fire dependent ecosystem. With the knowledge of what a 120 yr old eucalyptus stand looks like and its difficulties of management, we can give future	Comment noted	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
				generations a more diversified landscape, able to meet the many goals of conservation, preservation, production, safety and recreation. A diverse mosaic of vegetation types and ages is the most productive and resilient defense to a catastrophic event that is likely to effect the current monotype stand.		
90	8/16/18	Public Workshop	Cris Lange	Understory and debris is important for monarchs when they fall to the ground. Can't remove debris before allowing new plants to establish and replace it.	Comment Noted. The final 2018 IP will incorporate this concern and is not calling to remove all debris. .	Restoration
91	8/2/18 & 8/9/18	Stakeholder meeting	Lisa Stratton, UCSB CCBER	Eucalyptus trees have been shown to reduce creek flows through excessive transpiration, thereby reducing habitat quality. If diversify with native trees have a better chance of having sustainable creek flows which support butterflies and other wildlife and long term survivorship of species adapted to coastal California (e.g. oaks, sycamores, willows, toyon).	Comment Noted.	Restoration
92	8/9/18	Email	Lisa Stratton, UCSB CCBER	I should clarify that we don't have a vision for the long term elimination of the Eucalyptus grove, but for creating a patchwork of native areas along the edges and between the aggregation areas that will be implemented in a strategic and incremental manner as trees die to create a mixed age, diverse woodland that is sustainable in the long run and continues to support psilids for warblers, trees for hawks and woodland for butterflies WITH important nectar providing, flowering plants. Such a system would be more sustainable in the face of climate change, increased drought, increased fire, reduced water availability... and would reduce threats to residences nearby without compromising function for desired species.	Comment Noted.	Restoration
93	8/30/18	Email	Lisa Stratton, UCSB CCBER	Meade also notes that one of the more highly used areas in this section was in an area where there was a tree fall and ensuing opening which allowed a Toyon to get established that became a focal point for 'basking' by the Monarchs (page 44). The point being that a thinner, safer, less fire-prone Eucalyptus Forest with native plants is a favorable condition for Monarchs; far more than an un-managed "do nothing because the public doesn't want to see anything done" philosophy that has defined management for the past 10 years.	Comment Noted.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
94	9/4/18	Council Meeting	Mayor Paula Perotte	As for the location, Ellwood North is the most accessible. It's not the best prime butterfly habitat.	Comment Noted.	Restoration
95	9/3/18	Letter	FOTEM	Action 2-2.2 allows payments of compensatory mitigation fees into the Butterfly Fund, for projects with "limited impacts on monarch butterfly habitat." It is critical that the City not allow projects that impact monarch butterfly habitat. Action 2-2.2 should be revised to clarify that payment of compensatory mitigation fees are only allowed where projects have implemented all available measures to avoid impacts to monarch butterfly habitat, or to directly mitigate impacts on- site where appropriate, before projects may turn to compensatory mitigation.	Comment noted.	Restoration
96	9/3/18	Letter	Barbara Massey	There is not enough Council and public review of the actions of staff in implementing the plan. Too many inappropriate and unapproved actions have been taken that damaged the habitat in the last two years. There needs to be better protections put in place to stop tree removal and pruning without Council review.	Comment noted. The Plan calls for the appropriate review and monitors to be involved. All project specifics will be outlined in the Implementation Plans and be open for review by the public.	Authority/ Agency
97	8/30/18	Email	Lisa Stratton, UCSB CCBER	Native understory planting should occur where there are openings in the "aggregation" areas and in conjunction with targeted weed control activities. In addition, native trees are used by Monarchs and other butterflies and native trees, if established soon enough, can help provide the environmental amelioration benefits that support the use of the aggregation areas. As such, I think a more specific, say 5-year or 10-year action plan that addresses current die-off areas as well as strategic restoration planting in specific, mapped areas, would provide the clarity, direction, and guidance to allow for effective management of the restoration component of the plan. This is particularly important in light of the very limited window for removing dead trees and other restrictions on the timing of work in the grove and in light of the commendable commitment to using locally collected seed and plant material.	Comment noted.	Restoration
98	9/3/18	Letter	Barbara Massey	The Monarch Butterfly Habitat is an important and valuable environmental resource to be preserved and is not for the entertainment of the public. Public safety should be maintained by keeping the public from any area that might present a safety threat.	Comment noted. MBHMP Programs 5 (trails), 6 (waste management), 7 (aesthetics) provide management guidelines for public use. Implementation of the MBHMP will improve public safety while protecting monarch habitat.	Human Impacts

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
99	8/22/18	PTAC Meeting	Lynn Kirby	There is no mention of handicap accessibility in any of these plans. This has always been a problem out there and I cannot believe this is not a requirement of the state.	Comment noted.	Handicap Access
100	8/22/18	PTAC Meeting	Lynn Kirby	Would be nice to at least have a ADA-accessible trails map to show where someone who is handicapped can have a nature experience. Where do I park my car? Some signage would be very helpful.	Comment noted. ADA parking spots are present at the parking lot. All new signage locations are depicted on Figure 3 of the final 2018 IP with a majority being located at main entry points to the grove and minimized within the grove itself. Further, a separate permit for improved trail routes and designs and additional trail area restoration is currently under review by the Coastal Commission for the Ellwood Mesa outside of the butterfly habitat.	Handicap Access
101	8/16/18	Public Workshop	Eurie, Pacific Oaks	What is our general impression on how to handle the problem of homeless encampments on Ellwood Mesa?	Comment noted. Encampment problems are addressed by the Sheriff.	Human Impacts
102	8/16/18	Public Workshop	City Manager Michelle Greene	About the homeless encampments	Comment noted. Encampment problems are addressed by the Sheriff.	Human Impacts
103	8/7/18	Email	Kevin Duffy	One VERY important point missed was the city's OBLIGATION TO ADDRESS THE PROBLEM OF Invasive, Destructive, Persistent PRESENCE OF semipermanent CAMPERS who: 1) Create a public health risk (hepatitis) by using this environment as a toilet. 2) Accumulate then leave behind weathered piles of personal items , trash, and yes hypodermic needles, all of which I have photo documented and presented numerous times to city staff, council, etc. 3) Destroy shrubs, trees , disturb natural habitat , displace wildlife by hiding camps deep in thickets. 4) Create a fire hazard with camp fires and smoking.	Comment noted. Encampment problems are addressed by the Sheriff.	Human Impacts
104	8/16/18	Public Workshop	Julie Gilmore	Will the plan address busloads of people coming up from LA? City did a good job of directing them to the parking lot; still lots of impact. Will plan address this?	Comment noted. The MBHMP addresses visitor issues in Sections 5, 6, 11, 12, 18 and 20.	Human Impacts
105	9/4/18	Email	Ken Knight	Provide greater detail on the estimated amount of water and irrigation infrastructure needed for both newly planted young trees and strategic mature Blue Gum Eucalyptus to survive and thrive.	Comment noted. A watering and monitoring program is discussed in the final 2018 IP for Coastal Commission review and approval.	Irrigation

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
				▪ Underestimating water needs is a major reason why restoring the redwoods at Stow Grove has been so difficult. A 5 year irrigation plan may be necessary if the current drought continues. Irrigation water may not be available or prohibitively expensive.		
106	9/4/18	Council Meeting	Mayor Pro Tempore Stuart Kasdin	What is the plan for long-term irrigation for the a whole of Ellwood Mesa?	The MBHMP allows for use of water tanks to irrigate new plantings. Specific irrigation plans would be outlined in the IP's.	Irrigation
107	8/9/18	Stakeholder meeting	Bob Morgenstern	The Plan won't work if we don't replace what nature is no longer providing.	Comment noted.	Irrigation
108	9/4/18	Council Meeting	Mayor Pro Tempore Stuart Kasdin	I really want to see the irrigation plan for the whole of Ellwood Mesa.	Comment noted.	Irrigation
109	9/4/18	Council Meeting	Councilmember Michael T. Bennett	It would seem that the only water that we have available is the reclaimed water and we are not using anywhere near what is being produced. And we do have the pipes on Hollister Ave. Is the plan to bring it into the top end of Santa Barbara Shores?	Comment noted.	Irrigation
110	9/4/18	Council Meeting	Councilmember Michael T. Bennett	Will the current high salt content in the reclaimed water have an impact on the habitat?	Comment noted.	Irrigation
111	8/20/18	Email	Barbara Massey	The plans are weak without specific protections for the butterflies and the trees. There is far too much use of the wording "managed, as feasible," which further weakens any protections. There are no protections in these plans to keep a large number of trees from being cut down at any time without the Council's or public's knowledge. This is exactly what the Monarch Butterfly Habitat Management and Implementation Plans were supposed to stop.	Comment noted.	Definitions/ Terminology
112	9/3/18	Letter	Cynthia Brock	This plan should make it clear that the intention is NOT to REPLACE blue gum eucalyptus with native trees in any part of the eucalyptus grove—not in the "gaps" or along the edge of the groves, or on the banks of the creek.	Comment noted. Language clarified to designate areas of native planting in areas already occupied by non-eucalyptus vegetation	Restoration
113	8/16/18	Public Workshop	Mandi Burgess	planting on Ellwood North for variety of reasons, probably will run into same reasons that make it difficult to plant – water, access. What tools and resources will you use in the future when you need to plant further in? City of SB uses gatorbags, close off…	Comment Noted. A watering program is envisioned and included in the final 2018 IP.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
114	9/4/18	Council Meeting	Mayor Paula Perotte	Ok, and if you need watering, you can get the kids to come down from Ellwood School and do some watering for us.	Comment noted.	Public Involvement
115	9/4/18	Council Meeting	Mayor Paula Perotte	I think Ellwood North is a fine location.	Comment noted.	General Support
116	8/16/18	Public Workshop	Sharleen Marie	Put a tank up and drip Ellwood Main.	Comment noted.	Restoration
117	8/9/18	Stakeholder meeting	Lisa Stratton, UCSB CCBER	This plan needs to be more sustainable in the long term and support a higher diversity of species over time	Comment noted.	Restoration
118	8/30/18	Email	Lisa Stratton, UCSB CCBER	Finally, I think you and your consultants have done a good job overall with the plan and I would like to propose that the City contract with CCBER to do a number of the recommended actions. In particular, I think our staff could do a good job of conducting regular invasive plant monitoring program for the plan area. We could provide recommendations for action and oversight and/or monitoring of any work done by crews you hire to implement the work. We are concerned about weeds spreading from adjacent areas into campus and see weeds as a significant threat to the monarchs and all users of the open space. We also think we could help support a research program on insect biodiversity in and out of the grove because our director, Katja Seltmann, is an entomologist. These are just two realms outside of helping with providing plants and restoration expertise where we think we can become effective and long term, affordable partners in restoring the larger Ellwood-Devereux Open Space.	Comment noted.	Restoration
119	9/4/18	Email	Ken Knight	Provide a more detailed assessment of the ongoing costs and level of service needed to maintain a reasonable level of risk to the public using the area. ▪ The nature of Blue Gum Eucalyptus trees will require a level of ongoing maintenance similar to and exceeding that provided to street trees.	Comment noted.	Restoration
120	9/3/18	Letter	Barbara Massey	Instead of maintaining, replacing, and improving the eucalyptus groves, this plan is more interested in the removal of trees and the public use of the Ellwood Mesa Monarch Butterfly Habitat.	Comment noted.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
121	8/2/18 & 8/9/18	Stakeholder meeting	Lisa Stratton, UCSB CCBER	Lack of management in grove is leading to proliferation of saplings, particularly along southern edge. These many smaller trees are faster growing, use more water resources, compete with the large trees that support the monarchs. Management of woodland should involve active removal of saplings and small trees and planting of native trees.	Comment noted.	Restoration
122	8/30/18	Email	Lisa Stratton, UCSB CCBER	Further on this line of thinking is another comment from the 2013 document (page 23), which indicates in some areas the woodland is spreading to the south. This is an undesirable outcome because of the other habitat values on Ellwood Mesa. The southern edge, and any spreading edges, need to be managed. This also speaks to the need for a map.	Comment noted. The eucalyptus current boundary would not be expanded.	Restoration
123	8/30/18	Email	Lisa Stratton, UCSB CCBER	My overall point is that active management is needed and that integration with natives is important. The document suggests this, but I'm not sure it is spelled out clearly enough in terms of say a map of zones for native planting or with specific desired 'tree densities" or other measures that would support a clear next step in terms of defining active management goals for each September. This kind of specificity is important and should save money over time.	Comment noted.	Restoration
124	9/2/18	Email	Karl Rider	I would like to caution on the less is more approach that was mentioned several times throughout the meeting. While there are widely divergent goals of the different shareholder groups, there could be enough consensus to move forward with active planning to implement the 2018 goals. Active management of these goals will be needed to accomplish the timeframe that was mentioned (5yrs) to be eligible for the funding if I understood correctly. Actively managed lands are more productive, more resilient to change, and allow greater opportunities for recreation. This land has been actively managed for the last 120 years and its current use and importance is a testament to the success of actively managing land.	Comment noted.	Restoration
125	9/4/18	Council Meeting	Ana Citrin	It should be a public map…	Comment noted.	Definitions/ Terminology

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
126	9/4/18	Council Meeting	Ana Citrin	It would be helpful to go back and see that map because I haven't been able to find that map in the GP. I thought the zoning of the additional parcels was consistent, even though one area has a playground and is a little different. If you look at the draft MBHMP that was published on the City's website forever, and the print out included in the comments, it clearly includes additional area.	Comment noted.	Misc. Clarification
127	8/22/18	PTAC Meeting	Jessica Altstatt	How is canopy cover measured? What metrics are used? What is the baseline/reference point? If the baseline is from within the past five years, it will be reduced due to the drought. What are we trying to get back to? Also, are we taking into account the recent Edison tree removal?	Comment noted. Mapping will include up-to-date aerials, historic references, and current best practices.	Misc. Clarification
128	8/16/18	Email	Alfred Smith	Page 14 Background, Last Paragraph: Recommend that a footnote be added to provide the implications of terms like "Special Animals List" and "imperiled to vulnerable". How did those designations influence recommendations?	Comment noted. Reference added.	Misc. Clarification
129	8/16/18	Email	Alfred Smith	Page 19 Community Wildfire Protection Plan: "...butterfly and wildland fire experts…" Recommend a footnote to indicate who these experts were.	Comment noted. Experts will be City-approved.	Misc. Clarification
130	8/21/18	Email	Chris Messner	The Urban Forest is defined as all public and private trees. Including Street Tree Systems, trees in Parks and other Public Lands Under Resolution No. 12-78 -and- Ordinance No. 12-16, the UFMP clearly calls for a public Commission to advise and develop plans for all of the Urban Forest.	Comment noted.	Authority/ Agency
131	8/21/18	Email	Chris Messner	UFMP Chapter 1.0, First paragraph: "The City of Goleta initiated the development of this urban Forest Management plan to provide a guide for long term preservation and enhancement of the urban forest within the City's jurisdiction."	Comment noted. Reference added.	Misc. Clarification
132	8/21/18	Email	Chris Messner	UFMP Chapter 1.0, Third paragraph: "The Urban forest consists of all public and private trees, which include the street tree system, trees in parks and other public lands,… This plan deals with the City trees, focusing on those trees which line streets, walkways, parks and other City owned areas."	Comment noted.	Misc. Clarification

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
133	8/21/18	Email	Chris Messner	UFMP Chapter 1.0, Policy Goals: 1.0.1 "Implement the Urban Forest Management Plan covering all City areas, and all new land use development applications within the City of Goleta."	Comment noted.	Misc. Clarification
134	8/21/18	Email	Chris Messner	UFMP Chapter 4.15.1, Guidelines: Use UFMP adopted procedures for defining and designating the protection of Heritage/landmark trees on city property.	Comment noted.	Misc. Clarification
135	8/21/18	Email	Chris Messner	UFMP Chapter 4.15, Naming a Heritage Tree: When considering a heritage tree designation, PTAC will also make a recommendation to the City Council on the naming of the heritage trees. The name shall be informative: a. Location b. Common Name i.e.: the Stow Grove Park Redwoods the Ellwood Mesa Eucalyptus Grove the Old Town Park Sycamore (NOTE: reference of trees above are of Parks and Open Space areas)	Comment noted.	Misc. Clarification
136	8/21/18	Email	Chris Messner	UFMP Chapter 4.17: Public tree Advisory Commission (PTAC) "The Public Tree Advisory Commission was adopted by City Council through Resolution NO. 12-78, on November 6, 2012 (incorporated herein as Appendix E). The Public Tree Advisory Commission should provide advice to the Public Works Director and the City Council on how to plan and implement a City urban forestry management program. The mission of the commission should include advising, administration and management of City UFMP."	Comment noted.	Misc. Clarification
137	8/21/18	Email	Chris Messner	UFMP Appendix C, title of Appendix C: PUBLIC TREE PLANTING GUIDELINES	Comment noted.	Misc. Clarification

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
138	8/21/18	Email	Chris Messner	UFMP Appendix D Resolution 12-78, EXHIBIT "A" Duties and Responsibilities: 4. Review and provide suggestions to staff on the implantation of public tree planting. 7. Coordinate with appointed City commissions and make recommendations to staff on policies, standards, guidelines and regulations for street trees and other public trees located within City-owned open spaces.	Comment noted.	Misc. Clarification
139	8/31/18	email	Emma Pelton, Xerces Society	I would state the overwintering population's decline more bluntly on pg. 1. The way it's currently written: "The monarch butterfly populations at Ellwood Mesa and in California statewide have been in decline for several years." sounds like the species could be in relatively minor decline and that it's only a recent phenomenon. I would suggest re-framing this sentence to include the decline number of "over 95% since the 1980s" (Schultz et al. 2017) or at least "74% since the 1990s" (Pelton et al. 2016).	Comment noted. Additional language included.	Misc. Clarification
140	8/30/18	Email	Lisa Stratton, UCSB CCERB	Action 12-1.10 says, "Replace removed trees at a one to one ratio with five-gallon container stock". Is that replace with natives or non-natives? Needs clarification and seems wrong given the indication that too much forest density creates problems for Monarchs – add a caveat that allows you to integrate considerations for density, gallery areas, etc., and identify those areas specifically. You do something along those lines in Action 12-2.1, but please link tree planting to the criteria in 12-2.	Comment noted.	Restoration
141	8/16/18	Public Workshop	Lori Gastin	Lots of terms that are passive. "Shall encourage, as feasible, shall establish." Lots of qualifiers.	Comment noted.	Definitions/ Terminology
142	7/27/18	Email	Lara Drizd, USFWS	I wasn't sure if I was able to view all of the figures in the Implementation Plan because a couple of blank pages towards the end didn't include the blank page notice.	Comment noted.	Misc. Clarification
143	8/16/18	Email	Alfred Smith	Pg. 12 Executive Summary, Fourth paragraph: Recommend the executive summary provides the reader some indication of budget and schedule for each of the four bullet points. Without it, there is no way for the reader to grasp the magnitude of these plans.	Comment noted.	Misc. Clarification

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
144	8/16/18	Email	Alfred Smith	Methods: Suggest the main focus should also include recommended content of regular, concise reports to track progress and to whom they are delivered.	Comment noted. Monitoring reports are included in MBHMP Action 20-3.1.	Misc. Clarification
145	8/21/18	Email	Chris Messner	It has come to my attention that some city staff in the past have argued that the PTAC only covers Street Trees. This erroneous statement was recently put forward again. I would urge all staff who deal with tree, or open space, to actually read the City's adopted UFMP. The Ellwood Mesa Grove needs to go before PTAC whether or not staff wishes that were so because the City Council has spoken.	Comment noted.	Misc. Clarification
146	8/22/18	PTAC Meeting	Jessica Altstatt	A 1-page summary of the 2018 IP to describe "this is what we're doing" would be helpful.	Comment noted.	Misc. Clarification
147	8/22/18	PTAC Meeting	Jessica Altstatt	Why is this not a catastrophic event now? We've lost so many trees - how much worse can it get before we call it catastrophic?	Comment noted. The MBHMP requires approval by the City Council of a finding that an event is catastrophic (Section 9, Policy 9-2 and Action 9-2.3). This provides a public process and a decision by elected officials.	Misc. Clarification
148	8/22/18	PTAC Meeting	Lynn Kirby	Work in the 2018 IP is to be done in the month of September. However, if this goes to City Council and gets tweaked, none of it will start until 2019, if things go well.	Comment noted.	Misc. Clarification
149	9/3/18	Letter	FOTEM	Clarify Policy 1-1 to Ensure the MBHMP Reflects Current Data Regarding our Local Monarch Population. Suggested language::Policy 1-1: The City shall review, and revise as necessary, the MBHMP to reflect current data, butterfly conservation science, and management techniques regarding the local monarch population	Comment noted. Language will be clarified to emphasis information applicable to the local habitat.	Definitions/ Terminology
150	9/3/18	Letter	FOTEM	Changes such as the below recommended change to Policy 1-2 clarify that it is not protection of the environment in general, rather protection of monarch butterfly habitat specifically that is the MBHMP's charge. Policy 1-2. During implementation of the programs, goals, policies, and actions described in this MBHMP, and during the planning and implementation of other projects that may affect monarch butterfly habitat within the Ellwood Mesa Open Space, protection of monarch butterfly habitat the environment shall be given the utmost consideration	Comment noted. Language in Policy 1-2 is clarified.	Definitions/ Terminology

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
151	9/3/18	Letter	FOTEM	Policy 14.2 speaks about "Gaps in the eucalyptus groves" being considered for "restoration alternatives." Where are the gaps that this policy refers to? Please clarify and provide a map	Comment noted. Language clarified.	Definitions/ Terminology
152	9/3/18	Letter	FOTEM	Action 14-3.1 calls for the establishment of a riparian forest along the banks of Devereux using some native plants in or around the eucalyptus forest for windbreak, to fill out the understory, to provide nectar, or other functions that benefit the monarchs. This action seems to call for the substitution of one type of ESHA (native riparian forest) for another (monarch ESHA) and essentially strip Ellwood of its most important monarch habitat. This policy seems to directly contradict Policy 14.5 and others.	Comment noted. Language clarified to designate areas of native planting in areas already occupied by non-eucalyptus vegetation	Definitions/ Terminology
153	9/3/18	Letter	FOTEM	Expressly Include Activities Undertaken by Utilities and Other Non-City Entities and Clarify Minimum Requirements. Include additional language to include utilities and other non-City entities, and require City monitoring.	Comment noted. Although SCE has a separate permitting pathway, language added to include MBHMP standards.	Authority/ Agency
154	9/3/18	Letter	FOTEM	Goal 10. To facilitate ensure the ongoing use of Ellwood Mesa by the monarch butterfly.	Comment noted. Language clarified.	Definitions/ Terminology
155	9/3/18	Letter	FOTEM	Policy 10-1. The City shall encourage implement management strategies that facilitate the use of Ellwood Mesa by monarch butterflies.	Comment noted. Language clarified.	Definitions/ Terminology
156	9/3/18	Letter	FOTEM	Policy 10-2. Preservation of aggregation sites on Ellwood Mesa shall be a the focus of management activities, as feasible, and in coordination with Program 9, Catastrophic Event Response Program.	Comment noted. Language clarified.	Definitions/ Terminology
157	9/3/18	Letter	FOTEM	Policy 20-3: Create a Monitoring Report, updated annually, when feasible, resulting from the information obtained during the implementation of the various policies and actions called for in this MBHMP	Comment noted. Language clarified.	Definitions/ Terminology
158	9/3/18	Letter	FOTEM	Action 20-3.1: Track the implementation of this MBHMP in the form of a Monitoring Report, preferably updated on an annual basis, and presented at a public workshop.	Comment noted. Language clarified.	Definitions/ Terminology
159	9/3/18	Letter	Cynthia Brock	Action 1-2.1 says, "…should normally include pre-activity surveys…as deemed appropriate." Why would it ever be inappropriate to do a pre-activity survey before doing "activities with the potential to significantly disrupt habitat values?" It should say, "Shall include pre-activity surveys…"	Comment noted. The phrase, "as deemed appropriate", follows a list of potential surveys, and applies to the type of survey. For example, it is not appropriate to survey for nesting birds in October, when birds are not nesting.	Definitions/ Terminology

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
160	9/3/18	Letter	Cynthia Brock	Policy 20-3 says a Monitoring Report should be updated annually when feasible." Why wouldn't it be feasible? That word should be removed.	Comment noted. Language clarified.	Definitions/ Terminology
161	9/3/18	Letter	Cynthia Brock	Action 20-3.1 says to "track the implementation of this plan in the form of a monitoring report preferably updated on an annual basis." Take out "preferably" and add "presented in a public workshop."	Comment noted. Language clarified. The report will be a public document.	Misc. Clarification
162	9/3/18	Letter	Cynthia Brock	Policy 8-1 speaks of a review for need for updates…at least every five years. But Action 22-1.3 talks about reviewing the plan every fifth year "as feasible." Is this the same review or a different one? This second mention of a review implies that it might be an even longer interval before there is such a review and evaluation. Even if this is done every five years, that is still not very often.	Comment noted. Action 22-1.3 is in the context of the adaptive management program and calls for review of management policies and actions with respect to any changes in butterfly use or ecosystem health. Goal 8 is a review of the entire MBHMP, not just biology.	Misc. Clarification
163	9/3/18	Letter	Cynthia Brock	Several of these policies and actions refer to managing aggregation sites, and not the entire ESHA. Others are like Policy 16-2 that says, "The City shall manage eucalyptus trees supporting monarch butterfly aggregation sites in the context of all eucalyptus habitat at Ellwood Mesa."" I am not sure what "in the context" means. Does it mean that all eucalyptus habitat will be maintained?	Comment noted.	Definitions/ Terminology
164	9/3/18	Letter	Cynthia Brock	It should be made clear that all eucalyptus forest designated as monarch ESHA should be maintained, not just "aggregation sites."	Comment noted.	Definitions/ Terminology
165	9/3/18	Letter	Cynthia Brock	Action 2-2.2 allows payments of compensatory mitigation fees to help fund the plan when a development project has impacts on monarch habitat. This is concerning because it suggests that a developer would be allowed to harm monarch habitat and just pay mitigation fees. And perhaps the City would welcome this as a way to fund the plan. Please clarify how this would not create a conflict of interest in the project approval process.	Comment noted.	Funding
166	9/3/18	Letter	Cynthia Brock	Policy 14.2 speaks about "Gaps in the eucalyptus groves" being considered for "restoration alternatives." Where are the gaps that this policy refers to?	Comment noted. Language clarified.	Definitions/ Terminology

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
167	9/3/18	Letter	Cynthia Brock	Action 14-3.1 calls for the establishment of a native riparian forest along the banks of Devereux Creek composed of native riparian tree species. This action would result in the replacing one type of ESHA (monarch habitat) with another (native riparian forest).	Comment noted. Language clarified to designate areas of native planting in areas already occupied by non-eucalyptus vegetation.	Misc. Clarification
168	9/4/18	Council Meeting	Councilmember Kyle Richards	Terminology and designations of the different areas included in the MBHMP	Comment noted.	Definitions/ Terminology
169	9/4/18	Council Meeting	Cynthia Brock	Comments to the Implementation Plan, Figure 1 shows 22 dead trees and should also show the trees that were removed.	Comment noted. Figure has been revised.	Misc. Clarification
170	9/4/18	Council Meeting	Cynthia Brock	Work will include trees proposed for removal	Comment noted. The Final 2018 IP describes work to be done; no additional trees are proposed for removal in the 2018 IP.	Misc. Clarification
171	7/27/18	Email	Lara Drizd, USFWS	MBHMP Pg 39-41 - Interpretive Program - If there's anything we can do to help with outreach and education, please let us know. Diana has already sent me her curriculum for the Monarch MOVES program which I'm currently going through. We also have a biologist in our office here who has been planting pollinator gardens with school groups for years and we could help out if you're interested in having kids involved in restoration and planting efforts.	Comment noted.	Public Involvement
172	8/20/18	Email	Barbara Massey	Docents need much better training so that they follow proper procedures. They should never go into areas not approved for visitors even when there is a lack of butterflies at the approved sites. This could be used as a teaching moment to discuss what happens when an area is disturbed or when their numbers decrease.	Comment noted. Training of the docents is the role of the monarch docent coordinator.	Public Involvement
173	8/16/18	Public Workshop	Barbara Massey	I don't trust Public Works.	Comment noted.	Authority/ Agency
174	8/22/18	PTAC Meeting	Lynn Kirby	Public Works is responsible for implementing the 2018 IP. Is Public Works getting more staff to do this work?	Comment noted.	Authority/ Agency
175	9/3/18	Letter	Barbara Massey	One of the worst parts of the Monarch Butterfly Habitat Management and Implementation Plans is that the Public Works Department has been given the responsibility for most of the Monarch Butterfly Habitat Management and Implementation Plans. This is placing the very people who tried to cut down 100s of eucalyptus trees in charge of their care. The plans should be the responsibility of the Planning	Comment noted	Authority/ Agency

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
				and Environmental Review Department with any work done by Public Works staff or qualified contractors.		
176	9/4/18	Council Meeting	Ana Citrin	It was encouraging to hear about the new management of an open space, however it is critical the staff members with biological resources expertise oversee implementation of this plan. PW is focused on getting the job done and here we need to ensure that the habitat is safeguarded.	Comment noted.	Authority/ Agency
177	9/2/18	Email	Karl Rider	I encourage the commission to seek the advice of a forester, familiar with managing a similar stand type, acknowledgement of the fact that this may need to be sourced from the eucalyptus native range. The forester would be able to discuss stand management, harvest strategies, regeneration rates and timber uses of the stand. Active management of the stand can be accomplished while addressing the various stakeholders needs. In keeping with the planters goals for the stand, an avenue could be explored for utilizing the wood that could be fuel wood, building materials, chips for paths, grade control structures for riparian restoration or other uses that will enhance and help preserve the site.	Comment noted.	Authority/ Agency
178	8/16/18	Public Workshop	Eurie, Pacific Oaks	hard time to figure out who to contact. Add this info to signs? Call XX if you see issues with Ellwood.	Comment noted.	Signs
179	8/16/18	Public Workshop	Mark Holmgren	clarification of removal of pest-infestation. Psillids – lurps on leaves – can be considered infestation but mostly just essential part/user of ecosystem.	Comment noted. Language clarified.	Restoration
180	8/16/18	Public Workshop	Tim Burges, SB Shores	Why is there a fire zone on the south east boundary?	Comment noted. Maps have been revised.	Fire
181	8/16/18	Public Workshop	Tim Burges, SB Shores	Boundary of plan area: the Pebble Beach and SB shores area is included in the GP maps and in Ellwood Dev OSP. Why was this area excluded and can it be included in the final plan?	Comment noted.	Restoration
182	8/16/18	Public Workshop	Public	Public wants to include this park area into the MBHMP	Comment noted.	Authority/ Agency
183	7/27/18	Email	Lara Drizd, USFWS	MBHMP Pg 1 - It was unclear to me how Ocean Meadows is being treated. The Implementation Plan seems to imply that it's not on City Property. I'm guessing the difference is that it doesn't regularly have monarchs, despite the trees being in fairly good health?	Comment noted.	Authority/ Agency
184	9/3/18	Letter	FOTEM	Request staff to expand boundary of the MBHMP to include Area S	Comment noted.	Authority/ Agency

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
185	9/3/18	Letter	Cynthia Brock	The area covered by the Monarch Butterfly Habitat Management Plan (MBHMP) should encompass all monarch ESHA on City-owned properties that were included in the Ellwood/Devereux Open Space Habitat Management Plan (OSHMP).	Comment noted.	Authority/ Agency
186	9/4/18	Council Meeting	Ana Citrin	Plan area scope and what is included in that Area. The area between Santa Barbara Shores Drive and Pebble Beach Drive that is included in the Devereux-Ellwood Open Space Plan, including the City's approved portion of it and included in all the General Plan maps. There is monarch ESHA in that area. One plan map identifies key site 4 as an open coastal spot, it is not clear to me that it is the exclusive open plan map and seems as those the open space management plan contains the guiding directives in terms of protecting monarch habitat and this area is recognized as part of that plan, specifically the value of unoccupied groves are acknowledged as providing backup of it. It is important that this additional area be preserved for the monarch butterfly. We encourage you to extend the MBHMP boundary to include this area. We have not heard a good reason as to why not. There is a small area with some playground equipment that could easily be treated differently to protect what's there for children.	Comment noted.	Authority/ Agency
187	9/4/18	Council Meeting	Ana Citrin	Boundary issue (continued)	Comment noted.	Authority/ Agency
188	9/4/18	Council Meeting	Ana Citrin	Ellwood Mesa Boundary Issue	Comment noted. The Open Space Element of the General Plan shows on Figure 3-2 Parks and Recreation Plan Map that the Ellwood Mesa is #30, 31 and 34 and are listed as Regional Open Space on Table 3-1. Santa Barbara Shores Open Space is labeled #33 and designated as Neighborhood Open Space. These different distinctions preclude the inclusion of the SB Shores area with the Ellwood Mesa area in the MBHMP.	Authority/ Agency
189	8/22/18	PTAC Meeting	Jessica Altstatt	The proposed restoration site is a good location - it is accessible for work and for visitors/education. It's also easier to monitor and care for the trees.	Comment noted.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
190	8/22/18	PTAC Meeting	Jessica Altstatt	The west side of Ellwood North would be a good site for native restoration (shrubs or trees) - it is out of the fire management area and visible for educational purposes. It also provides greater light, which is lacking within the eucalyptus grove. This would be beneficial for birds, bees, butterflies, and the public.	Comment noted.	Restoration
191	9/4/18	Council Meeting	Mayor Paula Perotte	Do we set the replacement ratio or is that the CCC?	Comment Noted. The total number of trees to be used in the restoration was derived by calculating the number of trees that could be planted and grow effectively within the restoration area to maximize the most suitable habitat and density sought. A "ratio" was not used.	Misc. Clarification
192	9/4/18	Council Meeting	Mayor Paula Perotte	If we want to increase the replacement ratio, would it be up to the Council? Because not all trees survive.	Comment noted. Yes, the MBHMP requires Council approval of IP recommendations.	Misc. Clarification
193	8/31/18	email	Emma Pelton, Xerces Society	Have you considered increasing the replacement ratio from 1:1 to 2:1? Just to account for some sapling mortality and/or have better wind protection sooner? However, it may require later thinning which I can see might require careful public messaging.	Comment Noted. The total number of trees to be used in the restoration was derived by calculating the number of trees that could be planted and grow effectively within the restoration area to maximize the most suitable habitat and density sought. A "ratio" was not used.	Restoration
194	9/4/18	Email	Ken Knight	Provide an estimated survival rate of newly planted trees, and a follow up process to replant and maintain those trees. ▪ This is a very challenging area to plant. It will be difficult to replant and irrigate after initial planting efforts have been completed.	Comment Noted. In any instance where a planted restoration trees dies, it will also be replaced in order to meet the 100% survival goal in the final 2018 IP.	Misc. Clarification
195	9/4/18	Email	Ken Knight	Update the 2001 UC Cooperative Extension planting standards used in the Plan to 2018 planting standards, such as International Society of Arboriculture Best Management Practices for planting trees. ▪ There have been great advances in planting methodologies over the last 17 years that have not addressed in the Plan including soil testing, root shearing before planting and techniques for planting in dry, compacted soils.	Comment Noted. More recent methodologies have been used and cited throughout the final 2018 IP.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
196	9/3/18	Letter	FOTEM	The 2018 IP is intended to include mitigation for the previous removal of 29 eucalyptus in 2017 authorized under an emergency permit from the Coastal Commission. We're concerned that the 2018 IP appears to include the absolute bare minimum, and should be revised to include additional eucalyptus planting proximate to the area where each of the 29 eucalyptus were removed under the 2017 emergency permit, in addition to the proposed planting near Ellwood North	Comment Noted. The final 2018 IP involves planting of 63 eucalyptus trees as replacement and/or habitat enhancement trees, with red ironbark eucalyptus planted closer to the outer edge of the restoration area and blue gum eucalyptus planted closer to the interior of the restoration area. This configuration will mean that the heartier tree species will be located on the outside of the grove, thereby offering protection for the tree species on the interior, to help ensure that the enhanced habitat will be healthier and therefore be more suitable for monarch butterflies.	Restoration
197	9/3/18	Letter	Cynthia Brock	Consider a higher mitigation ratio, or plan to plant additional trees when needed to re-create optimal structure and desirable density of the forest.	Comment Noted. The final 2018 IP involves planting of 63 eucalyptus trees as replacement and/or habitat enhancement trees, with red ironbark eucalyptus planted closer to the outer edge of the restoration area and blue gum eucalyptus planted closer to the interior of the restoration area. This configuration will mean that the heartier tree species will be located on the outside of the grove, thereby offering protection for the tree species on the interior, to help ensure that the enhanced habitat will be healthier and therefore be more suitable for monarch butterflies.	Restoration
198	9/4/18	Council Meeting	Cynthia Brock	Planting only 28 trees doesn't provide adequate mitigation for the previously removed trees. Some of the trees removed were very large, multi-trunk trees. One small tree won't replace the function of the older trees for many decades. If the mitigation ratio was higher, we could begin to restore the aggregation site buffers where the trees were removed as well as enhance the Ellwood North site. The blue gum eucs that were removed could be replaced in addition to adding the ironbark eucs. so plant more trees at least some of them in the areas where the trees were removed especially near the aggregation sites	Comment Noted. The final 2018 IP involves planting of 63 eucalyptus trees as replacement and/or habitat enhancement trees, with red ironbark eucalyptus planted closer to the outer edge of the restoration area and blue gum eucalyptus planted closer to the interior of the restoration area. This configuration will mean that the heartier tree species will be located on the outside of the grove, thereby offering protection for the tree species on the interior, to help ensure that	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
					the enhanced habitat will be healthier and therefore be more suitable for monarch butterflies.	
199	9/4/18	Council Meeting	Mayor Paula Perotte	Why not ask the CCC to plant more than 1:1 replacement ratio of trees?	Comment Noted. The final 2018 IP involves planting of 63 eucalyptus trees as replacement and/or habitat enhancement trees, with red ironbark eucalyptus planted closer to the outer edge of the restoration area and blue gum eucalyptus planted closer to the interior of the restoration area. This configuration will mean that the heartier tree species will be located on the outside of the grove, thereby offering protection for the tree species on the interior, to help ensure that the enhanced habitat will be healthier and therefore be more suitable for monarch butterflies.	Restoration
200	9/4/18	Council Meeting	Mayor Paula Perotte	I like the idea of putting them all in this one area for now and there must be other areas that need it.	Comment Noted.	Restoration
201	9/4/18	Council Meeting	Mayor Paula Perotte	What I read about the questioning of the 1:1 seemed to be questioning whether that was going to die off of the plantings and you need to accommodate for the survival rate being 100% or 70%.	Comment Noted.	Restoration
202	9/4/18	Council Meeting	Mayor Pro Tempore Stuart Kasdin	I see, so for the CCC, if you wanted to have a final take of 28 trees and we planted 40, they would want to see 40. They assume 100% survival rate and we would replace as we go along.	Comment Noted.	Restoration
203	9/4/18	Council Meeting	Councilmember Kyle Richards	Is there any other reason that we would want to not start planting aggressively now?	Comment Noted. Any restoration plantings or other activities within the Ellwood Mesa area will require approval by the Coastal Commission before the City is permitted to begin.	Restoration
204	9/4/18	Council Meeting	Mayor Paula Perotte	The only reason I am questioning the 1:1 is because I haven't heard of 1:1. I've heard of 2 or 3	Comment Noted. No "ratio" was used in the final 2018 IP, but rather a restoration area and healthy planting distances and methodology to derive 63 replacement trees.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
205	9/4/18	Council Meeting	Councilmember Kyle Richards	Regarding the density, I was thinking that if we had more, then we would look at a larger area, not putting more in the same area	Comment Noted.	Restoration
206	9/3/18	Letter	FOTEM	The location of the replanted trees is problematic. While we understand that the proposed replanting in the Ellwood North area carries certain benefits for the Ellwood North aggregation area, it does not directly mitigate for the trees lost. We encourage the City Council to direct Staff to revise the 2018 1P to include additional replanting of eucalyptus proximate to the locations where each of the 29 eucalyptus were removed.	Comment Noted. The proposed replanting location presents the fewest problems for successful replanting, and provides much needed protection of a monarch butterfly aggregation site. It is a high priority restoration area, where the location of dead tree removal is not. Removal of dead trees does not carry a "mitigation" requirement under the current permit, but is a restoration activity. Trees in the removal area will be replaced under the guidance of an approved CDP from the Coastal Commission, with the recommendations set forth in the 2018 IP.	Restoration
207	9/4/18	Council Meeting	Cynthia Brock	Will trees be planted to mitigate the removal of additional trees?	Comment Noted. No additional trees are proposed for removal in the 2018 IP.	Misc. Clarification
208	9/4/18	Council Meeting	Cynthia Brock	Will all the 28 replacement trees be planted along the western boundary Ellwood North and I guess we've had that answered, it would do nothing to mitigate the other areas where trees were removed. It doesn't address the condition in the emergency permit that calls for restoration of aggregation sites. 5 of the trees that were removed last year were within the buffer zones of Ellwood Main and West. The structure and function of those groves should be restored by planting some of these trees within the areas were trees were removed, especially within the aggregation sites.	Comment Noted. The proposed replanting location presents the fewest problems for successful replanting, and provides much needed protection of a monarch butterfly aggregation site. It is a high priority restoration area, where the location of dead tree removal is not. Removal of dead trees does not carry a "mitigation" requirement under the current permit, but is a restoration activity. Trees in the removal area will be replaced under the guidance of an approved CDP from the Coastal Commission, with the recommendations set forth in the 2018 IP.	Restoration
209	9/4/18	Council Meeting	Ana Citrin	Increase mitigation ratio is critical. You're going to need to go the coastal commission every time you want to do one of these approved. Why not ask for additional planting and get authorization for irrigation in additional planting areas now so that you have the flexibility to do that and to truly restore this area and mitigation for the impacts that were previously done to this area.	Comment Noted. No "ratio" was used in the final 2018 IP, but rather a restoration area and healthy planting distances and methodology to derive 63 replacement trees.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
210	9/3/18	Letter	Barbara Massey	There are no protections in these plans to keep a large number of trees from being cut down at any time without the Council's or public's knowledge or approval.	Comment Noted.	Authority/ Agency
211	9/4/18	Council Meeting	Councilmember Kyle Richards	Will there be a staff response to the comment letters? To what degree will we know that the comments have been received and that we did anything about them?	Comment Noted. City staff has created a matrix of comments and staff responses to each comment received during public discussions as well as those that were emailed to the City.	Misc. Clarification
212	9/4/18	Council Meeting	Councilmember Kyle Richards	What about when there is a conflict in the comments? With the type of species that we plant and the riparian areas? How do we manage that? Or will that come back to us?	Comment Noted. Conflicts are resolved with the best available information.	Misc. Clarification
213	9/4/18	Council Meeting	Councilmember Kyle Richards	I'd like to include the comments that were brought up today and the topic of the expansion area and the other concerns that were brought up today.	Comment Noted. Many of the comments received during the public meeting guided revisions to the draft IP and help form the final 2018 IP that submitted to the Coastal Commission for review as part of the follow-on CDP to the 2017 EMP.	Misc. Clarification
214	9/3/18	Letter	Cynthia Brock	The BMHMP assigns a large role to the docents to provide feedback about the management of the groves. While this group has valuable experience in the grove, there are many other members of the public who are very concerned and also bring valid information.	Comment Noted. Each IP will be presented at a public hearing for City Council review and approval.	Public Involvement
215	9/3/18	Letter	Cynthia Brock	Policy 18-2 makes the docents (through the docent coordinator) the only input for the signage program. What about all the other interested people? Their opinions and recommendations should also be sought. Add methods to solicit recommendations from other interested persons.	Comment Noted. Policy 18-2 states the Butterfly Docent Coordinator shall provide input regarding the interpretative program. The policy in no way restricts public comment or inquiry.	Public Involvement
216	8/16/18	Public Workshop	Sharleen Marie	What are we doing this year in September?	City continued to edit the final 2018 IP throughout later months of 2018 and will be submitting an application to the Coastal Commission to formally permit the emergency removal and pruning that occurred in late 2017.	Misc. Clarification
217	8/16/18	Public Workshop	Sharleen Marie	Will the City be cutting more trees? Removing vines? Planting things?	Not in 2018, but the City will consider if removal of additional dead trees will be necessary in the future. Any additional work for restoration will be discussed in detail in the final 2018 IP.	Misc. Clarification

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
218	8/16/18	Public Workshop	Eurie, Pacific Oaks	What's a stakeholder?	Anyone who is interested in process including but not limited to agencies, staff, council, public, neighbors at Coronado and North Campus open space.	Misc. Clarification
219	8/16/18	Public Workshop	Eurie, Pacific Oaks	Has there ever been any mgmt. of this area, ever?	Yes, the forest was actively managed as a wood lot from its beginning in the 1870s until the 1980s.	Misc. Clarification
220	8/16/18	Public Workshop	Mandi Burgess	What do you want from us? what we want to see?	Comment Noted. Staff has incorporated all relevant and applicable comments and suggestions into the final 2018 IP, as appropriate.	Misc. Clarification
221	8/16/18	Public Workshop	Cris Lange	What is CCC reviewing?	Comment Noted. The City will be including the final 2018 Implementation Plan in its application to the Coastal Commission, as required by the issued Emergency Permit. The City anticipates work detailed within the plan to begin in 2019.	Misc. Clarification
222	8/16/18	Public Workshop	General public comment	MBHMP page 126 says that down fuel does not play important role. Has anything in the research changed since 2012?	Comment Noted. MBHMP monitoring, research, and adaptive management programs will obtain new information as it becomes available.	Misc. Clarification
223	8/16/18	Email	Alfred Smith	Pg. 12 Executive Summary, Second paragraph: Why is the UFMP not mentioned as a key policy document? Was the UFMP referenced at all when developing the plans?	Comment Noted. Reference to the UFMP was added to the policy section of the document.	Authority/ Agency
224	8/22/18	PTAC Meeting	Phebe Mansur	Are you coordinating with the folks on the Coronado Plan?	Comment Noted. The City coordinates Plans.	Misc. Clarification
225	9/4/18	Council Meeting	Mayor Paula Perotte	Will the signage be going to the design review board?	Comment Noted. Public signage within City-owned parks and open spaces is determined by the City Council (and the Coastal Commission within the Coastal Zone areas of the City) and is installed and maintained by Public Works. Signage would likely only go to DRB if directed by the Council to do so.	Misc. Clarification
226	9/4/18	Council Meeting	Mayor Pro Tempore Stuart Kasdin	If you put together a budget and an irrigation plan I presume after the MBHMP, would that be part of submitting this?	Comment Noted. The final 2018 IP has been revised to describe the restoration work sought by the City.	Misc. Clarification

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
227	9/4/18	Council Meeting	Mayor Pro Tempore Stuart Kasdin	So for the irrigation you will have already taken care of the introductory requirements and will then just need permitting?	Comment Noted. The final 2018 IP has been revised to describe the restoration work sought by the City.	Misc. Clarification
228	9/4/18	Council Meeting	Cynthia Brock	Will the 22 dead trees in Figure 1 be removed prior to restoration planting?	Comment Noted. Figure 1 depicts only those trees that were previously removed or pruned in 2017 under the Emergency Permit.	Misc. Clarification
229	9/4/18	Council Meeting	Mayor Paula Perotte	Did you get the direction that you wanted?	Comment Noted. Staff has incorporated all relevant and applicable comments and suggestion into the final 2018 IP, as appropriate.	Misc. Clarification
230	9/4/18	Council Meeting	Mayor Paula Perotte	The big question is the scope of the open space plan. I think we need to make it really clear what is the scope. I'm still a little confused as to the boundary and the scope of the plan. How can we deal with it?	Comment noted. The MBHMP provides a map (Figure 2) that shows the Monarch Butterfly Habitat Management Plan Coverage Area. It is not defined by parcels.	Authority/ Agency
231	9/3/18	Letter	Cynthia Brock	Is the treatment different for "aggregation areas," "roosts," "trees supporting seasonal monarch butterfly aggregation sites," "aggregation site buffers," or the eucalyptus forest beyond the buffers.	There is no difference in the treatments for these various areas.	Restoration
232	9/3/18	Letter	Cynthia Brock	If other types of eucalyptus will be considered for restoration, a table should be added that shows those different types and compares their attributes like size, growing habit, nectaring time, whether they are known to be used for aggregation, etc.	Comment Noted. Restoration in North Ellwood associated with the emergency removal of hazard Eucalyptus trees will use both eucalyptus trees and native understory. A variety of tree and plant species are being considered throughout the other areas of the grove.	Restoration
233	8/30/18	Email	Lisa Stratton, UCSB CCBER	Policy 14-2 says: "Gaps in eucalyptus groves shall be considered for habitat enhancement and restoration alternatives" – the subsequent actions are good – but could you add a strategic time line to this (now that funding is available) that says something like: A strategic planting plan and map will be created in 2018-19 with the goal of addressing all current and developing gaps and restoration opportunities by (say) 2024.	Comment noted. Language clarified to designate areas of native planting in areas already occupied by non-eucalyptus vegetation.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
234	8/16/18	Public Workshop	Barbara Massey	Want eucs restored with eucs, not natives.	Comment Noted. As discussed in the final 2018 IP, there would be 11 red ironbark eucalyptus planted closer to the outer edge of the restoration area, and 52 blue gum eucalyptus planted closer to the interior of the restoration area.	Restoration
235	8/16/18	Public Workshop	Mandi Burgess	About eucs vs natives discussion	Comment Noted. Restoration in North Ellwood associated with the emergency removal of hazard Eucalyptus trees will use both eucalyptus trees and native understory. A variety of tree and plant species are being considered throughout the other areas of the grove.	Restoration
236	8/16/18	Public Workshop	Jennifer Loftis	Dead trees prevent recruitment of understory – how are you doing restoration?	Comment Noted. The total number of trees to be used in the restoration was derived by calculating the number of trees that could be planted and grow effectively within the restoration area to maximize the most suitable habitat and density sought. A “ratio” was not used.	Restoration
237	8/2/18 & 8/9/18	Stakeholder meeting	Lisa Stratton, UCSB CCBER	No maps provided in plan, see below for proposed focus on doing active restoration of all non-aggregation areas with native trees which can reduce fire risk, establish early to continue to provide environmental amelioration of the grove, support insects, birds, wildlife to complement Eucalyptus trees	Comment Noted. The 2018 IP has been updated with maps.	Restoration
238	9/3/18	Letter	Barbara Massey	There seems to be a continuing push from staff to restore eucalyptus trees with native plants, not eucalyptus trees. At the workshop the public strongly supported any restoration to be with the more appropriate eucalyptus trees.	Comment Noted. The MBHMP Identifies planting eucalyptus as the action to correct habitat deficiencies.	Restoration
239	9/3/18	Letter	Barbara Massey	There is also too much emphasis on clearing understory and removing fallen trees which are much needed by the other wildlife in the groves. I see this as no improvement or very little over current flawed plans.	Comment Noted.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
240	9/4/18	Council Meeting	Councilmember Roger S. Aceves	Restoration with native understory makes good sense to me. Assuming this is in the preferred restoration site, how would we deal with this? (photo on slide 5 of presentation)	Comment Noted. Restoration in North Ellwood associated with the emergency removal of hazard Eucalyptus trees will use both eucalyptus trees and native understory. A variety of tree and plant species are being considered throughout the other areas of the grove.	Restoration
241	9/4/18	Council Meeting	Councilmember Roger S. Aceves	Would the debris in the restoration area be removed?	Comment Noted. The final 2018 IP will incorporate this concern and is not calling to remove all debris.	Restoration
242	8/16/18	Public Workshop	General public comment	In terms of replanting: how are you defining success of trees that you are planting? Could die in 5-10 years. When do you say you're done with the tree?	Comment Noted. The final 2018 IP includes a tree monitoring program to ensure replacement trees are successfully established and have a 100% survival rate.	Restoration
243	8/16/18	Public Workshop	Wes Herman, retired fireman	Post "no fire" signs at the entrances and at the beach	Comment Noted.	Signs
244	8/16/18	Public Workshop	Cynthia Brock	Add "No Parking" signage at end of SB Shores drive to keep the fire access clear	Comment Noted.	Signs
245	8/16/18	Public Workshop	Sharleen Marie	Will the trail closure signs that are up stay there this season?	Comment Noted. If approved by the Coastal Commission, the City would be replacing trail closure signs with warning signs, as shown on Figure 3 of the final 2018 IP.	Signs
246	8/16/18	Public Workshop	Tim Burges, SB Shores	Votes for "enter at your own risk" Do not try to protect everyone that goes through them.	Comment Noted.	Signs
247	7/27/18	Email	Lara Drizd, USFWS	MBHMP Pg 16 - Signage/Fencing - It wasn't clear to me if these activities would be done outside of the OW time period. I would just add a note that installation and maintenance of signage and fencing will be conducted in such a way as to not disturb overwintering monarchs.	Comment Noted.	Signs
248	9/3/18	Letter	Cynthia Brock	Most interpretive signage should be placed at the main entry points rather than in the forest. The parking lot and the Coronado Preserve are both good places for informational and directional signs	Comment Noted.	Signs

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
249	9/3/18	Letter	Cynthia Brock	We should consider the possibility of using simple brochures, distributed at the parking lot or other main entry points to provide information, rather than installing a profusion of signs in our natural area. I think most people would deposit their brochures for re-use. And the forest wouldn't be "littered" with obtrusive signs.	Comment Noted.	Signs
250	9/4/18	Council Meeting	Councilmember Kyle Richards	Questions about the trail closure signs, are we talking about an "enter at your own risk" sign? So, it would be open to the public just with more warnings about there is danger here so it decreases our liability?	Comment Noted. If approved by the Coastal Commission, the City would be replacing trail closure signs with warning signs, as shown on Figure 3 of the final 2018 IP.	Signs
251	9/4/18	Council Meeting	Mayor Paula Perotte	I will comment on the replacement of the trail signs with cautionary signs. We checked with JPA and the "enter at your own risk" is fine. I support that.	Comment Noted.	Signs
252	9/4/18	Council Meeting	Mayor Paula Perotte	Will signage be approved by the DRB?	Comment Noted. However, public signage within City-owned parks and open spaces is determined by the City Council (and the Coastal Commission within the Coastal Zone areas of the City) and is installed and maintained by Public Works.	Signs
253	9/3/18	Letter	Cynthia Brock	Any further signage and fencing in the monarch groves should be required to be reviewed, in a public meeting, by the Design Review Board. The City itself should be held to standards as high as any commercial establishment or developer is. And the public should be given just as much of a chance to comment on these features as they would on any other project.	Comment Noted. However, public signage within City-owned parks and open spaces is determined by the City Council (and the Coastal Commission within the Coastal Zone areas of the City) and is installed and maintained by Public Works.	Signs
254	9/3/18	Letter	Cynthia Brock	Signs directing tourists who want to visit monarchs should point them only to the Ellwood Main site. Tourism can be a destructive force in the groves and its impact should be limited by channeling groups to just one area where they can be controlled by fencing, docent presence, etc. Don't provide other signals like cleared paths or seating areas that would visually direct tourists into the other aggregation sites.	Comment Noted.	Signs

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
255	8/31/18	Letter	Cherie Topper, Santa Barbara Audubon Society	The MBHMP encompasses a significant riparian system (i.e., channels, tributaries) that has been heavily and negatively impacted by human activity as well by neglect. While the MBHMP mentions modest efforts to address riparian degradation, we believe that a more concerted focus on restoration and rehabilitation of this important habitat would benefit the monarch aggregation sites as well as the local ecosystem as a whole.	Although the primary focus of the MBHMP is monarch butterfly habitat, improvement of habitat for other wildlife species within the coverage area is also a priority. This is embodied in the Habitat Enhancement and Restoration Program (Program 14), which includes actions for habitat enhancement and native restoration in areas outside the butterfly groves, and along Devereux Creek in particular (Action 14.3-1).	Native Habitats
256	8/31/18	Letter	Cherie Topper, Santa Barbara Audubon Society	Expanding on the above point, we believe the key to successful restoration efforts is a carefully targeted approach to the selection and design of native restoration sites. This might result, for example, in restoration efforts limited to within 50-100 feet of existing waterways, that is, wetter areas where some native vegetation (e.g., coast live oak and toyon) already exists. (One strategy here might be to remove competing eucalyptus and design restoration around these natives; additionally, dead eucalyptus would need to be removed so as to allow sunlight to reach the restoration areas.) The attached annotated map suggests such possible areas. More precise siting ideally would be informed by bringing expert (hydrologic, geologic) knowledge to bear on more detailed mapping of the seeps and springs that occur along the Ellwood segment of the More Ranch Fault (see attached), many of which are now degraded, weakly expressed, or entirely obliterated. This fault is known to host persistently wet riparian habitats, which, among other attributes, makes it one of National Audubon's Important Bird Areas (IBAs). Principles underlying this recommendation include the facts that: a. Monarchs may aggregate in vegetation other than eucalyptus b. The habitat structure requirements needed to achieve correct micro-climate conditions can be achieved through native as well as eucalyptus plantings. c. Restoration with natives provides more diversity than eucalyptus alone. d. Carefully sited and designed native habitats have the greatest likelihood of being self-sustaining and	While monarch overwintering in native vegetation has been documented in San Luis Obispo County and to the north, native vegetation in Santa Barbara County and southward does not tend to support suitable monarch aggregation habitat for the duration of the overwintering season without the support of eucalyptus trees. Integrating native species into restoration designs is envisioned as part of the MBHMP's programs, but must be undertaken cautiously to ensure that butterfly habitat is not compromised. In and near known aggregation sites, replacement of eucalyptus with other species would be considered experimental and would only be implemented as part of the research or adaptive management programs until data show that maintaining a climax aggregation site with native species in Southern California is feasible. The City is fully committed to enhancing habitats within the Coverage Area for other wildlife, in addition to monarchs, but at least in the short term we expect the focus for native plantings to be on areas outside the eucalyptus groves. The precipitous decline of the monarch population, combined with the extraordinary importance of wintering habitat (and wintering habitat on Ellwood	Native Habitats

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
				supportive of diverse insect and bird life.	Mesa in particular) for the species, necessitates placing the highest priority on butterfly habitat objectives. Proposed actions such as better researching the locations of historic seeps that could be suitable for restoration are could be conducted under the MBHMP's research program. As stated in MBHMP Action 12-1.2 and Table 2, the selective removal of standing dead trees is an option for active management of the eucalyptus groves and would be implemented where beneficial for habitat or necessary for safety reasons.	
257	8/31/18	Letter	Cherie Topper, Santa Barbara Audubon Society	We encourage the plan to provide for the gradual replacement of dead eucalyptus outside monarch aggregation areas with appropriately selected native trees	Transitioning eucalyptus habitat to a native tree habitat is not included in the MBHMP, because the eucalyptus groves are designated monarch butterfly ESHA and converting them to another habitat type is therefore inconsistent with the General Plan. An ESHA area to be converted to a different habitat type would first need to have the ESHA designation removed through a General Plan amendment.	Native Habitats
258	8/31/18	Letter	Cherie Topper, Santa Barbara Audubon Society	The concern of damage by unleashed dogs is not addressed in the MBHMP and conflicts with two program goals, Trail Management Program Goal 5 and Waste Management Program Goal 6.	While dogs are not addressed explicitly by the MBHMP, the City's municipal code requires that dogs be on-leash on Ellwood Mesa. Under MBHMP Policy 6-2 the City would take steps, including signage, informing visitors as to rules and restrictions that apply within the grove. Rules related to dogs, including proper leash use and cleanup of animal waste, could be addressed under this policy.	Dogs
259	8/31/18	Letter	Cherie Topper, Santa Barbara Audubon Society	The final plan, especially the Habitat Enhancement and Restoration Program (Section 14), should include an assessment of the impacts of all proposed actions on potentially affected downstream habitats, such as North Campus Open Space (NCOS) and Coal Oil Point Reserve (COPR).	The project's impacts were described in the IS/MND, which is available for public review and comment until February 24th. However, because all eucalyptus plantings and enhancement would be confined to the existing groves, which have been dominated by eucalyptus for decades, no	Environmental impacts

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
					adverse impacts related to the introduction or spread of eucalyptus are anticipated. Other impacts, such as those from native habitat restoration and signage to improve rules awareness, would be positive.	
260	8/31/18	Letter	Cherie Topper, Santa Barbara Audubon Society	The Coronado Seep is an important birding hot spot and the MBHMP should protect and preserve this spot.	The MBHMP does not recommend any actions that would disrupt the Coronado Seep.	Coronado Seep
261	8/31/18	Letter	Cherie Topper, Santa Barbara Audubon Society	The "Program Status" paragraph at the end of Section 14 states: "An Implementation Plan that describes work activities to occur each year will accompany this MBHMP." We applaud this element of the plan and trust it will be annually circulated for public review and comment well in advance of the work commencement date. This will ensure that it serves as an effective mechanism for public communication and feedback and for project monitoring and accountability.	Comment noted. We are hopeful that the approach of using specific Implementation Plans to further the goals of the overarching MBHMP will be successful, for all the reasons you've mentioned.	General Support
Comments Received during the Draft IS-MND Public Comment Period						
262	2/25/19	Letter	Jacqueline Phelps, District Supervisor, California Coastal Commission	The commenter describes the background and context for the MBHMP, noting that the health of eucalyptus groves at Ellwood Mesa has been compromised as a result of drought and pest infestation. The commenter further notes that the California Coastal Commission (CCC) issued an Emergency Coastal Development Permit (CDP) to the City in September 2017, authorizing removal of 29 dead or high-risk trees that posed a threat to public safety. As a condition of this Emergency CDP, the City is required to submit a complete CDP application addressing not only mitigation for the removed trees, but also aggregation site restoration, habitat management, and trail repair and maintenance strategies. The commenter states that the MBHMP, as written, lacks specific project details and implementation actions and recommends inclusion of detailed measures into the MBHMP to guide implementation of a comprehensive, ecosystem-based approach for management of Ellwood Mesa to fulfill the requirements of the Emergency CDP. The commenter adds that the plan should include alternatives for replacing removed and trimmed eucalyptus trees with native tree species and replacing them with a mixture of	The MBHMP provides a long-term conservation strategy built around broad objectives, outcomes, and management policies for Ellwood Mesa monarch butterfly habitat. Policy 1-4 of the MBHMP states that "periodic Implementation Plans shall identify and describe short-term actions needed to further the goals and objectives of the MBHMP, taking into consideration current conditions and funding levels at the time each Implementation Plan is prepared." The 2018 Implementation Plan was released along with the July 2018 draft of the MBHMP and includes activities aimed at satisfying conditions of Emergency CDP issued to the City by the CCC. The purpose of the 2018 Implementation Plan is to address previous emergency tree removals with restoration of the aggregation sites in the groves and to reopen trails. Primary	MBHMP Scope/Detail

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
				native and non-native tree species as well as incorporating as many native nectar producing species in the planting palette as possible.	tasks identified in the 2018 Implementation Plan include conducting nesting bird and monarch butterfly surveys, installation of enhancement plantings and signage, removal of existing closure signs, and long-term replacement tree monitoring. The CCC is currently reviewing the 2018 Implementation Plan. The Draft IS-MND evaluates the 13 MBHMP programs with potential to result in environmental impacts, and includes the range of specific covered activities that could occur under these programs. Covered activities for each of these programs are listed in the Draft IS-MND, beginning on Page 10.	
263	2/25/19	Letter	Ana Citrin, Law Offices of Marc Chytilo, APC, for Friends of the Ellwood Monarchs	The commenter recommends that the MBHMP be revised to specifically state that removed eucalyptus trees will be replaced in kind and identify blue gum and other eucalyptus species in the identified plant list.	This comment is noted. The MBHMP calls for maintaining a "living forest within the outline of pre-drought forest extent," and contains a number of policies and actions supporting eucalyptus growth within the boundaries of the existing eucalyptus groves. Such actions include Action 12-1.11, which calls for a pilot planting for any eucalyptus species considered for tree restoration that is not present in the MBHMP area as of 2018, and Action 12-2. 5, which calls for protecting blue gum saplings as necessary to encourage natural recruitment of trees in the eucalyptus forest. Finally, the 2018 Implementation Plan calls for planting of 63 eucalyptus trees within the existing grove boundaries as mitigation for the 27 trees removed and 2 trees trimmed in 2017. The 2018 Implementation Plan is currently under review by the CCC.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
264	2/25/19	Letter	Ana Citrin, Law Offices of Marc Chytilo, APC, for Friends of the Ellwood Monarchs	The commenter recommends changes to Policy 12-1 of the MBHMP to state that eucalyptus trees in the groves hall be managed to ensure tree health and longevity throughout the Coverage Area, rather than just in groves containing aggregation sites.	The commenter's proposed changes to Policy 12-1 of the MBHMP have been accepted. Policy 12-1 of the MBHMP has been revised, as follows: "**Policy 12-1**. Eucalyptus trees in the groves ~~containing monarch butterfly aggregation sites~~ within the MBHMP coverage area shall be managed, as feasible, to ensure tree health and longevity."	Restoration
265	2/25/19	Letter	Ana Citrin, Law Offices of Marc Chytilo, APC, for Friends of the Ellwood Monarchs	The commenter recommends a change to Action 12-1.2 of the MBHMP. Specifically, the commenter suggests that Table 2 of the MBHMP be revised to include "Planting eucalyptus trees or planting native trees" as a Potential Action/Tool for Management to correct habitat deficiencies.	This comment is noted. As currently written, Table 2 allows for planting of trees to correct habitat deficiencies, such as sparse overstory, strong winds in the groves, or tree death, toppling, or removal. Such trees may be eucalyptus or native, depending on the location within the Coverage Area, the conditions at this location, and the habitat deficiency to be corrected.	Restoration
266	2/25/19	Letter	Ana Citrin, Law Offices of Marc Chytilo, APC, for Friends of the Ellwood Monarchs	The commenter recommends changes to Actions 12-1.6 and 12-1.10 of the MBHMP specifying maintenance of a living eucalyptus forest and replanting eucalyptus trees.	This comment is noted. The MBHMP calls for maintaining a "living forest within the outline of pre-drought forest extent," and contains a number of policies and actions supporting eucalyptus growth within the boundaries of the existing eucalyptus groves. Such actions include Action 12-1.11, which calls for a pilot planting for any eucalyptus species considered for tree restoration that is not present in the MBHMP area as of 2018, and Action 12-2. 5, which calls for protecting blue gum saplings as necessary to encourage natural recruitment of trees in the eucalyptus forest. Finally, the 2018 Implementation Plan calls for planting of 63 eucalyptus trees within the existing grove boundaries as mitigation for the 27 trees removed and 2 trees trimmed in 2017. The 2018 Implementation Plan is currently under review by the CCC.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
267	2/25/19	Letter	Ana Citrin, Law Offices of Marc Chytilo, APC, for Friends of the Ellwood Monarchs	The commenter recommends changes to Action 10-1.1, Policy 10-2, Action 10-2.1, and Policy 10-4 expanding the application of these actions and policies to eucalyptus groves and windrows in the Coverage Area, as opposed to monarch butterfly aggregation sites.	This comment is noted. The MBHMP includes a number of policies and actions supporting eucalyptus growth within the existing grove boundaries. Additional protections included in the MBHMP are intended to provide an added layer of management directive to protect known aggregation sites in the Coverage Area. They do not preclude larger habitat restoration efforts from occurring throughout the Coverage Area, such as removal of dead trees and debris, planting trees as needed to maintain grove density and improve monarch habitat (Action 12-1.10), or monarch butterfly patrolling habitat enhancement efforts (Action 12-2.2).	Restoration
268	2/25/19	Letter	Ana Citrin, Law Offices of Marc Chytilo, APC, for Friends of the Ellwood Monarchs	The commenter states that Action 2-2.2 allows for payments of compensatory mitigation fees to the Butterfly Fund for projects with limited impacts on monarch butterfly habitat. The commenter adds that the City should not allow projects that impact monarch butterfly habitat, and Action 2-2.2 should be revised to allow payment of compensatory mitigation fees only where projects have implemented all available measures to avoid impacts to monarch butterfly habitat, or to directly mitigate impacts on-site where appropriate.	This comment is noted. Action 2-2.2 allows for payments of compensatory mitigation fees into the Butterfly Fund, as deemed appropriate during project-specific CEQA analysis for projects with limited impacts on monarch butterfly habitat. Such projects would still be required to undergo the appropriate level of project-specific environmental review evaluating and mitigating impacts to monarch butterflies, as necessary.	Environmental Impacts and Mitigation
269	2/25/19	Letter	Ana Citrin, Law Offices of Marc Chytilo, APC, for Friends of the Ellwood Monarchs	The commenter states that language in the Habitat Enhancement and Restoration Program is insufficiently clear and requires revision to ensure that restoration activities do not result in the destruction of eucalyptus and monarch habitat and associated potentially significant impacts. Specifically, the commenter suggests changes to the Overview language in the MBHMP clarifying that enhancement or restoration of the Devereux Creek corridor would occur in existing native riparian areas. The commenter adds that this language is consistent with the language in supporting Policy 14.3, which limits restoration actions to existing native riparian areas, and Policy 14-2, which states that, “areas between eucalyptus groves shall be considered for habitat enhancement and restoration	This comment is noted. The MBHMP is a long-term management plan intended to guide habitat restoration and enhancement efforts through management goals, policies, and supporting actions. Specific management activities, including the location and nature of riparian restorations, would be identified in annual Implementation Plans. Pursuant to Action 1-4.2, City staff shall present each annual Implementation Plan at a public hearing for stakeholder input and City Council approval.	Restoration

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
				alternatives."		
270	2/25/19	Letter	Ana Citrin, Law Offices of Marc Chytilo, APC, for Friends of the Ellwood Monarchs	The commenter requests a map in the MBHMP showing the location of existing native riparian areas. Specifically, the commenter requests that the MBHMPM include Figure 2 from the Draft IS-MND showing drainages and vegetation communities in the Coverage Area. Additionally, the commenter recommends changes to Action 11-2.4 of the MBHMP to specify that restoration in the Devereux Creek riparian corridor would be for "existing native riparian areas."	This comment is noted. The commenter appears to be referring to Figure 7 of the Draft IS-MND, which is included in Section 4, *Biological Resources*, of the document. As described in the staff response to Comment 269, above, specific management activities, including the location and nature of riparian restorations, would be identified in annual Implementation Plans. Pursuant to Action 1-4.2, City staff shall present each annual Implementation Plan at a public hearing for stakeholder input and City Council approval.	Restoration
271	2/25/19	Letter	Ana Citrin, Law Offices of Marc Chytilo, APC, for Friends of the Ellwood Monarchs	The commenter notes the importance of monitoring and reporting as key tools necessary to ensure that the MBHMP functions as intended and that provisions of the MBHMP relied on to self-mitigate impacts to monarch butterflies and their habitat are actually effective at reducing impacts to less than significant levels. The commenter recommends changes to Policy 20-3 and Action 20-3.1 to firmly require annual Monitoring Reports and present such reports at public workshops.	The commenter's proposed changes are noted. In addition to monitoring actions proposed in the MBHMP, the MBHMP IS-MND contains 15 mitigation measures incorporated to reduce potential impacts to the environment to a less than significant level. A Mitigation Monitoring and Reporting Program (MMRP), included as Appendix D of the Final IS-MND, requires the City to monitor the effectiveness of these mitigation measures and includes required actions, monitoring timing, frequency, responsible parties, and compliance verification steps.	Monitoring
272	2/25/19	Letter	Ana Citrin, Law Offices of Marc Chytilo, APC, for Friends of the Ellwood Monarchs	The commenter requests changes to Action 1-2.1 of the MBHMP. Specifically, the commenter request that the action firmly require pre-activity surveys for nesting birds, monarch butterfly aggregations, and other wildlife, the presence of an environmental monitor during construction, and other protections, as deemed appropriate whenever vegetation removal, ground disturbance, construction, or other activities are proposed within the Coverage Area by the City or any other entity. Additionally, the commenter requests that the measure be revised to require the City to monitor such activities to ensure environmental protection measures are used and that activities are limited to those permitted.	The commenter's proposed changes to Action 1-2.1 of the MBHMP have been accepted. Action 1-2.1 now reads as follows: "**Action 1-2.1**. Whenever vegetation removal, ground disturbance, construction, or other activities with the potential to significantly disrupt habitat values are proposed within the MBHMP coverage area by the City or any other agency or utility, environmental protection measures shall be implemented. These measures shall be determined in coordination with a qualified	Monitoring

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
					biologist, and ~~should normally~~ shall include at a minimum pre-activity surveys for nesting birds or other wildlife, pre-activity surveys for monarch butterfly aggregations, presence of an environmental monitor during construction, and other protections, as deemed appropriate. The City will monitor these activities to ensure that environmental protection measures are used and that activities are limited to those permitted."	
273	2/22/19	Letter	Maeton Freel, Resident	The commenter states that the MBHMP provides a generic approach to managing the Coverage Area primarily for eucalyptus trees, while mentioning other existing wildlife resources and native riparian and upland habitats in and adjacent to the Coverage Area. The commenter recommends a more balanced approach to better support both butterflies and other native species. The commenter further recommends use of The Xerces Society's 2017 publication Protecting California's Butterfly Groves: Management Guidelines for Monarch Butterfly Overwintering Habitat and working with the United States Fish and Wildlife Service (USFWS) in their review of proposals to have the monarch butterfly listed as threatened or endangered.	The purpose of the MBHMP is to provide a programmatic approach to management of the habitats that support the monarch butterfly seasonal aggregation areas at the Ellwood Mesa Open Space, as well as a variety of other plant and animal species and coastal access and recreation. The publication recommended by the commenter was consulted and is included as a reference in the MBHMP. Additionally, the MBHMP notes the ongoing effort by the USFWS review the monarch butterflies candidacy for listing as threatened or endangered under the Federal Endangered Species Act. Policy 3-1 of the MBHMP states that the City shall pursue cooperative relationships with other agencies regarding regulatory goals and policies that the partners have in common concerning the Ellwood Mesa Open Space, in particular, goals and policies that have an impact on the management of the monarch butterfly aggregation sites. Supporting Action 3-1.1 specifically encourages such relationships with federal agencies such as the USFWS.	MBHMP Scope/Detail

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
274	2/22/19	Letter	Maeton Freel, Resident	The commenter states that the maps included in the MBHMP are general and need to be at a scale which provides for definition of tree densities, areas of dead and dying trees, and other factors critical to managing the habitat.	The MBHMP is a long-term planning document for the Coverage Area. Conditions such as tree density, areas of dead or dying trees, and other factors critical to managing the habitat, are subject to changes over time as MBHMP activities are implemented. Annual Implementation Plans prepared for the Coverage Area may contain more detailed maps or other materials to inform specific management actions.	MBHMP Scope/Detail
275	2/22/19	Letter	Maeton Freel, Resident	The commenter states that comments provided by Lisa Stratton, Director of Ecosystem Restoration at the University of California, Santa Barbara, provide additional factors which need to be included in a sound management plan in order to determine whether an area is actually meeting desired habitat characteristics for monarch butterflies and other wildlife and plants occurring in the area.	Comments received on the MBHMP, including those noted by the commenter, are included in this comment matrix. Please refer to the responses above.	Public Comments
276	2/24/19	Letter	Michael Mills, Resident	The commenter states that the MBHMP does not adequately address the extreme risks to property and human life that would occur due to a fire in the eucalyptus groves. The commenter notes that the plan was prepared by an environmental consulting firm with expertise in monarch butterfly habitat preservation, not fire risk assessment or the development of fire mitigation strategies. The commenter states that neighborhoods adjacent to the groves are at significant risk of fire, and concludes that the MBHMP should provide fire risk reduction strategies. Finally, the commenter states that such strategies should be made in consultation with fire risk experts, especially those with expertise in the specific risks posed by fires in eucalyptus groves.	The purpose of the MBHMP is to provide a programmatic approach to management of the habitats that support the monarch butterfly seasonal aggregation areas at the Ellwood Mesa Open Space, as well as a variety of other plant and animal species and coastal access and recreation. The MBHMP is not intended to be a wildfire protection or mitigation plan, though it does pledge support for the policies and activities contained in the CWPP, which includes policies intended to reduce fire hazards from fuel loads in the Coverage Area. The MBHMP is intended to fulfill its stated purpose of supporting habitat for monarch butterflies and other plant and animal species, coastal access, and recreation while not exacerbating wildfire risk in or around the Coverage Area.	Wildfire

No.	Date	Source	Name	Comment	Staff Response	Subject/Topic
277	2/25/19	E-mail	Laura Maskrey, Resident	The commenter notes that the MBHMP is not an emergency response plan, but that there exists a possibility that monarch butterflies may not return to the Coverage Area next year. The commenter recommends that there should be some urgent discussions about what should be done before the next year, since this plan may not take effect before then.	The commenter is correct that the MBHMP is not an emergency response plan. However, the City published the 2018 Implementation Plan in July 2018, which calls for conducting nesting bird and monarch butterfly surveys, installation of enhancement plantings and signage, removal of existing closure signs, and long-term replacement tree monitoring. The schedule in the 2018 Implementation Plan calls for installation of enhancement plantings, signage, and removal of trail closure signage as early as March 2019. However, the 2018 Implementation Plan is currently being reviewed by the CCC, and requires CCC approval prior to implementation.	MBHMP Scope/Detail

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Response to Comments

This section includes comments received during the circulation of the Draft Initial Study and Mitigated Negative Declaration (IS-MND) prepared for the Monarch Butterfly Habitat Management Plan (MBHMP).

The Draft IS-MND was circulated for a 30-day public review period that began on January 25, 2019 and concluded on February 24, 2019. The City received nine (9) comment letters on the Draft IS-MND. The commenter and the page number on which each commenter's letter appears are listed below.

Letter No. and Commenter		Page No.
1	Jacqueline Phelps, District Supervisor, California Coastal Commission (CCC)	C-2
2	Deborah L. Williams, Resident	C-5
3	Ana Citrin, Law Offices of Marc Chytilo on behalf of Friends of the Ellwood Monarchs	C-11
4	Maeton Freel, Resident	C-27
5	Michael Mills, Resident	C-36
6	Cherie Topper, Executive Director, Santa Barbara Audubon Society	C-38
7	Christina Lange, Friends of the Ellwood Coast	C-60
8	Chuck Davis, Len and Cathleen Grabowski, Matt Graham, and Carolyn Grenier, Residents	C-62
9	Laura Maskrey, Resident	C-75

The comment letters and responses follow. Each comment letter has been numbered sequentially and each separate issue raised by the commenter, if more than one, has been assigned a number. The responses to each comment identify first the number of the comment letter, and then the number assigned to each issue (Response 1.1, for example, indicates that the response is for the first issue raised in comment Letter 1).

STATE OF CALIFORNIA -- CALIFORNIA NATURAL RESOURCES AGENCY
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Letter 1

February 25, 2019

Anne Wells
City of Goleta, Planning Division
130 Cremona Drive, Suite B
Goleta, CA 93117

RE: Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan Initial Study & Mitigated Negative Declaration

Dear Ms. Wells,

Commission staff has reviewed the Initial Study & Mitigated Negative Declaration (IS/MND) for the Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan, and we appreciate the opportunity to provide comments for your consideration. The purpose of the subject IS/MND is to assess the Monarch Butterfly Habitat Management Plan (MBHMP), which has been created to provide an approach to management of monarch butterfly seasonal aggregation habitat, additional species habitats, and public access and recreation. Within the subject MBHMP, 22 programs are identified to guide the overall management approach, and within each program a goal and several policies and objectives for implementation are outlined.

As described within the IS/MND, the eucalyptus trees at Ellwood Mesa are currently threatened by drought and pest infestation. The health of the trees has been compromised, which has resulted in the death of numerous trees and the degradation of aggregation sites. In July 2017, over 1,200 eucalyptus trees were dead, and hundreds more were highly degraded and dying. The IS/MND also describes that the monarch butterfly population at Ellwood Mesa has been in decline for several years. In 2018, the population at Ellwood declined to 230 butterflies, which is approximately 0.5 percent of the 30-year population high (47,500 butterflies in 2011). 1

In September 2017, in order to address 29 trees that were dead and/or at high risk of failure and hazardous to public safety due to their proximity to public trails, the Commission issued Emergency Coastal Development Permit (CDP) Number G-4-17-0048 to allow for removal of the trees. In recognition of the need for a comprehensive approach to habitat and access management at Ellwood, Condition Four of this Emergency CDP requires that the City submit a complete regular CDP application for an Ellwood Mesa Habitat Management Plan to not only address mitigation for the 29 trees removed, but also restoration of the aggregation sites and a strategy for re-opening and maintaining future use of all public trail segments in coordination with habitat management strategies.

The subject MBHMP identifies several goals, policies, and objectives for the comprehensive management of Ellwood, including directives to restore aggregation sites, enhance biodiversity, and maintain public access. However, the MBHMP lacks specific project details and implementing actions. Conditions at Ellwood seem to warrant expedited action as the heath of

the aggregation sites and monarch butterfly population appear to be degrading rapidly. As such, Commission staff recommends that the City incorporate detailed measures into the MBHMP to guide implementation of a comprehensive, ecosystem based approach for management of Ellwood, and that the plan be submitted to the Commission in the context of a CDP application to fulfill the requirements of Condition Four of Emergency CDP G-4-17-0048. The plan should include alternatives for replacing removed and trimmed eucalyptus trees with native tree species and replacing them with a mixture of native and non-native tree species as well as incorporating as many native nectar producing species in the planting palette as possible. A CDP for such a plan would provide the City with the ability to implement all project components expeditiously if necessary, or could be structured to allow for implementation on a programmatic or phased basis as funding sources become available. 1

Again, we appreciate the opportunity to provide comments for your consideration and we look forward to our continued coordination. If you have any questions regarding these comments, please contact me at 805-585-1800.

Sincerely,

Jacqueline Phelps
District Supervisor

Letter 1

COMMENTER: Jacqueline Phelps, District Supervisor, California Coastal Commission

DATE: February 25, 2019

Response 1.1

The commenter describes the background and context for the MBHMP, noting the health of eucalyptus groves at Ellwood Mesa has been compromised by drought and pest infestation. The commenter further notes the California Coastal Commission (CCC) issued an Emergency Coastal Development Permit (CDP) to the City in September 2017, authorizing removal of 29 dead or high-risk trees that posed a threat to public safety. As a condition of this Emergency CDP, the City is required to submit a complete CDP application addressing not only mitigation for the removed trees, but also aggregation site restoration, habitat management, and trail repair and maintenance strategies. The commenter states the opinion the MBHMP, as written, lacks specific project details and implementation actions and recommends inclusion of detailed measures into the MBHMP to guide implementation of a comprehensive, ecosystem-based approach for management of Ellwood Mesa to fulfill the requirements of the Emergency CDP. The commenter adds the plan should include alternatives for replacing removed and trimmed eucalyptus trees with native tree species and replacing them with a mixture of native and non-native tree species as well as incorporating as many native nectar producing species in the planting palette as possible.

This comment does not relate to the content or adequacy of the Draft IS-MND, but instead to the content and composition of the MBHMP. Therefore, this comment has been moved to the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP, and a response was provided in the matrix. The MBHMP Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

Letter 2

Comments on the Draft Initial Study/Mitigated Negative Declaration (IS/MND) for the Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan (MBHMP)

Submitted by Deborah L. Williams

February 19, 2019

Attn: Anne Wells, Advance Planning Manager, City of Goleta

As a resident of Goleta, and as someone who both visits Ellwood Mesa/Sperling Preserve regularly and is deeply concerned about the future of monarch butterflies, I respectfully submit the following comments on the Draft Initial Study/Mitigated Negative Declaration (IS/MND) for the Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan (MBHMP).

My comments focus on four areas: (1) the use of insecticides, herbicides, and other pesticides in the areas; (2) the related provisions regarding invasive species eradication; (3) the potential tagging of monarch butterflies; and (4) a correction.

1. **The Management Plan Should be Modified to Preclude the Use of Chemical Insecticides, Herbicides, and other Pesticides, Unless It Is Clearly and Unambiguously Documented that Such Use is Absolutely Necessary for Monarch Survival.**

The Draft Initial Study correctly states that:

> The long-term decline of the monarch population in California may be attributed to the loss of milkweed and nectar plants (caused by herbicides, drought, and removal), loss and degradation of overwintering groves (removal and aging) and other factors including use of insecticides, disease, and fluctuations in weather and temperatures associated with climate change (The Xerces Society 2017). (p. 65)

1

Scientists have known for a long time that insecticides, herbicides and other pesticides are harmful to monarch butterflies. As a result, Ellwood Mesa should be designated an herbicide and pesticide-free area, unless it is clearly and unambiguously documented that use of herbicides and pesticides are absolutely necessary for monarch survival.

As currently written, this needed rigorous standard and approach is not adopted. On page 14, the study simply states: “Apply herbicides as needed to control invasive, non-native plant species.” (p.14) The use

of the phrase “as needed” is entirely too vague. It is very hard to imagine any circumstances that would require the use of herbicides. Fortunately, we live in a community where citizens enthusiastically volunteer for invasive species removal projects. This strategy should be implemented, where needed. Alternatively, given the $3.9 million in funds from the State of California, money could be used to hire people for this work. Mechanical removal is a much safer and more appropriate strategy.

Similarly, on page 14, the Study states: “Apply insecticides, herbicides, and other pesticides, as necessary.” The phrase “as necessary” is not defined. While it can be argued that Ellwood Mesa should be an insecticide, pesticide, and herbicide-free zone under all circumstances, at the very least “as necessary” needs to be defined as “it is clearly and unambiguously documented that use of pesticides or herbicides is absolutely necessary for monarch survival.” 1

On page 98 the Study states:

> The MBHMP recommends the use of biological control methods such as birds, lady beetles, spiders, and other predators, *as the use of chemical control such as pesticides and herbicides may be dangerous to butterflies*. Nevertheless, application, handling, and transport of chemical pesticides, herbicides, and fertilizers may be necessary to ensure the long-term viability of new plantings or eradication of invasive species. Chemical applications have the potential to create the unintended release of a hazardous material. (EMPHASIS ADDED) (p. 98).

This statement seems to suggest that it is more important to ensure the long-term viability of new plantings or the eradication of invasive species than ensure the safety of the monarchs. The priority must be the health of the monarch population, and as such, herbicides, insecticides and other pesticides should not be used. There are safer alternatives.

2. **The Goal of Eradicating Existing Stands of Invasive Species, Especially If It Requires the Use of Herbicides and is Harmful to Monarchs is Neither Desirable Nor Appropriate.**

On page 25 of the Study, the following goal and strategy are described:

> Goal: To eradicate existing stands of invasive non-native species and prevent or control new occurrence of invasive non-native plant species within the monarch butterfly habitat at Ellwood Mesa. 15-2: The City shall control all “High,” “Moderate,” and “Limited” priority invasive plant species within the monarch butterfly habitat, as except those species for which monarch butterflies are dependent, as feasible (p.25) 2

Notably, eucalyptus is a non-native species. During the California Gold Rush in the 1850s, eucalyptus trees were introduced to California by Australians. Just because a species is non-native, this certainly does not mean it is necessarily harmful to monarchs. While it is important to remove, by mechanical means, some unproductive non-native species in some areas to plant species that will help monarchs, it is an overreach, with negative consequences (such as the proposed application of herbicides) to seek to “eradicate existing stands of invasive non-native species.” This should be changed to be more realistic

and beneficial. Monarchs first. Monarchs should not be exposed to herbicides to meet a hypothetical, overstated and non-essential goal. 2

3. **Given the Extremely Small Size of the Current Monarch Population, It Is Likely Too Risky to Capture, Tag, and Release Monarch Butterflies for Tracking At This Time (p.15)**

As the Study notes: "recent data collected during the 2018 winter season showed an all-time low peak population of 230 monarch butterflies observed." (p. 65). Given this very small population, it is likely too risky and dangerous to capture, tag and release monarch butterflies for tracking at this time. There needs to be a sufficient population of monarchs to do this, and 230 is does not appear to be sufficient. There should be population parameters established before the goal, set out on page 15 of capturing, tagging and releasing monarch butterflies is allowed or implemented. 3

4. **Errata**: The Study states that "Goleta has six City parks and eight open spaces, totaling approximately 482 acres (City of Goleta 2018a)." Goleta has 16 parks. 4

Thank you for the opportunity to submit these comments.

Deborah Williams

Goleta Resident (451 Barling Terrace)

Lecturer UCSB

Deborah1518@gmail.com

Letter 2

COMMENTER: Deborah L. Williams, Resident

DATE: February 19, 2019

Response 2.1

The commenter requests the MBHMP be modified to preclude the use of chemical insecticides, herbicides, and other pesticides, unless it is clearly and unambiguously documented that such use is absolutely necessary for monarch survival. The commenter states the opinion insecticides, herbicides, and other pesticides are harmful to monarch butterflies and requests Ellwood Mesa be designated an herbicide and pesticide-free area. The commenter further requests the Project Description in the Draft IS-MND be more specific when discussing the potential use of insecticides, herbicides, or other pesticides, rather than stating such chemicals would be applied "as needed" or "as necessary." The commenter notes Page 98 of the Draft IS-MND states "application, handling, and transport of chemical pesticides, herbicides, and fertilizers may be necessary to ensure the long-term viability of new plantings or eradication of invasive species." The commenter concludes this language improperly prioritizes the long-term viability of new plantings over the safety of monarchs.

The purpose of the MBHMP is to provide a programmatic approach to management of the habitats that support the monarch butterfly seasonal aggregation areas at the Ellwood Mesa Open Space, as well as a variety of other plant and animal species and coastal access and recreation. In support of this purpose, new plantings would occur in the Coverage Area, including native species and non-native species critical to monarch butterfly seasonal aggregation areas. Ensuring the long-term viability of these new plantings is essential to fulfill the overarching purpose of the MBHMP. The MBHMP emphasizes the use of a range of pest management strategies to control or eradicate, as feasible, plant, animal, fungal, and other pests that would result in impacts on monarch butterflies or degrade monarch butterfly habitat. In particular, the MBHMP's Integrated Pest Management Program includes the use of biological control strategies, limiting stress-inducing activities to periods of reduced pest activity, and planting pest-resistant species. However, as noted by the commenter, the use of insecticides, herbicides, and other pesticides may be necessary to support new plantings and habitat restoration efforts. As such, insecticide, herbicide, and other pesticide application is included as a covered activity under the MBHMP, and is evaluated and addressed in the IS-MND.

Mitigation Measure HWQ-2 requires the preparation of a Chemical Application Control Plan prior to commencement of native planting, eucalyptus grove restoration, invasive species eradication, and pest control activities. As specified in the mitigation measure, the Chemical Application Control Plan would specify thresholds to determine when fertilizer, herbicide, or pesticide application would be necessary, as well as the potential chemicals to be used and the rate, timing, and placement of application. The measure further requires the use of chemical forms that are the least toxic to non-target organisms be employed in the event pesticides or herbicides are deemed necessary. Additionally, as noted in Section 4 of the Draft IS-MND, *Biological Resources*, Action 10-4.1 of the MBHMP requires all potentially invasive activities to occur between April 1 and September 30 unless authorized by a qualified biologist, which would minimize potential direct impacts to monarch butterflies as the species would not likely be present during this time. Action 10-4.1 of the MBHMP specifically identifies invasive species eradication, which may include application of herbicides, as one such activity subject to this restriction. Section 4 of the Draft IS-MND, *Biological Resources*,

concludes impacts to monarch butterflies would be less than significant with incorporation of Mitigation Measures HWQ-2, as well as BIO-1, BIO-2, and BIO-3, which require site housekeeping, biological monitoring during vegetation removal, and worker environmental awareness training. Long-term impacts to monarch butterflies associated with implementation of the MBHMP would be beneficial.

Response 2.2

The commenter restates the Goals, Policies, and Actions of the MBHMP's Invasive Plant Management Program. Specifically, the commenter states just because a species is non-native does not mean it is inherently harmful to monarch butterflies. The commenter opines eradicating existing stands of invasive non-native species is excessive and could result in negative consequences for monarch butterflies, particularly if doing so requires application of herbicides. The commenter further notes mechanical removal of non-native species should be used.

This comment is noted. Covered activities listed under the MBHMP's Habitat Enhancement and Restoration Program and the Invasive Plant Management Program on Pages 13 and 14 of the Draft IS-MND include both hand removal of invasive non-native plant species and application of herbicides, as needed. Section 4, *Biological Resources,* on Page 71 of the Draft IS-MND acknowledges that short-term impacts to monarch butterflies could occur due to disturbance of suitable habitat through restoration activities and application of pesticides, herbicides, and insecticides. However, as noted in this section and in Response 2.1 above, Action 10-4.1 of the MBHMP requires all potentially invasive activities be conducted between April 1 and September 30 unless authorized by a qualified biologist, which would reduce impacts to monarch butterflies since the species is generally not present in the Coverage Area during this period. Action 10-4.1 of the MBHMP specifically identifies invasive species eradication as one such activity subject to this restriction. Furthermore, Mitigation Measure HWQ-2 further restricts application of herbicides and pesticides by requiring a Chemical Application Control Plan prior to use of chemical fertilizers, herbicides, and pesticides. The Draft IS-MND concludes that impacts to monarch butterfly would be less than significant, and would be further reduced through implementation of the pesticide restrictions in Mitigation Measure HWQ-2 and the site housekeeping, biological monitoring, and worker awareness provided by Mitigation Measures BIO-1, BIO-2, and BIO-3.

Response 2.3

The commenter opines given the small population of monarch butterflies, it is likely too risky and dangerous to capture, tag, and release monarch butterflies for tracking, which is a covered activity under the MBHMP's Monarch Research Program. The commenter further requests population parameters be established for this covered activity to occur.

The MBHMP allows for capture, tagging, and release of monarch butterfly individuals in conjunction with approved research efforts to provide information helpful to MBHMP management programs. Such efforts would be subject to approval by the City and regulated by Scientific Research Permits, as noted in Action 21-1.1 of the MBHMP. Additionally, Action 21-1.2 of the MBHMP requires scientists to use non-invasive research methods at Ellwood Mesa.

The City of Goleta's Scientific Research Permit Application requires information such as estimated research project duration and dates, summary of proposed research, species and number of individuals to be held captive. The application process allows the City to review proposed research

efforts prior to their implementation to verify such methods would be non-invasive, consistent with Action 21-1.2 of the MBHMP above. Furthermore, the application includes a checklist to identify other permits required from CDFW or the U.S. Fish and Wildlife Service, including a scientific collecting permit for projects involving collection of vertebrate or invertebrate wild animals or plants, which would include any proposed capture and tagging of monarch butterflies. Review of proposed research methods by the City in addition to other applicable agencies would ensure such methods do not pose a threat to monarch populations at Ellwood Mesa. Therefore, covered activities under the MBHMP's Monarch Research Program would not result in a potentially significant impact to monarch populations, and impacts to the species would remain less than significant with mitigation incorporated, as noted in Section 4, *Biological Resources,* of the Draft IS-MND.

Response 2.4

The commenter states the City of Goleta has 16 parks, as opposed to the 6 parks and 8 open spaces noted in Section 16, *Recreation*, of the Draft IS-MND.

Page 125 of the Draft IS-MND has been revised as follows:

> Goleta has ~~six City~~16 public parks, 4 private parks, and ~~eight~~18 public open spaces, totaling approximately ~~482~~526 acres (City of Goleta 200618a). This equates to approximately ~~15~~16.4 acres per 1,000 residents (based on a current [2018] population of 31,949 [DOF 2018]).

Letter 3

LAW OFFICE OF MARC CHYTILO, APC

ENVIRONMENTAL LAW

February 25, 2019

Anne Wells, Advanced Planning Manager
City of Goleta
130 Cremona Dr. #B
Goleta, CA 93117

By email to awells@cityofgoleta.org

RE: Mitigated Negative Declaration for the Ellwood Draft Monarch Butterfly Habitat Management Plan

Dear Ms. Wells:

This office represents the Friends of the Ellwood Monarchs (FOTEM), a community group formed in response to various threats to the Ellwood eucalyptus forest which is critical overwintering habitat for Monarch butterflies. We have reviewed the Draft Mitigated Negative Declaration and Revised Draft Monarch Butterfly Habitat Management Plan (MBHMP) and offer the following comments. Our suggested language changes are indicated in ~~strikethrough~~ and underline.

We appreciate that the revised MBHMP includes many of the revisions that we suggested in our 9/3/18 comment letter on the proposed Draft MBHMP. While we understand and accept that not all of our suggested changes were included, there are several – discussed below - that are critical to ensuring that the MBMHP does not result in potentially significant impacts to monarch butterfly habitat. Moreover, some other changes made in the revised MBHMP actually weaken previous protections for monarch habitat contained in the draft MBHMP. Since the revised MBHMP was prepared, the western monarch population has experienced a dramatic decline. Accordingly, it is more imperative than ever that the City take an extremely cautious approach toward management of the grove to ensure ongoing use by the monarch butterfly (see Goal 10), and only allow habitat restoration that focuses on other habitat values where it also enhances rather than diminishes habitat values for the monarch butterfly. Below we suggest specific language changes necessary to ensure that the MBHMP including restoration activities will not result in potentially significant impacts to the monarch butterfly and its habitat.

Additionally, there are several areas of the MND, including its discussion of aesthetics and historic/cultural resources, that require revision to be consistent with California Environmental Quality Act (CEQA) requirements. We request that the City address the issues raised herein in revisions to the MND and to the MBHMP.

1. CEQA Overview

"The foremost principle under CEQA is that the Legislature intended the act 'to be interpreted in such manner as to afford the fullest possible protection to the environment within the

1

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reasonable scope of the statutory language.'" (*Friends of Mammoth v. Board of Supervisors* (1972) 8 Cal.3d 247, 259). CEQA "creates a low threshold requirement for initial preparation of an EIR and reflects a preference for resolving doubts in favor of environmental review when the question is whether any such review is warranted." (*League for Protection of Oakland's Architectural and Historic Resources v. City of Oakland* (1997) 52 Cal. App. 4th 896, 904-905; Pub. Res. Code § 21151.)

An MND may be prepared in lieu of an EIR *only* where feasible and specific mitigation measures are so clearly effective that no substantial evidence can be produced that the revised project may still have significant environmental effects. (California Environmental Law & Land Use Practice (Matthew Bender & Co., Inc., 2013) § 21.09; Pub. Res. Code § 21080 (c)(2); Guidelines §§ 15064 (f)(2), 15070 (b).) 1

Here, the MND relies largely on the policies and provisions of the MBHMP to self-mitigate potentially significant impacts including impacts to monarch butterflies and their habitat. As currently drafted, key provisions of the MBHMP are not so clearly effective that no substantial evidence of potentially significant impacts can be produced. Below, we identify areas for clarification and suggest specific policy language that would ensure potentially significant impacts to monarchs, and also to aesthetics and cultural resources, are mitigated to less than significant levels as CEQA requires.

2. Aesthetics

To enable an assessment of whether a project's environmental effects are likely to be significant, the environmental document must include an accurate description of the environmental setting. (*Communities for a Better Environment v. South Coast Air Quality Management Dist*. (2010) 48 Cal.4th 310, 315; CEQA Guidelines § 15125 (a).) The MND's aesthetic impact discussion begins with a description of the existing setting which describes views and scenic vistas in the area. (Pp. 31-32.) This description is incomplete however, because it omits any description of the existing Ellwood eucalyptus grove which is a dominant visual feature of the Project area landscape. Blue-gum eucalyptus with their substantial height and girth, is the main tree type that characterizes the grove's aesthetics, and must be expressly identified and included in the environmental setting to enable an adequate discussion of the Project's aesthetic impacts. 2

A Project that would "substantially damage scenic resources, including but not limited to, trees…" would result in significant environmental impacts to the aesthetic environment. (MND p. 32.) The MND's discussion of this potential impact focuses on removal of dead and diseased vegetation improving the eucalyptus grove as a visual resource, however does not discuss how the visual integrity of the grove will be preserved over time as dead and diseased trees are removed. The draft MBHMP had identified "Planting eucalyptus trees" "To correct habitat deficiencies such as: The overstory has become too sparse…" (draft MBHMP, p. 25, Table 1 (Identified Threats and Potential Response Actions).) However, the revised MBHMP refers only to "Planting trees". (p.

30, Table 2 (Identified Threats and Potential Response Actions).) The visual qualities of tree species are distinct, and especially here where no native tree species have similar height and evergreen qualities. (*See Monarch Butterfly Overwintering Sites in Santa Barbara County, California,* Meade, 1999.) Accordingly, without an express provision calling for replacing lost eucalyptus in kind, the visual character of the grove will eventually be lost, resulting in potentially significant impacts to aesthetics. 2

To ensure that the Project's aesthetic impacts are mitigated below significant levels, the MBHMP must be revised to reincorporate the planting of eucalyptus trees when the overstory has become too sparse (Identified Threats and Potential Response Actions Table), and as discussed in section 3 below, include a specific provision calling for the replacement of removed eucalyptus trees in kind and identification of blue gum and other eucalyptus species in the identified plant list. Additionally, Policy 12-1 should be modified to clarify that not only eucalyptus trees within the aggregation sites are included as follows: 3

> **Policy 12-1.** Eucalyptus trees in the groves ~~containing monarch butterfly aggregation sites~~ <u>within the Coverage Area</u> shall be managed, as feasible, to ensure tree health and longevity.

As modified, Policy 12-1 not only helps mitigate potential aesthetic impacts from excessive tree loss, but it also better accomplishes the Plan's goal of ensuring the ongoing use of Ellwood Mesa by the monarch butterfly (further discussion and other proposed changes to Program 12 in section 3.b. below).

3. Biological Resources

a. Importance of Eucalyptus Replacement

The MND and responses to comments on the draft MBHMP are clear that eucalyptus are critical for overwintering monarch butterflies, especially in this area. The MND explains "agencies and resource experts maintain that management of the eucalyptus trees that support the butterflies are paramount to continued overwintering by the species." (MND p. 65.) The MND relies on tree replacement identified in the MBHMP to conclude the Project would not result in potentially significant impacts to monarch habitat. For example, the MND states: 4

> "implementation of the Natural Resource Program in the MBHMP would maintain and enhance suitable habitat for the monarch butterfly. Replanting habitats where dead or dying eucalyptus trees are removed will help sustain the long-term viability of the eucalypts groves as monarch butterfly habitat."

(MND p. 71, *see also* p. 73 "The MBHMP calls for the replacement of the removed trees and enhancement of the groves with planting of eucalyptus in the historical grove footprint only . . . gaps or reductions in the grove caused by tree die off would be replenished").

However, as currently drafted, the revised MBHMP does not clearly call for the replacement of dead or dying eucalyptus trees with other eucalyptus trees. *A plan whose goal is to manage, preserve, maintain, and improve the eucalyptus forest that is monarch butterfly habitat should describe when and where planting or replanting eucalyptus trees, as well as native trees, may be necessary.* Below are specific changes to Program 12 that are necessary to ensure that the specific language of the MBHMP is consistent with the MND, and to ensure that the MBHMP self-mitigates any impacts from eucalyptus tree loss by clearly calling for replacement in kind. 4

Action 12-1.2. Table 2 should say *"*Planting eucalyptus trees or planting native trees*"* as Potential Actions/Tools for Management to "Correct habitat deficiencies" caused by death of trees or insufficient canopy or site protection. To remedy these threats there must be an option to plant eucalyptus trees when indicated to preserve habitat value. 5

Action 12-1.6 and **12-1.10** require clarification of the type of habitat that should be created within the outline of the pre-drought eucalyptus forest where dead zones have occurred due to tree die-offs. The re-establishment of eucalyptus forest monarch butterfly habitat in this area should be specified.

A map to clarify the outline of the historic pre-drought eucalyptus forest would facilitate preservation of monarch habitat.

> **Action 12-1.6.** Maintain a living eucalyptus forest within the outline of pre-drought forest extent as determined with historic aerial photographs. Replant sections of the eucalyptus forest where dead zones occur due to multiple tree die-offs. 6
>
> **Action 12-1.10.** Plant trees as needed to maintain grove density and improve monarch butterfly habitat. Plant in locations that improve aggregation site conditions as per the best available scientific analysis, and replant eucalyptus in areas within historic eucalyptus grove extent where gaps have occurred from drought die-back.

b. Importance of Unoccupied Groves

The MND states "Grove and windrow areas between aggregation sites have not been recorded to support monarch butterfly aggregations." (MND p. 53.) However, these areas are valuable to the monarch population, and are identified as monarch ESHA in the City's General Plan. Moreover the Ellwood-Devereux Coast Open Space and Habitat Management Plan explains the biological significance of the eucalyptus groves outside the aggregation sites and their designation as ESHA despite the fact that no known monarch aggregation sites exist as follows: "Unoccupied eucalyptus groves within the City of Goleta in areas adjacent to the overwintering sites that contain suitable conditions to support overwintering butterflies are also considered ESHAs because they could be used at any time in the future, and because they provide additional habitat in 7

the event that the occupied groves are damaged." (P. 21.)[1] The damaged conditions currently manifesting in and around the Ellwood Open Space aggregation sites underscores the importance of protecting the entire grove and not merely the aggregation areas.

While it appears that the MBHMP is intended to apply to the eucalyptus groves in the coverage area generally and not only the aggregation sites, it is not entirely clear from the document. In the Comment Matrix, the second from last comment on page 25 asks "Is the treatment different for "aggregation areas," "roosts," "trees supporting seasonal monarch butterfly aggregation sites," "aggregation site buffers" or "the eucalyptus forest beyond the buffer." The response is "There is no difference in the treatments for these various areas." However, that is not entirely clear from reading some parts of the MBHMP. 7

In particular, Program 10, Monarch Butterfly Management Program, refers only to the conservation of, the preservation of, and the timing of work in, only "aggregation sites." The below Program 10 actions and policies should be revised as indicated to clarify that they apply throughout the eucalyptus grove, which is necessary to ensure that the Project will not result in potentially significant impacts to monarch ESHA.

Figure 2 in the MBHMP, Monarch Butterfly Aggregation Sites, depicts the aggregation sites as small red circles. It could be understood that the protections for monarch habitat and eucalyptus trees only apply to these small areas, so this needs to be clarified, and a map such as Figure 7 in the MND which depicts the coverage of the grove should be included in the MBHMP itself for additional clarity.

> **Action 10-1.1.** Implement Program 12, Tree Management Program, to help facilitate the conservation of the eucalyptus groves and windrows in the Monarch Butterfly Habitat Management Plan Coverage Area ~~monarch butterfly aggregation sites~~.
>
> **Policy 10-2.** Preservation of the eucalyptus groves and windrows ~~aggregation sites~~ on Ellwood Mesa shall be the focus of management activities, ~~as feasible~~, and in coordination with Program 9, Catastrophic Event Response Program. 8
>
> **Action 10-2.1.** Should one or more catastrophic events result in impacts on the sustainability of monarch butterfly aggregation sites, consider alternative management and recovery strategies

[1] As explained in our 9/1/18 comment letter on the draft MBHMP, these valuable unoccupied eucalyptus groves include the un-named City-owned open space, west and north of the Coronado site that that crosses Santa Barbara Shores Dr. and extends north to Hollister between Santa Barbara Shores Dr. and Pebble Beach Dr. which we called "Area S". To ensure maximum potential monarch habitat is protected, our preference is for the MBHMP to include Area S.

that incorporate goals for sustaining the eucalyptus groves and windrows ~~aggregation sites~~ at Ellwood Mesa.

Policy 10-4. To avoid impacts on monarch butterflies while they are present at the Ellwood aggregation sites, no maintenance or restoration work shall be conducted in the eucalyptus groves and windrows at Ellwood Mesa ~~aggregation sites~~ from October 1 through March 31 of each year, unless authorized by a qualified biologist. 8

Additionally, Action 2-2.2 allows payments of compensatory mitigation fees into the Butterfly Fund, for projects with "limited impacts on monarch butterfly habitat." It is critical that the City not allow projects that impact monarch butterfly habitat, especially now with the precipitous decline observed this past overwintering season. Action 2-2.2 should be revised to clarify that payment of compensatory mitigation fees are only allowed where projects have implemented all available measures to *avoid* impacts to monarch butterfly habitat, or to directly mitigate impacts on-site where appropriate, before projects may turn to compensatory mitigation. 9

c. Devereaux Creek Restoration Activities

Program 14, Habitat Enhancement and Restoration Program, calls for restoration activities including replacement with native plant species along the banks of Devereaux Creek. While it appears the intent of this Program is to limit its applicability to areas outside the eucalyptus grove, the language in the MBHMP is insufficiently clear and requires revision to ensure that restoration activities do not result in the destruction of eucalyptus and monarch habitat, and associated potentially significant impacts.

Language in the Overview describing areas where enhancement or restoration can take place should be consistent with language in the following Policies and Actions in this program. The Overview speaks about the "restoration of the Devereux Creek corridor along the northern margin of Ellwood West, Ellwood Main, and Ellwood East groves. However, the northern margins of Ellwood West and Ellwood East are not "existing native riparian areas," nor are they "areas between eucalyptus groves. "Restoration" is restricted in Action 14.3 to "existing native riparian areas," and in Action 14-2 to "areas between eucalyptus groves." In addition, the northern margin of Ellwood East is not within the MBHMPP coverage area because it is on private property. For consistency and accuracy, we suggest the following change to the language of the overview: 10

Overview: This program focuses on the enhancement of the eucalyptus groves from a native plant and wildlife habitat perspective and on the restoration of the Devereux Creek corridor in existing native riparian areas. ~~along the northern margin of Ellwood West, Ellwood Main, and Ellwood East groves.~~ The mid-canopy vegetation and understory of the eucalyptus groves is generally lacking or in some situations is composed of non-native invasive plant species. Enhancement of groves with native plant species would benefit native wildlife. Various native plants are present but scattered within the groves. Most of these plant species have fleshy fruits

> and are bird-dispersed. Restoration with native plants of portions of Devereux Creek in areas between ~~associated with~~ eucalyptus groves, as feasible, is consistent with the goal to restore Devereux Creek. This restoration would provide important habitat for native plant and animal species and would potentially improve water quality flowing downstream to Devereux Slough and the Pacific Ocean.

10

In addition, clarification is required to Policy 14.3, Action 11-2.4, as follows:

Policy 14.3 allows "restoration of Devereux Creek "only in areas that are "existing native riparian areas." However, there is no map that defines where those areas are. The MBHMP should include Figure 2 from the MND showing the Drainages and Vegetation Communities within the MBBHMP coverage areas to clarify this policy.

In Action 11-2.4, the Devereux Creek restoration language should be consistent with language in Policy 14.3, which restricts restoration of Devereux Creek to "the existing native riparian areas." Specifically, we suggest the following revision:

11

> **Action 11-2.4.** Implement restoration for the existing native riparian areas in the Devereux Creek riparian corridor to improve functions for wildlife, consistent with the goals of this MBHMP for monarch butterflies.

Without these changes, the MBHMP is insufficiently clear and does not clearly self-mitigate with respect to Program 14 without these changes.

d. Monitoring Activities

Monitoring and reporting are key tools necessary to ensure that the MBHMP functions as intended, and that provisions of the Plan relied on to self-mitigate impacts to monarch butterflies and their habitat are actually effective at reducing impacts below significant levels as CEQA requires. We suggest the following two changes to ensure that monitoring and public reporting are adequately incorporated into the Plan.

12

> Policy 20-3: Create a Monitoring Report, updated annually, ~~when feasible,~~ resulting from the information obtained during the implementation of the various policies and actions called for in this MBHMP.
>
> Action 20-3.1: Track the implementation of this MBHMP in the form of a Monitoring Report, ~~preferably~~ updated on an annual basis, and presented at a public workshop.

Additionally, the City of Goleta is not the only entity that may undertake activities within the MBHMP coverage area. For example, Southern California Edison (SCE) undertakes activities including tree limbing to reduce fire hazards associated with their lines. We appreciate that the

13

revised MBHMP includes reference to activities undertaken by other utilities and agencies in Action 1-2.1, however the monitoring component we suggested was not incorporated, and without that it the Plan lacks the enforceability necessary to avoid potentially significant impacts from the tree pruning, removal, and other activities of other entities. Last year, SCE undertook a limbing project which far exceeded the scope of their emergency permit, as noted by Dr. Meade at the September 2018 Council hearing on the draft MBHMP. Accordingly, we ask that you incorporate additional changes to Action 1-2.1, as follows: 13

> Action 1-2.1. Whenever vegetation removal, ground disturbance, construction, or other activities with the potential to significantly disrupt habitat values are proposed within the MBHMP coverage area by the City or any other agency or utility, environmental protection measures shall be implemented. These measures shall be determined in coordination with a qualified biologist, and ~~should normally~~ shall include at a minimum pre-activity surveys for nesting birds or other wildlife, pre-activity surveys for monarch butterfly aggregations, presence of an environmental monitor during construction, and other protections, as deemed appropriate. The City will monitor these activities to ensure that environmental protection measures are used and that activities are limited to those permitted. 14

4. Historical/Cultural Resources

As with visual resources, the environmental setting for historical/cultural resources is fundamentally flawed and incomplete for failing to recognize the historic and cultural value of the Ellwood eucalyptus groves. It is well recognized that landscapes may be historically or culturally significant – and eligible for listing on the national, state, and local registers of historic resources - including where, as here, they are associated with a historic event, activity, or person. The National Park Service defines a cultural landscape as *a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or exhibiting other cultural or aesthetic values*. (https://www.nps.gov/subjects/culturallandscapes/understand-cl.htm.) The City's General Plan also recognizes historical and cultural landscapes and states an objective "*to identify, preserve, protect, and enhance historic landscaping, gardens, and open spaces, including agricultural areas and heritage trees, which contribute to the setting or context of Goleta*." (Visual and Historic Resources Element, Policy VH 6.) Here, the Ellwood eucalyptus groves were planted by Ellwood Cooper in the 1870s, as described and recognized in the City's Tree and Landscape Study and the City's Historic Preservation Context Statement (3/5/18, available at https://www.cityofgoleta.org/projects-programs/historic-preservation and incorporated herein by reference.) The MND must describe the historical significance of the Ellwood grove to enable an adequate analysis of the Project's potentially significant impacts to cultural/historic resources. 15

A Project that causes a substantial adverse change in the significance of a historical resource results in a significant environmental impact. (MND p. 81; Pub. Res. Code § 21084.1.) Historical

resources include both listed resources, and resources determined to be eligible for listing. (*Id.*) It is imperative that the MND be revised to incorporate an analysis of whether the Ellwood grove is eligible for listing as a cultural landscape, and if so, whether the Project may result in potentially significant impacts to that resource. Plan revisions we identified above to ensure that aesthetic and biological resource impacts are adequately mitigated – in particular those clarifying that eucalyptus shall be replaced with eucalyptus – would also appear to mitigate potential cultural resource impacts.

15

5. Conclusion

We ask that the City incorporate the above identified changes in revisions to the MND and to the MBHMP to ensure that the documents are comprehensive, legally adequate, and that all potentially significant impacts are fully mitigated.

Respectfully submitted,

LAW OFFICE OF MARC CHYTILO, APC



Ana Citrin
For FOTEM

Letter 3

COMMENTER: Ana Citrin, Law Offices of Marc Chytilo, APC, for Friends of the Ellwood Monarchs

DATE: February 25, 2019

Response 3.1

The commenter provides background information on the intent of the California Environmental Quality Act (CEQA) and comments the Draft IS-MND relies largely on the policies and provisions of the MBHMP to self-mitigate potentially significant impacts, including impacts to monarch butterflies and their habitat. The commenter opines that, as drafted, key provisions of the MBHMP are not so clearly effective that no substantial evidence of potentially significant impacts can be produced.

The Draft IS-MND assesses the potential environmental impacts associated with implementation of the MBHMP, including covered activities with the potential to occur under the MBHMP's 22 programs. The purpose of the MBHMP is to provide a programmatic approach to management of the habitats that support the monarch butterfly seasonal aggregation areas at the Ellwood Mesa Open Space, as well as a variety of other plant and animal species and coastal access and recreation. In light of this purpose, implementation of the MBHMP would largely result in less than significant—and in some cases, beneficial—impacts to several of the resource concerns evaluated pursuant to CEQA, including biological resources, recreation, and wildfire. While many provisions of the MBHMP would result in less than significant or beneficial environmental impacts, the Draft IS-MND does not rely exclusively on such provisions to reduce impacts to a less than significant level. The Draft IS-MND contains Mitigation Measures AQ-1, BIO-1 through BIO-9, CUL-1, GEO-1, HWQ-1 and HWQ-2, and N-1 to reduce impacts to aesthetics, air quality, biological resources, cultural resources, geology and soils, hydrology and water quality, and noise such that they would be less than significant with mitigation incorporated. The effectiveness of these measures in reducing impacts below the level of significance is demonstrated in the impact analyses contained in Section 1, *Aesthetics,* Section 4, *Biological Resources*, Section 5, *Cultural Resources*, Section 7, *Geology and Soils*, Section 10, *Hydrology and Water Quality,* Section 13, *Noise*, and Section 21, *Mandatory Findings of Significance*, of the Draft IS-MND. Any additional actions not covered by the IS-MND would require separate review under CEQA.

The remainder of this comment is general in nature and do not raise specific environmental concerns about the Draft IS-MND or the MBHMP. Therefore, no further response is required to this portion of the comment. (See Browning-Ferris Indus. v. City of San Jose (1986) 181 Cal.App.3d 852 [where a general comment is made, a general response is sufficient].) Responses to specific resource areas identified by the commenter as lacking substantial evidence of no potentially significant impacts are addressed in subsequent responses below.

Response 3.2

The commenter notes the Draft IS-MND's description of the existing setting with respect to aesthetics is incomplete because it omits any description of the existing Ellwood eucalyptus grove, which is a dominant visual feature of the Coverage Area. The commenter adds the Draft IS-MND's discussion of impacts to scenic resources focuses on the removal of dead and diseased vegetation improving the eucalyptus grove as a visual resource, however, the MBHMP only states that dead or diseased eucalyptus trees will be replaced with trees and does not specify that such trees will be

eucalyptus trees. The commenter notes this may alter the visual character of the groves over time if eucalyptus trees are not replaced with other eucalyptus trees.

The Draft IS-MND addresses potential impacts to the visual character of the Coverage Area in Section 1, *Aesthetics*. The existing setting on Page 31 of the Draft IS-MND has been revised to include discussion of the visual character of Coverage Area, as follows:

> The Coverage Area is located in Ellwood Mesa Open Space, an undeveloped open space area categorized in the General Plan as "Open Space/Passive Recreation" where "significant environmental values or resources, wildlife habitats, significant views, and other open space value" exists (City of Goleta 2006a). The visual character of the Coverage Area is dominated by existing eucalyptus groves, creating a forested landscape. The generally evergreen nature of eucalyptus trees creates a patchy- to fully-shaded setting in the Coverage Area, with hanging bark, leaves, and vegetated understory protruding between tree trunks.

As noted in that section and in the Aesthetic Resources Management Program of the MBHMP, the existing eucalyptus groves suffer from grove senescence, drought, pests, disease, or lack of formal management efforts to maintain consistent aesthetic values. As further noted in Section 1, *Aesthetics*, the removal of dead and diseased trees or deadfall would not be considered removal of any scenic resources on the Coverage Area as it would benefit the overall health of the groves. The MBHMP Tree Management Program calls for reforestation along with removal of dead and diseased specimens with covered activities that include "plant new eucalyptus trees, native and/or fire-resistant understory species, and native nectar sources" for migrating butterflies. The consistent management structure provided by the MBHMP would maintain the visual character of the Coverage Area by improving the health of the groves and supporting monarch butterfly habitat.

Response 3.3

The commenter recommends the MBHMP be revised to specifically state removed eucalyptus trees will be replaced in kind and identify blue gum and other eucalyptus species in the identified plant list. Additionally, the commenter recommends changes to Policy 12-1 of the MBHMP to state eucalyptus trees in the groves shall be managed to ensure tree health and longevity throughout the Coverage Area, rather than just in groves containing aggregation sites.

This comment does not relate to the content or adequacy of the Draft IS-MND, but instead to the content of the MBHMP. Therefore, this comment has been moved to the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP, and a response was provided in the matrix. The MBHMP Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

Response 3.4

The commenter states the Draft IS-MND relies on tree replacement identified in the MBHMP to conclude the MBHMP would not result in potentially significant impacts to monarch habitat. However, the commenter notes the MBHMP does not clearly call for the replacement of dead or dying eucalyptus trees with other eucalyptus trees. The commenter adds the plan should describe when and where planting or replanting eucalyptus trees, as well as native trees, may be necessary.

The MBHMP is a long-term management plan intended to guide habitat restoration and enhancement efforts through management goals, policies, and supporting actions. The covered

activities, including tree replanting actions, are general in nature to reflect the need for adaptive management in the face of changing conditions in the Coverage Area. However, the MBHMP contains actions supporting eucalyptus growth within the boundaries of the existing eucalyptus groves, including Action 12-1.11, which calls for a pilot planting for any eucalyptus species considered for tree restoration that is not present in the MBHMP area as of 2018, and Action 12-2. 5, which calls for protecting blue gum saplings as necessary to encourage natural recruitment of trees in the eucalyptus forest. Additionally, the Draft IS-MND does not rely solely on replanting of eucalyptus trees in its determination that impacts to the monarch butterfly would be less than significant with mitigation incorporated. In Section 4, *Biological Resources*, the Draft IS-MND also notes that planting native species, eradication of non-native species (excluding eucalyptus), and integrated pest management efforts to reduce pests that stress monarch butterflies or their habitat would further enhance suitable habitat for the species in the Coverage Area.

Response 3.5

The commenter recommends a change to Action 12-1.2 of the MBHMP. Specifically, the commenter suggests that Table 2 of the MBHMP be revised to include "Planting eucalyptus trees or planting native trees" as a Potential Action/Tool for Management to correct habitat deficiencies such as sparse overstory, strong wind speeds in the grove, and tree death, toppling, or removal.

This comment does not relate to the content or adequacy of the Draft IS-MND, but instead to the content of the MBHMP. Therefore, this comment has been moved to the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP, and a response was provided in the matrix. The MBHMP Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

Response 3.6

The commenter recommends changes to Actions 12-1.6 and 12-1.10 of the MBHMP specifying maintenance of a living eucalyptus forest and replanting eucalyptus trees.

This comment does not relate to the content or adequacy of the Draft IS-MND, but instead to the content of the MBHMP. Therefore, this comment has been moved to the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP, and a response was provided in the matrix. The MBHMP Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

Response 3.7

The commenter cites language on Page 53 of the Draft IS-MND, which states, "Grove and windrow areas between aggregation sites have not been recorded to support monarch butterfly aggregations." The commenter notes unoccupied groves are still valuable to the monarch population and identified as monarch Environmentally Sensitive Habitat Area (ESHA) in the City's General Plan. The commenter states it is not entirely clear in the MBHMP that the MBHMP is intended to apply to the eucalyptus groves in the Coverage Area generally and not only the aggregation sites. In particular, the commenter notes the Monarch Butterfly Management Program refers only to the conservation of, preservation of, and timing of work in aggregation sites, as opposed to the entire eucalyptus grove. Additionally, the commenter notes Figure 2 of the MBHMP depicts aggregation sites in small red circles, which could be interpreted to mean that protections

for monarch habitat and eucalyptus trees only apply to these small areas. The commenter recommends this point be clarified, and a figure similar to Figure 7 in the Draft IS-MND, which depicts the coverage of the grove, be included in the MBHMP.

The Draft IS-MND notes the extent of monarch butterfly ESHA within the Coverage Area in Section 4, *Biological Resources*. Certain supporting policies and actions of the MBHMP are intended to preserve aggregation sites in the Coverage Area, such as Policy 10-2 of the Monarch Butterfly Management Program, which states, "Preservation of aggregation sites on Ellwood Mesa shall be the focus of management activities, as feasible, and in coordination with Program 9, Catastrophic Event Response Program." Such policies and supporting actions provide an added layer of management directive to protect known aggregation sites in the Coverage Area; they do not preclude larger habitat restoration efforts from occurring throughout the Coverage Area, such as removal of dead trees and debris, planting trees as needed to maintain grove density and improve monarch habitat (Action 12-1.10), or monarch butterfly patrolling habitat enhancement efforts (Action 12-2.2). The application of certain MBHMP policies and actions to aggregation sites is accounted for in the analysis of potential environmental impacts, including those to monarch butterflies and their habitat, described in the Draft IS-MND. Given MBHMP management activities would improve habitat conditions throughout the Coverage Area, as discussed in the Draft IS-MND, it would also provide benefits in the areas outside of established aggregation sites.

Response 3.8

The commenter recommends changes to Action 10-1.1, Policy 10-2, Action 10-2.1, and Policy 10-4 expanding the application of these actions and policies to eucalyptus groves and windrows in the Coverage Area, as opposed to monarch butterfly aggregation sites.

This comment does not relate to the content or adequacy of the Draft IS-MND, but instead to the content of the MBHMP. Therefore, this comment has been moved to the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP, and a response was provided in the matrix. The MBHMP Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

Response 3.9

The commenter states Action 2-2.2 allows for payments of compensatory mitigation fees to the Butterfly Fund for projects with limited impacts on monarch butterfly habitat. The commenter adds the City should not allow projects that impact monarch butterfly habitat, and Action 2-2.2 should be revised to allow payment of compensatory mitigation fees only where projects have implemented all available measures to avoid impacts to monarch butterfly habitat, or to directly mitigate impacts on-site where appropriate.

This comment does not relate to the content or adequacy of the Draft IS-MND, but instead to the content of the MBHMP. Therefore, this comment has been moved to the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP, and a response was provided in the matrix. The MBHMP Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

Response 3.10

The commenter states language in the Habitat Enhancement and Restoration Program is insufficiently clear and requires revision to ensure restoration activities do not result in the destruction of eucalyptus and monarch habitat and associated potentially significant impacts. Specifically, the commenter suggests changes to the Overview language in the MBHMP clarifying enhancement or restoration of the Devereux Creek corridor would occur in existing native riparian areas. The commenter adds this language is consistent with the language in supporting Policy 14.3, which limits restoration actions to existing native riparian areas, and Policy 14-2, which states, "areas between eucalyptus groves shall be considered for habitat enhancement and restoration alternatives."

This comment does not relate to the content or adequacy of the Draft IS-MND, but instead to the content of the MBHMP. Therefore, this comment has been moved to the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP, and a response was provided in the matrix. The MBHMP Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

Response 3.11

The commenter requests a map in the MBHMP showing the location of existing native riparian areas. Specifically, the commenter requests the MBHMP include Figure 2 from the Draft IS-MND showing drainages and vegetation communities in the Coverage Area. Additionally, the commenter recommends changes to Action 11-2.4 of the MBHMP to specify restoration in the Devereux Creek riparian corridor would be for "existing native riparian areas."

This comment does not relate to the content or adequacy of the Draft IS-MND, but instead to the content of the MBHMP. Therefore, this comment has been moved to the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP, and a response was provided in the matrix. The MBHMP Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

Response 3.12

The commenter notes the importance of monitoring and reporting as key tools necessary to ensure the MBHMP functions as intended and provisions of the MBHMP relied on to self-mitigate impacts to monarch butterflies and their habitat are actually effective at reducing impacts to less than significant levels. The commenter recommends changes to Policy 20-3 and Action 20-3.1 to firmly require annual Monitoring Reports and present such reports at public workshops.

As noted in Response 3.1, above, the Draft IS-MND contains 15 mitigation measures incorporated to reduce potential impacts to a less than significant level. A Mitigation Monitoring and Reporting Program (MMRP), included as Appendix D, requires the City to monitor the effectiveness of these mitigation measures and includes required actions, monitoring timing, frequency, responsible parties, and compliance verification steps. The remainder of this comment, notably recommended changes to Policy 20-3 and Action 20-3.1 of the MBHMP, does not relate to the content or adequacy of the Draft IS-MND, but instead to the content of the MBHMP. Therefore, this comment has been moved to the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP, and a response was provided in the matrix. The MBHMP

Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

Response 3.13

The commenter states the City is not the only entity that may conduct activities in the Coverage Area, noting previous tree pruning, removal, and other activities by SCE.

Vegetation and tree removal efforts conducted by SCE in the Coverage Area occur pursuant to permits obtained by the utility. While the City may conduct covered activities in the existing SCE easements in the Coverage Area, it cannot prevent SCE from conducting tree topping, trimming, or removals if such activities are consistent with its easement rights and SCE has obtained necessary permits, such as those issued by the CCC.

Response 3.14

The commenter requests changes to Action 1-2.1 of the MBHMP. Action 1-2.1 of the MBHMP states that pre-activity surveys for nesting birds, monarch butterfly aggregations, and other wildlife, the presence of an environmental monitor during construction, and other protections, as deemed appropriate, should normally occur whenever vegetation removal, ground disturbance, construction, or other activities are proposed within the Coverage Area by the City or any other entity. The commenter requests that this language be revised to indicate that such measures always occur. Additionally, the commenter requests the measure be revised to require the City to monitor such activities to ensure environmental protection measures are used and activities are limited to those permitted.

This comment does not relate to the content or adequacy of the Draft IS-MND, but instead to the content of the MBHMP. Therefore, this comment has been moved to the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP, and a response was provided in the matrix. The MBHMP Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

Response 3.15

The commenter states the opinion the environmental setting for historical/cultural resources contained in the Draft IS-MND is fundamentally flawed and incomplete for failing to recognize the historic and cultural value of the Ellwood eucalyptus groves. The commenter adds that the Draft IS-MND must describe the historical significance of the Ellwood grove to provide adequate analysis of the MBHMP's potentially significant impacts to cultural/historical resources, including an analysis of whether the Ellwood grove is eligible for listing as a cultural landscape and, if so, whether the MBHMP would result in potentially significant impacts to that resource.

The existing setting in Section 5, *Cultural Resources*, acknowledges the history of the eucalyptus groves, stating, "In the 1870s, Ellwood Cooper introduced eucalyptus trees to Ellwood Mesa and by the mid-1870s had successfully planted approximately 50,000 trees of more than 50 varieties. The groves have matured and become useful for windbreaks. Today the eucalyptus groves present on Ellwood Mesa are a remnant of Cooper's early attempt at eucalyptus forestry."

The MBHMP prescribes management directives to enhance, restore, and maintain monarch butterfly habitat within the Coverage Area, including the existing eucalyptus groves. As discussed in

Response 3.4 above, the MBHMP contains actions targeted at supporting eucalyptus growth within the existing grove boundaries and maintaining a healthy forest system. Covered activities would improve the health and vibrancy of the deteriorating groves and, therefore, would not adversely change the historical or cultural significance of the groves. The MBHMP Tree Management Program calls for reforestation along with removal of dead and diseased specimens with covered activities that include “plant new eucalyptus trees, native and/or fire-resistant understory species, and native nectar sources” for migrating butterflies. In addition, without implementation of the MBHMP, additional eucalyptus trees would deteriorate and the overall health of the grove would decline. Because of this provision and the ability to manage the health of the grove, no impact to a cultural landscape, if present, would occur.

Letter 4

RECEIVED
FEB 25 2019
City of Goleta
Planning & Environmental Svcs.

February 22, 2019

City of Goleta Planning and Environmental Review
130 Cremona Drive, Suite B
Goleta,CA 93117

Comments on Draft Initial Study-Mitigated Negative Declaration for the Monarch Butterfly Habitat Management Plan (MBHMP)

Attention: Ms. Anne Wells, Advance Planning Manager

Dear Ms. Wells,

In reviewing the draft MBHMP it provided a fairly focused yet generic approach to managing the area primarily for eucalyptus trees while giving some mention for other existing wildlife resources and native riparian and upland habitats in and adjacent to the study area. There is a need for a more balanced approach to truly provide for a "healthy riparian habitat area" which will better support the butterflies along with the other native species which exist here.

There is a need for more specific descriptions of what constitutes the primary constituent elements of habitat critical for the overwintering butterflies, not just planting and watering more eucalyptus trees (which in themselves provide a significant source of fuel for potential wildfires). Use of the Xerces Society 2017 publication: Protecting California's Butterfly Groves: Management Guidelines for Monarch Butterfly Overwintering Habitat would be one source from which to gain said information. Working with the U.S. Fish and Wildlife Service in their review of proposals to have the species listed as threatened or endangered would be another recommendation. 1

The few maps provided are extremely general and need to be of a scale which provides for definition of densities of trees; areas with dead and dying trees and other factors critical to managing the habitat. 2
The comment letter provided by Lisa Stratton, Director of Ecosystem Restoration at UC Santa Barbara, provides added factors which need to be included in a sound management plan in order to be able to determine if the area is actually meeting desired habitat characteristics for the butterflies and other unique and sensitive wildlife and plants which may occur in the area. 3

Both the Community Wildfire Protection Plan(CWPP) and MBHMP address habitat management activities to protect, maintain and enhance the Monarch Butterfly Management Area, except neither of them mention the presence of or maintenance needs relative to the SCE power lines and the potential that these power lines hold to become a significant ignition source for wildfire, which poses the greatest threat to the Monarchs and their habitat in addition to the residents and properties which exist adjacent to the management area. 4

The following comments are respectfully submitted to address what should qualify as a significant issue which I believe has been overlooked in both the Goleta Community Wildfire Protection Plan (CWPP) of 2012, and the current Draft Monarch Butterfly Habitat Management Plan (MBHMP) and related Draft Mitigated Negative Declaration of 2019.

The issue of concern is the management of Southern California Edison power lines which exist adjacent to and within the designated MBHMP area as depicted on page 3, Figure 2 of the IS/MND.

The following is provided to point out information and direction which exists in the Draft MBHMP but which has not been tied to the SCE power lines and the ongoing vegetative maintenance work that SCE is required to conduct relative to State of California Public Resources Code 4293; and California Public Utilities Commission General Order 95, Section III, Rule 35 covering Vegetation Management of power lines.

General Order 95, Section III, Rule 35 includes direction for all power lines including: "When a supply or communication company has actual knowledge, obtained either through normal operating practices or notification to the company, that dead, rotten or diseased trees or dead, rotten or diseased portions of otherwise healthy trees overhang or lean toward and may fall into a span of supply or communication lines, said trees or portions thereof, should be removed."

California Public Resources Code 4293 further mandates, "the mitigation of the hazard created by dead, dying and diseased or weakened trees which hold the potential to damage or cause downing of power lines."

Due to the ever increasing number, size and intensity of wildland fires in California, and the documented cause of a number of these fire starts being tied to downed power lines, the California State Legislature enacted Senate Bill 901 in 2018. This bill created an Order instituting rulemaking to implement "Electric Utility Wildfire Mitigation Plans" by all utility companies in California. Southern California Edison submitted its company's U338-E 2019 Wildfire Mitigation Plan (WMP) on February 6, 2019. A portion of that plan, below states: 4

WMP Section 4.4.2.4 Vegetation Management Program Re-Design: Paragraph 2, "SCE's vegetation management program is currently undergoing a comprehensive redesign and restructuring. The staged deployment of the revised vegetation management program is anticipated to commence in early 2019 and continue into 2020. Enhancements reflected in SCE's revised vegetation management program include, but are not limited to:...increased focus on hazard tree removals/mitigation; and increased identification and removal of vegetation overhangs."

Section 4.4.2.4 Paragraph 5: ..."In addition, the area between the outer-most conductors and the ROW border will be cleared of brush and trees that have the potential to strike electric facilities. . . SCE will use LiDAR technology to identify trees along the ROW border that can potentially contact conductors during high wind events."

SCE undertook hazard tree pruning activities, under permit from the Coastal Commission and City, during the summer of 2018 along the eastern boundary of the Ellwood North MBF Aggregation area, just west of Pebble Beach Drive to comply with the above State mandated regulations. Although SCE wound up cutting/pruning more trees than originally identified they did so in order to fully comply with the above legal mandates. This pruning/topping activity has had no known affect on the use of the aggregation site and has removed the significant safety problem related to falling trees or limbs being any threat to the treated section of SCE line.

The small grove of eucalyptus just east of this treated section, (Between Pebble Beach Dr. and Santa Barbara Shores Dr) which is bounded on both the east and west by SCE lines, has since experienced the

falling of two large green and apparently healthy eucalyptus which narrowly missed the power lines and adjacent homes. A third tree farther down stream also fell taking down the SCE line and damaging one home severely enough that the occupants had to vacate until the roof, ceilings and other structural damage is repaired. Fortunately no one was injured...this time!

The above information hopefully provides adequate information to validate the significant issue that unmaintained eucalyptus trees have, in and adjacent the MBFHMP area, to cause the downing of SCE power lines with the potential to start a wildland fire which could easily threaten or destroy not only the MBHMP area but the residents and homes adjacent to the management area.

4

In order to provide meaningful protection of public safety, property and the sensitive biological habitats and species which exist in the planning area, the above issue needs to be amended to the Draft Mitigated Negative Declaration and appropriate management direction provided to mitigate the Significance of this Issue.

Such mitigation should include, but not be limited to: added tree maintenance standards tied specifically to the power line maintenance activity; allowance of and support for SCE to conduct their State mandated vegetation management program; and actions by the City itself to address any further needed vegetation management actions which would help preclude hazard trees from contacting or striking SCE power lines within the Ellwood Mesa area.

Other existing management direction and comments:

Page 4 –Background Information: " Drought has compromised the health of eucalyptus trees in Ellwood Mesa exacerbating wildfire risk and increasing vulnerability to pest infestations."

"The study by Althouse and Meade, Inc. 2017, identified over 1,200 dead and hundreds of dying eucalyptus trees within the MBHMP study area." Therefore, any wildfire which may occur in or adjacent to this area has the heightened potential to not only adversely affect but to completely consume the highly stressed and highly flammable stands of eucalyptus which comprise a majority of the study area.

5

Due to the above factors, wildfire poses the greatest threat to the very existence of the management area and the Monarch butterflies for which it was established and every effort should be undertaken by the City to avoid or minimize potential sources of fire in this sensitive area.

Page 5 - Referencing the Goleta Community Wildfire Protection Plan (CWPP) of 2012. Second paragraph, line 6:

"The protection of human life and safety is the highest priority for all fire management strategies in Goleta, followed by the protection of property. Given that the CWPP has been approved, activities under the CWPP would occur In Ellwood Mesa Open Space regardless of the MBHMP because the CWPP was developed with consideration of the Monarch butterfly aggregation sites in Ellwood Mesa."

6

One of the primary causes of major wildfires in recent years has been downed power lines within heavily vegetated areas. This has led the California Public Utilities Commission to enact more and more stringent guidelines and regulations relating to management of vegetation which has the potential to have contact with, or be blown into, or fall upon power lines. General Order 95, Title 18, Section 4293

of the California Resources Code mandates that the utility companies, or other agencies responsible for said power lines, undertake actions to preclude contact with or damage to power lines caused by vegetation.

In order for the City to be in compliance with its own Community Wildfire Protection Plan and with the mandates of the Public Utilities Commission, it should be taking every opportunity to provide support for Southern California Edison to conduct needed pruning, topping or removal of any trees which have the potential to grow into or fall upon and strike SCE power lines within our community. 6

Page 7 – Defining activity zones: Primary defense zone is 0 to 30 feet from structures; and fuel reduction zone is 30 to 100 feet from structures. The focus of activity in these zones is to remove understory and ground cover which poses a threat of fire from ground ignition sources. Table 1 of the CWP: Prescription Guidance for Butterfly Aggregation areas. For areas within 100 feet of residences and structures. **."Only trees that do not provide protection of monarch butterfly aggregation sites should be trimmed or thinned."**

Fuel Reduction Zone (30 – 100 ft) from structures: "Thin or trim trees that do not provide protection to Monarch butterfly aggregation sites.""Leave larger trees – unless toppling hazard"* *As defined by the City arborist. The main problem with this directive is that neither the City Arborist nor any arborist can fully predict which large tall eucalyptus trees are likely to fall. Yes, dead and dying trees are identifiable but due to the poor root systems and moist soils which occur along the creek areas, even green, healthy eucalyptus trees have fallen and continue to fall even without severe wind events. Given the above State mandates to SCE and recent felling of at least three large trees within the grove between Pebble Beach Dr and Santa Barbara Shores Dr, the City should be proactive and support the topping, trimming or removal of all trees which hold the potential to fall and strike SCE power lines in this and similar areas. 7

Page 12: Tree Management Program: This program includes the following covered activities.

"Selectively prune or remove standing dead, dying, or vulnerable trees that pose a threat to public safety or monarch aggregation sites". As stated above, the trees between Pebble Beach and Santa Barbars Shores Drives would fall into the class of "vulnerable trees" as evidenced by their actively falling within the past couple weeks.

Page 13: Habitat Enhancement and Restoration Program. "Plant native species of ground cover and woody species of bushes and nectar sources (See UCSB comment letter of Aug 30, 2018).

Page 16: Table 2 MBHMP program policies and actions with potential effects on the environment 8

Program 4 Community Wildfire Protection Plan. Goal: Provide management practices that support healthy MB Habitat "and are compatible with the Community Wildfire Protection Plan."

4.1 Policies: "The Goals, Policies and Actions of the MBHMP shall be consistent with the intent of the CWPP to reduce the ignitability of homes and structures." Here again downed power lines pose a high risk of ignitability of homes and structures which are usually less than 30 feet from them.

Page 20: Tree Management: Goal.....(5) Sensitivity to Wildfire Hazards

12.1.2 – Identify potential threats to aggregation sites including: fire. Here again the potential for SCE power lines to fall and ignite vegetation. 8

Note: Areas between existing groves of eucalyptus should NOT be planted with eucalyptus as this only provides a continuous interconnected supply of highly flammable vegetation likely to carry fire from a source into the aggregation sites. Having gaps "fuel breaks" is a much better way to ensure the long term viability of the aggregation sites, not just planting more fuel. 9

Another unique factor of the small grove of eucalyptus between Pebble Beach and Santa Barbara Shores is a forestry factor known as "wind throw". This small stand of very tall senescent trees being only two to three trees wide in places is highly susceptible to wind throw due to the extreme height and mass of their canopies coupled with direct exposure to high winds, and the weakened root anchorage resulting from years of drought make them very susceptible to falling. Having the creek run nearby also results in saturated soils which add to the instability of the root systems. This wind throw factor adds to the definition of these trees as hazard trees with a high potential to fall and strike the power lines which run along both the east and west boundary of this grove. 10

Page 28: Second Paragraph: Some species of eucalyptus trees found on Ellwood Mesa, including blue gum, have deciduous bark, which is shed annually and presents a fire hazard. The bark catches fire readily and streamers from the lose bark tend to carry fire into the canopy and cast firebrands ahead of the main fire front. The leaf litter, which is the accumulation of dead, dry and oily leaves, is also a fire hazard as it is extremely flammable.

This statement again confirms the hazardous nature of the eucalyptus trees which comprise almost 100 percent of the aggregation and other groves of trees in the study area. The CWPP documents that eucalyptus is the hottest burning tree species in the Ellwood Mesa area and the potential for this highly flammable fuel to be ignited by a falling power line is one of the most significant sources of wildfire in this area. Again begging the City to take action to help minimize or prevent such an event from happening by properly managing the eucalyptus groves in and adjacent the MBHMP area. Allowing and supporting SCE to trim or remove all trees deemed by them to be a hazard with the potential to contact or strike their power lines! 11

Thank you for the opportunity to provide input to this important planning effort. We all want to maintain and protect the Monarchs and their "critical habitat areas", but this should not preclude any actions deemed to pose a threat to public safety or loss of property. These are not mutually exclusive goals but can and should be managed as a combined goal of the City's management of this unique and valuable habitat area.

Sincerely,

Maeton Freel
273 Santa Barbara Shores Dr
Goleta, CA

Letter 4

COMMENTER: Maeton Freel, Resident

DATE: February 22, 2019

Response 4.1

The commenter opines the MBHMP provides a generic approach to managing the Coverage Area primarily for eucalyptus trees, while mentioning other existing wildlife resources and native riparian and upland habitats in and adjacent to the Coverage Area. The commenter recommends a more balanced approach to better support both butterflies and other native species. The commenter further recommends use of The Xerces Society's 2017 publication *Protecting California's Butterfly Groves: Management Guidelines for Monarch Butterfly Overwintering Habitat* and working with the United States Fish and Wildlife Service (USFWS) in its review of proposals to have the monarch butterfly listed as threatened or endangered.

This comment does not relate to the content or adequacy of the Draft IS-MND, but instead to the content of the MBHMP. Therefore, this comment has been moved to the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP, and a response was provided in the matrix. The MBHMP Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

Response 4.2

The commenter provides the opinion the maps included in the MBHMP are general and need to be at a scale which provides for definition of tree densities, areas of dead and dying trees, and other factors critical to managing the habitat.

This comment does not relate to the content or adequacy of the Draft IS-MND, but instead to the content of the MBHMP. Therefore, this comment has been moved to the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP, and a response was provided in the matrix. The MBHMP Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

Response 4.3

The commenter draws attention to comments provided by Lisa Stratton, Director of Ecosystem Restoration at the University of California, Santa Barbara, which provide additional factors for consideration in a sound management plan to determine whether an area is actually meeting desired habitat characteristics for monarch butterflies and other wildlife and plants occurring in the area.

This comment does not relate to the content or adequacy of the Draft IS-MND, but instead to the content of the MBHMP. Therefore, this comment has been moved to the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP, and a response was provided in the matrix. The MBHMP Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

Response 4.4

The commenter states neither the Community Wildfire Protection Plan (CWPP) nor the MBHMP mention the presence or maintenance needs of existing Southern California Edison (SCE) power lines in the Coverage Area. The commenter notes power lines are an ignition source for wildfire and discusses State policies requiring vegetation maintenance work along power lines, specifically Public Resources Code 4293 and California Public Utilities Commission General Order 95. The commenter mentions hazard tree pruning activities during the summer of 2018 along the eastern boundary of the Ellwood North aggregation site were necessary to comply with State regulations and have had no known effect on the use of the aggregation site. The commenter adds the Draft IS-MND should include specific tree maintenance standards tied to the power line maintenance activities, allowance of and support for SCE to conduct State-mandated vegetation management programs, and actions by the City to address any further needed vegetation management actions which would preclude hazard trees from contacting or striking SCE power lines in the Ellwood Mesa area.

The Draft IS-MND discusses potential wildfire impacts in Section 20, *Wildfire*. The discussion contained in this section notes implementation of the MBHMP would reduce potential wildfire risk in the Coverage Area by removing dead, dying, or otherwise hazardous trees and re-planting the understory around aggregation sites with fire-resistant, native plant species. The Draft IS-MND concludes implementation of the MBHMP would result in no impact related to wildfire, and may result in a beneficial effect.

Vegetation and tree removal efforts conducted by SCE in the Coverage Area occur pursuant to permits obtained by the utility. While the City may conduct covered activities in the existing SCE easements in the Coverage Area, it cannot prevent SCE from conducting tree topping, trimming, or removals if such activities are consistent with its easement rights and SCE has obtained necessary permits, such as those issued by the CCC. Such activities would continue as deemed necessary by SCE to reduce wildfire risks associated with its electrical facilities in the Coverage Area. Section 20, *Wildfire*, of the Draft IS-MND has been amended to include this information, with the following language added:

The MBHMP does not propose construction or maintenance of any new infrastructure which may pose a fire risk. The Coverage Area contains existing power lines owned and operated by SCE. SCE has previously conducted vegetation removal efforts to reduce fuel loads and hazardous trees in the vicinity of these lines. These vegetation removal efforts would continue, subject to SCE's own permits and easement rights.

The MBHMP would not involve construction of any structures, and therefore would not expose any additional people or structures to risk of wildfire. <u>As noted in Section 9, *Hazards and Hazardous Materials*, the project would not interfere with an adopted emergency response or evacuation plan.</u> Given its gentle sloping topography, the Coverage Area would not be susceptible to post-fire flooding, landslides, or slope instability. There would be no impact.

Response 4.5

The commenter cites language in the Draft IS-MND's Background section stating drought has compromised the health of eucalyptus trees in Ellwood Mesa exacerbating wildfire risk. The commenter states wildfire poses the greatest threat to the Coverage Area and every effort should be undertaken by the City to avoid or minimize potential sources of fire in the Coverage Area.

This comment is noted. Please refer to Response 4.4, above, for discussion of how the MBHMP would affect wildfire risk and hazard mitigation efforts.

Response 4.6

The commenter cites language from the CWPP stating the protection of human life and safety is the highest priority for all fire management strategies in Goleta, followed by the protection of property. The commenter states this language supports efforts by SCE to conduct needed pruning, topping, and removal of any trees with potential to grow into or fall on power lines and that the City should support these efforts.

As discussed in Section 20 of the Draft IS-MND, *Wildfire*, the MBHMP pledges support for the policies and activities contained in the CWPP, which includes policies intended to reduce fire hazards from fuel loads in the Coverage Area. Please refer to Response 4.4 for discussion of how the MBHMP relates to efforts by SCE to prune, top, or remove trees along power lines in the Coverage Area.

Response 4.7

The commenter notes the CWPP states larger trees in the Fuel Reduction Zone (30-100 feet from structures) should be left in place unless they pose a toppling hazard as defined by the City arborist. This directive is noted in Table 1 of the Draft IS-MND. The commenter states no arborist can fully predict which trees are likely to fall, and the City should be proactive and support the topping, trimming, and removal of all trees with potential to fall and strike SCE power lines.

As noted by the commenter and described in the Draft IS-MND, the directive to leave larger trees in the Fuel Reduction Zone in place unless they pose a toppling hazard is contained in the CWPP, not the MBHMP. The CWPP was previously approved in 2012, and the MBHMP proposes no changes to the CWPP. Please refer to Response 4.4 for discussion of how the MBHMP relates to efforts by SCE to prune, top, or remove trees along power lines in the Coverage Area.

Response 4.8

The commenter notes Goals, Policies, and Actions, as well as covered activities identified for the MBHMP's programs support the need to reduce wildfire hazards associated with SCE power lines in the Coverage Area.

This comment is noted. Please refer to Response 4.4 for discussion of how the MBHMP relates to efforts by SCE to prune, top, or remove trees along power lines in the Coverage Area.

Response 4.9

The commenter recommends areas between existing groves of eucalyptus should not be planted with eucalyptus, as this only provides a continuous interconnected supply of highly flammable vegetation. The commenter further states gaps between groves, or fuel breaks, would better support the long-term viability of the aggregation sites by reducing wildfire risk.

As described in Section 20, *Wildfire*, of the Draft IS-MND, replacement trees would be planted within the boundaries of the existing eucalyptus groves, and no expansion of the existing eucalyptus groves would occur. As a result, implementation of the MBHMP would not increase the supply of

highly flammable vegetation in the Coverage Area, and would reduce fuel by replacing dead, dying, or otherwise hazardous trees with less fire-prone healthy trees.

Response 4.10

The commenter notes the small grove of eucalyptus trees between Pebble Beach Drive and Santa Barbara Shores Drive is highly susceptible to wind throw due to the extreme height and mass of their canopies coupled with direct exposure to high winds. The commenter adds these trees have weakened root systems due to years of drought and are located on unstable, saturated soils given their proximity to Devereux Creek, making them susceptible to falling. The commenter states the opinion this further qualifies these trees as hazard trees with potential to fall on power lines along the eastern and western boundary of this grove.

The eucalyptus grove between Pebble Beach Drive and Santa Barbara Shores Drive is not located in the Coverage Area, and covered activities of the MBHMP would not occur in this grove. SCE's tree pruning, topping, and removal efforts may continue in this grove under permits obtained by the utility, as long as such efforts are consistent with SCE's existing easement rights. Please refer to Response 4.4 for discussion of efforts by SCE to prune, top, or remove trees along power lines in the Coverage Area.

Response 4.11

The commenter cites language in the Draft IS-MND noting some species of eucalyptus on Ellwood Mesa, such as blue gum, have deciduous bark, which poses a fire hazard as streamers from loose bark carry fire into the canopy and cast firebrands ahead of the main fire front. The commenter states this language confirms the hazardous nature of eucalyptus trees and encourages the City to take action to help minimize or prevent a wildfire event by managing the eucalyptus groves in and adjacent to the Coverage Area, including supporting SCE in efforts to trim or remove all trees deemed by them to be a hazard with the potential to contact or strike their power lines.

The MBHMP contains management actions intended to restore and enhance habitat in the Coverage Area, including the existing eucalyptus groves. The Draft IS-MND concludes implementation of the MBHMP would result in no impact related to wildfire, and may result in a beneficial effect by removing dead, dying, or hazardous trees and restoring understory with native, fire-resistant species. Furthermore, as discussed in Response 4.4 above, Section 20, *Wildfire*, has been revised to indicate that SCE tree pruning, trimming, and removal activities may continue to occur as long as such activities obtain all necessary permits and are consistent with SCE's existing easement rights.

Letter 5

To: Ann Wells, Planning Manager, City of Goleta, awells@cityofgoleta.org

From: Michael Mills, Goleta resident, 7628 Carmel Beach Circle, memills@gmail.com

Re: Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan

The Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan (or "Plan") does not adequately address the extreme risks to property and human life that would occur due to a fire in the eucalyptus groves. The author of the Plan, Rincon Associates, is an environmental consulting firm with expertise on preserving Monarch butterfly habitat. They are not experts in fire risk assessment, or the development of fire mitigation strategies. As a result, their Plan does not adequately address these fire risks. Nor does it prioritize human life and property above butterfly habitat preservation.

The neighborhoods adjacent to the groves are at significant risk of fire. Many home fire insurance companies will not underwrite fire insurance in these areas, and, those that have previously are dropping existing policies.

The 1991 Oakland Hills firestorm was largely driven by the extreme flammability of eucalyptus trees. As noted by Wikipedia, the firestorm:

> ...ultimately killed 25 people and injured 150 others. The 1,520 acres (620 ha) destroyed included 2,843 single-family dwellings and 437 apartment and condominium units. The economic loss from the fire was estimated at $1.5 billion (1991 USD).

1

Should a similar conflagration occur here, the City risks very significant legal liability for its failure to mitigate known fire risks posed by the eucalyptus groves.

The Plan needs significant revisions to provide fire risk reduction strategies. Those revisions should be made in consultation with fire risk experts, especially those with expertise in the specific risks posed by fires in eucalyptus groves.

Letter 5

COMMENTER: Michael Mills, Resident

DATE: February 24, 2019

Response 5.1

The commenter states the opinion the MBHMP does not adequately address the extreme risks to property and human life that would occur due to a fire in the eucalyptus groves. The commenter notes the plan was prepared by an environmental consulting firm with expertise in monarch butterfly habitat preservation, not fire risk assessment or the development of fire mitigation strategies. The commenter states the opinion neighborhoods adjacent to the groves are at significant risk of fire, and concludes the MBHMP should provide fire risk reduction strategies. Finally, the commenter states that such strategies should be made in consultation with fire risk experts, especially those with expertise in the specific risks posed by fires in eucalyptus groves.

This comment relates to the content of the MBHMP and does not relate to the content or adequacy of the Draft IS-MND. Therefore, this comment has been included in the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP. The MBHMP Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

The Draft IS-MND does, however, include discussion of the relationship between the MBHMP and fire protection. As discussed under the Community Wildfire Protection Program subheading on page 10 of the Draft IS-MND, the MBHMP is not intended to be a wildfire protection or mitigation plan, though it does pledge support for the policies and activities contained in the CWPP, which includes policies intended to reduce fire hazards from fuel loads in the Coverage Area. Instead, the MBHMP is intended to fulfill its stated purpose of supporting habitat for monarch butterflies and other plant and animal species, coastal access, and recreation while not exacerbating wildfire risk in or around the Coverage Area. The Draft IS-MND addressed potential impacts of the MBHMP related to wildfire in Section 20, *Wildfire*, and found that the MBHMP would result in no impact related to wildfire and may have a beneficial effect by removing dead, dying, or otherwise hazardous trees and re-planting understory vegetation with native, fire-resistant species.

Letter 6

Santa Barbara Audubon Society
A Chapter of the National Audubon Society

PO Box 5508
Santa Barbara, CA 93150
www.santabarbaraaudubon.org

Date: February 25, 2019

To: City of Goleta Planning & Environmental Review and Public Works Staff

Re: MBHMP Initial Study – Mitigated Negative Declaration

Dear City of Goleta Planning & Environmental Review and Public Works Staff,

This letter provides comments of the Santa Barbara Audubon Society (SBAS) regarding the City's January 2019 Initial Study – Mitigated Negative Declaration (IS-MND) for the Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan (MBHMP). This is a follow-up to our comments on the July 2018 Draft MBHMP provided in a letter to the City of August 31, 2018.

SBAS works to connect people with birds and nature through education, science-based projects, and advocacy. SBAS has been a voice for the natural world in the Santa Barbara area for more than 50 years and has over 1,100 members, including hundreds in the City of Goleta.

SBAS continues to be supportive of the City's approach toward protection and enhancement of the historical monarch butterfly aggregation sites in the Ellwood eucalyptus groves, while balancing the multiple, complex, and interactive elements of the MBHMP in a way that serves the long-term interests not only of monarchs, but of wildlife in general and the wide array of migratory, wintering, and breeding birds that find sustenance at Ellwood. As indicated in our comments of August 31st, we believe this is best accomplished through restoration efforts designed to create a diverse ecosystem comprised of a carefully planned mix of eucalyptus and natives that would enhance the long-term value of this habitat for both monarch aggregation sites and other wildlife. We are most appreciative of the City's detailed and thoughtful responses to our comments that appear in Appendix B of the IS-MND.

We offer the following additional comments on the IS-MND:

1. The first full paragraph on p. 67 acknowledges nearby Devereux Slough as an important migratory bird annual stopover location, and Ellwood Mesa Open Space as a National-Audubon-designated IBA (Important Bird Area). It would be appropriate and helpful to explicitly note that these descriptions apply as well to the Devereux Creek riparian corridor within the project Coverage Area. This would provide a stronger context for the project's Habitat Enhancement and Restoration Program, as outlined on pp. 13-14 and in section 14 of Table 2, and for demonstrating awareness of the need to ensure that the proposed program activities do not negatively impact the value of this corridor as a migratory bird stopover. As it stands, the generality of the language around planned habitat enhancement/restoration actions ("remove vegetation along Devereux Creek riparian corridor, as needed," p. 14; "restoration activities include establishment of a riparian area along the banks of Devereux Creek composed of native riparian tree species," p. 23) leaves unclear, for example, whether such activities could include eucalyptus removal or other elements (e.g., reduction/elimination of water catchment areas within the corridor) that could undermine the migratory stopover value of the area. 1

2. Many of the proposed mitigations (and other project activities) are qualified by language regarding their "feasibility" or "practicality." Within just the Biological Resources section, examples include BIO-5 ("Any ground disturbing activities in riparian and wetland habitats shall be conducted when the channel is dry to the maximum extent feasible"), BIO-6 ("To the maximum extent feasible, tree trimming activities must occur in September…"), and BIO-9 ("Impacts to vernal pools, wetlands, and streambeds shall be avoided to the maximum extent practicable, unless they are affected for the purpose of habitat enhancement. If avoidance is not feasible…"). Such language opens the door to allowing exceptions to critical environmental protections, without any clear definition of "feasibility" or the process by which it would be evaluated. It is crucial that any such contemplated project modifications or exceptions be fully specified and subject to public review and comment prior to their implementation. 2

3. Regarding the City's response to our August 31st comment concerning potential downstream project impacts (see item #259 in IS-MND Appendix B), even if the City believes that such impacts would be neutral, negligible, or only positive, we suggest that it would be appropriate to make this view explicit in the study, given that these immediately adjacent areas (North Campus Open Space, Coal Oil Point Reserve, Devereux Slough) are of high value, sensitivity, and public interest. 3

4. The various study references to bird nesting season dates are internally inconsistent (stated as March 15 to August 15 on pp. 12, 19, and 73; stated as February 1 to September 15 on p. 78). We have suggested March through mid-August in our *Protect Our Nesting Birds* brochure. For more detailed guidance on impact avoidance, see California Department of Fish and Wildlife (CDFW) website section https://www.wildlife.ca.gov/Conservation/Survey-Protocols#377281284-birds) or the attached CDFW document. 4

SBAS appreciates the opportunity to comment on this project. Please do not hesitate to contact us if further clarification on any of these points is desired.

Sincerely,



Cherie Topper, Santa Barbara Audubon Society Executive Director

Appendix I

CDFW's Conservation Measures for Biological Resources That May Be Affected by Program-level Actions

Table I-1. California Department of Fish and Wildlife's Conservation Measures for Biological Resources that May Be Affected by Program-level Actions

Conservation Measure	Description
GC	**General Conservation Measures**
GC-1. Conduct contractor environmental awareness training	a. For any project activity that involves construction or ground-disturbing activities, all construction workers will be required to participate in environmental awareness training. The training will educate workers on: (1) special-status species that may occur in the work area, (2) procedures to follow in the event a species is observed, and (3) other environmental BMPs and emergency spill response protocols.
GC-2. Work hours	a. All non-emergency work activities will be confined to daylight hours (i.e., sunrise to sunset), unless necessary for assessing or protecting biological resources.
GC-3. Best Management Practices	a. Prior to conducting work in streams, CDFW will identify the limits of the required access routes and encroachment into the stream. CDFW will restrict access routes and encroachment into the stream to the maximum extent while still allowing for necessary activities to be completed. CDFW will take care to prevent trampling riparian vegetation during daily visits to Project sites; as necessary, multiple routes to in-channel Project sites will be identified and used. Disturbance of riparian vegetation will be avoided to the greatest extent practicable. Access routes will not be overtly flagged, to prevent drawing attention to Project equipment and possible damage to related riparian habitat by persons not related to the Project. b. A spill prevention plan will be prepared describing measures to be taken to minimize the risk of fluids or other materials used during construction (e.g., oils, transmission and hydraulic fluids, cement, fuel) from entering streams or contaminating adjacent riparian areas. In addition to a spill prevention plan, a cleanup protocol will be developed before construction begins and will be implemented in case of a spill. c. Stockpiling of materials, including portable equipment, vehicles and supplies (e.g., chemicals), will be restricted to the designated construction staging areas, exclusive of any riparian and wetland areas. d. A qualified biological monitor will be present during construction activities that include clearing, grubbing, pruning and /or trimming of vegetation. The qualified biological monitor will also visit each job site during construction initiation, midway through construction, and at the close of construction to monitor implementation of conservation measures and water quality.
DBC	**Delta button-celery**
DBC-1. Avoid and minimize loss of habitat and risk of take for implementation of construction activities	a. Prior to conducting ground-disturbing activities, suitable habitat within the footprint and a 250-foot buffer around of the proposed activity will be surveyed by a qualified botanist for Delta button-celery in accordance with the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009 or current version). Floristic surveys will include the use of a reference population to increase the likelihood of detection and will be performed during the appropriate bloom period(s). b. If Delta button-celery plants are found on or adjacent to the Project site, in consultation with the CDFW Regional botanist, a minimum 50-foot no disturbance buffer will be placed around individual plant(s) or population(s) during activities that could result in disturbance. A greater no disturbance buffer may be warranted to ensure the hydrology of the site is not disrupted and the plants and seed bank will not be impacted. The no disturbance buffer will be clearly identified in the field by staking, flagging, or fencing around depressions, swales, or other features containing Delta button-celery plants. Project activity will avoid buffer areas to ensure that the buffer area is not being encroached upon and that effects are being avoided.
PALM	**Palmate-bracted bird's beak**

Conservation Measure	Description
PALM-1. Avoid and minimize effects to species	a. Prior to conducting ground-disturbing activities, suitable habitat within the footprint and a 250-foot buffer around the proposed activity will be surveyed by a qualified botanist for palmate-bracted bird's in accordance with the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009 or current version). Floristic surveys will include the use of a reference population to increase the likelihood of detection and will be performed during the appropriate bloom period(s). b. If palmate-bracted bird's beak plants are found on or adjacent to the Project site, in consultation with the CDFW Regional botanist, a minimum 50-foot no disturbance buffer will be placed around individual plant(s) or population(s) during activities that could result in disturbance and consistent with recommendations in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). A greater no disturbance buffer may be warranted to ensure the hydrology of the site is not disrupted and the plants and seed bank will not be impacted. The no disturbance buffer will be clearly identified in the field by staking, flagging, or fencing. Project activity will avoid buffer areas to ensure that the buffer area is not being encroached upon and that effects are being avoided.
PLANTS	
PLANTS-1. Avoid and minimize effects to special-status plants	a. Within one year prior to the commencement of ground-disturbing activities, habitat assessment surveys for the special-status plants listed in Table J-1 of Appendix J, will be conducted by a qualified botanist, in accordance with the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009 or current version) and at the appropriate time of year when the target species would be in flower or otherwise clearly identifiable. b. Locations of special-status plant populations will be clearly identified in the field by staking, flagging, or fencing a minimum 100-foot wide buffer around them prior to the commencement of activities that may cause disturbance. No activity will occur within the buffer area. c. Some special-status plant species are annual plants, meaning the plant completes its entire lifecycle in one growing season. Other special-status plant species are perennial plants that return year after year until they reach full maturity. Due to the differences in life histories, all general conservation measures will be developed on a case-by-case basis and will include strategies that are species and site-specific to avoid or minimize impacts to special-status plants. d. Minimization measures may include transplanting perennial species, seed collection and dispersal for annual species, and other conservation strategies that will protect the viability of the local population. If minimization measures are implemented, monitoring of plant populations will be conducted annually for 5 years to assess the mitigation's effectiveness. The performance standard for the mitigation will be no net reduction in the size or viability of the local population.
VP	**Vernal pool habitats, fleshy (succulent) owl's clover, Hoover's spurge, Bogg's Lake hedge-hyssop, Colusa grass, San Joaquin Valley Orcutt grass, hairy Orcutt grass, Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, and western spadefoot toad**
VP-1. Avoid effects to species and habitat	a. If vernal pools have the potential to be disturbed by a project activity, a qualified biologist will identify and map vernal pools and seasonal wetland habitat potentially suitable for listed vernal pool plants, invertebrates, and western spadefoot toad within the footprint. A 250-foot no disturbance buffer will be established from the high water mark of the vernal pool or wetland habitat and will be delineated by staking, flagging or fencing. b. Access, egress, and ground-disturbing activities will be sited to avoid vernal pools.

Conservation Measure	Description
VP-2. Minimize effects to species and habitat	a. If vernal pools are present, a 250-foot no disturbance buffer will be established from the high water mark of vernal pools and seasonal wetlands that provide suitable habitat for vernal pool crustaceans or vernal pool plants. This buffer will be established prior to ground-disturbing activities, and remain until ground-disturbing activities in that area are completed. Vernal pool habitat and buffer areas will be clearly identified in the field by staking, flagging, or fencing.
VP-3. Compensate for temporary or permanent loss of habitat	a. If activities occur within the microwatershed or 250-foot buffer for vernal pool habitat, a wetland delineation will be submitted to USACE for verification and mitigation requirements will be determined. CDFW will develop a compensatory mitigation plan consistent with USACE's and EPA's April 10, 2008 *Final Rule for Compensatory Mitigation for Losses of Aquatic Resources* (33 CFR Parts 325 and 332 and 40 CFR Part 230) and other applicable regulations and rules at the time of implementation that will result in no net loss of acreage, function, and value of affected vernal pool habitat. Unavoidable effects will be compensated through a combination of creation, preservation, and restoration of vernal pool habitat or purchase of credits at a mitigation bank approved by the applicable regulatory agency/agencies. b. As applicable, Project effects and compensation will be determined in consideration of the *Vernal Pool Recovery Plan* goals for core areas, which call for 95% preservation for habitat in the Grasslands Ecological Area and Madera core areas, and 85% habitat preservation in the Fresno core area (USFWS 2005). c. Appropriate compensatory ratios for loss of habitat both in and out of core areas would be determined during coordination and consultation with USFWS, as appropriate. d. If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures will be developed as part of the USFWS coordination and consultation process. The plan will include information on responsible parties for long-term management, holders of conservation easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations. Any impacts that result in a compensation purchase will be required to do so with an endowment for land management in perpetuity prior to any project groundbreaking activities.
VELB	**Valley elderberry longhorn beetle**
VELB-1. Avoid and minimize effects to species	a. Prior to conducting all project-related activities, a qualified biologist will identify any elderberry shrubs within the footprint and a 100-foot buffer around of the proposed activity. The qualified biologist will survey potentially affected shrubs for valley elderberry longhorn beetle (VELB) exit holes in stems greater than 1- inch in diameter. b. If elderberry shrubs are found on or adjacent to the site, a 100-foot wide avoidance buffer (measured from the dripline of the plant) will be established around all elderberry shrubs with stems greater than 1-inch diameter at ground level and will be clearly identified in the field by staking, flagging, or fencing. No construction activities involving mechanized equipment will occur within the buffer areas. Human access may be permitted in the buffer, provided that it does not cause disturbance to the shrubs. Elderberry shrubs cannot be used as an anchor for any in-channel project equipment. Project workers shall receive training prior to installing any such equipment, to allow them to identify and avoid elderberry shrubs.

Conservation Measure	Description
VELB -2. Compensate for temporary or permanent loss of habitat	a. If impacts to VELB habitat cannot be avoided, CDFW will consult with USFWS to determine appropriate compensation ratios. Compensatory mitigation measures will be consistent with the C*onservation Guidelines for Valley Elderberry Longhorn Beetle* (USFWS 1999), or current guidance. b. Compensatory mitigation for adverse effects may include the transplanting of elderberry shrubs during the dormant season (November 1 to February 15), if feasible, to an area protected in perpetuity as well as required additional elderberry and associated native plantings as approved by the USFWS. c. If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures will be included in the mitigation plan and must occur with full endowments for management in perpetuity. The plan will include information on responsible parties for long-term management, holders of conservations easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.
BNLL	**Blunt-nosed leopard lizard**
BNLL-1. Avoid and minimize effects to species	a. Three locations in the Restoration Area have been identified as having potential blunt-nosed leopard lizard habitat based on aerial maps. These areas include approximately 2,460 acres along the southwest side of the San Joaquin River in Reach 2, approximately 490 acres in a portion of the Eastside Bypass and adjacent lands near Reach 4A of the San Joaquin River, and approximately 2,938 acres encompassing the northern side of the Mariposa Bypass and parcels north of the Mariposa Bypass and west of the Eastside Bypass. Prior to conducting work in these areas, CDFW will perform a focused habitat assessment for blunt-nosed leopard lizard. Prior to any ground-disturbing activities in any area of potentially suitable habitat (e.g., grassland and shrub scrub habitat that contains required habitat elements such as small mammal burrows; open space patches between suitable habitat elements including disturbed sites and unpaved access roadways) qualified CDFW biologists will conduct protocol-level surveys in accordance with the *Approved Survey Methodology for the Blunt-nosed Leopard Lizard* (CDFG 2004). If blunt-nosed leopard lizard are detected, in any area where ground-disturbing activities will occur, suitable burrows within and adjacent to potential habitat for blunt-nosed leopard lizard will be avoided by a minimum 50 foot no disturbance buffer and an appropriate number of qualified CDFW biologists will be present during all ground-disturbing activities to ensure that blunt-nosed leopard lizards above ground are not impacted. Any blunt-nosed leopard lizard(s) that may enter an area of Project activity will be allowed to leave unobstructed on its own. If a blunt-nosed leopard lizard is detected in habitat adjacent to an unpaved road that will serve as ingress and egress routes for motorized transport of equipment and staff, exclusion fencing, qualified CDFW biological monitors, and reduced speed limits will be used to guide vehicles to the site and reduce the probability of vehicle strikes. All survey and monitoring results will be provided to the USFWS; negative finding results of the protocol level surveys will be good for one year.
CTS	**California tiger salamander**
CTS-1. Avoid effects to species	a. Prior to commencing any ground-disturbing activities, the work area will be assessed by CDFW or a qualified biologist for potential California tiger salamander (CTS) habitat. All potential CTS breeding ponds and upland habitat with 1.3 miles of a potential breeding pond will be considered suitable habitat. Ground-disturbing activities will avoid areas that contain suitable breeding and upland habitat for CTS, whenever possible.

Conservation Measure	Description
CTS-2: Minimize effects to species	a. Prior to conducting ground-disturbing activities in suitable CTS habitat, CDFW will conduct a minimum of 2 years of surveys to determine the presence/absence of CTS in accordance with the *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (USFWS 2003). In consultation with the USFWS, CDFW may modify survey protocols to reflect site conditions and known utilization of habitat by CTS. In the absence of protocol surveys, CDFW will assume presence of CTS in all potential breeding and upland refugia habitat. b. To the extent feasible, all ground-disturbing activities will be designed to avoid impacts to suitable CTS upland habitat. Such avoidance measures may include adjusting access routes or choosing alternate locations. c. In the absence of conducting 2 years of protocol surveys or in the event protocol surveys detect CTS, CDFW will consult with the USFWS and after consultation will implement the following minimization measures during construction in suitable CTS habitat: ▪ Prior to commencing ground disturbing activities, construction workers will be educated regarding CTS, and the measures intended to protect this species. ▪ When feasible, there will be a 50-foot no-disturbance buffer around burrows that provide suitable upland habitat for CTS. Burrows considered suitable for CTS will be determined by a qualified biologist, approved by USFWS. ▪ All suitable burrows directly impacted by construction will be hand excavated under the supervision of a qualified wildlife biologist. If CTS are found, the biologist will relocate the organism to the nearest burrow that is outside of the construction impact area. ▪ All ground-disturbing work will occur during daylight hours in coordination with USFWS, and depending on the level of rainfall and site conditions. CDFW will monitor the National Weather Service (NWS) 72-hour forecast for the work area. If a 70% or greater chance of rainfall is predicted within 72 hours of project activity, all activities in areas within 1.3 miles of potential or known CTS breeding sites will cease until no further rain is forecast. If work must continue when rain is forecast, a qualified biologist will survey the Project site before construction begins each day rain is forecast. If rain exceeds 0.25 inch during a 24-hour period, work will cease until no further rain is forecast. This restriction is not applicable for areas located greater than 1.3 miles from potential or known CTS breeding sites once they have been encircled with CTS exclusion fencing. However, even after exclusion fencing is installed, this condition would still apply to construction related traffic moving though areas within 1.3 miles of potential or known CTS breeding sites but outside of the salamander exclusion fencing (e.g. on roads). ▪ For work conducted during the CTS migration season (November 1 to May 31), exclusionary fencing will be erected around the construction site during ground-disturbing activities after hand excavation of burrows has been completed. A qualified biologist will visit the site weekly to ensure that the fencing is in good working condition. Fencing material and design will be subject to the approval of the USFWS. If exclusionary fencing is not used, a qualified biological monitor will be on-site during all ground disturbance activities. Exclusion fencing will also be placed around all spoils and stockpiles. ▪ For work conducted during the CTS migration season (November 1 to May 31), a qualified biologist will survey the active work areas (including access roads) in mornings following measurable precipitation events. Construction may commence once the biologist has confirmed that no CTS are in the work area. ▪ Prior to beginning work each day, underneath equipment and stored pipes greater than 1.2 inches (3 cm) in diameter will be inspected for CTS. If any are found they will be allowed to move out of the construction area under their own

Conservation Measure	Description
	accord. ▪ Trenches and holes will be covered and inspected daily for stranded animals. Trenches and holes deeper than 1 foot will contain escape ramps (maximum slope of 2:1) to allow trapped animals to escape uncovered holes or trenches. Holes and trenches will be inspected prior to filling. ▪ All food and food-related trash will be enclosed in sealed trash containers at the end of each workday and removed completely from the construction site once every three days to avoid attracting wildlife. ▪ A speed limit of 15 mph will be maintained on dirt roads. ▪ All equipment will be maintained such that there are no leaks of automotive fluids such as fuels, oils, and solvents. Any fuel or oil leaks will be cleaned up immediately and disposed of properly. ▪ Plastic monofilament netting (erosion control matting) or similar material will not be used at the Project site because CTS may become entangled or trapped. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds. ▪ Hazardous materials such as fuels, oils, solvents, etc. will be stored in sealable containers in a designated location that is at least 100 feet from wetlands and the San Joaquin River channel. If it is not feasible to store hazardous materials 100 feet from wetlands and the river channel, then spill containment measures will be implemented to prevent the possibility of accidental discharges to wetlands and waters.
WST	**Western spadefoot toad**
WST-1. Avoid effects to species	a. For work conducted during the western spadefoot toad migration and breeding season (November 1 to May 31), a qualified biologist will survey the active work areas (including access roads) in mornings following measurable precipitation events. Construction may commence once the biologist has confirmed that no spadefoot toads are in the work area. b. When feasible, there will be a 50-foot no-disturbance buffer around burrows that provide suitable upland habitat for western spadefoot toad. Burrows considered suitable for spadefoot will be identified by a qualified CDFW biologist. The biologist will delineate and mark the no-disturbance buffer. c. If western spadefoot toad is found within the construction footprint, it will be allowed to move out of harm's way of its own volition or a qualified biologist will relocate the organism to the nearest burrow that is outside of the construction impact area. d. Prior to beginning work each day, a qualified biologist will inspect underneath equipment and stored pipes greater than 1.2 inches (3 cm) in diameter for western spadefoot toad. If any are found they will be allowed to move out of the construction area under their own accord. e. Trenches and holes will be covered and inspected daily for stranded animals. Trenches and holes deeper than one foot deep will contain escape ramps (maximum slope of 2:1) to allow trapped animals to escape uncovered holes or trenches. Holes and trenches will be inspected prior to filling.
GGS	**Giant garter snake**
GGS-1. Avoid effects to species	a. Prior to commencing any ground-disturbing activities, a qualified biologist will assess the footprint and a 100-foot buffer around of the proposed activity for potential giant garter snake (GGS) habitat. Potential GGS habitat in the Project Area includes burrows and crevices in which GGS could be present.

Conservation Measure	Description
	b. If the suitable habitat is present, then CDFW will avoid ground-disturbing activities, whenever possible. Avoidance of suitable GGS habitat, as determined by USFWS and CDFW, will occur by demarcating and maintaining a 300-foot-wide no disturbance buffer around these areas.
GGS-2. Minimize effects to species	a. If impacts to GGS habitat cannot be avoided, pre-construction surveys will be completed by a qualified biologist within a 24-hour period before any ground disturbance of potential giant garter snake habitat. If construction activities stop on the Project site for a period of 2 weeks or more, a GGS survey will be repeated no more than 24 hours before the restart of construction activities b. For Project activities within potential GGS habitat, all activity involving disturbance of potential GGS habitat will be restricted to the period between May 1 and October 1, the active season for the species. The construction site will be re-inspected when a lapse in construction activity of two weeks or greater has occurred. c. Clearing will be confined to the minimal area necessary to facilitate construction activities. GGS habitat within or adjacent to the Project site will be flagged, staked, or fenced and designated as an Environmentally Sensitive Area. No activity will occur within this area and USFWS-approved biological monitoring will be conducted to ensure that avoidance measures are being implemented. Construction activities will be minimized within 200 feet of the banks of GGS habitat. Movement of heavy equipment will be confined to existing roadways to minimize habitat disturbance. d. Vegetation will be hand cleared in areas where GGS are suspected to occur. e. If a GGS is found during construction activities, the USFWS will be immediately notified. The biological monitor, or his/her assignee, will stop construction in the vicinity of the find and allow the snake to leave on its own. The monitor will remain in the area for the remainder of the work day to ensure the snake is not harmed. Escape routes for GGS should be determined in advance of construction and snakes will be allowed to leave on their own. If a GGS does not leave on its own within one working day, USFWS will be consulted. f. All construction-related holes will be covered to prevent entrapment of individuals. Where applicable, construction areas will be dewatered two weeks prior to the start of activities to allow giant garter snakes and their prey to move out of the area prior to any disturbance. g. For installation of research and monitoring equipment, t-posts used for anchoring will be placed within the channel when feasible, to minimize impacts to GGS in burrows along the river banks. Prior to t-post installation in the river bank, workers shall inspect the area for burrows and crevices in which GGS could be present. Fyke nets shall be inspected daily to ensure no GGS individuals are caught in the net mesh. If GGS is detected at any time during project activities, workers shall cease working and the individual shall be allowed to leave the site of its own volition before Project activity continues.

Conservation Measure	Description
GGS-3. Compensate for temporary or permanent loss of habitat.	a. Temporarily affected GGS aquatic habitat will be restored in accordance with criteria listed in the USFWS *Mitigation Criteria for* Restoration and/or Replacement of Giant Garter Snake Habitat (Appendix A to *Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo Counties, California* (USFWS 1997)) or the most current criteria from USFWS or CDFW. b. Permanent loss of GGS habitat will be compensated at a ratio and at a manner agreed upon in consultation with the USFWS. Compensation may include preservation and enhancement of existing populations, restoration or creation of suitable habitat, or purchase of credits at a regulatory agency approved mitigation bank in a sufficient quantity to compensate for the effect. Credit purchases, land preservation or enhancement to minimize effects to giant garter snakes should occur geographically close to the impact area. If off-site compensation is chosen, it will include dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, and the details of these measures will be included in the mitigation plan and must occur with full endowments for management in perpetuity. The plan will include information on responsible parties for long-term management, holders of conservations easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.
FYLF	**Foothill yellow-legged frog**
FYLF-1. Avoid and minimize loss of individuals	a. If foothill yellow-legged frog (FYLF) has the potential to be present within a work area, a qualified biologist will make an initial site visit to determine if suitable habitat for the species exists within the vicinity of the work area. b. If work activities occur between April 1 and August 31, CDFW will conduct surveys for FYLF eggs and tadpoles. If FYLF eggs or tadpoles are identified in the work area or within 250 feet downstream of the work area, CDFW will modify the activity to ensure it does not directly or indirectly disturb eggs or tadpoles. c. For research, monitoring and broodstock collection activities, instream sampling equipment (e.g., fyke nets, screw traps) will be inspected daily to ensure no FYLF individuals are caught in the equipment. If FYLF are found in sampling equipment, a biologist will relocate frogs to suitable habitat downstream of the work area.
WPT	**Western pond turtle**
WPT-1. Avoid and minimize loss of individuals	a. Pre-construction surveys for western pond turtle (WPT) shall be conducted by a qualified biologist 14 days before and 24 hours before the start of ground-disturbing activities where suitable habitat exists (e.g., along riparian areas and freshwater emergent wetlands). b. If WPT or their nests are observed during pre-construction surveys, a qualified biologist shall be on-site to monitor construction in suitable WPT habitat. WPT found within the construction area will be allowed to leave of its own volition or it will be captured by a qualified biologist and relocated out of harm's way to the nearest suitable habitat immediately upstream or downstream from the Project site. c. If WPT nests are identified in the work area during pre-construction surveys, a 300-foot no disturbance buffer shall be established between the nest and any areas of potential disturbance. Buffers shall be clearly marked with temporary fencing. Construction will not be allowed to commence in the exclusion area until hatchlings have emerged from the nest, or the nest is deemed inactive by a qualified biologist. d. For research, monitoring and broodstock collection activities, instream sampling equipment (e.g., fyke nets, screw traps) will be inspected daily to ensure no WPT individuals are caught in the equipment. If WPT are found in sampling equipment, a biologist

Conservation Measure	Description
	will relocate WPT to suitable habitat downstream of the work area.
EAGLE	**Bald eagle and golden eagle**
EAGLE-1. Avoid and minimize effects to bald and golden eagles (as defined in the Bald and Golden Eagle Protection Act)	a. Surveys for bald and golden eagle nests will be conducted within 2 miles of any construction areas supporting suitable nesting habitat and important eagle roost sites and foraging areas. Surveys will be conducted in accordance with the *USFWS Interim Golden Eagle Inventory and Monitoring Protocols* (USFWS 2010a), and *CDFW's Bald Eagle Breeding Survey Instructions* (CDFG 2010), or current guidance. b. If an active eagle's nest is found, project disturbance will not occur within 0.5 mile of the active nest site during the breeding season (December 30 through July 1) or any disturbance if that action is shown to disturb the nesting birds. The 0.5 mile no disturbance buffer will be maintained throughout the breeding season or until the young have fledged and are no longer dependent upon the nest or parental care for survival.
SWH	**Swainson's hawk and White Tailed Kite**
SWH-1. Avoid and minimize impacts to Swainson's Hawk	a. If construction activities occur between February 1 and August 31, CDFW will conduct surveys for Swainson's hawk and white tailed kite in accordance with the Swainson's Hawk Technical Advisory Committee 2000 guidelines (SHTAC 2000), or current guidance. Surveys will cover a minimum of a 0.5-mile radius around the construction area. If nesting Swainson's hawks or white tailed kites are detected, CDFW will establish a 0.5 mile no disturbance buffer. Buffers will be maintained until a qualified CDFW biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.
SWH-2. Compensate for loss of nest trees	a. If potential nesting trees are to be removed during construction activities, removal will take place outside of Swainson's hawk and white tailed kite nesting season and CDFW will develop a plan to replace known nest trees at a ratio of 3:1. If replacement planting is implemented, monitoring will be conducted annually for 5 years to assess the mitigation's effectiveness. The performance standard for the mitigation will be 65% survival of all replacement plantings.
RAPTOR	**Other nesting raptors**
RAPTOR-1. Avoid and minimize loss of individual raptors	a. Construction activity, including vegetation removal, will only occur outside the typical breeding season for raptors (September 16 to December 31), if raptors are determined to be present. b. If construction occurs between February 1 and August 31, CDFW will conduct surveys for nesting raptors in accordance with established CDFW raptor survey protocols. Surveys will cover a minimum of a 0.5-mile radius around the construction area. If nesting raptors are detected, CDFW will establish buffers around nests that are sufficient to ensure that breeding is not likely to be disrupted or adversely impacted by construction. Buffers around active raptor nests will be 500 feet for non-listed raptors, unless a qualified biologist determines that smaller buffers would be sufficient to avoid impacts to nesting raptors. Factors to be considered for determining buffer size will include: the presence of natural buffers provided by vegetation or topography; nest height; locations of foraging territory; and baseline levels of noise and human activity. Buffers will be maintained until a qualified CDFW biologist has determined that young have fledged and are no longer reliant upon the nest or parental care for survival.
RAPTOR-2. Compensate for loss of nest trees	a. If potential nesting trees are to be removed during construction activities, removal will take place outside of the raptor nesting season and CDFW will develop a plan to replace known nest trees at a ratio of 3:1. If replacement planting is implemented, monitoring will be conducted annually for 5 years to assess the mitigation's effectiveness. The performance standard for the mitigation will be 65% survival of all replacement plantings.
BRO	**Burrowing owl**

Conservation Measure	Description
BRO-1. Avoid and minimize impacts to species	a. Pre-construction surveys for burrowing owls will be conducted in areas supporting potentially suitable habitat and within 30 days prior to the start of construction activities. If ground-disturbing activities are delayed or suspended for more than 30 days after the pre-construction survey, the site will be resurveyed. CDFW will conduct surveys for burrowing owls in accordance with protocols established in the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012 or current version). b. If burrowing owls are detected, disturbance to burrows will be avoided during the nesting season (February 1 through August 31). CDFW will establish buffers around occupied burrows in accordance with guidance provided in the *Staff Report on Burrowing Owl Mitigation*. Buffers around occupied burrows will be a minimum of 656 feet (200 meters) during the nesting season, and 160 feet (100 meters) during the non-breeding season. c. Outside of the nesting season (February 1 through August 31), passive owl relocation techniques will be implemented. Owls would be excluded from burrows in the immediate impact zone within a 160-foot buffer zone by installing one-way doors in burrow entrances. These doors will be in place at least 48 hours prior to excavation to insure the owls have departed. d. The work area will be monitored daily for 1 week to confirm owl departure from burrows prior to any ground-disturbing activities. e. Where possible, burrows will be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe will be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.
BRO-2. Compensate for impacts to species	a. If occupied burrows cannot be avoided during the non-breeding season, CDFW will enhance or create burrows in adjacent habitat at a 1:1 ratio of burrow destroyed to created at least one week prior to implementation of passive relocation techniques. If burrowing owl habitat enhancement or creation takes place, CDFW will develop and implement a monitoring and management plan to assess the effectiveness of the mitigation. If monitoring indicates that the actions have not adequately mitigated for the Project's impacts, CDFW will implement remedial actions (e.g., enhancing or creating additional burrows) that compensate for these impacts.
RNB	**Riparian nesting birds: Western yellow-billed cuckoo, least Bell's vireo, and willow flycatcher**
RNB-1. Avoid effects to species	a. If western yellow-billed cuckoo, least Bell's vireo, or willow flycatcher has the potential to be present within a work area, a qualified biologist will make an initial site visit to determine if suitable habitat for the species exists within the vicinity of the project footprint. b. Where suitable habitat is present, surveys will be conducted by biologists adhering to guidance offered in *Western Yellow-billed Cuckoo Natural History Summary and Survey Methodology* (Halterman et al. 2009)*; Least Bell's Vireo Survey Guidelines* (USFWS 2001); and/*or A Survey Protocol for Willow Flycatcher in California* (Bombay et al. 2003). c. If nests are detected, CDFW will establish buffers around nests that are sufficient to ensure that breeding is not likely to be disrupted or adversely impacted by construction. No-disturbance buffers around active nests will be a minimum of 500 feet, unless a qualified CDFW biologist determines that smaller buffers would be sufficient to avoid impacts to nesting birds. Factors to be considered for determining buffer size will include: the presence of natural buffers provided by vegetation or topography; nest height; locations of foraging territory; and baseline levels of noise and human activity. Buffers will be maintained until a qualified CDFW biologist has determined that young have fledged and are no longer reliant upon the nest or parental care for survival.
RNB-2. Minimize effects to species	a. If western yellow-billed cuckoo, least Bell's vireo, or willow flycatcher are detected or suspected to be present in the vicinity of the work area based on information collected in RNB-1, then no activities that involve clearing of vegetation, generation of mechanical noise, or ground disturbance will take place during the nesting season of the species that may be present.
MBTA	**Other birds protected by the Migratory Bird Treaty Act**

Conservation Measure	Description
MBTA-1. Avoid and minimize effects to species	a. Whenever possible, impacts to native nesting birds will be avoided by not conducting Project activities that involve clearing of vegetation, generation of mechanical noise, or ground disturbance during the typical breeding season (February 1 to September 1), if species covered under the Migratory Bird Treaty Act and Fish and Game Code sections 3503, 3503.5, and 3513 are determined to be present. b. If Project activities must be conducted during the nesting bird season, CDFW will conduct surveys for nesting birds within a 1,000-ft radius of the construction area. If nests are detected, CDFW will establish buffers around nests that are sufficient to ensure that breeding is not likely to be disrupted or adversely impacted by construction. Buffers around active nests will be a minimum of 250 feet, unless a qualified CDFW biologist determines that smaller buffers would be sufficient to avoid impacts to nesting birds. Factors to be considered for determining buffer size will include: the presence of natural buffers provided by vegetation or topography; nest height; locations of foraging territory; and baseline levels of noise and human activity. Buffers will be maintained until young have fledged or the nests become inactive.
BAT	**Special-status bats**
BAT-1: Avoid and minimize loss of species	a. If suitable roosting habitat for special-status bats will be affected by Project construction (e.g., removal or buildings, modification of bridges), a qualified wildlife biologist will conduct surveys for special-status bats during the appropriate time of day to maximize detectability to determine if bat species are roosting near the work area no less than 7 days and no more than 14 days prior to beginning ground disturbance and/or construction. Survey methodology may include visual surveys of bats (e.g., observation of bats during foraging period), inspection for suitable habitat, bat sign (e.g., guano), or use of ultrasonic detectors (e.g., Anabat, etc.). Visual surveys will include trees within 0.25 mile of Project construction activities. The type of survey will depend on the condition of the potential roosting habitat. If no bat roosts are found, then no further study is required. b. If evidence of bat use is observed, the number and species of bats using the roost will be determined. Bat detectors may be used to supplement survey efforts. c. If roosts are determined to be present and must be removed, the bats will be excluded from the roosting site before the facility is removed. A mitigation program addressing compensation, exclusion methods, and roost removal procedures will be developed prior to implementation. Exclusion methods may include use of one-way doors at roost entrances (bats may leave, but not re-enter), or sealing roost entrances when the site can be confirmed to contain no bats. Exclusion efforts may be restricted during periods of sensitive activity (e.g., during hibernation or while females in maternity colonies are nursing young).
BAT-2: Compensate for loss of habitat	a. If roosts cannot be avoided or it is determined that construction activities may cause roost abandonment, such activities may not commence until permanent, elevated bat houses have been installed outside of, but near the construction area. Placement and height will be determined by a qualified wildlife biologist, but the height of bat house will be at least 15 feet. Bat houses will be multi-chambered and be purchased or constructed in accordance with CDFW standards. The number of bat houses required will be dependent upon the size and number of colonies found, but at least one bat house will be installed for each pair of bats (if occurring individually), or of sufficient number to accommodate each colony of bats to be relocated.
BAD	**American Badger**
BAD-1: Avoid and minimize loss of species	a. No less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities, CDFW will conduct a survey to determine if American badger den sites are present at the site. If dens are found, they will be monitored for badger activity. If CDFW determines that dens may be active, the entrances of the dens will be blocked with soil, sticks, and debris for three to five days to discourage the use of these dens prior to project disturbance activities. The den entrances will be blocked to an incrementally greater degree over the 3 to 5-day period. After the qualified CDFW biologist determines that badgers

Conservation Measure	Description
	have stopped using active dens, the dens will be hand-excavated with a shovel to prevent re-use during construction. No disturbance of active dens will take place when cubs may be present and dependent on parental care, as determined by a qualified CDFW biologist.
SJAS	**San Joaquin antelope squirrel**
SJAS-1: Avoid and minimize loss of individuals	a. If San Joaquin antelope squirrels have the potential to be present within a work area, a qualified biologist will make an initial site visit to determine if suitable habitat for the species may exist within and adjacent to the vicinity of the project footprint. If suitable habitat is present, daytime visual surveys will be conducted using line transects with 10 to 30 meter spacing when temperatures are between 68°- 86° F (20°- 30° C). Focused live trapping may also be required when visual surveys are inconclusive. b. Where suitable habitat is present and neither surveys nor trapping has not been conducted, a 50-foot minimum no disturbance buffer will be maintained from all small mammal burrows of suitable size for San Joaquin antelope squirrel.
FKR	**Fresno kangaroo rat**
FKR-1: Avoid and minimize effects to species	a. Focused surveys will be conducted by a qualified biologist within 60 days prior to ground-disturbing activities. The biologist will conduct burrow searches by systematically walking transects, which will be adjusted based on vegetation height and topography. Transects will be used to identify the presence of kangaroo rat burrows. When burrows suitable for use by Fresno kangaroo rat are found within 100 feet of the Proposed Project footprint, focused live trapping surveys will be conducted by a qualified and permitted biologist following a methodology approved in advance by USFWS. b. In all areas of potentially suitable Fresno kangaroo rat habitat, a 50-foot no disturbance buffer will be implemented around small mammal burrows when live trapping is not conducted or when, in consultation with the USFWS, live trapping results are inconclusive in determining presence/absence for the species.
SJKF	**San Joaquin kit fox**
SJKF-1: Avoid and minimize effects to species	a. A qualified biologist will conduct pre-construction surveys no less than 14 days and no more than 30 days before the commencement of activities to identify potential dens more than 5 inches in diameter. CDFW will implement USFWS' *Standardized Recommendations for Protection of San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011 or current version). CDFW will notify USFWS in writing of the results of the pre-construction survey within 30 days after these activities are completed. b. If potential dens are located within the Proposed Project's work area and cannot be avoided during construction activities, a USFWS-approved biologist will determine if the dens are occupied. c. If occupied dens are present within the work area, their disturbance and destruction will be avoided. Exclusion zones will be implemented following the most current USFWS procedures (currently USFWS 2011). d. CDFW will notify USFWS immediately if a natal or pupping den is found in the survey area, and will present the results of pre-activity den searches within 5 days after these activities are completed and before the start of construction activities in the area. e. Construction activities will be conducted at a time that is least likely to affect the species (i.e., after the normal breeding season of December through September) (Ahlborn 1999). This timing will be coordinated with USFWS.
SJKF-2: Compensate for loss of habitat	a. CDFW, in coordination with USFWS, will determine if kit fox den removal is appropriate. If unoccupied dens need to be removed, the USFWS-approved biologist will remove these dens by hand-excavating them in accordance with USFWS procedures (USFWS 2011). b. Additional conservation measures will be coordinated with USFWS and DFW, and may include replacing dens, installing off-site

Conservation Measure	Description
	artificial dens, acquisition of compensatory habitat, or other options to be determined. Compensation may include dedicating conservation easements, purchasing mitigation credits, or other off-site conservation measures, and the details of these measures will be included in the mitigation plan and must occur with full endowments for management in perpetuity. The plan will include information on responsible parties for long-term management, holders of conservations easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.
DS	**Delta smelt**
DS-1: Avoid and minimize effects to species	a. All work within waters where there is potential for Delta smelt to occur, as defined by the most recent USFWS guidance, will be confined to a seasonal work window of August 1 through November 30 when Delta smelt are least likely to be present. Because this species does not regulate its movements strictly within this time frame, modifications to the work windows may be approved by the USFWS prior to project implementation based on information from the various in-Delta monitoring programs. b. If activities occur within Delta smelt habitat, measures will be taken to maintain or increase shading of suitable willow water habitat. The project will also avoid areas deemed suitable for Delta smelt habitat that have established aquatic vegetation or have not been previously disturbed.
GS	**Green sturgeon (Southern Distinct Population Segment)**
GS-1. Avoid and minimize loss of habitat and individuals	a. Weir and fish sampling equipment placed in the San Joaquin River will be operated in a manner that will allow for passage of green sturgeon, where applicable. To reduce stress on captured fish, all trapping devices will be checked at least once per day. Untargeted species caught in traps will be released into suitable habitat for the species. Traps will be checked more frequently during times when conditions are stressful (e.g., high temperatures, large amounts of debris during high flow events) to reduce the time that fish are subject to trap-related stress.
CVS	**Central Valley steelhead**
CVS-1. Minimize loss of habitat and risk of take of species	a. In-channel construction activities that could affect designated critical habitat for Central Valley steelhead will be limited to the low-flow period between June 1 and October 1 to minimize potential for adversely affecting federally listed anadromous salmonids during their emigration period. b. If individual Central Valley steelhead are observed within a work area, NMFS will be notified. NMFS personnel will have access to construction sites during construction, and following completion, to evaluate species presence and condition and/or habitat conditions.
PL	**Pacific lamprey**
PL-1: Avoid and minimize effects to species	a. A qualified biologist will conduct pre-construction surveys as outlined in Attachment A of *Best Management Practices to Minimize Adverse Effects to Pacific Lamprey (Entosphenus tridentatus)*(USFWS 2010b). b. Work in documented areas of Pacific Lamprey presence will be timed to avoid in-channel work during typical lamprey spawning (March 1 to July 1).
RHSNC	**Riparian habitat and other sensitive natural communities**
RHSNC-1. Avoid and minimize loss of riparian habitat and other sensitive natural communities	a. If effects occur to riparian habitat, emergent wetland, or other sensitive natural communities associated with streams, CDFW will comply with Section 1602 of the California Fish and Game Code; compliance may include measures to protect fish and wildlife resources during the project.

Conservation Measure	Description
RHSNC-2: Compensate for loss of riparian habitat and other sensitive natural communities	a. If losses of other sensitive natural communities (e.g., recognized as sensitive by CNDDB, but not protected under other regulations or policies) would not be offset by the benefits of the Proposed Project, then additional compensation will be provided through creating, restoring, or preserving in perpetuity in-kind communities at a sufficient ratio for no net loss of habitat function or acreage. If habitat enhancement or creation takes place, CDFW will develop and implement a monitoring and management plan to assess the effectiveness of the mitigation. If monitoring indicates that the actions have not adequately mitigated for the Project's impacts, CDFW will implement remedial actions that compensate for these impacts.
WUS	**Waters of the United States/waters of the State**
WUS-1. Identify and quantify wetlands and other waters of the United States	a. Before implementing Proposed Project actions that may affect waters of the United States or waters of the State, CDFW will map the distribution of wetlands (including vernal pools and other seasonal wetlands) in the vicinity of the work area. b. CDFW will determine, based on the mapped distribution of these wetlands and waters, the acreage of effects, if any, on waters of the United States. If it is determined that wetlands will be affected by the Proposed Project, CDFW will conduct a delineation of waters of the United States, and submit the delineation to USACE for verification. The delineation will be conducted according to methods established in the USACE *Wetlands Delineation Manual* (Environmental Laboratory 1987) and *Arid West Supplement* (Environmental Laboratory 2008). c. Construction will be designed to minimize effects on waters of the United States and waters of the State and will employ best management practices to avoid indirect effects on water quality.
WUS-2. Obtain permits and compensate for any loss of wetlands and other waters of the United States/waters of the State	a. CDFW, in coordination with USACE, will determine the acreage of effects on waters of the U. S. and waters of the State that will result from implementation of the Proposed Project. b. CDFW will obtain Section 404 and Section 401 permits and comply with all permit terms. The acreage, location, and methods for compensation will be determined during the Section 401 and Section 404 permitting processes. c. CDFW will adhere to a "no net loss" basis of the acreage of wetlands and other waters of the U. S. and waters of the State that will be removed and/or degraded. Wetland habitat will be restored, enhanced, and/or replaced at an acreage and location and by methods agreeable to USACE, the Central Valley RWQCB, as appropriate, depending on agency jurisdiction. The replacement of waters or wetlands will be equivalent to the nature of the habitat lost, and will be provided at a suitable ratio to ensure that, at a minimum, there is no net loss of habitat acreage or value. The replacement habitat will be set aside in perpetuity for habitat use.
CH	**Critical habitat**
CH-1. Avoid and minimize effects to critical habitat	a. Designated critical habitat within the vicinity of project activities will be identified. All Proposed Project actions will be designed to avoid direct and indirect adverse modifications to these areas. Minimization measures, such as establishing and maintaining buffers around areas of designated critical habitat will be implemented in the event that avoidance is not feasible.
CH-2. Compensate for unavoidable adverse effects on Federally designated critical habitat	a. If critical habitat may be adversely modified by the implementation of Proposed Project actions, the area to be modified will be evaluated by a qualified biologist to determine the potential magnitude of the project effects (e.g., description of primary constituent elements present and quantification of those affected) at a level of detail necessary to satisfy applicable environmental compliance and permitting requirements b. CDFW will implement compensatory conservation measures developed through consultation with USFWS or NMFS. If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures. The plan will include information on responsible parties for long-term management, holders of conservation easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable

Conservation Measure	Description
	populations. Any impacts that result in a compensation purchase will be required to do so with an endowment for land management in perpetuity prior to any project groundbreaking activities.
EFH	**Essential Fish Habitat (Pacific salmonids)**
EFH-1. Minimize loss of habitat and risk of take	a. In-channel construction activities which could affect habitat for Pacific salmonids will be limited to the low-flow period between June 1 and October 1 to minimize potential for adversely affecting federally listed anadromous salmonids during their emigration period. b. In-channel construction activities which could affect habitat for Pacific salmonids will be limited to daylight hours during weekdays, leaving a nighttime and weekend period of passage for federally listed fish species. c. Construction BMPs for off-channel staging and storage of equipment and vehicles will be implemented to minimize the risk of contamination of the waters of the San Joaquin River by spilled materials. BMPs will also include minimization of erosion and stormwater runoff, as appropriate. d. Riparian vegetation removed or damaged will be replaced at a ratio, coordinated with the NMFS, within the immediate area of the disturbance to maintain habitat quality. e. If individuals of listed species are observed present within a work area, then NMFS must be notified. NMFS personnel will have access to construction sites during construction and following completion in order to evaluate species presence and condition and/or habitat conditions. f. If bank stabilization activities should be necessary, then such stabilization will be constructed to minimize predator habitat, minimize erosion potential, and contain material suitable for supporting riparian vegetation.

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Conservation Measure	Description

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Key:
° C = degrees Celsius
° F = degrees Fahrenheit
BMP = best management practice
BO = Biological Opinion
CFR = Code of Federal Regulations
cfs = cubic feet per second
CNDDB = California Natural Diversity Database
CVP = Central Valley Project
DFW = California Department of Fish and Wildlife
DWR = California Department of Water Resources
EPA = Federal Environmental Protection Agency
NMFS = National Marine Fisheries Service
Reclamation = U.S. Department of the Interior, Bureau of Reclamation
RWQCB = Regional Water Quality Control Board
Settlement = Stipulation of Settlement in NRDC, et al,. v. Kirk Rodgers, et al.
State = State of California
SWP = State Water Project
USACE = U.S. Army Corps of Engineers
USFWS = U.S. Fish and Wildlife Service

Letter 6

COMMENTER: Cherie Topper, Executive Director, Santa Barbara Audubon Society

DATE: February 25, 2019

Response 6.1

The commenter notes Page 67 of the Draft IS-MND acknowledges nearby Devereux Slough as an important migratory bird annual stopover location and Ellwood Mesa Open Space as a National-Audubon-designated Important Bird Area (IBA). The commenter recommends that the Draft IS-MND explicitly note these descriptions apply as well to the Devereux Creek riparian corridor within the Coverage Area, in order to provide a stronger context for the project's Habitat Enhancement and Restoration Program and demonstrate awareness of the need to ensure the proposed program activities do not negatively impact the value of this corridor as a migratory bird stopover. The commenter adds that, as written, the generality of covered activities (e.g., removing vegetation along the Devereux Creek riparian corridor as needed, or establishing riparian area along the banks of Devereux Creek composed of native riparian tree species) leaves uncertainty as to whether such activities could undermine the value of the Coverage Area as a migratory bird stopover.

The commenter is correct that the Devereux Creek riparian corridor within the Coverage Area is part of the Goleta Coast IBA. Page 67 of the Draft IS-MND has been revised as follows:

> Ellwood Mesa Open Space<u>, including the Devereux Creek riparian corridor within the Coverage Area,</u> is also part of the Goleta Coast Important Bird Area, designated by the National Audubon Society. It is considered to be globally important due to its location on the Pacific Flyway.

The MBHMP is a long-term management plan intended to guide habitat restoration and enhancement efforts through management goals, policies, and supporting actions. The covered activities are general in nature to reflect the need for adaptive management in the face of changing conditions in the Coverage Area. However, the Draft IS-MND identifies mitigation measures to protect riparian, wetland, and other natural habitat areas in the Coverage Area under the range of covered activities that could occur under the MBHMP. Mitigation Measure BIO-8 would prohibit all staging and temporary stockpiling from occurring in riparian habitats, wetlands, vernal pools, native grasslands, and active nest buffers. Mitigation Measure BIO-9 would require covered activities to avoid impacts to vernal pools, wetlands, and streambeds to the maximum extent practicable. In instances where avoidance is infeasible, Mitigation Measure BIO-9 notes any vegetation trimming or removal or ground disturbance activities would be subject to all applicable permit requirements, including CDFW Streambed Alteration Agreements or Clean Water Act Section 404 requirements.

Response 6.2

The commenter states many proposed mitigation measures and project activities are qualified by language regarding their practicality or feasibility (e.g., "Any ground disturbing activities in riparian and wetland habitats shall be conducted when the channel is dry to the maximum extent feasible"). The commenter specifically notes examples of such language in Mitigation Measures BIO-5, BIO-6, and BIO-9. The commenter adds this language can undermine critical environmental protections and exceptions to these protections should be fully specified and subject to public review prior to their implementation.

As discussed in Response 6.1, the MBHMP is a long-term management plan intended to guide habitat restoration and enhancement efforts through management goals, policies, and supporting actions. Qualifying language is necessary at this time to provide some level of adaptive capacity for the MBHMP over the course of its planning horizon. However, where mitigation measures use such language, the measures also specify the environmental protections to occur in the event an avoidance measure is determined to be infeasible. This includes detailed requirements for nesting bird surveys when ground disturbance or vegetation removal must occur during the nesting season (Mitigation Measure BIO-6) or not allowing work within 50 feet of pools if ground disturbing activities occur in wetland or riparian areas when ponded water is present (Mitigation Measure BIO-5).

The MBHMP also requires the preparation of annual Implementation Plans specifying specific actions to occur under the MBHMP over the coming year. As detailed in Policy 1-4 of the MBHMP, the Implementation Plans shall identify and describe short-term actions needed to further the goals and objectives of the MBHMP, taking into consideration current conditions and funding levels at the time each Implementation Plan is prepared. Pursuant to Action 1-4.2, City staff shall present each annual Implementation Plan at a public hearing for stakeholder input and City Council approval.

Response 6.3

The commenter refers to their previous comment made on August 31 (Item 259 in Appendix B) suggesting the final plan, particularly the Habitat Restoration and Enhancement Program, include an assessment of the impacts of all proposed actions on potentially affected downstream habitats, such as North Campus Open Space (NCOS) and Coal Oil Point Reserve (COPR). The commenter reiterates that even if the City believes such impacts would be neutral, negligible, or only positive, it would be appropriate to make this view explicit in the study, given that these immediately adjacent areas are of high value, sensitivity, and public interest.

As this comment is general in nature and does not provide any specifics regarding which impacts may potentially affect downstream habitats, a general response to these concerns is provided. (See Browning-Ferris Indus. v. City of San Jose (1986) 181 Cal.App.3d 852 [where a general comment is made, a general response is sufficient].) In general, discussion of impacts to downstream habitats relates to the topics of biological resources and hydrology and water quality. As discussed in Section 4 of the Draft IS-MND, *Biological Resources*, Mitigation Measures BIO-8 and BIO-9 would reduce impacts to riparian and wetland habitats by prohibiting stockpiling or temporary materials storage and avoiding activities in these areas unless it is for the purpose of habitat enhancement. Additionally, Mitigation Measures in Section 10, *Hydrology and Water Quality*, require erosion control practices for all ground disturbing activities and preparation of a Chemical Application Control Plan to reduce the potential for migration of fertilizers, herbicides, or pesticides into waterbodies on-site and downstream. As determined in the impact analyses for these sections, the MBHMP would result in less than significant impacts with mitigation incorporated.

Response 6.4

The commenter notes references to the bird nesting season dates are internally inconsistent throughout the Draft IS-MND document, indicating that the season is marked as March 15 to August 15 on Pages 12, 19, and 73 but February 1 to September 15 in Mitigation Measure BIO-6 (Page 78). The commenter suggests March through mid-August as a nesting bird season, and also attaches

CDFW's Conservation Measures for Biological Resources That May Be Affected by Program-level Actions (n.d.) for reference.

The March 15 to August 15 nesting season is noted in the MBHMP in Action 11-1.3 under the Wildlife Habitat Management Program, which seeks to "avoid removal of or disturbance to trees or other woody vegetation during nesting bird season (March 15 to August 15), when feasible." The instances of these dates appearing in the Draft IS-MND noted by the commenter occur when referencing Action 11-1.3 of the MBHMP. However, the guidance attached by the commenter from CDFW recommends conducting nesting bird surveys for raptor species between February 1 and August 31. The February 1 to September 15 season where nesting bird surveys would be required by Mitigation Measure BIO-6 encompasses the March to mid-August season requested by the commenter, the February 1 to August 31 season suggested by CDFW, the March 15 to August 15 season indicated in Action 11-1.3 of the MBHMP, and includes some additional buffer to provide more conservative environmental protections for nesting birds in the Coverage Area.

Subject: Comments on DRAFT INITIAL STUDY/MITIGATED NEGATIVE DECLARATION for Monarch Butterfly Habitat Management Plan Case No. 13-087

Planning and Environmental Review
Attention: Anne Wells
Advance Planning Manager

Letter 7

February 25, 2019

Re: Draft IS/MND for Monarch Butterfly HMP

Dear Ms. Wells,

I am writing in support of comments provided by Friends of the Ellwood Monarch/FOTEM as provided by Ana Citrin of the Law Office of Marc Chytilo. 1

Respectfully,
Christina Lange
Friends of the Ellwood Coast

Letter 7

COMMENTER: Christina Lange, Friends of the Ellwood Coast

DATE: February 25, 2019

Response 7.1

The commenter notes their support of comments submitted by Ana Citrin of the Law Offices of Marc Chytilo on behalf of the Friends of the Ellwood Monarchs (Letter 3).

This comment is noted. Please refer to Responses 3.1 through 3.15 above.

Letter 8

Response from The Bluffs Communit
to the
Monarch Butterfly Habitat Management Plan (MBHMP)

Background:
The Bluffs Community is located on the Western Side of the Ellwood Mesa Eucalyptus Forest, with the Sandpiper Golf Course to the West and Ellwood Preserve to the West, South and East. The Sandpiper and Ellwood North Monarch Butterfly aggregation sites are both in close proximity to this community. Specifically:

- We are a community of 62 homes that was established following the 2004 land-swap between the City of Goleta and the builder of the community.

- The homeowners in the community are passionate about maintaining the beauty, health and integrity of the preserve that surrounds our homes. We want to make sure that it is there for everyone to enjoy for decades, if not centuries, to come. It is one of the primary reasons that we live here.

- The Bluffs community is committed to working with the City of Goleta to ensure that a workable Monarch Butterfly Habitat Management Plan is approved and implemented that protects the forest and all of the natural plant species and wildlife that make it their home. Along with this, there needs to be a balance with the safety, security and fire-mitigation needs of the communities that reside within the Ellwood Mesa Preserve boundaries.

1

Introduction:
The Bluffs was built in this location so that residents of the community would be able to enjoy the natural beauty of the preserve surrounding us. Homes were built, starting in 2005 and the community was completed by the end of 2013. Since that time, we have been able to enjoy the natural migration patterns of the butterflies and have had hundreds of them flying through our neighborhood during the winter and early Spring. Over the years, the condition of the preserve around us has become more and more a concern for homeowners and there has been a steady decline in the number of butterflies visiting our gardens.

This community did not need the Ellwood Monarch Habitat Assessment Report to inform us that the grove was steadily deteriorating with virtually no steps to manage it being done by the City of Goleta. We could see this progressive change on a constant basis. It is for this reason that we anticipated the arrival of the MBHMP as we felt it could help finally outline a plan for the ongoing maintenance, management and improvement efforts of the Ellwood Mesa Eucalyptus Forest surrounding us.

2

Residents of The Bluffs community, therefore, read through the MBHMP with the following basic questions in mind.

1. Does the implementation of this plan help reduce the risk of fire to the communities living within the boundaries of the Ellwood Mesa Preserve?

2. Does this plan provide improved management of dead/dying and diseased trees and reduce the safety hazards to recreational users and our communities?

3. Will this plan restore the health of the Ellwood Mesa Eucalyptus Preserve in both the short and longer term for the enjoyment of all?

2

Overall, we think the plan provides us with a lot of information about how work will be completed and what will be done to protect the plants and living creatures in the area. There are a number of overarching questions, however, that do not seem to be addressed. We believe they are critical to our being able to answer our three foundational questions listed above. Since we already know that a significant number of trees have been identified as needing to be removed (1,260+), it is important to understand the following:

1. What is the timeframe for the implementation of this plan? If the plan is approved this March, will work begin once the butterfly overwintering period is over (April 1st). How will the bird nesting period impact this work?

3

2. What is the plan with respect to the number of trees that the City is planning on trimming, cutting or removing per year? How much of the understory in areas can be cleaned up and removed at the same time?

4

3. What is the ratio of trees removed to new trees planted during this period of time?

5

4. How long does the City of Goleta feel it will need to restore the health to the most critical monarch butterfly aggregation areas?

6

5. What near term steps will the City of Goleta take to reduce the potential for fire posed by the dead and fallen trees in the preserve that could potentially devastate both the butterfly preserve and endanger the residents in the area?

7

We want to encourage the City of Goleta to begin the work of maintaining and improving the Ellwood Mesa Preserve as quickly as possible. It has taken the City nine years to get the MBHMP to this stage during which time minimal maintenance or improvements have been made to the Preserve. The condition of the Eucalyptus forest is not getting better with each passing day. We continue to lose trees in the areas surrounding our community at a frightening rate (seven more trees down in the past few months along the Western Trail alone). Fortunately, none fell towards any of our homes. Although we are thrilled to have had an average amount of rainfall this year, we are always concerned with the overall condition of the preserve around us, the instability of the current trees, and the risk of fire when the dry season arrives.

8

Specific responses to MBHMP

Mitigation of Fire Risk to the communities living within the boundaries of the Ellwood Mesa Preserve

1. *"Goleta is prone to large wildfires and the combination of hot, dry weather and ignitable vegetation adjacent to structures creates a fire environment that could potentially threaten public safety. In March 2012 the City adopted the Community Wildfire Protection Plan (CWPP). Protection of Human life and safety is the highest priority for all fire management strategies in Goleta, followed by the protection of property." (MBHMP - Page 5)*

   The MBHMP includes the Community Wildfire Protection Program to be consistent with the intent of the City's CWPP and ensure fire safety and habitat protection are balanced. This program includes actions supporting the implementation of the CWPPs 100-foot-wide fire buffer around homes and structures in the Ellwood Mesa eucalyptus groves. The MBHMP states that implementation of this plan poses no additional fire risk and in fact reduces fire hazard, improves public safety and eliminates trees that threaten the sustainability of the butterfly aggregation sites.

   <u>We would like to understand what the City of Goleta will do annually to mitigate the fire risk the grove poses for our community</u>.
   While the plan mentions the CWPP there are limited details provided that highlight what is included in this plan. Members of The Bluffs community have worked annually (Since 2010) with the City of Goleta Public Works Department (Bob Morgenstern) to highlight vegetation abatement needs, to inform them of downed trees and branches blocking the trails and/or to report dead/dying or diseased trees that we feared were unstable and could pose a risk to the public or community should they fall or burn. This has frequently resulted in a very modest level of activity, usually the mowing of the perimeter of the community and Open Space Lot 69 to manage the non-native dry grasses growing there or the dragging of a fallen branch or two into the debris-filled understory. In some years, we have had to get the fire department (Fred Tan, Captain/Pre-Fire Engineer of the SBCFD Fire Prevention Division) to further highlight the fire risk that the grasses and dead wood located on the City property posed to our community before action was taken.

   The CWPP map that designates the areas that should have vegetation abatement does not include Open Space LOT 69 which is the large open space area between the community and the Western Trail. That area is filled with non-native grasses and a small patch of ice plant and is the area that needs to be mowed or cut back annually. Without some form of treatment, this area grows to a height of 6-9 ft and poses a high fire-risk to that side of The Bluffs Community. The City of Goleta had initially planned on planting low height, drought-resistant native plants in this area but the plans were never approved

9

and implemented by the City. In addition, the first part of the western trail, immediately abutting the homes nearest Hollister, does not seem to have any abatement or fuel reduction indicators on the map. These are BOTH high areas of concern for our community. A separate attachment of the map with these areas identified for the City will be provided with this response. 9

2. *"The large trees are not the primary fuel of concern in the spread potential of wildfires. Instead., the greater threat is from the understory vegetation, dead-downed trees, and fuels that can create fire ladders. Therefore, fuel treatment activities focus on removing hazardous fuels rather than large trees." (MBHMP - Page 7).*

   "Some species of Eucalyptus trees found on Ellwood Mesa, including Blue Gum, have deciduous bark, which shed annually and present a fire hazard. The bark catches fire readily and streamers from those loose bark tend to carry fire into the canopy and cast firebrands ahead of the main fire front. The leaf litter, which is the accumulation of dead, dry and oily leaves, is also a fire hazard as it is extremely flammable." (MBHMP - Pages 28 & 98)

   We are not clear about how the understory in the groves surrounding us will be cleared out and what will be done with the debris.
   Not only is it extremely flammable but it also burns hotter than most other vegetation. It is also known that due to their oil content, leaves and bark will decay at slower rates than other vegetation. An acre of Eucalyptus trees can accumulate 8-12 tons of debris. Because of its slower level of decay, this can easily build to around 30 tons per acre unless active management of the forest is done. This is a lot of flammable debris. As we look at the groves around our community, there are piles of debris that rise 5-8 feet in places. 10

   To further complicate the fire risk, non-native annual grasslands dominate in areas without tree canopy, and are located immediately adjacent to the trees and the large volume of debris described above. In the open spaces surrounding The Bluffs, these grasses can grow to a height of 6-9 ft, especially in years with extensive rainfall. By April, these grassy areas begin to dry out and are the perfect fire-starter unless mowed down to a height of 4" or less. The entire circumference of The Bluffs Community is surrounded by these types of grasses. Lot 69 in particular, highlighted above, is one of those areas.

Improved management of dead/dying and diseased trees to reduce the safety hazards to recreational users and members of our communities?

1. *The goal of the Trail Management Program is to develop and maintain public access trails that provide a safe and meaningful experience for visitors while limiting impacts to habitats and wildlife, in particular monarch butterflies and their seasonal aggregation sites." (MBHMP – Page 10)* 11

When looking at the trails around The Bluffs this is not being done. Trails are covered with fallen trees and branches and have been this way for several years despite calls to Public Works to clear them for the public. As a result, recreational users are making their own trails through the trees and grasslands to avoid stepping or tripping on these obstacles. This seems to pose a higher risk to the plant and wild life we are all trying to protect. 11

2. *"Taking down dead or dying eucalyptus trees could involve the staging or placement of debris piles, equipment, or personnel in areas where special-status plant species have a potential to occur and would impact these species." (MBHMP - Page 70).*

   Large debris piles placed around the base of trees removed could not only impact native species of plants but could also increase fire risk as they are combined with the already debris-filled understory. This is further exacerbated if the grasslands are not properly mowed or maintained. We would like to better understand how all of these risks will be maintained and managed on an annual basis. There are many large piles of debris that have been eft behind by the City for years within the preserve. These piles MUST be a temporary situation, to help with the aggregation and removal efforts, and not left behind as kindling for months or years to come. 12

3. *"The risk management program in the GUFMP ensures proper management of trees to allow for healthy attractive communities while reducing risk. Implementation of the MBHMP would result in the removal of eucalyptus trees that pose an unacceptable risk to <u>recreational users</u> on the Coverage Area."* (MBHMP – Page 75)

   Recreational users? <u>What about residents who live within this area. We have trees within 5-6 feet of the perimeters of our homes.</u> This is true at The Bluffs, Santa Barbara Shores and all Communities adjacent to Ellwood West, Ellwood Main and Ellwood East. The City seems to be listening to those "recreational users" who visit the preserve from time to time and not those who live in the shade of these trees and are in the preserve on a daily basis. Let's make sure that we are clear about who currently has the "biggest threat to their safety" in this environment. 13

   <u>When the 27 trees were removed in 2018, which posed a public safety risk, NONE were removed within the proximity of our homes at The Bluffs. Only trees on trails that the City wanted to reopen were removed.</u> Homeowners contacted the City Arborist and were told that they did not have the funds to remove those along the Western trail. At the request of a homeowner, a tagged tree was finally removed. Homeowners concerned for their safety petitioned the city to get permits to have the trees pruned at their own expense. ALL permits were granted as it was deemed that the branches did 14

in fact pose a threat to their homes. These owners had arborists complete the work at their own expense. 14

4. *Many trails in the coverage area have been closed indefinitely since July 2017 due to safety hazards posed by dead or dying trees. Implementation of the MBHMP would remove these hazards, in turn restoring access to trails and improving active transportation opportunities in the Coverage Area. (MBHMP - Page 129)*

   This is an interesting statement to make considering the Western Trail was one of the trails closed and is within feet of the Common walls of our community. How is it that trails are closed for the protection of recreational users and yet nothing is done to protect the homeowners living within feet of these trees. It was also just announced that the trails are now reopened with ABSOLUTELY NO WORK DONE BY THE CITY TO MITIGATE RISK TO THE COMMUNITY. Seven trees have fallen this year, many branches are down, the path continues to be blocked in areas by fallen branches and trees, and there is more tree debris and garbage than ever in these locations. Along the top of the western trail, nearest Hollister Avenue there are rusting metal pipes, concrete blocks and other hazardous obstacles along this walkway as well. If anything, the situation is worse and more volatile than when the trail was originally closed to the public. 15

Restored health of the Ellwood Mesa Eucalyptus Preserve in both the short and longer term for the enjoyment of all?

1. *Replanting habitats where dead or dying eucalyptus trees are removed will help sustain the long-term viability of the Eucalyptus groves as monarch butterfly habitats. (MBHMP - Page 71)*

   Maintain and revegetate moderate cover of understory in and around aggregation sites with fire-resistant native plant species (The Xerces Society 2017 – Appendix 3.) 16

   We agree with this and would love to see a combination of trees planted (not just eucalyptus trees) so that the entire forest becomes more stable. Additionally, we encourage the planting of the appropriate native ground cover, shrub and mid canopy species of plants. We know there were plans to plant a number of Eucalyptus trees, equal to the 27 removed last year, across from Ellwood School. To our knowledge this was never done, and we have lost almost an entire rainy season which would have helped these trees become initially established in the area.

   There were also plans made by the City of Goleta to plant and maintain "native grassland areas" in immediate proximity/adjacent to the homes in our community. These plans were never implemented as committed to. The 17

funds for this project were reapportioned to other initiatives within the preserve. The Coastal Commission was of the opinion that these improvements were completed and that based on the plan the area was cultivated and maintained so that no mowing would be required. We need to make sure that it is well documented that no planting or improvements were ever done to Open Space Lot 69 so that it can become part of the CWPP vegetation aggregation plans. 17

2. *The goal of Trail Management is to maintain public access trails that provide a safe and meaningful experience for visitors while also limiting impacts to habitats and wildfires, in particular monarch butterflies and their seasonal aggregation sites. (MBHMP – Page 16)*

   We strongly support this initiative as the trails today are not maintained and have weathered poorly. In addition, many of them are covered with downed branches, fallen trees or are overgrown with grasses. In some places, the trails seem to almost disappear, and their signage is either damaged or no longer visible with the debris. New trails have been formed by users using the area when the original one is blocked or covered. The new trails and even some of the existing trails are not designed to be trails and many have hazardous obstacles on them that could cause injury if not navigated carefully. A well-managed trail system will do a lot to enhance the beauty and enjoyment of this preserve by the public visiting it. 18

We hope that this project gets quick approval and that the work can start as soon as possible. The City of Goleta and the Planning Department have spent far too much time and energy getting "the reports and plans right on paper" with no actual action taking place to start to turn this situation around. We cannot let 2019 go by without having made significant forward progress towards the improved safety and health of this preserve. We hope the City Council understands this and acts to more forward soon! 19

Thank you!

Chuck Davis
Len and Cathleen Grabowski
Matt Graham
Carolyn Grenier

Letter 8

COMMENTER: Chuck Davis, Len and Cathleen Grabowski, Matt Graham, and Carolyn Grenier, Residents

DATE: February 25, 2019

Response 8.1

The commenters provide background information on The Bluffs community, located on the western side of the Ellwood Mesa. The commenters state The Bluffs community is committed to working with the City to ensure a workable MBHMP is approved and implemented and the plan balances safety, security, and fire-mitigation needs of the communities surrounding Ellwood Mesa.

This comment will be forwarded to City decision-makers for consideration.

Response 8.2

The commenters provide additional information regarding when The Bluffs community was constructed and note the decline of the surrounding preserve and the number of butterflies. The commenters add they reviewed the MBHMP to see how it would reduce the risk of fire to communities surrounding Ellwood Mesa; provide improved management of dead, dying, or diseased trees; and restore the health of the Ellwood Mesa preserve in the short and long term.

Background information regarding the state of the eucalyptus groves and monarch butterfly populations are included in the Draft IS-MND, beginning on Page 4.

Response 8.3

The commenters request clarification regarding the timeframe for implementation of the MBHMP. The commenters asked if the MBHMP is approved this March, will work begin once the butterfly overwintering period is over. Additionally, the commenters asked how the bird nesting period would impact work.

The MBHMP provides a long-term conservation strategy built around broad objectives, outcomes, and management policies for Ellwood Mesa monarch butterfly habitat. However, the MBHMP calls for preparation of annual Implementation Plans to identify activities to occur over the coming year. The 2018 Implementation Plan was released along with the July 2018 draft of the MBHMP and calls for conducting nesting bird and monarch butterfly surveys, installation of enhancement plantings and signage, removal of existing closure signs, and long-term replacement tree monitoring. The schedule in the 2018 Implementation Plan calls for installation of enhancement plantings, signage, and removal of trail closure signage as early as March 2019. However, the 2018 Implementation Plan is currently being reviewed by the CCC, and requires CCC approval prior to implementation.

Certain actions under the MBHMP call for avoidance of vegetation removal or ground disturbance during the nesting bird season. However, vegetation removal or ground disturbance may occur, as necessary, following completion of nesting bird surveys within the identified nesting bird period. Additionally, Mitigation Measure BIO-6 described in the Draft IS-MND requires surveys for nesting birds and raptors prior to any ground disturbance or vegetation removal work conducted in the nesting season, defined to be February 1 to September 15.

Response 8.4

The commenters request clarification regarding the number of trees the City is planning on trimming, cutting, or removing per year. Additionally, the commenters request information regarding how much of the understory in areas can be cleaned up and removed at the same time.

As stated above, the MBHMP provides a long-term conservation strategy built around broad objectives, outcomes, and management policies for Ellwood Mesa monarch butterfly habitat. The MBHMP does not prescribe numbers of trees which can be removed or trimmed per year, nor does it limit the amount of understory that can be cleaned up and removed at the same time. Instead, the MBHMP calls for annual Implementation Plans to be prepared identifying activities to occur over the course of the upcoming year. Pursuant to Action 1-4.2, City staff shall present each annual Implementation Plan at a public hearing for stakeholder input and City Council approval.

Response 8.5

The commenters query the ratio of trees removed to new trees planted during this period of time.

The commenter does not specify the period of time to which they are referring. However, specific tree trimming, removal, and replanting information is not contained in the MBHMP and would be provided in subsequent Implementation Plans prepared pursuant to Policy 1-4. The 2018 Implementation Plan currently calls for planting of 63 trees to replace the 27 trees removed and 2 trees trimmed in 2017.

Response 8.6

The commenters asked how long the City will need to restore the health to the most critical monarch butterfly aggregation areas.

The MBHMP includes policies and actions aimed at improving grove health near existing aggregation sites. Restoration of grove health in these areas is dependent on approval of the MBHMP and Implementation Plans, availability of funding, and success of habitat restoration efforts.

Response 8.7

The commenters asked what near term steps the City will take to reduce potential for fire posed by the dead and fallen trees in the preserve that could devastate both the butterfly preserve and endanger residents in the area.

As noted in Response 5.1, the MBHMP is not intended to be a wildfire protection or mitigation plan, though it does pledge support for the policies and activities contained in the CWPP, which includes policies intended to reduce fire hazards from fuel loads in the Coverage Area. The MBHMP is intended to fulfill its stated purpose of supporting habitat for monarch butterflies and other plant and animal species, coastal access, and recreation while not exacerbating wildfire risk in or around the Coverage Area. As noted in Section 20, *Wildfire*, of the Draft IS-MND, the MBHMP would result in no impact related to wildfire and may have a beneficial effect by removing dead, dying, or otherwise hazardous trees and re-planting understory vegetation with native, fire-resistant species.

Response 8.8

The commenters encourage the City to begin work maintaining and improving the Ellwood Mesa Preserve as quickly as possible, noting ongoing deterioration in the Preserve such as falling trees and growing fire risk.

This comment will be forwarded to City decision-makers for consideration.

Response 8.9

The commenters ask what the City will do annually to mitigate the fire risk posed by the grove. The commenters note the MBHMP lacks details on this front and mention work by members of The Bluffs community with the City's Public Works Department to highlight vegetation abatement needs; inform the City of downed trees and branches; and report dead, dying, or diseased trees. The commenters add this has resulted in modest fire abatement activity. The commenters further note the CWPP-related fuel reduction zones within the Coverage Area map (Figure 3 of the MBHMP) does not include Open Space Lot 69, a large open space area between the community and the Western Trail filled with non-native grass that needs to be mowed or cut annually. Additionally, the commenters note areas of the Western Trail immediately abutting homes nearest Hollister Avenue also appear to lack any abatement or fuel reduction indicators on the map.

This comment relates to the content of the previously-approved CWPP. It does not relate to the content or adequacy of the Draft IS-MND. The MBHMP does not propose any changes to the CWPP. Additionally, the areas noted by the commenter do not show fuel reduction zones on Figure 3 of the MBHMP because these areas are not located within the Coverage Area for the MBHMP.

Response 8.10

The commenters request clarification regarding how the understory in the groves will be cleared and what will be done with debris. The commenters note this debris is extremely flammable and burns hotter than most other vegetation. The commenters further note non-native annual grasslands dominate in areas without tree canopy immediately adjacent to the trees. The commenters particularly note that Lot 69 contains these grasses, which serve as a potential ignition source.

The Draft IS-MND discusses treatment of potential greenwaste, or debris from understory clearing and tree trimming or removals, in Section 19, *Utilities and Service Systems*. Greenwaste would either be repurposed on-site (e.g., using downed trees for seating or slope stability) or disposed of at the South Coast Recycling and Transfer Station, which was determined to have an adequate maximum permitting capacity to accommodate greenwaste generated by MBHMP activities. As noted in Response 9.9, Open Space Lot 69 is not included in the MBHMP Coverage Area.

Response 8.11

The commenters cite language from Page 10 of the Draft IS-MND, which states, "The goal of the Trail Management Program is to develop and maintain public access trails that provide a safe and meaningful experience for visitors while limiting impacts to habitats and wildlife, in particular monarch butterflies and their seasonal aggregation sites." The commenters note this is not being done, and trails are covered with fallen trees and branches. The commenters add this has led to recreational users making their own trails through trees and grassland areas.

The Trail Management Program noted by the commenters is a component of the MBHMP, evaluated in the Draft IS-MND. The MBHMP has not yet been adopted and, therefore, Trail Management Program activities have not yet occurred.

Response 8.12

The commenters cite language from Page 70 of the Draft IS-MND, which states, "Taking down dead or dying eucalyptus trees could involve the staging or placement of debris piles, equipment, or personnel in areas where special-status plant species have a potential to occur and would impact these species." The commenters state large debris piles around the base of removed trees could also increase fire risk. The commenters add they would like to better understand how all of these risks will be maintained and managed on an annual basis. The commenters note there are large piles of debris that have been left behind by the City for years in the Preserve, and any piles must be temporary to help with aggregation site restoration and tree removal efforts.

In consideration of this concern, Mitigation Measure BIO-8 has been revised to clarify any stockpiling and staging associated with covered activities would be temporary in nature. Mitigation Measure BIO-8 has been revised, as follows:

Staging and stockpiling of debris associated with covered activities shall be temporary in nature, the duration of which shall be specified in the annual Implementation Plan prior to commencement of the covered activity. All staging and temporary stockpiling shall be limited to areas outside of riparian habitats, wetlands, vernal pools, native grasslands, and active nest buffers on site. Absolutely no staging and/or stockpiling of any materials shall be allowed in these buffers at any time. Locations to be avoided must be clearly identified with fencing, flagging, rope, or other conspicuous material, and the contractor(s) conducting vegetation maintenance activities must be trained on the limits of work prior to commencing work. Placement of chipped woody materials must avoid impacting native grasslands, riparian, and wetland vegetation. The biological monitor would ensure avoidance for the duration of activities near these areas.

Additionally, Section 20, *Wildfire,* of the Draft IS-MND has been revised to include discussion of stockpiling of debris and greenwaste, with the following language added:

Mitigation measure BIO-8 would require any stockpiling of potentially ignitable debris or greenwaste to be temporary in nature, with the duration of debris stockpiling specified in the annual Implementation Plan prior to commencement of covered activities. Removed dead or dying trees would be replaced with healthy trees, which are less fire-prone, and which, pursuant to mitigation measure BIO-7, would be monitored annually for a period of five years to ensure they remain healthy. Both of these measures would further address community concerns about wildfire impacts associated with implementation of the MBHMP. No expansion of the existing eucalyptus groves would occur.

As noted in Response 8.10 above, greenwaste such as downed trees and understory debris, would either be repurposed on-site (e.g., mulched for trail cover, downed trees or logs serving as seating or erosion control) or disposed of off-site. Furthermore, as previously noted, the MBHMP is not intended to serve as a fire mitigation or abatement plan; however, the MBHMP is intended to support the previously-adopted CWPP and would reduce fire risk by removing dead, dying, or hazardous trees and replanting understory with native, fire-resistant species. For additional analysis of potential wildfire impacts associated with implementation of the MBHMP, please refer to Section 20, *Wildfire*, of the Draft IS-MND.

Response 8.13

The commenters cite language from Page 75 of the Draft IS-MND, which states, "The risk management program in the Goleta Urban Forest Management Plan ensures proper management of trees to allow for healthy attractive communities while reducing risk. Implementation of the MBHMP would result in the removal of eucalyptus trees that pose an unacceptable risk to recreational users on the Coverage Area." The commenters note nearby residents, not just recreational users, face risks from falling trees in the Coverage Area.

Removal of dead, dying, or otherwise hazardous trees would improve safety for residents adjacent to the Coverage Area, as well as recreational users. Page 75 of the Draft IS-MND has been revised as follows:

Implementation of the MBHMP would result in the removal of eucalyptus trees that pose an unacceptable risk to residents and recreational users ~~on~~ within and adjacent to the Coverage Area.

Response 8.14

The commenters note when 27 trees were removed previously, none were removed in proximity to homes in The Bluffs community. The commenters add homeowners contacted the City Arborist and ultimately had trees pruned at their own expense.

As described above, the MBHMP does not identify specific trees to be removed or replanted. Such activities would be identified in subsequently prepared annual Implementation Plans, drafted pursuant to MBHMP Policy 1-4 and presented at public hearings for stakeholder input and City Council approval.

Response 8.15

The commenters cite language from Page 129 of the Draft IS-MND, which states many trails in the Coverage Area have been closed indefinitely since July 2017 due to safety hazards posed by dead or dying trees. The commenters question why more was not done to protect homeowners living within feet of hazardous trees. The commenters also question why trails have reopened, particularly as there is more tree debris and garbage along trails now. The commenters specifically note rusting pipes, concrete blocks, and other hazardous obstacles at the top of the Western Trail nearest Hollister Avenue.

This comment does not directly relate to the content or adequacy of the Draft IS-MND. The portion of the Western Trail near Hollister Avenue is not located within the Coverage Area of the MBHMP. As noted throughout the Draft IS-MND, covered activities under the MBHMP would continue to improve safety for recreational users by removing dead, dying, or otherwise hazardous trees. As noted in Response 8.13, above, such activities would also improve safety for residents adjacent to the Coverage Area.

Response 8.16

The commenters support efforts to plant a combination of trees (not just eucalyptus) to improve the stability of the groves. Additionally, the commenters encourage the planting of appropriate native ground cover, shrub, and mid-canopy species of plants. The commenters note there were plans to replace the 27 trees removed in 2017 across from Ellwood School, but indicate this was not done.

The commenters support for the replanting components of the MBHMP is noted. Additionally, the 2018 Implementation Plan details efforts to plant 63 replacement trees in the Coverage Area to mitigate the impacts of removing 27 trees in 2017. According to Figure 4, Enhancement Plan, of the 2018 Implementation Plan, these plantings would be located on 0.58 acre of existing eucalyptus grove south of Hollister Avenue/Ellwood School and east of the existing parking lot. The CCC is currently reviewing the 2018 Implementation Plan.

Response 8.17

The commenters note the City planned to plant and maintain native grassland areas in the immediate vicinity of homes in The Bluffs community, but such plans were never implemented. The commenters seek to make the City aware no such planting or improvements have occurred in Open Space Lot 69.

This comment does not relate to the content or adequacy of the Draft IS-MND. The Open Space Lot 69 is not included within the Coverage Area for the MBHMP, and the MBHMP does not propose any grassland restoration or maintenance efforts on this parcel, nor does it preclude such efforts from occurring.

Response 8.18

The commenters support initiatives noted in the Trail Management Program of the MBHMP to maintain public access trails that provide a safe and meaningful experience for visitors while limiting impacts to habitats and wildlife, in particular monarch butterflies and their seasonal aggregation sites. The commenters note the deterioration of trails in the Coverage Area and support a well-managed trail system.

The commenters support for the trail management activities in the MBHMP is noted and will be forwarded to City decision-makers for consideration.

Response 8.19

The commenters state they hope the project is approved quickly and that work begins as soon as possible. The commenters reiterate the urgency of improving safety and health of the preserve and urge the City Council to act.

The commenters support for approval is noted and will be forwarded to City decision-makers for consideration.

Letter 9

From: Laura Maskrey <lmmaskrey88@gmail.com>
Sent: Monday, February 25, 2019 4:58 PM
To: Anne Wells <awells@cityofgoleta.org>
Subject: Comments - Draft Initial Study/Mitigated Negative Declaration (IS/MND) for the Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan (MBHMP

My Name it is Laura Maskrey, I am a Goleta Resident address 7484 Sea Gull Drive,

I can be reached at 805-455-1653

I have the following general comment on this document: It seems like we are in an emergency with regards to the Monarch population and this is not an emergency response plan, I understand that this is what we have and where we are at, but there seems like a good possibility the monarchs could possibly not come back next year - so at the very least there should be some urgent discussions being had about what we should be doing before the next year - since clearly this plan will not being taking effect before then. 1

I unfortunately have just not had time to review the specifics of the plan.

Thank you for your consideration

Laura Maskrey

Letter 9

COMMENTER: Laura Maskrey, Residents

DATE: February 25, 2019

Response 9.1

The commenter notes the MBHMP is not an emergency response plan, but there exists a possibility monarch butterflies may not return to the Coverage Area next year. The commenter recommends there should be some urgent discussions about what should be done before the next year, since this plan will not take effect before then.

This comment relates to the content and timing of the MBHMP and does not relate to the content or adequacy of the Draft IS-MND. Therefore, this comment has been moved to the MBHMP Comment Matrix in Appendix B that was prepared to address comments related specifically to the MBHMP, and a response was provided in the matrix. The MBHMP Comment Matrix will be provided to City Council for its review prior to considering adoption of the MBHMP.

Mitigation Monitoring and Reporting Program

CEQA requires that a reporting or monitoring program be adopted for the conditions of project approval that are necessary to mitigate or avoid significant effects on the environment (Public Resources Code 21081.6). This mitigation monitoring and reporting program (MMRP) is designed to ensure compliance with adopted mitigation measures during implementation of the Monarch Butterfly Habitat Management Plan. For each mitigation measure outlined in the Final Initial Study-Mitigated Negative Declaration, specifications are made herein that identify the action required and the monitoring that must occur. In addition, a responsible agency is identified for verifying compliance with individual conditions of approval contained in this MMRP.

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Party	Compliance Verification		
					Initial	Date	Comments
Air Quality							
AQ-1 Dust Control							
All covered activities shall incorporate the following dust control measures to reduce potential PM10 emissions during implementation of the MBHMP. ▪ Covered activities shall minimize the amount of disturbed area to the extent feasible ▪ Onsite vehicle speeds shall be limited to 5 miles per hour or less ▪ The City or City-approved contractor shall install gravel pads at the access points to Ellwood Mesa Open Space to prevent tracking of dirt/mud onto public roads ▪ After a ground-disturbing activity is completed, the City or City-approved contractor shall treat the disturbed area by watering, revegetating, or spreading soil binders	The City shall comply with the requirements of this measure.	Throughout ground-disturbing activities	Periodically during and at completion of ground-disturbing activities	City of Goleta Public Works			
Biological Resources							
BIO-1 General Housekeeping							
General requirements that shall be followed by all personnel are listed below. ▪ MBHMP-related vehicles shall observe a 5-mile-per-hour speed limit in the Coverage Area at all times ▪ MBHMP-related vehicles and equipment shall restrict off-road travel to approved routes, which shall be sited by the City to minimize environmental impacts ▪ All food-related trash items, such as wrappers, cans, bottles, and food scraps, generated during implementation of the MBHMP shall be removed from the site daily ▪ No deliberate feeding of wildlife shall be allowed ▪ No pets shall be allowed on in the Coverage Area	The City shall comply with the requirements of this measure.	Throughout MBHMP activities	Periodically during MBHMP activities	City of Goleta Public Works			

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Party	Compliance Verification		
					Initial	Date	Comments
▪ No firearms shall be allowed in the Coverage Area ▪ If vehicle or equipment maintenance is necessary including refueling of equipment, it shall be performed outside the buffers of ESHAs, bird nests, and monarch aggregation sites ▪ Any worker who inadvertently injures or kills a special status species or finds one dead, injured, or entrapped shall immediately report the incident to the biological monitor. The monitor shall immediately notify City of Goleta staff. The City of Goleta shall follow up with written notification to USFWS and CDFW as appropriate, depending on the species. The biological monitor shall also independently notify USFWS of any unanticipated harm to any federally listed endangered species associated with implementation of the MBHMP. All observations of federally or State-listed threatened or endangered species shall be recorded on CNDDB field sheets and sent to CDFW by City of Goleta or the biological monitor.							

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Party	Compliance Verification		
					Initial	Date	Comments
BIO-2 Qualified Biological Monitor							
A qualified biological monitor shall be present during all vegetation removal and ground disturbing activities to ensure compliance with all mitigation measures, applicable permit conditions, and any conditions required by federal and State agencies. The monitor shall be responsible for: ▪ Ensuring that procedures for verifying compliance with environmental mitigation measures are followed. ▪ Lines of communication and reporting methods. ▪ Daily and weekly reporting of compliance. ▪ MBHMP crew training regarding environmentally sensitive areas. ▪ Authority to stop work. ▪ Action to be taken in the event of non-compliance.	The City shall retain a qualified biological monitor.	Prior to ground-disturbing and/or vegetation removal activity	Once	City of Goleta Public Works			
BIO-3 Biological Resources Awareness Training							
Before any ground-disturbing work or vegetation removal/trimming occurs in the Coverage Area, a qualified biologist shall conduct a mandatory biological resources awareness training for all MBHMP personnel about federally and State listed species that could occur on site. The training shall include the natural history, representative photographs, and legal status of each federally listed species. Proof of personnel attendance shall be kept on file. If new MBHMP personnel are added to the crew, the contractor shall ensure that the new personnel receive the mandatory training before starting work. The subsequent training of personnel can include videotape of the initial training and/or the use of written materials rather than in-person training by a biologist.	The qualified biologist shall conduct the pre-activity training for all MBHMP personnel, and record and maintain a record of all those who have attended this training. The City shall review records.	Prior to ground-disturbance or vegetation removal (conduct training; maintain attendance record); as needed (with the addition of new personnel; maintain attendance record); following trainings (review records)	Once prior to work (conduct training); as needed during MBHMP activities (with the addition of new personnel; maintain attendance record); periodically (review records)	City of Goleta Public Works			

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Party	Compliance Verification		
					Initial	Date	Comments
BIO-4 Special-Status Plants							
To avoid impacts to special-status plants, periodic rare plant surveys the Coverage Area must occur at least once every five years during a normal rainfall year, following current standard practice for botanical surveys (CDFW 2018), which may require multiple passes to detect or rule out all potential species. If special-status plants remain absent from work areas, no further action is required. If special-status plants are detected in work areas, locations must be mapped, and the plants must be avoided during MBHMP activities. A pre-work training must be provided to the contractor(s) conducting vegetation maintenance activities that identifies special-status plants in and near the work area and locations to be avoided. If weed control is required in areas supporting special-status plants, this work must be conducted with hand tools. Vegetation control in these areas must emphasize control of non-native species, avoid flowering and fruiting seasons of the identified special-status plants to the maximum extent possible, and ensure that activities do not remove special-status plant individuals.	The City shall retain a qualified biologist to conduct surveys and trainings, and shall review surveys and training records.	During a normal rainfall year (conduct and review surveys); as needed (review training records)	At least every five years (conduct and review surveys); as needed (review training records)	City of Goleta Public Works			
BIO-5 California Red-legged Frog							
Any ground disturbing activities in riparian and wetland habitats shall be conducted when the channel is dry to the maximum extent feasible. Additionally, within seven days prior to start of work, a biologist must conduct a survey prior to any ground disturbance to verify that riparian and wetland areas do not contain ponded water and that no California red-legged frogs are present. If ponded water is present, no work may occur within 50 feet of pools. If suitable resident frog habitat is present or frogs are noted during the surveys, a biological monitor must be present during vegetation clearing	The City shall comply with the requirements of this measure. The qualified biologist shall conduct a survey and a biological monitor will be present when required per this measure. The City shall coordinate with USFW/CDFW as needed.	Prior to ground-disturbing activity (retain biologist and, if needed, biological monitor); No more than seven days prior to ground disturbance (perform/review surveys); as needed (field monitoring for compliance and	Once (retain biologist and, if needed, biological monitor); once prior to ground disturbance (perform/review surveys); as needed (field monitoring for compliance and coordinate with	City of Goleta Public Works			

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Party	Compliance Verification		
					Initial	Date	Comments
and removal activities in riparian and wetland habitats. The biologist will have the authority to stop work and identify areas that must be avoided. Listed species must be fully avoided unless take permits are obtained from the USFWS and/or CDFW. Only handheld tools shall be used. Removal of native vegetation shall be limited to dead, damaged, and diseased material.		coordinate with USFWS/CDFW)	USFWS/CDFW)				
BIO-6 Nesting Bird Survey							
To the maximum extent feasible, tree trimming activities must occur in September to ensure that raptor nests and monarchs are not active in the work area. Surveys for nesting birds and raptors are required prior to any ground disturbance or vegetation removal work conducted in the nesting season, defined to be February 1 to September 15. If ground-disturbing or vegetation removal work does occur during the nesting season, then not more than three (3) days before ground disturbance and/or vegetation removal commences, a bird and raptor survey must be conducted by a City-approved biologist in the disturbance footprint plus a 300-foot buffer, as feasible. If the MBHMP activity is phased, a subsequent nesting bird and raptor survey is required in the Coverage Area before each phase of the activity. If no raptor or other bird nests are observed no further mitigation is required. Nesting bird and raptor surveys must be conducted during the time of day when bird species are active and be of sufficient duration to reliably conclude presence/absence of nesting birds and raptors in the 300-foot buffer. If active nests of species protected by CFG Code 3503 or the MBTA Migratory Bird Treaty Act are found within 300 feet of the Coverage Area, their locations must be flagged and then mapped onto an aerial photograph of the Coverage Area at a scale no	The City shall comply with the requirements of this measure. The qualified biologist shall conduct surveys and a biological monitor will be present when required per this measure.	No more than three days prior to start of tree trimming, ground disturbance, and/or vegetation removal (perform surveys); as needed (ensure compliance)	Once per commencement of tree trimming, ground-disturbing, and/or vegetation removal activities, if necessary (perform survey); as needed (ensure compliance)	City of Goleta Public Works			

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Party	Compliance Verification		
					Initial	Date	Comments
less than 1" =200' and/or recorded with the use of a GPS unit. If active raptor nests are detected, the map will include topographic lines, parcel boundaries, adjacent roads, known historical nests for protected nesting species, and known roosting or foraging areas, as required by Conservation Element Policy 8.3 of the Goleta General Plan. If feasible, the buffer must be 300 feet in compliance with Conservation Element Policy CE 8.4 of the Goleta General Plan. If the 300-foot buffer is infeasible, the City approved biologist may reduce the buffer distance as appropriate, dependent on the species and the proposed work activities. If any active non-raptor bird nests are found, a suitable buffer area (varying from 25-300 feet), depending on the species, must be established by the City-approved biologist. No ground disturbance can occur in the buffer until the City-approved biologist confirms that the breeding/nesting is completed, and all the young have fledged. Alternately, a City-approved biologist must monitor the active nest full-time during MBHMP activities in the buffer to ensure MBHMP activities are not indirectly impacting protected nesting birds and raptors.							
BIO-7 Tree Replacement							
All replacement trees planted in the Coverage Area must be monitored annually for a minimum period of 5 years. At the end of the 5-year monitoring period, replacement trees shall be inspected by a City approved arborist to determine the successful establishment of the trees. The arborist may extend the monitoring period as deemed necessary. If a replacement tree dies during the monitoring period, it shall be replaced and monitored as required by this mitigation measure.	The City Council shall review and approve annual implementation plans, which will include the tree replacement plan; The arborist shall inspect trees and The City shall replace dead trees as needed.	Prior to tree planting (approve plan); ongoing (inspection and replacement)	Once (approve plan); periodic (inspection and replacement)	City Council; City of Goleta Public Works			

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Party	Compliance Verification		
					Initial	Date	Comments
BIO-8 Native Habitats							
Staging and stockpiling of debris associated with covered activities shall be temporary in nature, the duration of which shall be specified in the annual Implementation Plan prior to commencement of the covered activity. All staging and temporary stockpiling shall be limited to areas outside of riparian habitats, wetlands, vernal pools, native grasslands, and active nest buffers on site. Absolutely no staging and/or stockpiling of any materials shall be allowed in these buffers at any time. Locations to be avoided must be clearly identified with fencing, flagging, rope, or other conspicuous material, and the contractor(s) conducting vegetation maintenance activities must be trained on the limits of work prior to commencing work. Placement of chipped woody materials must avoid impacting native grasslands, riparian, and wetland vegetation. The biological monitor would ensure avoidance for the duration of activities near these areas.	The City Council shall review and approve annual implementation plans, which shall include staging/stockpiling plans; The biological monitor will be present when required per this measure.	Prior to stockpiling (approve plan) ; as needed (ensure compliance)	Once (approve plan); as needed (ensure compliance)	City Council; City of Goleta Public Works			
BIO-9 Riparian/Wetland Areas							
Impacts to vernal pools, wetlands, and streambeds shall be avoided to the maximum extent practicable, unless they are affected for the purpose of habitat enhancement. If avoidance is not feasible, the City shall acquire and comply with regulatory permits for any vegetation trimming, removal, or ground disturbing activities to be completed in potentially jurisdictional areas including in the vicinity of Devereux Creek or other riparian/wetland habitats in the Coverage Area. The CDFW shall be notified and a Streambed Alteration Agreement shall be obtained for any activities that will result in impacts to a streambed or riparian vegetation. In addition, authorizations from the U.S. Army Corps of	The City shall review activities and acquire permits from USFW/CDFW as needed.	Prior to approving ground-disturbing and/or vegetation removal activities	Once	City of Goleta Public Works			

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Party	Compliance Verification		
					Initial	Date	Comments
Engineers and Central Coast Regional Water Quality Control Board (RWCB) will be secured for any activities involving discharges of fill material into a wetland or streambed.							
Cultural Resources							
CR-1 Archaeological and Native American Monitoring							
Ground-disturbing activities associated with the MBHMP, including but not limited to trail modification and vegetation and tree removal, shall be observed by a qualified archaeological monitor under the direction of an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for prehistoric archaeology (National Park Service 1983) and a local Native American monitor. If archaeological resources are encountered during ground-disturbing activities, work in the immediate area shall halt and the find evaluated for significance. Archaeological and/or Native American monitoring may be reduced or halted at the discretion of the monitors as warranted by conditions including, but not limited to, negative findings during the first 60 percent of ground disturbance. If monitoring is reduced to spot-checking, spot-checking shall occur when ground-disturbing activities occur in a new location in the Coverage Area or when ground disturbance would extend to depths not previously reached (unless those depths are within bedrock). If archaeological resources are identified during ground disturbance, they shall be left in place and avoided when feasible. If avoidance is infeasible, a Phase II testing and evaluation program shall be implemented. If resources are determined significant or unique through Phase II testing and site avoidance is not possible, appropriate site-specific measures shall be identified in the Phase II evaluation. These	The City shall retain a qualified archaeologist and local Native American monitor, and comply with the requirements of this measure. The archaeologist and local Native American monitor shall ensure compliance.	Prior to ground-disturbing activities (retain archaeologist and Native American monitor) ; throughout ground-disturbing activities (ensure compliance)	Once (approve archaeologist and retain Native American Monitor); as needed (ensure compliance)	City of Goleta Public Works			

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Party	Compliance Verification		
					Initial	Date	Comments
measures may include, but would not be limited to, a Phase III data recovery program, capping, or other appropriate actions to be determined by a qualified archaeologist in consultation with the Native American monitor.							
Geology and Soils							
GEO-1 Unanticipated Discovery of Paleontological Resources							
In the event of an unanticipated discovery of a paleontological resource during ground disturbance from the implementation of the MBHMP, work in the immediate area shall be temporarily halted and a qualified paleontologist (per Society of Vertebrate Paleontology standards 2010) shall be contacted to evaluate the find. If the discovery proves to be significant and cannot be avoided, additional work, such as salvage excavation, may be required to address any significant impacts.	The City shall comply with the requirements of this measure.	Immediately upon discovery of resource	As needed	City of Goleta Public Works			
Hydrology and Water Quality							
HWQ-1 Erosion Control Best Management Practices							
Prior to commencement of any ground-disturbing activities not covered by a SWPPP prepared in compliance with the requirements of the NPDES Construction General Permit, the City or City-authorized contractor shall implement the following erosion control BMPs: ▪ Ground-disturbing activities shall occur between April 1 and September 30 to coincide with the dry season and avoid impacts to overwintering monarch butterflies. ▪ Silt fencing, straw bales composed of rice straw (that are certified to be free of weed seed), fiber rolls, gravel bags, mulching erosion control blankets, soil stabilizers, and storm drain filters shall be used, in conjunction with other methods,	The City shall implement the erosion control BMPs.	Prior to and during ground-disturbing activity	Periodic	City of Goleta Public Works			

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Party	Compliance Verification		
					Initial	Date	Comments
to prevent erosion throughout the Coverage Area and siltation of stream channels and detention basins. ▪ Temporary berms and sediment basins shall be constructed to avoid unnecessary siltation into local waterways during ground-disturbing activities. ▪ Erosion controls which protect and stabilize exposed soils shall be used to prevent movement of materials. Potential erosion control devices include plastic sheeting held down with rocks or sandbags over exposed soils and use of silt fences or berms of hay bales. ▪ Frequency of sediment removal from detention basins, locations and types of erosion and sediment control structures, and materials that would be used in the Coverage Area during MBHMP activities shall be specified. ▪ All exposed soils present in and around the disturbed area shall be stabilized within seven days of ground disturbance using mulch, geotextile binding fabrics, and/or native, drought-tolerant revegetation, as necessary.							
HWQ-2 Chemical Application Control Plan							
Prior to commencement of native planting, eucalyptus grove restoration, invasive species eradication, and pest control activities, the City shall prepare and implement a Chemical Application Control Plan to be approved by the City Biologist. The plan shall identify thresholds to determine when fertilizer, herbicide, or pesticide application is necessary, the chemical to be used, and the rate, timing, and placement of application. Pesticides or insecticides shall be used only when necessary to cure a problem and in positively identified pre-emergent situations, not as a preventive measure or as a regular, periodic application.	The City shall review and approve a chemical application control plan.	Prior to chemical application	Once	City of Goleta Public Works			

Mitigation Measure/ Condition of Approval	Action Required	Monitoring Timing	Monitoring Frequency	Responsible Party	Compliance Verification		
					Initial	Date	Comments
When pesticide or herbicide application is deemed necessary, use of chemical forms that are the least toxic to non-target organisms shall be employed. Only slow release organic fertilizers shall be used in the Coverage Area to minimize the potential for eutrophication in Devereux Creek. The application of fertilizers, herbicides, or pesticides shall be minimized during winter months when the greatest precipitation is likely to occur.							
Noise							
N-1 Noise Management							
Consistent with mitigation recommended in the City's Environmental Thresholds and Guidelines Manual, all noise-generating MBHMP activities, including, but not limited to, tree removal, pruning, trail maintenance, and riparian restoration, shall be limited to between 8:00 a.m. and 5:00 p.m. on weekdays. Noise-generating MBHMP activities shall not occur on weekends or State holidays. If diesel-powered construction equipment is necessary, all such equipment shall have properly maintained sound-control devices, and no equipment shall have an unmuffled exhaust system. Equipment shall not be left to idle while not in use.	The City shall comply with the requirements of this measure.	Throughout noise-generating activities	Periodic	City of Goleta Public Works			

Attachment 5

CWPP Prescription Guidance

Fuels Management Prescription Guidance
Undeveloped VMUS

Table 12 Prescription Guidance in Undeveloped VMUS

Location →	Primary Defense Zone (A) (0 – 30')*	Fuel Reduction Zone (B) (30' – 100')	Fuel Reduction Zone (C) (100' – 150' - applies to larger areas)
Fuel Type ↓	Based on Defensible Space PRC - 4291		Based on Firefighter Safety
Grass/ Forbs	Reduce fuel depth to 4 inches; methods include mowing, masticating, weed-whacking, biological browsing	Same treatment as (A); longer grass in isolated open areas is acceptable	Treatment may be needed in portions on a case by case basis
Surface dead/down material	Clear dead/down flammable materials; methods include raking, hand-piling/removal, masticating chipping/dispersal on site	Reduce dead/down flammable material to < 3" depth; methods same as (A); < 5 tons/acre in isolated logs acceptable.	Reduce heavier pockets of dead/down flammable material to < 5" depth; < 5-7 tons/acre in isolated logs acceptable.
Brush/ Shrub fuel	Remove to a spacing (between edges of brush) generally 2x brush height on <20% slopes; methods include masticating or hand-cutting, biological browsing	Same Treatment as (A); a pocket or clump of brush can be treated as one large shrub in more open site conditions.	Less intensive brush removal; with spacing approximately 10 ft; and more clumping of shrubs.
Trees Overstory (without brush understory)	Thin smaller trees leaving larger trees at 10-20 ft crown spacing (based on slope, tree size and type); reduce ladder fuels by pruning lower branches 6-15 ft up, or lower 1/3 of tree height on smaller trees; method likely hand-cut	Thin smaller trees leaving larger trees at approx. 10 ft crown spacing (based on slope, tree size and type); reduce ladder fuels by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees; method likely hand-cut.	Reduce ladder fuels by pruning lower branches of larger trees that have broken limbs, dead material etc. 6 ft up; method likely hand-cut.
Trees Overstory (with brush understory)	Thinning specs same as Trees Overstory without brush understory (A). Understory: remove brush ladder fuel; methods include masticating or hand-cutting	Thinning specs same as Trees Overstory without brush understory (B). Understory: remove brush ladder fuel; intermittent patches of shrubs and small trees in openings (non-canopy) is acceptable; methods include masticating or hand-cutting	Thinning specs same as Trees Overstory without brush understory (C). Understory: less intensive removal of brush ladder fuel; intermittent patches of shrubs and small trees in openings (non-canopy) is acceptable; methods include masticating or hand-cutting

*For further information specific to homeowner/structure mitigation measures. See Section 6.2.1

Fuels Mitigation Prescription Guidance
Developed VMUs

Table 13 Prescription Guidance Developed VMUs

Location →	Primary Defense Zone (A) (0 – 30')*	Fuel Reduction Zone (B) (30' – 100')
Fuel Type ↓	Based on Defensible Space PRC – 4291 and Firefighter Safety	
Grass/ Forbs	Reduce fuel depth to 4 inches; methods include mowing, masticating, weed-whacking, biological browsing	Same treatment as (A); longer grass in isolated open areas is acceptable.
Surface dead/down material	Clear dead/down flammable materials; methods include raking, hand-piling/removal, masticating chipping/dispersal on site	Reduce dead/down flammable material to < 3" depth; methods same as (A).
Brush/ Shrub fuel	Remove to a spacing (between edges of brush) generally 2x brush height on <20% slopes; methods include masticating or hand-cutting, biological browsing	Same Treatment as (A); a pocket or clump of brush can be treated as one large shrub in more open site conditions.
Trees Overstory (without brush understory)	On case-by-case basis**: Thin smaller or unhealthy trees leaving larger trees at 10-20 ft crown spacing (based on slope, tree size and type). Reduce ladder fuels by pruning lower branches 6-15 ft up, or lower 1/3 of tree height on smaller trees; method likely hand-cut	On case-by-case basis**: Thin smaller or unhealthy trees. Reduce ladder fuels by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees; method likely hand-cut.
Trees Overstory (with brush understory)	Thinning specs (case-by-case) same as Trees Overstory without brush understory (A). Understory: remove brush ladder fuel; methods include masticating or hand-cutting	Thinning specs (case-by-case) same as Trees Overstory without brush understory (B). Understory: remove brush ladder fuel; intermittent patches of shrubs and small trees in openings (non-canopy) is acceptable; methods include masticating or hand-cutting

(Note: Treatments listed are primarily those currently applied by Goleta City Management; the areas are mostly smaller, manicured park type settings.)
*For further information specific to homeowner/structure mitigation measures see Section 6.2.1.
**The decision for this treatment need should be from the Goleta City Project Manager overseeing VMU mitigation work. Initial input from a wildland fire specialist is also recommended.

Table 14 Prescription Guidance for Butterfly Aggregation Areas Adjacent to Structures

Location →	Primary Defense Zone (A)*** (0 – 30')	Fuel Reduction Zone (B*** (30' – 100')
Fuel Type ↓	Based on Defensible Space PRC – 4291 and Firefighter Safety	
Grass/ Forbs	Reduce fuel depth to 4 inches; methods include mowing, masticating, weed-whacking, biological browsing	Same treatment as (A); longer grass in isolated open areas is acceptable.
Surface dead/down material	Clear dead/down flammable materials; methods include raking, hand-piling/removal, masticating chipping/dispersal on site	Reduce dead/down flammable material to < 3" depth; methods same as (A).
Brush/ Shrub fuel	Remove to a spacing (between edges of brush) generally 2x brush height on <20% slopes; methods include masticating or hand-cutting, biological browsing	Same Treatment as (A); a pocket or clump of brush can be treated as one large shrub in more open site conditions.
Trees Overstory without brush understory	Trim or thin only trees that do not provide protection to monarch butterfly aggregation sites* Thin smaller or unhealthy trees at 10 – 20 ft crown spacing (as determined by slope, tree size and type);Leave larger trees unless toppling hazard.** Reduce ladder fuels by pruning lower branches 6-15 ft up, or lower 1/3 of tree height on trees smaller than 18 ft..	Trim or thin only trees that do not provide protection to monarch butterfly aggregation sites* Thin smaller or unhealthy trees at approximately 10 ft crown spacing (as determined by slope, tree size and type);. Leave larger trees unless toppling hazard.** Reduce ladder fuels by pruning lower branches approximately 6 ft up, or lower 1/3 of tree height on trees smaller than 18 ft..
Trees Overstory with brush understory	Trim or thin only vegetation that does not provide protection to monarch butterfly aggregation sites* Thin small or unhealthy trees at 10-20 ft crown spacing (based on slope, tree size and type). Leave larger trees at 10 ft. crown spacing unless toppling hazard.**(Reduce ladder fuels by pruning lower branches 6-15 ft up, or lower 1/3 of tree height on smaller trees In understory: remove brush ladder fuel. Methods include masticating or hand-cutting.	Trim or thin only vegetation that does not provide protection to monarch butterfly aggregation sites* Thin small or unhealthy trees to approximately 10 ft. crown spacing. Leave larger trees unless toppling hazard.** Reduce ladder fuels by pruning lower branches approximately 6 ft up, or lower 1/3 of tree height on smaller trees. In understory remove brush ladder fuel. In non-canopied areas, noncontinuous patches of shrubs or small trees in openings is acceptable.. Methods include masticating or hand-cutting.

*As determined by the Goleta City Project Manager overseeing mitigation work in consultation with a City approved monarch butterfly specialist and a City approved wildland fire specialist.
**As determined by the Goleta City Project Manager and Goleta City arborist.
***For further information specific to homeowner/structure mitigation measures see Section 6.2.1.

Attachment 6

CWPP Treatment Zones

Fuel Reduction/Treatment Types

Treatment Type	Summary
Unmodified Standard	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
Modified Standard	Within 100 feet of structures: Modify the standard treatment to be less removal, based on site specific conditions
Unmodified Aggregation	Within 100 feet of monarch aggregation sites: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 3 feet Trim and thin unhealthy trees Reduce fuel ladders and intermittent patches of shrubs and small trees in openings
Modified Aggregation	Within 100 feet of aggregation sites: Modify the aggregation treatment to be less removal, based on site specific conditions

CWPP Treatment Zones

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
0A	Zone 0	Modified Standard	2,497	Modification is to trim or remove eucalyptus within 10 feet of existing path to create access. Trim canopies by hand. Retain eucalyptus stump for wildlife.
0B	Zone 0	Modified Standard	2,016	Modification is to trim or remove eucalyptus within 10 feet of existing path to create access. Trim canopies by hand. Remove vegetation overhanging structures.
0C	Zone 0	Modified Standard	2,026	Modification is to trim or remove eucalyptus within 10 feet of existing path to create access. Trim canopies by hand.
0D	Zone 0	Modified Standard	2,035	Modification is to trim or remove eucalyptus within 10 feet of existing path to create access. Trim canopies by hand.

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
0E	Zone 0	Modified Standard	2,045	Modification is to trim or remove eucalyptus within 10 feet of existing path to create access. Trim canopies by hand.
0F	Zone 0	Modified Standard	2,054	Modification is to trim or remove eucalyptus within 10 feet of existing path to create access. Trim canopies by hand.
0G	Zone 0	Modified Standard	2,063	Modification is to trim or remove eucalyptus within 10 feet of existing path to create access. Trim canopies by hand.
1A	Zone 0/Zone 1	Modified Standard/ Unmodified Standard	6,291	**Zone 0:** Modification is to trim or remove eucalyptus within 10 feet of existing path to create access. **Zone 1:** Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
1B	Zone 1	Unmodified Standard	7,881	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
1C	Zone 1	Unmodified Standard	8,012	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
1D	Zone 1	Unmodified Standard	9,966	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
1E	Zone 1	Unmodified Standard	10,000	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
1F	Zone 1	Unmodified Standard	10,000	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
1G	Zone 1/ Zone 2	Unmodified Standard/ Unmodified Standard	9,964	Zone 1 and 2: Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
1H	Zone 1	Unmodified Standard	5,646	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
1I	Zone 1	Unmodified Standard	9,988	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
1J	Zone 1	Unmodified Standard	10,000	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
1K	Zone 1	Unmodified Standard	9,767	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
1L	Zone 1	Unmodified Standard	818	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
1M	Zone 1	Unmodified Standard	3,030	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
1N	Zone 1	Unmodified Standard	8,733	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
1O	Zone 1	Unmodified Standard	10,000	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
1P	Zone 1	Unmodified Standard	2,687	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
1Q	Zone 1	Unmodified Standard	1,238	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
1R	Zone 1	Unmodified Standard	3,680	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
2A	Zone 1/ Zone 2	Unmodified Standard/ Unmodified Standard	8,144	Zone 1 and 2: Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
2B	Zone 2	Unmodified Standard	8,275	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
2C	Zone 2	Unmodified Standard	2,937	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
2D	Zone 2	Unmodified Standard	8,406	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
2E	Zone 2	Unmodified Standard	2,618	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
2F	Zone 2	Unmodified Standard	8,538	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
2G	Zone 2	Unmodified Standard	2,524	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
2H	Zone 2	Unmodified Standard	8,669	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
2I	Zone 2	Unmodified Standard	2,628	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
2J	Zone 2	Unmodified Standard	8,800	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
2K	Zone 2	Unmodified Standard	3,321	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
2L	Zone 2	Unmodified Standard	8,931	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
2M	Zone 2	Unmodified Standard	5,646	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
2N	Zone 2	Unmodified Standard	9,072	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
2O	Zone 2	Unmodified Standard	6,969	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
3A	Zone 3	Unmodified Standard	618	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
3B	Zone 3	Unmodified Standard	3,764	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
3C	Zone 3	Unmodified Standard	4,741	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
3D	Zone 3	Unmodified Standard	7,311	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
3E	Zone 3	Unmodified Standard	6,917	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
4A	Zone 4	Unmodified Standard	5,618	**Zone 4:** Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
4B	Zone 4/ Zone 5	Unmodified Standard/ Modified Standard	5,314	Zone 4: Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees **Zone 5:** Modification is no thinning of riparian trees.
5A	Zone 5	Modified Standard	6967	Modification is no thinning of riparian trees.
5B	Zone 5	Modified Standard	4,930	Modification is no thinning of riparian trees
5C	Zone 5	Modified Standard	5,003	Modification is no thinning of riparian trees
5D	Zone 5	Modified Standard	9,467	Modification is no thinning of riparian trees
5E	Zone 5	Modified Standard	1,767	Modification is no thinning of riparian trees
5F	Zone 5	Modified Standard	1,192	Modification is no thinning of riparian trees
5G	Zone 5	Modified Standard	4,208	Modification is no thinning of riparian trees
5H	Zone 5	Modified Standard	7,450	Modification is no thinning of riparian trees
5I	Zone 5	Modified Standard	7,302	Modification is no thinning of riparian trees
5J	Zone 5	Modified Standard	441	Modification is no thinning of riparian trees
5K	Zone 5	Modified Standard	1,450	Modification is no thinning of riparian trees
5L	Zone 5	Modified Standard	2,669	Modification is no thinning of riparian trees
5M	Zone 5	Modified Standard	410	Modification is no thinning of riparian trees
6A	Zone 6	Modified Standard	1,183	Modification is no thinning in riparian vegetation
6B	Zone 6	Modified Standard	4,976	Modification is no thinning in riparian vegetation
6C	Zone 6	Modified Standard	6,793	Modification is no thinning in riparian vegetation
6D	Zone 6	Modified Standard	7,024	Modification is no thinning in riparian vegetation
6E	Zone 6	Modified Standard	6,257	Modification is no thinning in riparian vegetation
6F	Zone 6	Modified Standard	5,797	Modification is no thinning in riparian vegetation

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
6G	Zone 6	Modified Standard	2,817	Modification is no thinning in riparian vegetation
6H	Zone 6	Modified Standard	4,238	Modification is no thinning in riparian vegetation
6I	Zone 6	Modified Standard	6,843	Modification is no thinning in riparian vegetation
6J	Zone 6	Modified Standard	986	Modification is no thinning in riparian vegetation
6K	Zone 6	Modified Standard	933	Modification is no thinning in riparian vegetation
6L	Zone 6	Modified Standard	6,483	Modification is no thinning in riparian vegetation
6M	Zone 6	Modified Standard	430	Modification is no thinning in riparian vegetation
6N	Zone 6	Modified Standard	2,185	Modification is no thinning in riparian vegetation
6O	Zone 6	Modified Standard	5,156	Modification is no thinning in riparian vegetation
6P	Zone 6	Modified Standard	4,314	Modification is no thinning in riparian vegetation
6Q	Zone 6	Modified Standard	669	Modification is no thinning in riparian vegetation
6R	Zone 6	Modified Standard	1,845	Modification is no thinning in riparian vegetation
6S	Zone 6	Modified Standard	123	Modification is no thinning in riparian vegetation
6T	Zone 6	Modified Standard	2,753	Modification is no thinning in riparian vegetation
6U	Zone 6	Modified Standard	729	Modification is no thinning in riparian vegetation
6V	Zone 6	Modified Standard	543	Modification is no thinning in riparian vegetation
6W	Zone 6	Modified Standard	57	Modification is no thinning in riparian vegetation
7A	Zone 7	Modified Standard	1,451	Modification is to remove all nonnative vegetation.
8A	Zone 8	Unmodified Standard	7,908	**Zone 8:** Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
8B	Zone 8	Unmodified Standard	7,226	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
8C	Zone 8	Unmodified Standard	7,081	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
8D	Zone 8	Unmodified Standard	7,088	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
9A	Zone 8/ Zone 9	Unmodified Standard/ Modified Aggregation	6,717	Zone 8: Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees **Zone 9:** Modification is to reduce treatment of trees near aggregation areas, to prevent wind exposure.
9B	Zone 9	Modified Aggregation	7,175	Modification is to reduce treatment of trees near aggregation areas, to prevent wind exposure.

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
9C	Zone 9	Modified Aggregation	7,025	Modification is to reduce treatment of trees near aggregation areas, to prevent wind exposure.
9D	Zone 9	Modified Aggregation	6,875	Modification is to reduce treatment of trees near aggregation areas, to prevent wind exposure.
9E	Zone 9	Modified Aggregation	5,780	Modification is to reduce treatment of trees near aggregation areas, to prevent wind exposure.
9F	Zone 9	Modified Aggregation	5,609	Modification is to reduce treatment of trees near aggregation areas, to prevent wind exposure.
9G	Zone 9	Modified Aggregation	6,840	Modification is to reduce treatment of trees near aggregation areas, to prevent wind exposure.
9H	Zone 9	Modified Aggregation	6,329	Modification is to reduce treatment of trees near aggregation areas, to prevent wind exposure.
9I	Zone 9	Modified Aggregation	7,043	Modification is to reduce treatment of trees near aggregation areas, to prevent wind exposure.
10A	Zone 9/ Zone 10	Modified Aggregation/ Unmodified Standard	9,582	**Zone 9:** Modification is to reduce treatment of trees near aggregation areas, to prevent wind exposure. **Zone 10:** Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
10B	Zone 10	Unmodified Standard	7,374	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
10C	Zone 10	Unmodified Standard	7,106	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
10D	Zone 10	Unmodified Standard	5,354	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
11A	Zone 11 - East of existing SCE ROW	Modified Standard	1,188	Modification is to adjust treatment for vegetation east of trail, existing vegetation is largely landscaped with non-natives.
11B	Zone 11 - East of existing SCE ROW	Modified Standard	1,027	Modification is to adjust treatment for vegetation east of trail, existing vegetation is largely landscaped with non-natives.
11C	Zone 11 - East of existing SCE ROW	Modified Standard	869	Modification is to adjust treatment for vegetation east of trail, existing vegetation is largely landscaped with non-natives.
11D	Zone 11 - East of existing SCE ROW	Modified Standard	709	Modification is to adjust treatment for vegetation east of trail, existing vegetation is largely landscaped with non-natives.
11E	Zone 11 - East of existing SCE ROW	Modified Standard	780	Modification is to adjust treatment for vegetation east of trail, existing vegetation is largely landscaped with non-natives.
11F	Zone 11 - East of existing SCE ROW	Modified Standard	390	Modification is to adjust treatment for vegetation east of trail, existing vegetation is largely landscaped with non-natives.
11G	Zone 11 - East of existing SCE ROW	Modified Standard	229	Modification is to adjust treatment for vegetation east of trail, existing vegetation is largely landscaped with non-natives.

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
12A	Zone 11 - East of existing SCE ROW / Zone 12	Unmodified Standard	6,737	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
12B	Zone 12	Unmodified Standard	6,546	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
12C	Zone 12/ Zone 13	Unmodified Standard	2,596	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees.
13A	Zone 13	Modified Standard	5,853	Modification is to keep native grasses, no mowing.
13B	Zone 13	Modified Standard	7,307	Modification is to keep native grasses, no mowing.
14A	Zone 14	Modified Standard	7,291	Modification is to remove fire prone landscaped non-native vegetation.
14B	Zone 14	Modified Standard	7,659	Modification is to remove fire prone landscaped non-native vegetation
15A	Zone 14/ Zone 15	Modified Standard/Modified Standard	6,977	Modification is to remove fire prone landscaped non-native vegetation.
15B	Zone 15	Modified Standard	5,289	Modification is to remove fire prone landscaped non-native vegetation.
15C	Zone 15	Modified Standard	4,220	Modification is to remove fire prone landscaped non-native vegetation.
15D	Zone 15	Modified Standard	2,883	Modification is to remove fire prone landscaped non-native vegetation.

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
15E	Zone 15	Modified Standard	5,457	Modification is to remove fire prone landscaped non-native vegetation.
16A	Zone 16	Unmodified Standard	10,066	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
16B	Zone 16	Unmodified Standard	1,937	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
16C	Zone 16	Unmodified Standard	7,057	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
16D	Zone 16	Unmodified Standard	7,648	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
16E	Zone 16	Unmodified Standard	7,031	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
16F	Zone 16	Unmodified Standard	6,342	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
17A	Zone 16/ Zone 17	Unmodified Standard/Modified Aggregation	6,287	Zone 16: Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees **Zone 17:** Modification to be determined based on wind model data and with monarch butterfly specialist at the time of treatment. Some trees to be retained for wind protection of aggregation site.
17B	Zone 17	Modified Aggregation	4,411	Modification to be determined based on wind model data and with monarch butterfly specialist at the time of treatment. Some trees to be retained for wind protection of aggregation site.
17C	Zone 17	Modified Aggregation	4,006	Modification to be determined based on wind model data and with monarch butterfly specialist at the time of treatment. Some trees to be retained for wind protection of aggregation site.

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
17D	Zone 17	Modified Aggregation	4,664	Modification to be determined based on wind model data and with monarch butterfly specialist at the time of treatment. Some trees to be retained for wind protection of aggregation site.
18A	Zone 18	Modified Standard	7,097	Modification is to limit pruning of native trees and leave saplings in place. Standard treatment for nonnative vegetation.
19A	Zone 19	Unmodified Standard	6,074	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
19B	Zone 19	Unmodified Standard	2,624	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
19C	Zone 19	Unmodified Standard	1,023	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
19D	Zone 19	Unmodified Standard	6,143	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
19E	Zone 19	Unmodified Standard	7,521	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
19F	Zone 19	Unmodified Standard	7,017	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
19G	Zone 19	Unmodified Standard	5,294	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
20A	Zone 20	Unmodified Standard	5,547	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
20B	Zone 20	Unmodified Standard	7,352	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
20C	Zone 20/ Zone 21	Unmodified Standard/ Unmodified Standard	7,716	Zone 20 and 21: Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
21A	Zone 21	Modified Standard	4,322	Modification to be determined in collaboration with the Audubon Society due to high value habitat for migrating birds.
21B	Zone 21	Modified Standard	8,845	Modification to be determined in collaboration with the Audubon Society due to high value habitat for migrating birds.
21C	Zone 21	Modified Standard	6,156	Modification to be determined in collaboration with the Audubon Society due to high value habitat for migrating birds.
22A	Zone 22	Modified Standard/ Unmodified Standard	6,573	Zone 21 and Zone 22: Modification to be determined in collaboration with the Audubon Society due to high value habitat for migrating birds Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
22B	Zone 22	Unmodified Standard	6,874	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
23A	Zone 22/ Zone 23	Unmodified Standard/ Unmodified Aggregation	8,350	Zone 22: Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees **Zone 23:** Within 100 feet of monarch aggregation sites: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 3 feet Trim and thin unhealthy trees Reduce fuel ladders and intermittent patches of shrubs and small trees in openings
23B	Zone 23	Unmodified Aggregation	8,972	Within 100 feet of monarch aggregation sites: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 3 feet Trim and thin unhealthy trees Reduce fuel ladders and intermittent patches of shrubs and small trees in openings
Zone A	Zone A	Modified Standard	21,225	Modification is to leave riparian intact, no thinning of trees.
Zone B	Zone B	Modified Aggregation	282,126	Modification is to leave wind break of trees on eastern and western boundaries.
Zone C	Zone C	Modified Standard	28,254	Modification is to leave trees in parking lot planters as is.

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
	Zone D	Modified Aggregation	194,610	Modification is to include creation of designed aggregation sites while protecting existing aggregation sites.
	Zone E	Modified Standard	198,245	Modification is to leave wind break of trees protecting Zone F.
	Zone F	Modified Aggregation	78,263	Modification is to include creation of designed aggregation sites.
	Zone G	Modified Aggregation	109,275	Modification is to leave riparian vegetation intact, no thinning of native trees, and leave wind break of trees protecting Zone F.
	Zone H	Modified Standard	23,156	Modification is to leave wind break of trees.
	Zone I	Modified Aggregation	147,160	Modification is to leave wind break of trees on southern and western boundaries, and leave riparian vegetation intact.
	Zone J	Modified Aggregation	167,515	Modification to include mowing with consideration and avoidance of native grasses (bunching and not bunching)
	Zone K	Modified Aggregation	297,902	Modification to include cleanup of dead/browning vegetation. Eucalyptus trees to be left in place unless infested with beetles. Treatment of fuels (mostly grasses) on grove margin.
	Zone L	Modified Standard	202,512	Modification is to include felling a high fraction of standing dead eucalyptus trees, limbing down trees, and generally leaving large trunks in place.
	Zone M	Modified Aggregation	388,949	Modification is to leave riparian vegetation intact, no thinning of native trees.
	Zone N	Modified Aggregation	271,234	Modification is to leave riparian vegetation intact, no tree thinning, and incorporate protection of avian habitat at Coronado Seep.
	Zone O	Unmodified Standard	56,634	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
	Zone P	Modified Standard	146,288	Modification is no thinning of riparian trees and no disturbance to coastal sage scrub vegetation.

Grid Number	Zone	Treatment[1]	Square Feet	Public Notes
	Zone Q	Unmodified Standard	170,051	Within 100 feet of structures: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 2 feet Trim and thin unhealthy trees Reduce fuel ladders by pruning lower branches 6 ft up, or lower 1/3 of tree height on smaller trees
	Zone R	Unmodified Aggregation	186,189	Within 100 feet of monarch aggregation sites: Mow grasses Clear flammable materials from the ground Reduce brush/scrub height to 3 feet Trim and thin unhealthy trees Reduce fuel ladders and intermittent patches of shrubs and small trees in openings.

[1] Both Modified and Unmodified Aggregation treatments retain the trees that provide wind protection to the aggregation sites, vegetation removal is focused on dead and downed trees and vegetation zero to six feet in height.

Attachment 7

Status and Compliance with Conditions from NOI Permit Application No. 4-18-1223

Conditions of Approval from NOI Permit Application No. 4-18-1223

Special Conditions	III. Special Conditions	Completed/In Progress	To Be Completed During Project Activities
Special Condition One	**1. Final Implementation Plan**		
Prepare and **submit a Final Implementation Plan** that clearly identifies:1) interim and final success criteria and performance standards consistent with achieving the identified restoration plan goals and objectives, 2) measures to be implemented if success criteria are not met and; 3) long-term adaptive management of the restored area.	1.A Submit, for the review and written approval of the Executive Director, a **final Ellwood Mesa/Sperling Preserve Open Space 2018 Implementation Plan for the restoration** of the Ellwood North aggregation sites. See Staff Report for details.	The MBHMP IP - Phase 1 is being prepared by the City and encompasses the Ellwood North aggregation site and includes enhancement details. It will be submitted to the Coastal Commission in June/July 2023. The MBHMP IP Phase 2 will be submitted in 2024/2025.	
	1.A. 3. **Submit a Final Monitoring Plan** with success (performance) criteria and the qualitative and quantitative methods for measuring success for all species planted. See Staff Report for details.	The MBHMP IP - Phase 1 is being prepared by the City and includes a final monitoring plan.	
	1.A.4. **Submit two full-size sets of the Final Planting Plan**: extent and scope of enhancement activities, the locations of existing living vegetation within the enhancement area, the locations of all new plantings, water tank and staging areas.	The MBHMP IP - Phase 1 is being prepared by the City and includes a Final Planting Plan and required details.	

Special Condition Two	**2. Sensitive Species Surveys**		
Retain the services of a qualified biologist or environmental resources specialist to conduct sensitive species surveys (including birds and other terrestrial species) and monitor project operations.	2. Retain the services of a environmental resources specialist with appropriate qualifications acceptable to the Executive Director to conduct surveys and monitoring. See Staff Report for details. 2. A. **Submit the name and qualifications of the environmental resources specialist**, for the review and approval of the Executive Director.	Services have been retained/contracted and include: Qualified Biologists Certified Arborists Monarch butterfly experts	
	2.A.1**. Conduct sensitive species surveys** no more than two weeks before any project enhancement activities to detect any active sensitive species, reproductive behavior, and active nests within 500 feet of the project site. Nest surveys must continue on a monthly basis throughout the nesting season or until the project is completed		Sensitive species surveys will be conducted Nesting bird surveys will be conducted
	2.A.5. **Environmental resources specialist shall monitor** for/identify any sensitive species/breeding behavior/nests active within 300 feet (500 feet for raptors/owls) of any project enhancement activities. See Staff Report for details.		Monitoring will be conducted for active nest
Special Condition Three	**3. Construction Responsibilities**		

	See Staff Report for Requirements		All construction responsibilities will be met during project actitivities
Special Condition Four	**4. Approval of Comprehensive Management Plan**		
Submit a complete regular Coastal Development Permit Application for a comprehensive plan to manage and restore **all the aggregation sites within Ellwood Mesa.**	4. **Submit a complete regular Coastal Development Permit Application** for the comprehensive plan to manage and restore the aggregation sites within Ellwood Mesa.	The MBHMP IP - Phase 1 is being prepared by the City and will be submitted to the Coastal Commission in June/July 2023. The MBHMP IP Phase 2 will be submitted in 2024/2025.	
Special Condition Five	**5. Public Access Plan**		
Submit a public access plan, for review by the Executive Director, that includes a description of the methods by which safe public access to and around the project area shall be maintained during all project operations, and also requires the applicant to post the site with a notice indicating the expected dates of construction and/or temporary closures.	5. **Submit a public access plan**, for review by the Executive Director, that includes a description of the methods by which safe public access to and around the project area shall be maintained during all project operations, and also requires the applicant to post the site with a notice indicating the expected dates of construction and/or temporary closures.	The MBHMP IP - Phase 1 is being prepared by the City and includes an Access Plan.	
Special Condition Six	**6. Informational/Educational Signage**		
Submit an informational/educational signage plan, that describes the location, number, size, and contents of signs to be placed.	6. **Submit an informational/educational signage plan**, that describes the location, number, size, and contents of signs to be placed.	The MBHMP IP - Phase 1 is being prepared by the City and includes a Signage Plan.	

Appendix B

Past Coastal Development Permit Special Conditions Matrix

(See Attachment 7 - Special Conditions from NOI Permit Application 4-18-1223 (above)

Appendix C

Resource Avoidance Program

Ellwood Mesa MBHMP MND - Mitigation Measures, Ellwood North NOI CDP Special Conditions, and MBHMP Phase 1 Environmental Protection Practices

TASK TYPE	MEASURE/CONDITION	MEASURE NO.	DOCUMENT
Pre- Construction Surveys/ Monitoring			
Qualified Biological Monitor	A qualified biological monitor shall be present during all vegetation removal and ground disturbing activities to ensure compliance with all mitigation measures, applicable permit conditions, and any conditions required by federal and State agencies. The monitor shall be responsible for: ☐Ensuring that procedures for verifying compliance with environmental mitigation measures are followed.	BIO-2	MBHMP ISMND MMs/ MMRP
	☐Lines of communication and reporting methods.	BIO-2	MBHMP ISMND MMs/ MMRP
	☐Daily and weekly reporting of compliance.	BIO-2	MBHMP ISMND MMs/ MMRP
	☐Authority to stop work.	BIO-2	MBHMP ISMND MMs/ MMRP
	☐Action to be taken in the event of non-compliance.	BIO-2	MBHMP ISMND MMs/ MMRP
	At least 30 calendar days prior to commencement of any enhancement activities, the applicant shall submit the name and qualifications of the environmental resources specialist, for the review and approval of the Executive Director. The applicant shall have the environmental resources specialist ensure that all project enhancement activities are carried out consistent with the following requirements.	Special Condition 2-Sensitive Species	Ellwood North NOI CDP No. 4-18-1223
Biological Resources Awareness Training	☐MBHMP crew training regarding environmentally sensitive areas.	BIO-2	MBHMP ISMND MMs/ MMRP
	Before any ground-disturbing work or vegetation removal/trimming occurs in the Coverage Area, a qualified biologist shall conduct a mandatory biological resources awareness training for all MBHMP personnel about federally and State listed species that could occur on site. The training shall include the natural history, representative photographs, and legal status of each federally listed species. Proof of personnel attendance shall be kept on file. If new MBHMP personnel are added to the crew, the contractor shall ensure that the new personnel receive the mandatory training before starting work. The subsequent training of personnel can include videotape of the initial training and/or the use of written materials rather than in-person training by a biologist.	BIO-3	MBHMP ISMND MMs/ MMRP
Special-Status Plants	To avoid impacts to special-status plants, periodic rare plant surveys the Coverage Area must occur at least once every five years during a normal rainfall year, following current standard practice for botanical surveys (CDFW 2018), which may require multiple passes to detect or rule out all potential species. If special-status plants remain absent from work areas, no further action is required. If special-status plants are detected in work areas, locations must be mapped, and the plants must be avoided during MBHMP activities. A pre-work training must be provided to the contractor(s) conducting vegetation maintenance activities that identifies special-status plants in and near the work area and locations to be avoided. If weed control is required in areas supporting special-status plants, this work must be conducted with hand tools. Vegetation control in these areas must emphasize control of non-native species, avoid flowering and fruiting seasons of the identified special-status plants to the maximum extent possible, and ensure that activities do not remove special-status plant individuals.	BIO-4	MBHMP ISMND MMs/ MMRP
California Red-legged Frog	Any ground disturbing activities in riparian and wetland habitats shall be conducted when the channel is dry to the maximum extent feasible. Additionally, within seven days prior to start of work, a biologist must conduct a survey prior to any ground disturbance to verify that riparian and wetland areas do not contain ponded water and that no California red-legged frogs are present. If ponded water is present, no work may occur within 50 feet of pools. If suitable resident frog habitat is present or frogs are noted during the surveys, a biological monitor must be present during vegetation clearing and removal activities in riparian and wetland habitats. The biologist will have the authority to stop work and identify areas that must be avoided. Listed species must be fully avoided unless take permits are obtained from the USFWS and/or CDFW. Only handheld tools shall be used. Removal of native vegetation shall be limited to dead, damaged, and diseased material.	BIO-5	MBHMP ISMND MMs/ MMRP
Nesting Bird Survey	**Survey.** To the maximum extent feasible, tree trimming activities must occur in September to ensure that raptor nests and monarchs are not active in the work area. Surveys for nesting birds and raptors are required prior to any ground disturbance or vegetation removal work conducted in the nesting season, defined to be February 1 to September 15. Nesting bird and raptor surveys must be conducted during the time of day when bird species are active and be of sufficient duration to reliably conclude presence/absence of nesting birds and raptors in the 300-foot buffer.	BIO-6	MBHMP ISMND MMs/ MMRP
	Nest Flagging. If active nests of species protected by CFG Code 3503 or the MBTA Migratory Bird Treaty Act are found within 300 feet of the Coverage Area, their locations must be flagged and then mapped onto an aerial photograph of the Coverage Area at a scale no less than 1" =200' and/or recorded with the use of a GPS unit.	BIO-6	MBHMP ISMND MMs/ MMRP
	Active Raptor Nest. If active raptor nests are detected, the map will include topographic lines, parcel boundaries, adjacent roads, known historical nests for protected nesting species, and known roosting or foraging areas, as required by Conservation Element Policy 8.3 of the Goleta General Plan. If feasible, the buffer must be 300 feet in compliance with Conservation Element Policy CE 8.4 of the Goleta General Plan. If the 300-foot buffer is infeasible, the City approved biologist may reduce the buffer distance as appropriate, dependent on the species and the proposed work activities.	BIO-6	MBHMP ISMND MMs/ MMRP
	Active Non-raptor Nest. If any active non-raptor bird nests are found, a suitable buffer area (varying from 25-300 feet), depending on the species, must be established by the City-approved biologist. No ground disturbance can occur in the buffer until the City-approved biologist confirms that the breeding/nesting is completed, and all the young have fledged. Alternately, a City-approved biologist must monitor the active nest full-time during MBHMP activities in the buffer to ensure MBHMP activities are not indirectly impacting protected nesting birds and raptors.	BIO-6	MBHMP ISMND MMs/ MMRP

Ellwood Mesa MBHMP MND - Mitigation Measures, Ellwood North NOI CDP Special Conditions, and MBHMP Phase 1 Environmental Protection Practices

TASK TYPE	MEASURE/CONDITION	MEASURE NO.	DOCUMENT
Sensitive Species Survey & Reporting	**Survey.** The environmental resources specialist shall conduct sensitive species surveys no more than two weeks before any project enhancement activities to detect any active sensitive species, reproductive behavior, and active nests within 500 feet of the project site. Follow-up surveys must be conducted 3 calendar days prior to the initiation of enhancement activities and nest surveys must continue on a monthly basis throughout the nesting season or until the project is completed, whichever comes first. The environmental resources specialist shall be onsite to observe/identify any sensitive species/breeding behavior/nests active within 300 feet (500 feet for raptors/owls) of any project enhancement activities.	Special Condition 2- Sensitive Species	Ellwood North NOI CDP No. 4-18-1223
	Sensitive Species. In the event that any sensitive species are present in the project area but do not exhibit reproductive behavior and are not within the estimated breeding/reproductive cycle of the subject species, the environmental resources specialist shall implement a resource avoidance program with sufficient buffer areas to ensure adverse impacts to such resources are avoided. The applicant shall also immediately notify the Executive Director of the presence of such species and which of the above actions are being taken. If the presence of any such sensitive species requires review by the United States Fish and Wildlife Service and/or the California Fish and Wildlife Service, then no development activities shall be allowed or continue until any such review and authorizations to proceed are received, subject to the approval of the Executive Director.	Special Condition 2- Sensitive Species	Ellwood North NOI CDP No. 4-18-1223
	Active T/E Nest. If an active nest of a federally or state-listed threatened or endangered species, bird species of special concern, or any species of raptor or heron is found, the applicant shall notify the appropriate State and Federal agencies within 24 hours, and shall develop an appropriate action specific to each incident. The applicant shall notify the California Coastal Commission in writing by facsimile or e-mail within 24 hours and consult with the Commission regarding determinations of State and Federal agencies.	Special Condition 2- Sensitive Species	Ellwood North NOI CDP No. 4-18-1223
	Active T/E Nest. If an active nest of any federally or state listed threatened or endangered species, species of special concern, or other sensitive species is found within 300 feet of enhancement activities (500 feet for raptors), the applicant shall retain the services of an environmental resources specialist with experience conducting bird and noise surveys, to monitor bird behavior and construction noise levels. The environmental resources specialist shall be present at all relevant construction meetings and during all significant enhancement activities (those with potential noise impacts) to ensure that nesting birds are not disturbed by construction-related noise. The environmental resources specialist shall monitor birds and noise every day at the beginning of the project and during all periods of significant enhancement activities. Activities may occur only if construction noise levels are at or below a peak of 65 dB at the nest(s) site. If construction noise exceeds a peak level of 65 dB at the nest(s) site, sound mitigation measures such as sound shields, blankets around smaller equipment, use of mufflers, and minimizing the use of back-up alarms shall be employed. If these sound mitigation measures do not reduce noise levels, enhancement activities within 300 ft. (500 ft. for raptors) of the nesting trees/areas shall cease and shall not recommence until either new sound mitigation can be employed or nesting is complete.	Special Condition 2- Sensitive Species	Ellwood North NOI CDP No. 4-18-1223
	Monitoring/ Supplemental Program. The environmental resources specialist shall be present during all enhancement activities. The environmental resources specialist shall require the applicant to cease work within the area in question should any breach in permit compliance occur, or if any unforeseen sensitive habitat issues arise. If significant impacts or damage occur to sensitive habitats or to wildlife species, the applicant shall be required to submit a supplemental program to adequately mitigate such impacts. The supplemental program shall be submitted to the Executive Director for review and approval.	Special Condition 2- Sensitive Species	Ellwood North NOI CDP No. 4-18-1223
	For the purpose of this special condition, "sensitive species" shall be taken to mean any special-status wildlife species. Special-Status Species are species listed as Endangered, Threatened, or Rare under the federal or state Endangered Species Acts, Candidate Species, California Fully Protected Species, and, pursuant to CEQA Guidelines Section 15380(d), all other species tracked by the California Natural Diversity Database (CNDDB), which are considered by the California Department of Fish and Wildlife to be those species of greatest conservation concern, and locally important species including raptors, herons, and songbirds.	Special Condition 2- Sensitive Species	Ellwood North NOI CDP No. 4-18-1223
White-Tailed Kite and Special Status Raptor Buffer/ Avoidance	Prior to the start of construction and required nesting bird surveys, a qualified avian biologist will review citizen database records including the Santa Barbara Audubon Society (SBAS) Santa Barbara Breeding Bird Study (SBAS 2023), iNaturalist Observations (iNaturalist 2023), and eBird Online Database (eBird 2023) for current and historic records of raptor nesting/breeding activity. If white-tailed kites are observed to be nesting within the Study Area, a minimum 500- foot buffer will be established around the nest site and the City will consult with CDFW to determine appropriate actions. In consultation with CDFW, a qualified biologist will determine passive activities (i.e. foot traffic and restoration/trail management or tree planting) that will be allowed within the buffer and construction activities (ground disturbance and operation of heavy equipment) that will be restricted within the buffer until a qualified biologist determines that the young have fledged and are no longer dependent on the nest site.	Environmental Protection Practices	MBHMP Phase 1 Implementation BRA
Construction Responsibilities	Prior to the commencement of any enhancement activities, the limits of the work areas and staging areas shall be delineated in cooperation with a qualified biologist, limiting the potential area affected by construction and ensuring that all environmentally sensitive habitats adjacent to enhancement areas are avoided during construction. All vehicles and equipment shall be restricted to pre-established work areas and haul routes and to established or designated staging areas. Clearing shall be limited to the minimal footprint necessary and for the shortest time necessary to avoid impact to ESHA.	Special Condition 3- Sensitive Species	Ellwood North NOI CDP No. 4-18-1223
Riparian/ Wetland Areas	Impacts to vernal pools, wetlands, and streambeds shall be avoided to the maximum extent practicable, unless they are affected for the purpose of habitat enhancement. If avoidance is not feasible, the City shall acquire and comply with regulatory permits for any vegetation trimming, removal, or ground disturbing activities to be completed in potentially jurisdictional areas including in the vicinity of Devereux Creek or other riparian/wetland habitats in the Coverage Area. The CDFW shall be notified and a Streambed Alteration Agreement shall be obtained for any activities that will result in impacts to a streambed or riparian vegetation. In addition, authorizations from the U.S. Army Corps of Engineers and Central Coast Regional Water Quality Control Board (RWCB) will be secured for any activities involving discharges of fill material into a wetland or streambed.	BIO-9	MBHMP ISMND MMs/ MMRP

Ellwood Mesa MBHMP MND - Mitigation Measures, Ellwood North NOI CDP Special Conditions, and MBHMP Phase 1 Environmental Protection Practices

TASK TYPE	MEASURE/CONDITION	MEASURE NO.	DOCUMENT
Pre- construction Bat Survey	If construction activities with a potential to impact roosting bats (i.e. ground disturbance, operation of heavy machinery, vegetation trimming) occurs within maternity season (March 1 to September 30), a qualified bat biologist with education and experience in bat biology and identification will conduct a pre-construction bat survey of any suitable habitat (loose bark, holes, or crevices in suitable roost trees) for occupied roosts. If an active bat roost is found, the qualified biologist shall establish a no-disturbance buffer around the roost. The width of the buffer should be determined by the qualified bat biologist based on species, specific site conditions, and level of disturbance. The buffer should be maintained until the qualified bat biologist determines the roost is no longer occupied.	Environmental Protection Practices	MBHMP Phase 1 Implementation BRA
Woodrat Midden Avoidance/ Removal	Woodrat middens are assumed to be present within the Study Area due to the presence of dense eucalyptus and oak woodlands. The middens likely belong to the common big-eared woodrat (Neotoma macrotis). If an active woodrat midden is found during the pre-construction surveys and/or daily monitoring, a qualified biologist will flag the middens for avoidance during construction activities (ground disturbance, operation of heavy machinery, and vegetation trimming) and a 10-foot avoidance buffer will be established around the midden.	Environmental Protection Practices	MBHMP Phase 1 Implementation BRA
Native Tree Avoidance	The following tree protection measures will be implemented to ensure that impacts to mature native trees are minimized to the extent feasible or avoided, consistent with GP/CLUP Policy CE 9 prior to the start of construction: ☐A certified arborist or qualified biologist in direct communication with the arborist will monitor any ground disturbance or vegetation trimming activities that have a potential to impact mature native trees. ☐A minimum 3-foot-tall snow fencing will be placed around the tree protection zone (TPZ; dripline) in areas of active construction. Fencing should be maintained and in place through the duration of construction activities. ☐Any grading, cut-and fill, trenching, or other ground disturbance should be done slowly using hand tools as feasible to avoid ripping or tearing roots. Roots two inches or more in diameter should be avoided to the extent feasible. ☐Any root pruning should be done at a 90-degree angle with a clean sharp blade, and new cuts should be wetted and covered with absorbent tarp or heavy cloth fabric until backfill is completed. ☐No equipment or materials should be stored within TPZs as feasible. In areas where vehicles or equipment may impact tree roots, steel plates should be installed to protect the root zones as needed. ☐Pruning should be limited to only what is necessary for construction. Inadvertent damage to limbs and branches from equipment should be immediately trimmed with clean blades. All pruning should rely on best practices as determined by the arborist.	Environmental Protection Practices	MBHMP Phase 1 Implementation BRA
During Construction Surveys/ Monitoring			
Daily Construction Monitoring	A qualified biological monitor will be present during all construction activities to ensure compliance with all environmental protection practices, mitigation measures, applicable permit conditions, and any conditions required by federal and State agencies.	Environmental Protection Practices	MBHMP Phase 1 Implementation BRA
Native Habitats	Staging and stockpiling of debris associated with covered activities shall be temporary in nature, the duration of which shall be specified in the annual Implementation Plan prior to commencement of the covered activity. All staging and temporary stockpiling shall be limited to areas outside of riparian habitats, wetlands, vernal pools, native grasslands, and active nest buffers on site. Absolutely no staging and/or stockpiling of any materials shall be allowed in these buffers at any time. Locations to be avoided must be clearly identified with fencing, flagging, rope, or other conspicuous material, and the contractor(s) conducting vegetation maintenance activities must be trained on the limits of work prior to commencing work. Placement of chipped woody materials must avoid impacting native grasslands, riparian, and wetland vegetation. The biological monitor would ensure avoidance for the duration of activities near these areas.	BIO-8	MBHMP ISMND MMs/ MMRP
Archeological and Native American Monitoring	Ground-disturbing activities associated with the MBHMP, including but not limited to trail modification and vegetation and tree removal, shall be observed by a qualified archaeological monitor under the direction of an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for prehistoric archaeology (National Park Service 1983) and a local Native American monitor. If archaeological resources are encountered during ground-disturbing activities, work in the immediate area shall halt and the find evaluated for significance. Archaeological and/or Native American monitoring may be reduced or halted at the discretion of the monitors as warranted by conditions including, but not limited to, negative findings during the first 60 percent of ground disturbance. If monitoring is reduced to spot-checking, spot-checking shall occur when ground-disturbing activities occur in a new location in the Coverage Area or when ground disturbance would extend to depths not previously reached (unless those depths are within bedrock). If archaeological resources are identified during ground disturbance, they shall be left in place and avoided when feasible. If avoidance is infeasible, a Phase II testing and evaluation program shall be implemented. If resources are determined significant or unique through Phase II testing and site avoidance is not possible, appropriate site-specific measures shall be identified in the Phase II evaluation. These measures may include, but would not be limited to, a Phase III data recovery program, capping, or other appropriate actions to be determined by a qualified archaeologist in consultation with the Native American monitor.	CR-1	MBHMP ISMND MMs/ MMRP
Unanticipated Discovery of Paleontological Resources	In the event of an unanticipated discovery of a paleontological resource during ground disturbance from the implementation of the MBHMP, work in the immediate area shall be temporarily halted and a qualified paleontologist (per Society of Vertebrate Paleontology standards 2010) shall be contacted to evaluate the find. If the discovery proves to be significant and cannot be avoided, additional work, such as salvage excavation, may be required to address any significant impacts.	GEO- 1	MBHMP ISMND MMs/ MMRP

Ellwood Mesa MBHMP MND - Mitigation Measures, Ellwood North NOI CDP Special Conditions, and MBHMP Phase 1 Environmental Protection Practices

TASK TYPE	MEASURE/CONDITION	MEASURE NO.	DOCUMENT
Construction Responsibilities	**Trash.** During enhancement activities, all trash and construction debris shall be properly contained, removed from the worksite, and disposed of on a daily basis, and no construction materials shall be stored at the work site overnight. No construction materials, debris, or waste shall be placed or stored where it may enter sensitive habitat, receiving waters or a storm drain, or be subject to wind, rain, or erosion and dispersion. Any debris inadvertently discharged into coastal waters shall be recovered immediately and disposed of consistent with the requirements of this coastal development permit.	Special Condition 3-Sensitive Species	Ellwood North NOI CDP No. 4-18-1223
	Stockpiles. Temporarily stockpiles of excavated sediment/vegetation should be protected with geofabric or other appropriate cover. Permanent stockpiling of excavated material on site shall not be allowed. Vegetation and sediment shall be removed from the site on a regular basis during enhancement activities to prevent the accumulation of sediment and debris on the worksite. Excavated sediment and vegetation shall be stockpiled at designated temporary areas on the project site and be removed to a permitted disposal site within 24 hours of completion of the project.	Special Condition 3-Sensitive Species	Ellwood North NOI CDP No. 4-18-1223
	Equipment Staging. Equipment staging and materials stockpiling areas shall be limited to the locations and sizes specified in the approved final plans. Construction vehicles shall be restricted to designated haul routes. Construction equipment and materials shall be stored only in designated staging and stockpiling areas as depicted on the final plans approved pursuant to Special Condition One (1).	Special Condition 3-Sensitive Species	Ellwood North NOI CDP No. 4-18-1223
	Machinery and Fueling BMPs. Machinery and equipment shall be maintained and washed in confined areas specifically designed to control runoff. Thinners or solvents shall not be discharged into sanitary or storm sewer systems. Any fueling and maintenance of construction equipment shall occur within upland areas outside of environmentally sensitive habitat areas or within designated staging areas. Mechanized heavy equipment and other vehicles used during the enhancement process shall not be refueled or washed within 100 feet of coastal waters.	Special Condition 3-Sensitive Species	Ellwood North NOI CDP No. 4-18-1223
	Hazardous Materials. The discharge of any hazardous materials, including herbicides, into any receiving waters shall be prohibited	Special Condition 3-Sensitive Species	Ellwood North NOI CDP No. 4-18-1223
	BMPs. Best Management Practices (BMPs) and Good Housekeeping Practices (GHPs) designed to prevent spillage and/or runoff of construction-related materials, and to contain sediment or contaminants associated with construction activity, shall be implemented prior to the on-set of such activity. All BMPs shall be maintained in a functional condition throughout the duration of enhancement activities.	Special Condition 3-Sensitive Species	Ellwood North NOI CDP No. 4-18-1223
Dust Control	All covered activities shall incorporate the following dust control measures to reduce potential PM10 emissions during implementation of the MBHMP. ☐Covered activities shall minimize the amount of disturbed area to the extent feasible ☐Onsite vehicle speeds shall be limited to 5 miles per hour or less ☐The City or City-approved contractor shall install gravel pads at the access points to Ellwood Mesa Open Space to prevent tracking of dirt/mud onto public roads ☐After a ground-disturbing activity is completed, the City or City-approved contractor shall treat the disturbed area by watering, revegetating, or spreading soil binders	AQ-1	MBHMP ISMND MMs/ MMRP
Noise Management	Consistent with mitigation recommended in the City's Environmental Thresholds and Guidelines Manual, all noise-generating MBHMP activities, including, but not limited to, tree removal, pruning, trail maintenance, and riparian restoration, shall be limited to between 8:00 a.m. and 5:00 p.m. on weekdays. Noise-generating MBHMP activities shall not occur on weekends or State holidays. If diesel-powered construction equipment is necessary, all such equipment shall have properly maintained sound-control devices, and no equipment shall have an unmuffled exhaust system. Equipment shall not be left to idle while not in use.	N- 1	MBHMP ISMND MMs/ MMRP
General Housekeeping	General requirements that shall be followed by all personnel are listed below. ☐MBHMP-related vehicles shall observe a 5-mile-per-hour speed limit in the Coverage Area at all times ☐MBHMP-related vehicles and equipment shall restrict off-road travel to approved routes, which shall be sited by the City to minimize environmental impacts ☐All food-related trash items, such as wrappers, cans, bottles, and food scraps, generated during implementation of the MBHMP shall be removed from the site daily ☐No deliberate feeding of wildlife shall be allowed ☐No pets shall be allowed on in the Coverage Area ☐No firearms shall be allowed in the Coverage Area ☐If vehicle or equipment maintenance is necessary including refueling of equipment, it shall be performed outside the buffers of ESHAs, bird nests, and monarch aggregation sites ☐Any worker who inadvertently injures or kills a special status species or finds one dead, injured, or entrapped shall immediately report the incident to the biological monitor. The monitor shall immediately notify City of Goleta staff. The City of Goleta shall follow up with written notification to USFWS and CDFW as appropriate, depending on the species. The biological monitor shall also independently notify USFWS of any unanticipated harm to any federally listed endangered species associated with implementation of the MBHMP.	BIO-1	MBHMP ISMND MMs/ MMRP
	☐All observations of federally or State-listed threatened or endangered species shall be recorded on CNDDB field sheets and sent to CDFW by City of Goleta or the biological monitor.	BIO-1	MBHMP ISMND MMs/ MMRP

Ellwood Mesa MBHMP MND - Mitigation Measures, Ellwood North NOI CDP Special Conditions, and MBHMP Phase 1 Environmental Protection Practices

TASK TYPE	MEASURE/CONDITION	MEASURE NO.	DOCUMENT
Erosion Control Best Management Practices HWQ 1	Prior to commencement of any ground-disturbing activities not covered by a SWPPP prepared in compliance with the requirements of the NPDES Construction General Permit, the City or City-authorized contractor shall implement the following erosion control BMPs: ☐Ground-disturbing activities shall occur between April 1 and September 30 to coincide with the dry season and avoid impacts to overwintering monarch butterflies. ☐Silt fencing, straw bales composed of rice straw (that are certified to be free of weed seed), fiber rolls, gravel bags, mulching erosion control blankets, soil stabilizers, and storm drain filters shall be used, in conjunction with other methods to prevent erosion throughout the Coverage Area and siltation of stream channels and detention basins. ☐Temporary berms and sediment basins shall be constructed to avoid unnecessary siltation into local waterways during ground-disturbing activities. ☐Erosion controls which protect and stabilize exposed soils shall be used to prevent movement of materials. Potential erosion control devices include plastic sheeting held down with rocks or sandbags over exposed soils and use of silt fences or berms of hay bales. ☐Frequency of sediment removal from detention basins, locations and types of erosion and sediment control structures, and materials that would be used in the Coverage Area during MBHMP activities shall be specified. ☐All exposed soils present in and around the disturbed area shall be stabilized within seven days of ground disturbance using mulch, geotextile binding fabrics, and/or native, drought-tolerant revegetation, as necessary.	HWQ-1	MBHMP ISMND MMs/ MMRP
Post-Construction Surveys/ Monitoring			
Tree Placement	All replacement trees planted in the Coverage Area must be monitored annually for a minimum period of 5 years. At the end of the 5-year monitoring period, replacement trees shall be inspected by a City approved arborist to determine the successful establishment of the trees. The arborist may extend the monitoring period as deemed necessary. If a replacement tree dies during the monitoring period, it shall be replaced and monitored as required by this mitigation measure.	BIO-7	MBHMP ISMND MMs/ MMRP
Jurisdictional Waters and Coastal Wetland Avoidance/Restoration	Impacts to California Coastal Commission (CCC) coastal wetlands and jurisdictional water resources (regulated by CDFW, USACE, and RWQCB) shall be avoided to the maximum extent practicable, unless they are affected for the purpose of habitat enhancement. The construction of the public access improvements would temporarily impact 0.04-acre of jurisdictional water resources, including 0.01-acre of CCC coastal wetland. All temporary impact areas will be restored in place at a 1:1 ratio. The public access improvements will permanently impact 0.09 acres of jurisdictional water resources, including 0.09 acres of CCC coastal wetland. Permanently impacted areas will be restored at a 3:1 ratio, consistent with policies in the City of Goleta General Plan, totaling 0.28-acres to be restored on site. In addition per the MBHMP, the project will implement seven Natural Resources Management Programs, including: Monarch Butterfly Management, Wildlife Habitat Management, Tree Management, Integrated Pest Management, Habitat Enhancement and Restoration, Invasive Plant Management, and Ecosystem-wide Management Coordination. These plans articulate goals, policies, and actions necessary to maintain and improve the many important natural resources within the MBHMP coverage area. In addition, the MBHMP Phase 1 Implementation Plan (Rincon XX) was developed considering the elements within the CCC Suggestions for Resource Management Plans (CCC 2012).	Environmental Protection Practices	MBHMP Phase 1 Implementation BRA
Chemical Application Control Plan	Prior to commencement of native planting, eucalyptus grove restoration, invasive species eradication, and pest control activities, the City shall prepare and implement a Chemical Application Control Plan to be approved by the City Biologist. The plan shall identify thresholds to determine when fertilizer, herbicide, or pesticide application is necessary, the chemical to be used, and the rate, timing, and placement of application. Pesticides or insecticides shall be used only when necessary to cure a problem and in positively identified pre-emergent situations, not as a preventive measure or as a regular, periodic application. When pesticide or herbicide application is deemed necessary, use of chemical forms that are the least toxic to non-target organisms shall be employed. Only slow release organic fertilizers shall be used in the Coverage Area to minimize the potential for eutrophication in Devereux Creek. The application of fertilizers, herbicides, or pesticides shall be minimized during winter months when the greatest precipitation is likely to occur.	HWQ- 2	MBHMP ISMND MMs/ MMRP

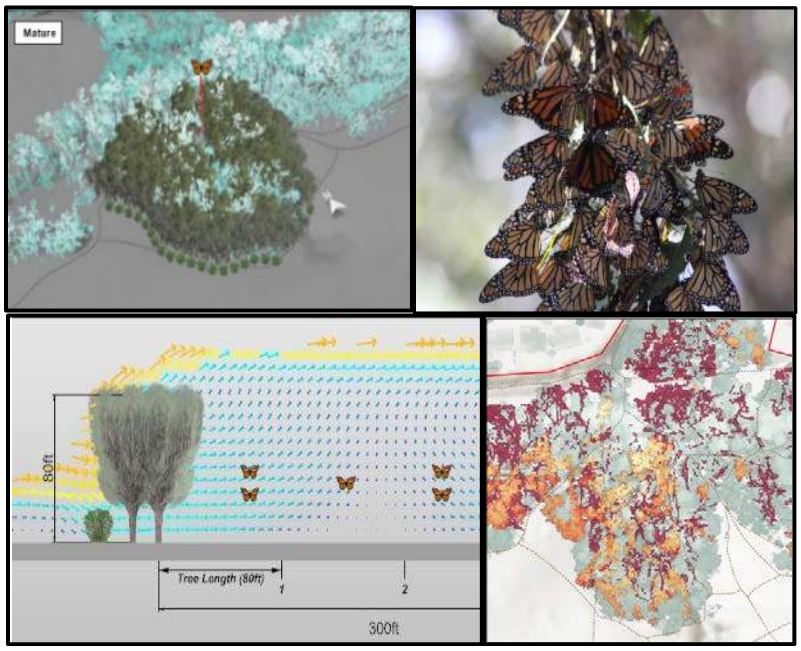
Appendix D

Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Overwintering Habitat Analysis and Recommendations for Restoration Report

Ellwood Mesa/Sperling Preserve Open Space

Monarch Butterfly Overwintering Habitat Analysis and Recommendations For Restoration

Goleta, California



Prepared for

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In memory of

Daniel E. Meade, PhD.

Table of Contents

1 EXECUTIVE SUMMARY 1

2 INTRODUCTION 3
2.1 History of Ellwood Mesa – 1800s to Present 4

3 MONARCH BUTTERFLY OVERWINTERING HABITAT AND BIOLOGY 8
3.1 Features of Overwintering Monarch Habitat 8
3.2 The Importance of Eucalyptus Trees 9
3.3 Tree Species Consideration and Selection 10
3.4 Tree Species for Restoration of Ellwood Mesa 15

4 ELLWOOD MESA BACKGROUND 20
4.1 Monarchs at Ellwood Mesa 20
4.2 Ellwood Mesa Monarchs Relative to the Western Population 20
4.3 Climate and topography at Ellwood Mesa 25
4.4 The 2012 – 2016 Drought: Unprecedented Event 29
4.4.1 Impacts of Drought on the Ellwood Forests 29
4.4.2 Tree Mortality 31
4.4.3 Effects of Tree Mortality on Monarch Habitat 32

5 STATUS OF THE HABITAT AT ELLWOOD MESA 43
5.1 Overview of Methods 43
5.1.1 Direct Observation 43
5.1.2 Hemispherical Photography 44
5.1.3 LiDAR 44
5.1.4 Arboriculture 44
5.1.5 Wind Model 45
5.2 Ellwood Main 46
5.2.1 Historical Conditions at Ellwood Main: Hemiphotos 1990, 1998, and 2021 50
5.2.2 Current Conditions at Ellwood Main 54
5.2.3 Recommendations for Ellwood Main Restoration Actions 56
5.3 Ellwood West 68
5.3.1 Current Conditions at Ellwood West 68
5.3.2 Recommendations for Ellwood West Restoration Actions 69
5.4 Ellwood East 75
5.4.1 Current Conditions at Ellwood East 75
5.4.2 Recommendations for Ellwood East Restoration Actions 77
5.5 Ellwood North 83

5.5.1 Current Conditions at Ellwood North-Central 83
5.5.2 Recommendations for Ellwood North-Central Restoration Actions 84
5.5.3 Current Conditions at Ellwood North-North 88
5.5.4 Recommendations for Ellwood North-North Restoration Actions 89
5.6 Ellwood Ironbark 93
5.6.1 Current Conditions at Ellwood Ironbark 93
5.6.2 Recommendations for the Creation of a New Site at Ellwood Ironbark 94
5.7 Sandpiper 97
5.8 Ocean Meadows 97
5.9 Extent of Forest Death 97
5.10 Wind and Monarch Movement between Ellwood Aggregation Sites 100

6 RECOMMENDATIONS 102
6.1 Perform Deferred Maintenance 102
6.1.1 Strategic Fuel Reduction 102
6.1.2 Prepare Restoration Areas 103
6.2 Restore Aggregation Trees and Wind Protection 104
6.2.1 Restore Aggregation Trees 104
6.2.2 Protect and Support Existing Live Trees 104
6.2.3 Double Wind Row Design 105
6.2.4 Wind Modeling at Ellwood Main 109
6.2.5 Ellwood Main Prescriptions 115
6.2.6 Ellwood West Prescriptions 117
6.2.7 Ellwood North Prescriptions 119
6.2.8 Ellwood East Prescriptions 121
6.2.9 Ellwood Ironbark Prescriptions 121
6.2.10 Sandpiper Prescriptions 121
6.2.11 Ocean Meadows Prescriptions 125

7 DISCUSSION 127

8 REFERENCES 129

9 APPENDICES 134

List of Tables

Table 1. Ranking of Five Eucalyptus species 12
Table 2. Leaf Characteristics of Five Eucalyptus Species 14
Table 3. Volume of Dead standing and Downed Wood by Monarch Site areas 32
Table 4. Description of Ellwood Mesa Canopy Slices 49
Table 5. Major Site Factors at Two Hemiphoto Sites in Cluster Zone for 1990, 1998, and 2021 50
Table 6. Details of 4 Hemiphotos Within Primary Cluster Zone 60
Table 7. Descriptions of Hemiphotos in Figure 21 60
Table 8. Example Hemiphoto Data and Comments at Ellwood West 68
Table 9. Example Hemiphoto Data and Comments at Ellwood East 76
Table 10. Example Hemiphoto Data and Comments at Ellwood North-Central 83
Table 11. Example Hemiphoto Data and Comments at Ellwood North-North 88
Table 12. Example Hemiphoto Data and Comments at Ellwood Ironbark 93
Table 13. Results of 2017 Tree Health Assessment at Ellwood Mesa 98
Table 14. Double Row Growth Chart 105

List of Graphs

Graph 1. Peak monarch population at Ellwood Main from 1989 to 2022 21
Graph 2. Totals of Western Monarch Population, Santa Barbara County Monarch Population, and Monarchs at Ellwood Main in Logarithmic Scale 22
Graph 3. Monarch Counts at Ellwood Mesa, 2015-2016 Season 23
Graph 4. Monarch Counts at Ellwood Mesa, 2021-2022 Season 24
Graph 5. Monarch Counts at Ellwood Mesa, 2022-2023 Season 25
Graph 6. Historical temperature observations from 1993 – 2023 26
Graph 7. Wind observations from 1993 – 2023 27
Graph 8. Annual Precipitation at Ellwood Mesa (Oct. 1 – Sept. 30) 29
Graph 9. Annual Climatic Water Deficit and 4-year Running Average 30
Graph 10. Annual Potential Evapotranspiration 31

List of Figures

Figure 1. General Location of Ellwood Mesa 6
Figure 2. Ellwood Mesa Project Boundary and Monarch Roosting Sites 7
Figure 3. Ellwood Mesa Topography 28
Figure 4. Dead Wood Volume Zones 33
Figure 5. Classified Dead Wood - Overview 34
Figure 6. Classified Dead Wood - Ellwood Main 35
Figure 7. Classified Dead Wood - Ellwood West 36
Figure 8. Classified Dead Wood - Ellwood East 37
Figure 9. Classified Dead Wood - Ellwood North 38
Figure 10. Classified Dead Wood - Ellwood Ironbark 39
Figure 11. Classified Dead Wood - Sandpiper 40
Figure 12. Classified Dead Wood - Ocean Meadows 41
Figure 13. Monarch Observations - Ellwood Main 47
Figure 14. A Profile Through Ellwood Main: Anatomy of a Major Aggregation Site 48
Figure 15. Hemiphotos from Three Years Between 1990 and 2021 at 60 and 70 meters into the Ellwood Main Grove 52
Figure 16. Graphic Assessment of canopy Gaps Observed in the Hemiphotos Each of Three Years 53
Figure 17. Graphic Assessment of 2021 Directional Exposure at Three Locations 10 Meters Apart in the Cluster Zone 53
Figure 18. Hemiphotos Transect Locations at Ellwood Main 57
Figure 19. Visible sky 58
Figure 20. Directional exposure from 8 directions 59
Figure 21. Ellwood Main Core Hemiphoto Examples 61
Figure 22. Insolation at Hemiphoto Sites 62
Figure 23. Oblique LiDAR View from South with Example Hemiphoto 63
Figure 24. Oblique LiDAR view from southwest with Example Hemiphoto 64
Figure 25. Oblique LiDAR View from N, with Two Hemiphotos along Gully 65
Figure 26. Ellwood Main Vulnerabilities and Recommendations for Restoration 66
Figure 27. Monarch Observations - Ellwood West 67
Figure 28A. Hemiphoto Transect Locations at Ellwood West 70
Figure 28B. Example Hemiphotos at Ellwood West 70
Figure 29. Point maps of hemiphoto results at Ellwood West 71
Figure 30. Oblique View Ellwood West Vulnerabilities 72
Figure 31. Ellwood West Vulnerabilities and Recommendations for restoration 73
Figure 32. Monarch Observations - Ellwood East 74

Figure 33A. Hemiphotos Transect Locations at Ellwood East 78
Figure 33B. Example Hemiphotos for Ellwood East 79
Figure 34. Point maps of hemiphoto results at Ellwood East 80
Figure 35. Ellwood East Vulnerabilities and Recommendations for Restoration 81
Figure 36. Monarch Observations - Ellwood North 82
Figure 37A. Hemiphoto Transect Locations at Ellwood North Central 85
Figure 37B. Example Hemiphotos at Ellwood North Central 85
Figure 38. Point maps of Hemiphoto results at Ellwood North-Central 86
Figure 39. Ellwood North-Central Vulnerabilities and recommendations for Restoration 87
Figure 40A. Hemiphoto Transect Locations at Ellwood North-North 89
Figure 40B. Example Hemiphotos at Ellwood North-North 90
Figure 41. Point Maps of Hemiphoto Results at Ellwood North-North 91
Figure 42. Monarch Observations - Ellwood Ironbark 92
Figure 43A. Hemiphoto Transect Locations at Ellwood Ironbark 95
Figure 43B. Example Hemiphotos at Ellwood Ironbark 95
Figure 44. Point Maps of Hemiphoto Results at Ellwood Ironbark 96
Figure 45. Ellwood Ironbark Recommendations 97
Figure 46. Ideal Double Wind Row Simulation 106
Figure 47. Double Row Layout 107
Figure 48. Double Row Species Models 108
Figure 49. Wind Modeling Scenarios 110
Figure 50. Existing Conditions Classified Stems 111
Figure 51. Above Ground Wind Conditions (30 ft) 112
Figure 52. Wind Conditions within Clustering Area 113
Figure 53. Vertical Profile of Wind Conditions at Viewing Area 114
Figure 54. Prescribed Tree Planting Areas - Ellwood Main 116
Figure 55. Prescribed Tree Planting Areas - Ellwood West 118
Figure 56. Prescribed Tree Planting Areas - Ellwood North 120
Figure 57. Prescribed Tree Planting Areas - Ellwood East 122
Figure 58. Prescribed Tree Planting Areas - Ellwood Ironbark 123
Figure 59. Prescribed Tree Planting Areas – Sandpiper 124
Figure 60. Prescribed Tree Planting Areas - Ocean Meadows 126

List of Appendices

Appendix A. Hemispherical Photography Methods
Appendix B. Wind Modelling Methods
Appendix C. Ellwood Mesa Monarch Counts 2015-2023
Appendix D. Monarch Butterfly Habitat on the Razor's Edge
Appendix E. Ellwood Wind Data
Appendix F. Dead Wood Removal and Monarch Butterfly Habitat Effects
Appendix G. Ellwood Monarch Butterfly Habitat Characterization Report

Cover Page: Samples of the wind modeling scenarios, hemispherical photography, LiDAR tree classification, and monarch photo by Charis van der Heide.

1 EXECUTIVE SUMMARY

The City of Goleta's Ellwood Mesa/Sperling Preserve Open Space (Ellwood Mesa) is an important and widely recognized overwintering site for monarch butterflies (*Danaus plexippus*). Historically, tens and hundreds of thousands of monarch butterflies utilized the forest in the winter months for the overwintering phase of their migration. Recently, tree health and the condition of the overwintering habitat dramatically declined, and monarch roosting sites are threatened. The City of Goleta is committed to restoration and management of the Ellwood Mesa forest for the benefit of monarch butterflies and other sensitive wildlife.

Restoration of monarch overwintering habitat is challenging because of the time it takes for trees to establish and mature. Our common goal for the Ellwood Mesa/Sperling Preserve Open Space is to maximize the probability that monarchs will continue to use the forest of Ellwood Mesa as overwintering grounds for many decades into the future.

Our technical studies provide the basis for implementation of the Monarch Butterfly Habitat Management Plan (MBHMP) relative to monarch overwintering biology and habitat needs. We report on five years of studies. Our work is extensive and rigorous to ensure the best restoration effort can be implemented and to address concerns of community members.

In this report, we present the information about the history of the Ellwood Mesa and the influence of Ellwood Cooper in the original establishment of the eucalyptus tree forest, in Section 2. We summarize the historic land swap that preserved the land of Ellwood Mesa in perpetuity in Section 2.1.

In Section 3, we explore the features of monarch butterfly overwintering habitat and biology. Monarchs roost at overwintering sites along the California coast between October and March. They seek wind-sheltered areas with a precise microclimate to support their survival through the winter and protect them from inclement weather. This habitat often has a dense wall of foliage from ground to canopy top with an open interior that receives a combination of full direct and dappled insolation (sunlight) and full shade. We discuss the importance of eucalyptus trees for the creation of this habitat in Section 3.2.

To select the best trees for our restoration efforts at Ellwood Mesa, we examine and evaluate the characteristics of 29 species of native trees, eucalyptus trees and other non-native trees for their usefulness in monarch overwintering habitat and their usefulness in restoration efforts in Section 3.3. Of the species considered for restoration at Ellwood Mesa, the following species are selected for their individual characteristics to improve the forest for overwintering monarchs: blue gum eucalyptus (*Eucalyptus globulus*), karri (*Eucalyptus diversicolor*), toyon (*Heteromeles arbutifolia*), red ironbark (*Eucalyptus sideroxylon*), coast live oak (*Quercus agrifolia*), western sycamore (*Platanus racemosa*), California bay laurel (*Umbellularia californica*), and Fremont cottonwood (*Populus fremontii*).

The Ellwood Mesa is an urban forest dominated by a mix of eucalyptus species and native trees that holds six monarch overwintering sites. Monarch butterfly surveys and counts have been conducted at the Ellwood Mesa for many years. Peak population counts were recorded for Ellwood Main (Goleta Butterfly Grove) since 1989 and counts for the Western Monarch Thanksgiving Count began in 1997. We present this data in Section 4.1. A graph of total population of western monarchs and the total population in Santa Barbara County alongside the yearly Thanksgiving Counts at Ellwood Main in Section 4.2 shows how monarch numbers at Ellwood Main continue to decline relative to California's population.

In Section 4.4, we discuss the unprecedented drought in California during 2012-2016 and the impact this had on the forest conditions at Ellwood Mesa. Forests exist in a dynamic equilibrium with available site water by growing more in wetter years and dying back in dry periods. A sustainable density of trees at a site result from a dynamic process. During wet periods, Ellwood Mesa experiences high growth and high tree mortality during and after the drought. Loss of trees and canopy cover during the past decade opened Ellwood's overwintering sites to increased wind exposure. At Ellwood Main, the depth of wind shelter diminished with mass mortality, leaving "thin green lines" of remaining live trees that provide very limited wind shelter. The forest's critical redundancy in wind shelter disappeared. We illustrate the dramatic extent of tree mortality in a series of figures with LiDAR (laser imaging, detection, and ranging) data.

In Section 5, we examine the status of monarch butterfly overwintering habitat at Ellwood Mesa and describe the myriad studies and research we conducted to better understand the habitat. We gathered data using direct observations, hemispherical photography, LiDAR, arboriculture and wind modeling. We examined these data for each monarch overwintering location: Ellwood Mesa: Ellwood Main, Ellwood West, Ellwood East, Ellwood North (North and Central), and Ellwood Ironbark. (Detailed analysis for monarch locations at Sandpiper and Ocean Meadows will be included in a later update.) Our site-specific detailed analyses include descriptions of current conditions using observations from hemispherical photographs for the Visible Sky, proportion of potential annual insolation, and monthly potential direct insolation. Each site analysis includes a detailed map of vulnerabilities and a list of our site-specific recommendations for habitat restoration that would reduce identified vulnerabilities and improve habitat conditions.

In Section 6, we present our recommendations for restoration of Ellwood Mesa as a whole. The first step is to perform deferred maintenance of the trees with strategic fuel management, surgically remove dead standing and downed trees, and clear debris to prepare planting areas. The second step is to restore wind protection around monarch roosting locations: protect existing trees (Section 6.2.1), install our recommended double wind row design (Section 6.2.3), and implement planting areas in prescribed areas (Section 6.2.1 to 6.2.10). Section 6.2.4, presents results of the wind modeling on our planting designs at Ellwood Main that illustrate expected success of improved habitat for roosting monarchs.

2 INTRODUCTION

Monarch butterfly migration is an amazing natural phenomenon worthy of conservation. Every year, monarchs migrate in massive numbers to overwintering sites in California to wait out the winter months. Overwintering habitat in coastal California is critical to this migration, providing the genetic source for the following year's migratory population. The City of Goleta's Ellwood Mesa/Sperling Preserve Open Space (Ellwood Mesa) is an important and widely recognized overwintering site where visitors delight at the sight of monarchs aggregating in the eucalyptus groves. Until recently, Ellwood Mesa supported many thousand monarchs that enveloped and draped over eucalyptus branches through winter months. Relatively rapid loss of eucalyptus trees reduced wind buffers and live branches necessary to protect overwintering monarch butterflies.

Overwintering sites are under threat from a variety of sources including urbanization, fire, drought and pests. Historically, Santa Barbara County provides an important area for overwintering monarchs with approximately 25% of the overwintering sites in California. The Ellwood Main (Monarch Butterfly Grove) has attracted some of the highest monarch counts in the state. Unfortunately, the quality of the habitat at Ellwood Main is declining. Before 2012, the monarch population at Ellwood Main fluctuated between 2 – 25% of the western population during the Thanksgiving Count with an average of 11%. Starting in 2013, the Ellwood Main portion of the western monarch population fell to 1% and has fluctuated between 0 – 2.3% with an average of 1% (Xerces Society 2023).

Blue gum (*Eucalyptus globulus*) trees comprise the dominant tree taxon for Ellwood Mesa's monarch butterfly habitat with six historic monarch overwintering locations—Ellwood Main being the largest and most well-known (Figure 1 and Figure 2). By 2016, the blue gums on Ellwood Mesa began dying off in massive numbers. This die-off creates a substantial risk for fire, injury to park goers, and degraded monarch clustering habitat. As roosting and wind buffer trees died, monarchs changed their roosting behavior, and in 2016 monarchs aggregated in higher numbers at sites adjacent to Ellwood Main (see monarch numbers Section 4).

The 2019 Monarch Butterfly Habitat Management Plan for Ellwood Mesa (MBHMP; Rincon) outlines 22 Programs to guide the maintenance and management of the monarch butterfly overwintering habitat on Ellwood Mesa. Recommended actions in the MBHMP include wildfire fuels reduction, tree maintenance, tree and nectar plant installation, and continued monitoring of monarch numbers and habitat health.

In response to public concerns about how the plan would be implemented, we conducted a series of technical and scientific studies of Ellwood Mesa eucalyptus groves. The purpose of the studies is to better understand monarch and wildlife habitat, inform forest management, and address habitat risks associated with proposed actions. Results of these studies detail conditions, past and present, in the Ellwood eucalyptus grove to guide restoration and habitat enhancement for monarch butterflies now and for decades to come.

Monarch restoration is particularly challenging because of the long-time horizons involved with tree growth. This technical report summarizes our investigations and recommendations. Our work is extensive and rigorous to ensure the best restoration effort can be implemented and to address concerns of community members and to facilitate timely recovery of monarch aggregation sites.

Our common goal with advocates of Ellwood Mesa/Sperling Preserve Open Space is to maximize the probability that monarchs will continue to use the forest of Ellwood Mesa as overwintering grounds for many decades into the future. We recognize that this goal is challenging due to tree growth rates, and the time required to provide optimal habitat benefits.

2.1 History of Ellwood Mesa – 1800s to Present

Ellwood Mesa was first planted with 150,000 blue gum eucalyptus trees in 1876 by Ellwood Cooper (Farmer 2013). Since World War II, Ellwood Mesa has been managed as a wood lot by Mr. Cooper, his horticultural successors, and by Goleta residents. Our earliest records of monarch butterflies using Ellwood Mesa as aggregation habitat is from the 1960's. Residents shared stories of riding horses during aggregation season and their horses would be covered by monarch butterflies seeking the nutrient-rich sweat of the horses.

The Ellwood Mesa is now managed by the City of Goleta after an innovative land swap and fund-raising effort in 2005 that preserved the land in perpetuity. The City of Goleta was incorporated in February 2002 and fundraising for the land swap began in January 2003 by the Trust for Public Lands and Friends of Ellwood Coast. The Ellwood-Devereux Coast Open Space and Habitat Management Plan was drafted by August 2003. The Trust for Public Lands achieved the fund-raising goal of $20.4 million in December 2004. Meanwhile, the Comstock Homes and City coastal access parking lot submitted their application to the California Coastal Commission in August 2004 and their application was approved in January 2005, providing opportunity to conserve most of the mesa's monarch butterfly habitat. In February 2005, the City of Goleta closed escrow on the ownership of Ellwood Mesa.

After acquisition, the City of Goleta implemented a hands-off approach to forest management of the eucalyptus grove at Ellwood Mesa. The City adopted the Ellwood-Devereux Coast Open Space and Habitat Management Plan (OSHMP) in 2004 that focused on broad management goals for maintaining the habitat for the monarch butterflies. For years, the City's opinion was that the forest is a natural and self-sustaining habitat that should be left alone.

The City hired Daniel E. Meade, Ph.D. with Althouse & Meade, Inc in 2010 to develop a Monarch Butterfly Habitat Management Plan for Ellwood Mesa (MBHMP). Several revisions were drafted while the needs of the habitat and the status of the trees continued to change and require additional sections in the MBHMP to address the growing list of issues.

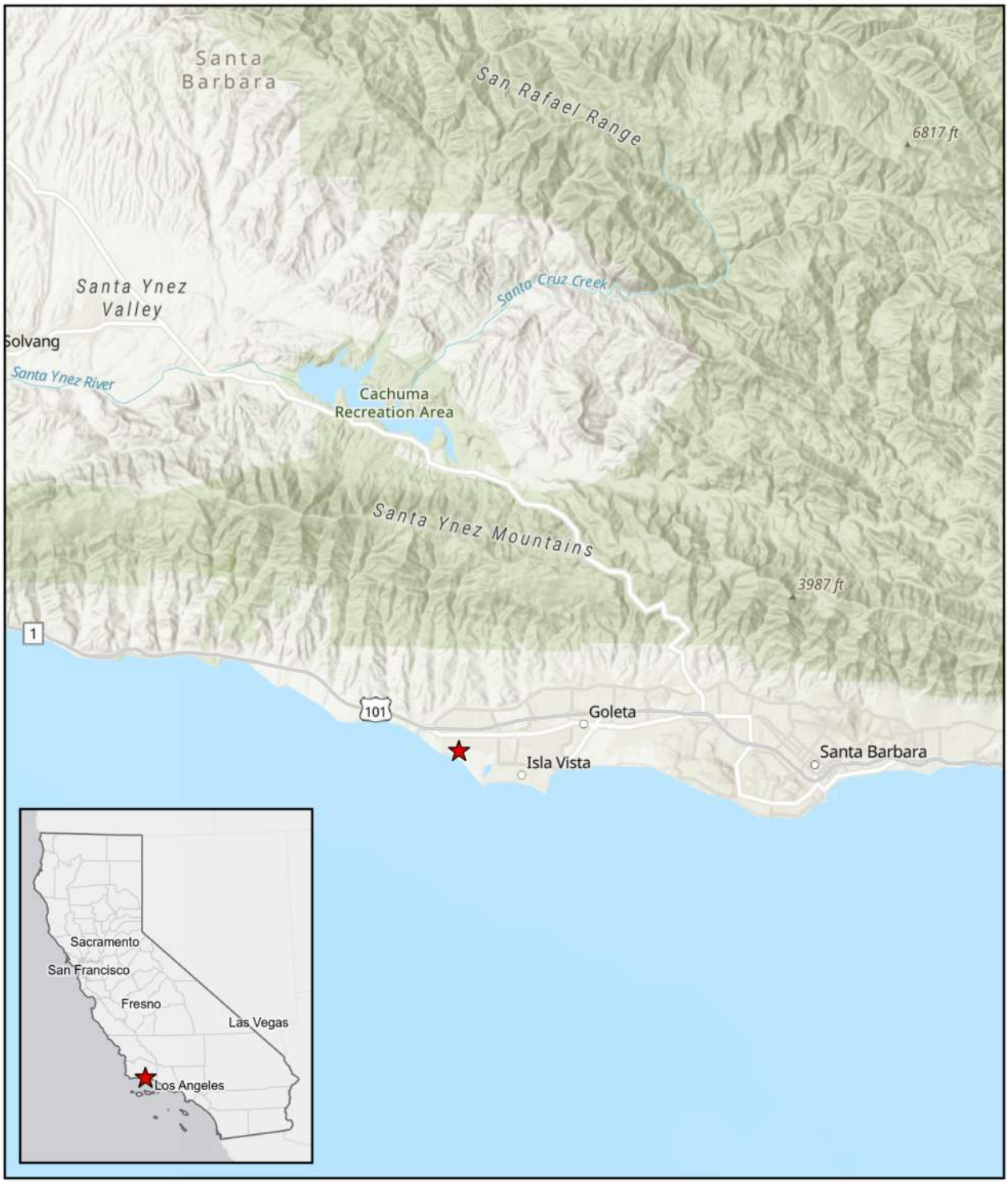
Unfortunately, while the MBHMP was still under development, the region and state of California experienced an extreme 5-year drought (2012-2016). The drought led to widespread forest dieback that degraded monarch butterfly habitat throughout the grove, a condition emphasized by a dramatic decline of monarch population numbers across the six aggregation sites on the mesa.

In response to the declining tree health, a tree health survey was conducted in 2017 which identified over 1,400 standing dead and dying trees in the eucalyptus forest at Ellwood Mesa. The Public Works Director suggested removing these trees immediately with an emergency permit. This proposal was met with harsh public backlash based on concerns about large-scale tree removal in and around the aggregation sites without the MBHMP in place to protect and restore monarch habitat. The City Council responded to community concerns by approving the removal of only those trees that posed a threat to public safety and directing the completion of the MBHMP. The City then prepared several in-depth scientific studies to understand the forest

habitat. The goal of the technical investigations was to understand grove complexity and recommend management actions that would protect and restore forest elements important to monarch butterflies.

The City received a state grant for $3.9 million for the implementation of the MBHMP in 2018. The MBHMP was adopted by the City of Goleta in March 2019. From 2019 until the present, the City is in the process of preparing permits and design plans for the approval from the many agencies with jurisdiction over the Ellwood Mesa land and habitat.

Figure 1. General Location of Ellwood Mesa



Legend

★ Project Location

N

0 5 10 Miles

Goleta Monarch Butterfly Groveat Ellwood Mesa
Map Center: 34.49408°N 119.8682°W
Goleta, Santa Barbara County

USGS Quadrangles: Dos Pueblos Canyon, Goleta

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February 14, 2023 01:25 PM by CDM

Figure 2. Ellwood Mesa Project Boundaries and Monarch Roosting Sites



Legend

MBHMP Coverage Area

Ellwood Mesa Open Space

N

0 500 1,000 Feet

Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42151°N 119.89267°W
Goleta, Santa Barbara County

Imagery Source: USDA NAIP, 06/20/2022

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February 14, 2023 01:26 PM by CDM

3 MONARCH BUTTERFLY OVERWINTERING HABITAT AND BIOLOGY

Overwintering monarchs are butterflies that migrate from inland summer breeding sites in Western North America in search of groves of trees in mild coastal climates where freezes rarely occur for the winter (Pelton et al. 2016, Xerces Society 2017a). Within those groves, they seek wind-sheltered areas which require a dense wall of foliage from ground to canopy top in the windward direction or sheltering hillslopes. Overwintering monarchs prefer microsites that receive a combination of full direct and dappled insolation (sunlight) for basking, but also have shaded areas for resting at cool temperatures. Large areas of deep shade are rarely occupied for long. Forests can be either too open, or too dense for cluster sites (Weiss et al. 1991).

Monarchs adjust their micro-distribution among trees and branches as winds and insolation shift, and will completely abandon sites if the microclimate, primarily wind, exceeds their tolerance. Winds greater than 2 m/s (5.2 mph) at ground level appear to be a limit for cluster sites (Leong 1990, Leong et al. 1991, Leong 2016). When weather is mild, monarchs will use a wide variety of sites and have an expansive micro-distribution. When storms approach, with the strongest winds from the SE, monarchs concentrate in the most SE-wind-sheltered spots. As the front passes, winds shift though S, SW, W, and NW and monarchs may readjust their cluster sites when they can fly again. But strong winds are possible from all directions, including dry N, NE, and E winds, so wind shelter over the entire 360° circle needs to be available somewhere in a site. It takes a delicate balance between dense canopy cover and more open areas to attract and retain monarchs, as they dynamically "crowd source the microclimate."

Dense perimeter trees and/or sheltering topography for wind protection in all directions, with an interior canopy gap for a varied insolation environment, is an ideal habitat configuration. Some viewers fondly consider this a "cathedral" arrangement of forest canopy surrounding a central opening.

3.1 Features of Overwintering Monarch Habitat

Across the monarchs' overwintering range there are similarities in their preferred habitat. Key elements of overwintering monarch habitat include:

1) Location within a mild coastal climate, where freezing is unlikely, and high temperatures are moderate so that monarchs can conserve their fat reserves and remain in reproductive diapause. These conditions are found along the immediate coast from Mendocino to Baja and near San Francisco Bay.
2) Trees on which to form clusters. Monarchs cluster on many tree species ranging from sparse Torrey pines, various eucalyptus species, dense live oaks, to broadleaf sycamores.
3) Most importantly, wind shelter from many, if not all directions. Monarchs will leave sites when the wind at ground level exceeds <2 m/s (5.2 mph, Leong 1990, Leong et al. 1991, Leong 2016). Topography can contribute to wind shelter, in addition to the key role of trees.
4) Canopy gaps that allow sunlight (insolation) into the grove. A mix of full sun for several hours, dappled light, and deeper shade within a small area is ideal.
5) Many sites, but not all, have a "cathedral" structure, with a large empty space above a clearing, often created by a stream or gully surrounded by tall trees. Monarchs can fly

freely in the open interior space and the surrounding trees provide a varied insolation environment within short distances.

A permanent overwintering site supports monarchs through the entire October-March overwintering season and must have all these elements within a compact area to do so. A transitory or autumnal site supports monarchs for a short time at the start of the season (October, November, December). Transitory sites often have several of these elements but are lacking key elements to offer the full spectrum of protection for monarchs through the entire overwintering season.

Monarchs are opportunistic creatures. The migrating population finds overwintering sites by exploring almost every grove of trees along the coast at some point during the migration. Early in the season when weather is mild, butterflies are widely scattered. As storms blow into California, the monarchs remain at sites that provide suitable wind shelter and insolation and leave sites that do not. As they fly from grove to grove, they use the presence of other monarchs as a cue that a site is suitable – they are very skilled at finding each other. The net result is that they dynamically accumulate at the suitable sites and abandon unsuitable sites as seasonal weather proceeds.

The same basic mechanism works within a grove as monarchs choose microsites for clustering. Every cluster is in a dynamic equilibrium between monarchs staying, leaving, and arriving. Monarchs will stay in place if conditions are suitable for their immediate physiological state. Sometimes clusters break up almost instantaneously if a burst of wind occurs during good flight conditions. Other times, a wind shift will cause butterflies to move. High winds can drive monarchs completely from overwintering groves. At night, or if it is too cool and/or cloudy for flight, then high winds can dislodge monarchs, who fall to the ground where they are vulnerable to predation and perhaps freezing. “Sunburst” behavior occurs when sunlight strikes a cluster and many monarchs warm and take flight. Monarchs also take flight to find nectar, water, or mates depending on their physiological needs affected by warm temperatures and the time of the season.

When a monarch decides where to land, the presence of other clustering monarchs is the best cue that it is a good site. The individual decisions of hundreds or thousands of butterflies in an overwintering aggregation create a dynamic micro-distribution as they “crowdsource the microclimate.”

The forest canopy filters outside weather according to its fine scale structure. Trees attenuate wind according to foliage density, and multiple layers of branches and leaves can create calm conditions even during storm winds. But small gaps and wind tunnels can allow wind to exceed critical thresholds in the interior of the grove. The cumulative loss of trees and branches - whether from drought, windfall, pests, disease or human cutting - can open a formerly wind sheltered stand or weaken multiple lines of shelter and increase vulnerability to further loss.

3.2 The Importance of Eucalyptus Trees

Eucalyptus trees are important to monarch overwintering sites because they grow taller than most native trees and provide suitable branching and canopy structure to sustain overwintering monarch aggregations (Meade et al. 2018, Meade et al. 2019, Meade et al. 2023, Griffiths and Villablanca 2015, Longcore, Rich, and Weiss 2020). This technical report supports and

encourages the presence and growth of eucalyptus trees for the benefit of overwintering monarchs.

Blue gum eucalyptus trees were introduced to California in the late 1800's from Tasmania and have since naturalized throughout the state. The intensity of the invasiveness of this species is under much debate. Blue gums can exhibit invasiveness and negative environmental impacts in some areas, but these are poorly represented in scientific journals. Thus, in 2015, California Invasive Plant Council (Cal-IPC) conducted a review of the literature and concluded that the data warranted the blue gum be resigned as "limited" invasive status from the previous "moderate" status (Wolf and Johnson 2014, Wolf and DiTomaso 2016, Cal-IPC 2023). Spread of blue gums is typically limited to expansion along the periphery of an existing population, especially in coastal areas in riparian habitat (Lopez 2015). In this case, limited status represents the widespread distribution of blue gums throughout the state and identifies that significant ecological impacts are limited to specific regions and there is minimal or no impact in other areas (Cal-IPC 2023). Wolf and DiTomaso note that blue gums alter fire regime by accumulation of significantly higher fuel loads than native woodlands (Wolf and DiTomaso 2016, CAL-IPC 2015).

Blue gum resprouts readily when cut, grazed, or burned. It coppices readily from stumps of all sizes and ages when the tree is damaged. If the tree is cut down, lignotubers become active and each bud produces a shoot bearing foliage. Such shoots are commonly known as "sucker growth" or coppice shoots, and a large number are usually formed (Skolmen and Ledig 1990, Bean and Russo 2014).

Contrary to popular opinion, there is no scientific evidence that blue gum eucalyptus trees produce an allelopathic effect to inhibit the growth of understory vegetation (Nelson et al. 2016). Nelson's study conducted at California Polytechnic State University, showed that germination and early seedling growth of five California native plants were not inhibited by blue gum eucalyptus chemical extracts. It is likely that any noticeable decrease of understory vegetation under eucalyptus trees is caused by the accumulation of fallen leaves, bark, and branches, and low rate of decomposition. Many native plants are regularly observed growing and thriving in gaps under eucalyptus tree canopies at monarch overwintering sites throughout the state.

Additionally, eucalyptus trees support a diversity of fauna. A 2015 study of eucalyptus woodlands in central California found that non-native eucalyptus and native oak groves had very similar bird community composition, species richness, and abundance (Fork et al., 2015). The study also reported similar abundance and richness of non-natives in eucalyptus versus oak woodlands and thus no evidence of ''invasional meltdown." Invasional meltdown was initially described in 1999 as that case where invasive species foster the spread and establishment of other non-native and/or invasive species (Simberloff and Von Holle 1999).

3.3 Tree Species Consideration and Selection

Overwintering monarchs have been observed roosting in many different species of trees and shrubs and the species of tree vary across their overwintering range in California (Xerces Society 2023). The paper *Monarch Butterfly Habitat on the Razor's Edge - Native and Non-native Vegetation in California and Occam's Razor* (2023) examined the characteristics of 29 species and their usefulness in monarch overwintering restoration efforts in Santa Barbara County (included in Appendix D).

Of the 130 overwintering sites in Santa Barbara County, 96 are dominated by eucalyptus (2 of which are eucalyptus and non-natives), 10 are mixed eucalyptus and California native trees, 9 sites are eucalyptus with local California native trees, 9 sites are California native trees, and 6 sites are local Santa Barbara County native trees (Meade et al. 2023). Eucalyptus trees are either the primary vegetation, or a significant contributor to the creation of monarch butterfly aggregation sites in Santa Barbara County in 88% percent of known or potential aggregation sites.

The Meade et al. 2023 paper evaluates native trees, eucalyptus species, and several other non-native trees that all have at least one record of monarchs using them as an aggregation tree (Xerces Society 2023). The paper concludes that several species of eucalyptus trees are the reliable choice for restoration when the goal is creating protective monarch butterfly aggregation habitat. Choices for native trees in Santa Barbara County are limited and are not sufficient for forming the typical structure of a monarch butterfly aggregation site with a flight area encircled by substantial, tall trees that filter light, buffer wind and ameliorate temperatures and humidity (Wenner 1987, Leong 1990, Weiss et al. 1991, Calvert 1991, Meade 1999, Leong 2016). The structures of a eucalyptus grove generally provide better protection from wind and rain for a longer period through the overwintering season than sycamore, oak, cottonwood, and willow habitats.

We've given these 29 tree species a rank based on the tree rating analysis that was conducted in the Meade et al. 2023 paper. This ranking system assigns Very High, High and Moderate labels to the tree species in order of their rating. This ranking relates to their usefulness in the restoration efforts of monarch butterfly overwintering habitat, all things considered.

The three highest ranked trees from the evaluation are three eucalyptus tree species and are given a Very High ranking label. These three trees are commonly found at aggregation sites and are naturalized in California: red iron bark gum *(Eucalyptus sideroxylon),* blue gum *(E. globulus),* and river red gum *(E. camaldulensis).* The next grouping of ranked trees are given a High ranking label and are six species that create suitable aggregation habitat for the duration of the overwintering season: lemon scented gum *(Corymbia citriodora),* red flowering gum *(Corymbia ficifolia),* toyon *(Heteromeles arbutifolia),* karri *(E. diversicolor),* Monterey cypress *(Hesperocyparis macrocarpa),* and sugar gum *(Eucalyptus cladocalyx).* All the trees with lower ratings are given the ranking label of Moderate and would provide additional habitat benefits by increasing diversity and wind shelter to an aggregation grove in association with the nine higher ranked species: Bishop pine *(Pinus muricata),* silver wattle *(Acacia dealbata),* Canary Island pine *(Pinus canariensis),* holly-leaf cherry *(Prunus ilicifolia* ssp. *ilicifolia),* Monterey pine *(Pinus radiata),* Torrey pine *(Pinus torreyana ssp. torreyana),* coast redwood *(Sequoia sempervirens),* evergreen ash *(Fraxinus uhdei),* cork oak *(Quercus suber),* blackwood *(Acacia melanoxylon),* California bay laurel *(Umbellularia californica),* western sycamore *(Platanus racemosa),* Fremont cottonwood *(Populus fremontii),* coast live oak *(Quercus agrifolia),* grand fir *(Abies grandis),* arroyo willow *(Salix lasiolepis),* Douglas fir *(Pseudotsuga menziesii),* monkey-puzzle *(Araucaria Araucana),* dawn redwood *(Metasequoia glyptostroboides),* and black cottonwood *(Populus trichocarpa).*

We explore the characteristics of five *Eucalyptus* species in Table 1 and list their rank (from Section 3.3), propensity to spread into wildlands (Invasiveness), distribution in Australia from tropical to Mediterranean (Natural Habitat), and on their height. The species include red river gum (*E. camaldulensis*), sugar gum (*E. cladocalyx*), karri (*E. diversicolor*), blue gum *(E.*

globulus), and red ironbark gum (*E. sideroxylon*). In Table 2, we list the leaf characteristics of these same five eucalyptus species.

TABLE 1. RANKING OF FIVE EUCALYPTUS SPECIES

Eucalyptus Species	Rank	Invasive/ Naturalized Lignotuber[1]	Natural Habitat	Height & Leaves
Red River Gum ***(E. camaldulensis)***  (Photo UFEI 2023)	Very High	Invasive. Lignotuber sometimes present	Near seasonal water	<25 m
Sugar Gum ***(E. cladocalyx)***  (photo EUCID 2020)	High	Naturalized. No lignotuber—has epicormic buds[2] on stem	Mediterranean (S. Australia)	10 – 20 m

[1] Lignotuber is a basal woody swelling that holds a large number of dormant buds in a protected position along with carbohydrates and other nutrients (Bortoloto et al. 2020).

[2] Epicormic bud will form shoots arising spontaneously from adventitious or dormant buds on stems or branches of woody plants, often following exposure to increased light levels or fire (Helms 1998).

Eucalyptus Species	Rank	Invasive/ Naturalized Lignotuber[1]	Natural Habitat	Height & Leaves
Karri *(E. diversicolor)*  (Photo UFEI 2023)	High	Not Naturalized. No lignotuber—has epicormic buds on stem	Mediterranean (SW of Western Australia)	90 m
Blue Gum (E. globulus)  (Photo UFEI 2023)	Very high	Very naturalized. Forms lignotuber.	Southeastern Australia with uniform climate/rainfall	<60 m
Red Ironbark Gum *(E. sideroxylon)*  (Photo UFEI 2023)	Very high	Reproduces occasionally (uncommon naturalized). Forms lignotuber.	Eastern Australia (wet summer)	7 – 25 m

TABLE 2. LEAF CHARACTERISTICS OF FIVE EUCALYPTUS SPECIES

Eucalyptus Species	Leaf Characteristics (EUCLID 2020)
Red River Gum ***(E. camaldulensis)***  © N Parks Flora&FaunaWeb	alternate, petiole 0.7-3 cm long; blade lanceolate or broadly so or falcate, 8-23 cm long, 1-4.2 cm wide, base tapering to petiole, concolorous, dull, bluish or blue-green, rarely green, or slightly glaucous, side-veins about 45° or more to midrib, venation usually sparsely to moderately reticulate, intramarginal vein parallel to and well removed from margin, oil glands numerous, island[3], rarely obscure. [leaf description for ssp. *arida*]
Sugar Gum ***(E. cladocalyx)***  (Photo by John Rawlings)	alternate, petiole 0.9–2.7 cm long; blade slightly falcate to lanceolate, 6.5–17 cm long, 1.2–4 cm wide, base usually tapering to petiole, strongly discolorous, glossy, darker green on upper side, paler below, side-veins at an acute or wider angle, densely to very densely reticulate, intramarginal vein parallel to and well removed from margin, oil glands small, obscure.
Karri ***(E. diversicolor)*** 	alternate, petioles 1–2 cm long; blade lanceolate, 7–13.5 cm long, 1.5–3.7 cm wide, base tapering or oblique, margin entire or subcrenulate, apex a drip-tip, discolorous, dark green and glossy above, paler below, penniveined, reticulation dense, intramarginal vein close to margin, oil glands mostly island, yellow.

[3] "island" in this context means the leaf oil glands occur in the center of the smallest unreticulated areas (areole) of the leaf, as opposed to intersectional oil glands that occur at the intersections of the veinlets.

Eucalyptus Species	Leaf Characteristics (EUCLID 2020)
(Photo from lucidcentral.org)	
Blue Gum *(E. globulus)*  From *Trees of Stanford and Environs, Ronald Bracewell*	alternate, petiole 2–3.5 cm long; blade lanceolate to falcate, 12–30 cm long, 1.7–3 cm wide, glossy, green, side-veins greater than 45° to midrib, densely reticulate, intramarginal vein parallel to and well removed from margin, oil glands island and intersectional.
Red Iron Bark Gum *(E. sideroxylon)*  © Ron Vanderhoff	alternate, petiole 0.5–2.5 cm long; blade lanceolate, 5–14 cm long, 1–4 cm wide, base tapering to petiole, concolorous, dull, green to blue-green, grey-green, grey or glaucous, side-veins at an acute or wider angle to midrib, moderately to densely reticulate, intramarginal vein parallel to and just within margin or well removed from it, oil glands island and intersectional.

3.4 Tree Species for Restoration of Ellwood Mesa

Of the species considered for restoration at Ellwood Mesa, the following species have risen to the top of the list and are selected for their individual characteristics to improve the forest for overwintering monarchs:

Blue gum (*Eucalyptus globulus*)

The blue gum eucalyptus (*Eucalyptus globulus*) is an evergreen tree with a max height of 50 m (165 ft). This species is well documented to provide suitable overwintering habitat for monarch butterflies in California (Meade et al. 2018, 2023). This species is native to the wet regions of Tasmania, and it has a medium water use rating (UFEI 2023). The blue gum has week branch strength and sheds bark and branches generously. Therefore, a healthy and sustainable blue gum forests require regular maintenance and management.

The blue gum eucalyptus tree is well established in the forest on Ellwood Mesa and functions as the dominant tree in the structure of the monarch aggregation habitat. Although the blue gum trees have experienced die-off from the extreme drought in the forest at higher rates compared to other eucalyptus species on the mesa, the species remains an extremely valuable element of the forest for monarch butterflies.

We recommend protecting and supporting the live blue gum trees, encouraging blue gum saplings and resprouts to flourish in the forest, and adding additional plantings of this species as the need arises to improve coverage in the monarch roost sites. In Phase 1 of the implementation of the MBHMP, blue gum trees will be planted to replaced dead and dying monarch roost trees in the monarch aggregation sites on Ellwood Mesa. See Section 6.2 for planting details.

Karri (Eucalyptus *diversicolor*)

The karri (*Eucalyptus diversicolor*) tree is native to Southwestern Western Australia and is often used as a windbreak and shade tree (Photo 1). It is the tallest tree in Western Australia with a max height of 64 m (210 ft). Its leaves are spear-shaped and similar to the sickle shape of the blue gum. The karri tree has medium branch strength and smooth bark that sheds less than blue gum trees. The karri tree has a low water use rating, compared with the medium of the blue gum, meaning that it is more tolerant to drought stress (UFEI 2023).

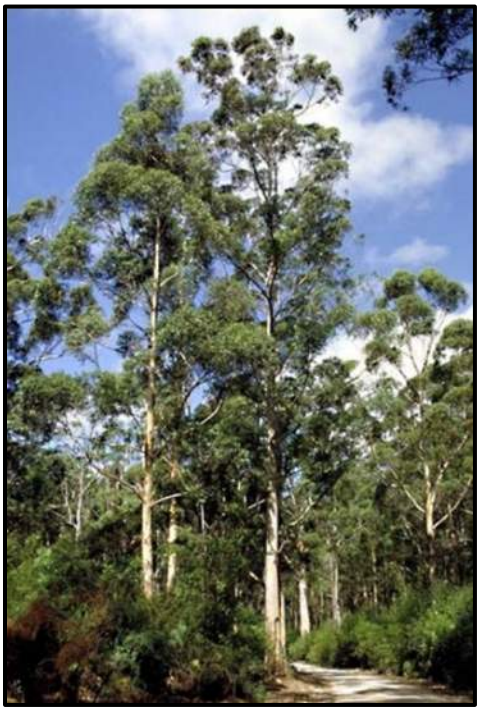


Photo 1. Karri. EUCLID 2020.

The karri tree is known to occur in the Goleta/Santa Barbara area. The book *Trees of Santa Barbara*" documents the occurrence of karri trees “along the west side of Sheffield Drive north of the intersection with San Leandro Lane." (p. 282 in Muller et al. 2005). This location is at the base of Ortega Hill which is a known monarch overwintering site. Karri trees in this location are part of the canopy of eucalyptus trees that may influence the wind protection to the Ortega Hill site, this is also known as the shelter zone for the site.

Of the *Eucalyptus* taxa found in aggregation sites, the karri tree is the only one considered not naturalized or is not found as a garden escape in California. The other four species in Table 1 are known to reseed into natural lands. The Australian Native Plants Society does not consider Karri to be an invasive risk in the wild in Australia (ANPSA 2023). Dr. Matt Ritter did not even consider it for inclusion in the Manual of California Vegetation because it is not found as a garden escape in California (Jepson Flora Project 2023; Ritter and Yost 2009; personal communication 2/10/2023 with LynneDee Althouse). It is Southwestern Australia's tallest tree with smooth, deciduous bark that changes color as it ages (EUCLID 2020).

Based on its characteristics and expert opinion, we are including the karri tree in the planting plans and restoration actions at Ellwood Mesa. While the blue gum is intended to remain the dominant tree at the monarch roost sites, the karri tree will strengthen the forest by adding diversity and structure. Our intention is to build a more drought resilient forest with the addition of the karri tree. See Section 6.2 for planting details.

Toyon (Heteromeles *arbutifolia*)

Toyon (*Heteromeles arbutifolia*) is an evergreen shrub and native the western part of California and the Sierra foothills. This perennial shrub is drought-tolerant and common in coastal sage scrub and chaparral plant communities (CNPS 2023). Toyon grows well in the understory of eucalyptus forests and is present on the Ellwood Mesa, see Photo 2.

Toyon shrubs grow to a mature height of 1.8 to 9 m (6 to 30 ft) (UFEI 2023). The evergreen and perennial characteristics of this species make it well suited to provide wind shelter to the monarch aggregation habitats. Monarchs are known to roost on this species in Santa Barbara County (Xerces Society 2023, Meade et al. 2023).

We are proposing to plant toyon around the existing monarch overwintering sites to strengthen the wind shelter zones and build a more drought resilient forest. See Section 6.2 for planting details.



Photo 2. Toyon shrub well established outside of eucalyptus grove at Ellwood Mesa.

Red ironbark (*Eucalyptus sideroxylon*)

Red ironbark (*Eucalyptus sideroxylon*) trees are the dominant species in the southern section of the Ellwood North area and some are growing on the eastern edge of Ellwood West along Santa Barbara Shores access road, see on Figure 2.

Red ironbark is native to Eastern Australia and has max tree height of 27 m (90 ft). Its leaves are spear-shaped and similar to the sickle shape of the blue gum. The red ironbark has medium branch strength and furrowed black or red bark that does not shed like blue gum trees. This tree has a low water use rating, compared with the medium of the blue gum, meaning that it is more tolerant to drought stress (UFEI 2023). Evidence of its higher drought tolerance was apparent during the 2012-2016 drought; no red ironbark trees succumbed to the drought conditions at Ellwood Mesa while many blue gum trees are drought stressed, as shown in Photo 3.

Monarchs are known to roost on this species in Santa Barbara County (Xerces Society 2023, Meade et al. 2018 and 2023). The red ironbark tree has pink to red flowers which bloom in fall, winter, spring and offers a nectar source for the overwintering monarchs (UFEI 2023).

We are proposing to plant red ironbark around the existing monarch overwintering sites to strengthen the wind shelter zones and build a more drought resilient forest. See Section 6.2 for planting details.



Photo 3. Red ironbark trees in the southern section of Ellwood North are green and healthy (on the right) while the blue gum trees (on the left) are drought stressed.

Coast live oak (*Quercus* agrifolia)

The coast live oak is native to central and southern California and is present in the Ellwood Mesa forest in the under and middle story among the eucalyptus trees. This evergreen tree has high wildlife value and is important to the California landscape. This oak has a max tree height of 21

m (70 ft) and given enough time this tree can develop a large spreading canopy often wider that its height (UFEI 2023). Coast live oak has a low water use rating and strong branch strength (UFEI 2023).

Monarchs are known to roost on this species in Santa Barbara County (Xerces Society 2023, Meade et al. 2018 and 2023). We are proposing planting this tree in the wind shelter zone on the Ellwood Mesa to improve the monarch habitat and add wildlife value.

Western sycamore (*Platanus racemosa*)

The western sycamore is a deciduous, California native riparian tree (UFEI 2023). This species is common along creeks and drainages in California and is present along Devereux Creek and other drainages on the Ellwood Mesa. This tree has a maximum height of 24 m (80 ft) and can have a canopy width between 6-15 m (20-50 ft). The western sycamore has a high water use rating and is tolerant of extreme heat and wind with medium branch strength (UFEI 2023).

Monarchs are known to roost on this species in Santa Barbara County (Xerces Society 2023, Meade et al. 2018 and 2023). Its deciduous nature causes this tree to offer decreased wind protection for monarchs by December or January as its leaves fall. This species is proposed for planting near Ellwood Main along Devereux Creek to close the wind vulnerability from the north.

California bay laurel (*Umbellularia californica*)

California bay laurel (*Umbellularia californica*) has a native range from southwestern Oregon to Baja California (UFEI 2023). It is an evergreen tree and is commonly associated riparian habitats, oak woodlands, and mixed-evergreen forests. This species has a maximum height of 22.8 m (75 ft) and can be as wide as it is tall (UFEI 2023).

Monarchs are known to roost on this species in Santa Barbara County (Xerces Society 2023, Meade et al. 2018 and 2023). This species is proposed for planting near Ellwood Main along Devereux Creek to close the wind vulnerability from the north.

Fremont Cottonwood (*Populus fremontii*)

Fremont Cottonwood (*Populus fremontii*) is a deciduous, California native riparian tree (UFEI 2023). This tree has a maximum height of 24 m (80 ft) and can have a canopy width between 9-15 m (30-50 ft). This species has a high water use rating and weak branch strength (UFEI 2023).

Monarchs are known to roost on this species in Santa Barbara County (Xerces Society 2023, Meade et al. 2018 and 2023). This species is proposed for planting near Ellwood Main along Devereux Creek to close the wind vulnerability from the north.

4 ELLWOOD MESA BACKGROUND

The Ellwood Mesa is an urban forest dominated by a mix of eucalyptus species and native trees. The eucalyptus forest on the Ellwood Mesa holds six monarch overwintering sites (Calvert 1991, Nagano and Sakai 1987, Meade 1999). These overwintering sites are scattered through the forest, as shown on Figure 2.

4.1 Monarchs at Ellwood Mesa

Monarch butterfly surveys and counts have been conducted at the Ellwood Mesa for many years. Peak population counts were recorded for Ellwood Main (Goleta Butterfly Grove) since 1989 and counts for the Western Monarch Thanksgiving Count began in 1997. Monarch aggregation locations are shown on Figure 2. The counts follow the Xerces Society's protocol for estimating number of monarch butterflies, the Step-by-Step Western Monarch Thanksgiving Count Monitoring Guide (The Xerces Society 2017b).

The monarch population at Ellwood Main (Goleta Butterfly Grove) fluctuates greatly from year to year, as shown in Graph 1. The highest monarch population at Ellwood Main was recorded at 47,510 in 2011 and the lowest was 5 in 2020. These fluctuations are natural and expected for insect populations (Xerces Society 2021).

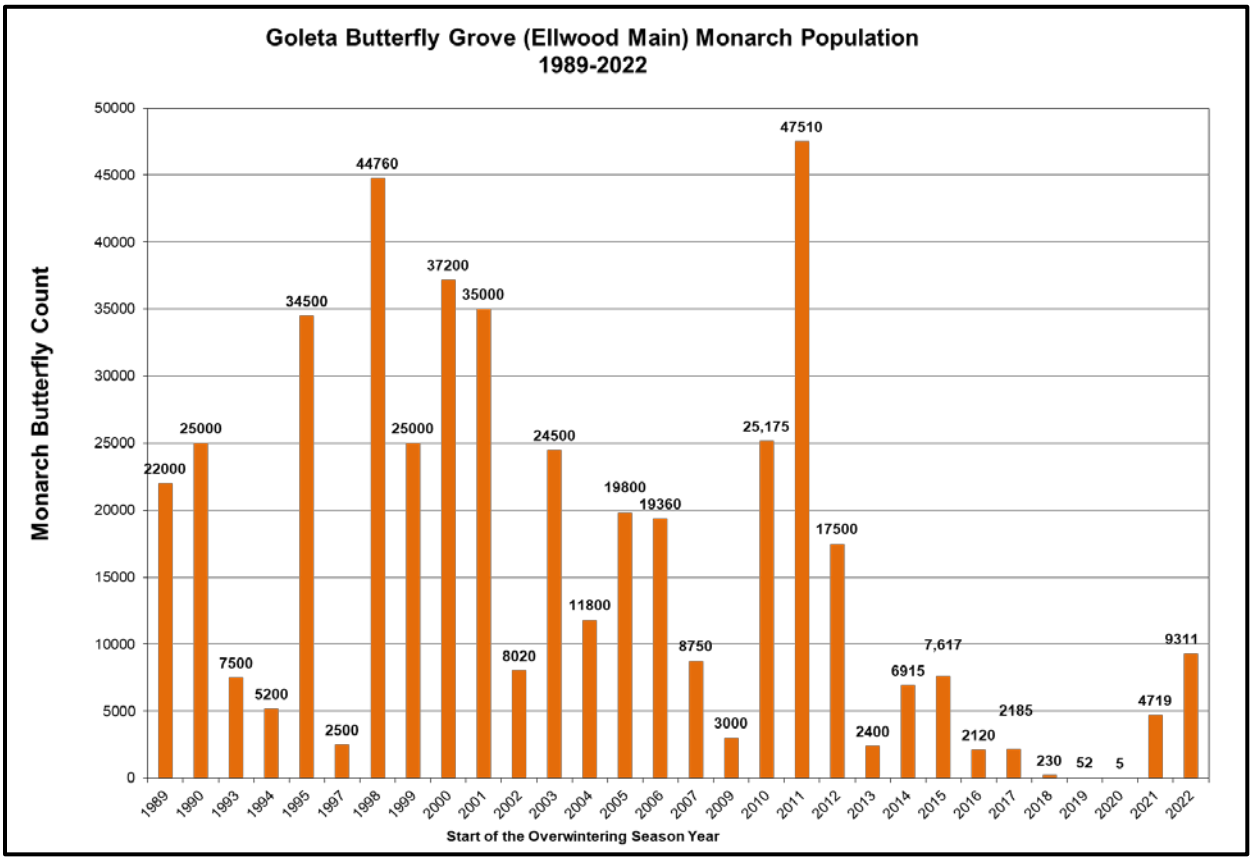
We assume that monarch butterflies vote on suitable overwintering habitat with their presence. Monarch butterflies select preferable and suitable habitat and show us these locations with their numbers. There is a direct relationship between suitable habitat and monarch counts. In a year with a decent population abundance to span the entire distribution of overwintering sites, we can assume that the sites with suitable and protective habitat will have higher monarch butterfly counts relative to those sites with less suitable and poorly protective habitat. Thusly, the decline of habitat quality can be shown in the relative decline of monarch numbers at a site over time.

4.2 Ellwood Mesa Monarchs Relative to the Western Population

When we graph the total population of western monarchs and the total population in Santa Barbara County alongside the yearly Thanksgiving Counts at Ellwood Main, we begin to see how the monarch numbers at Ellwood Main are declining relative to the larger populations, and thusly we can see the decline of the habitat at Ellwood Main. Graph 2 shows these population numbers on the logarithmic base 10 scale. Logarithmic scale is helpful for visualizing the growth and decline in populations and natural systems. In Graph 2, we can see how the total populations of western monarchs in California and Santa Barbara County are closely linked with the monarch numbers at Ellwood Main and the fluctuations are parallel from 1997 until 2010. In 2011, the monarch numbers at Ellwood Main start to decline while the western and Santa Barbara County populations follow a similar upwards and fluctuating trend. The monarch numbers at Ellwood decline drastically in the years 2013 and 2016 which the populations of western monarchs and the Santa Barbara County showed an increase. One explanation for this incongruity is the decline of the habitat quality because of the drought discussed in Section 4.4.

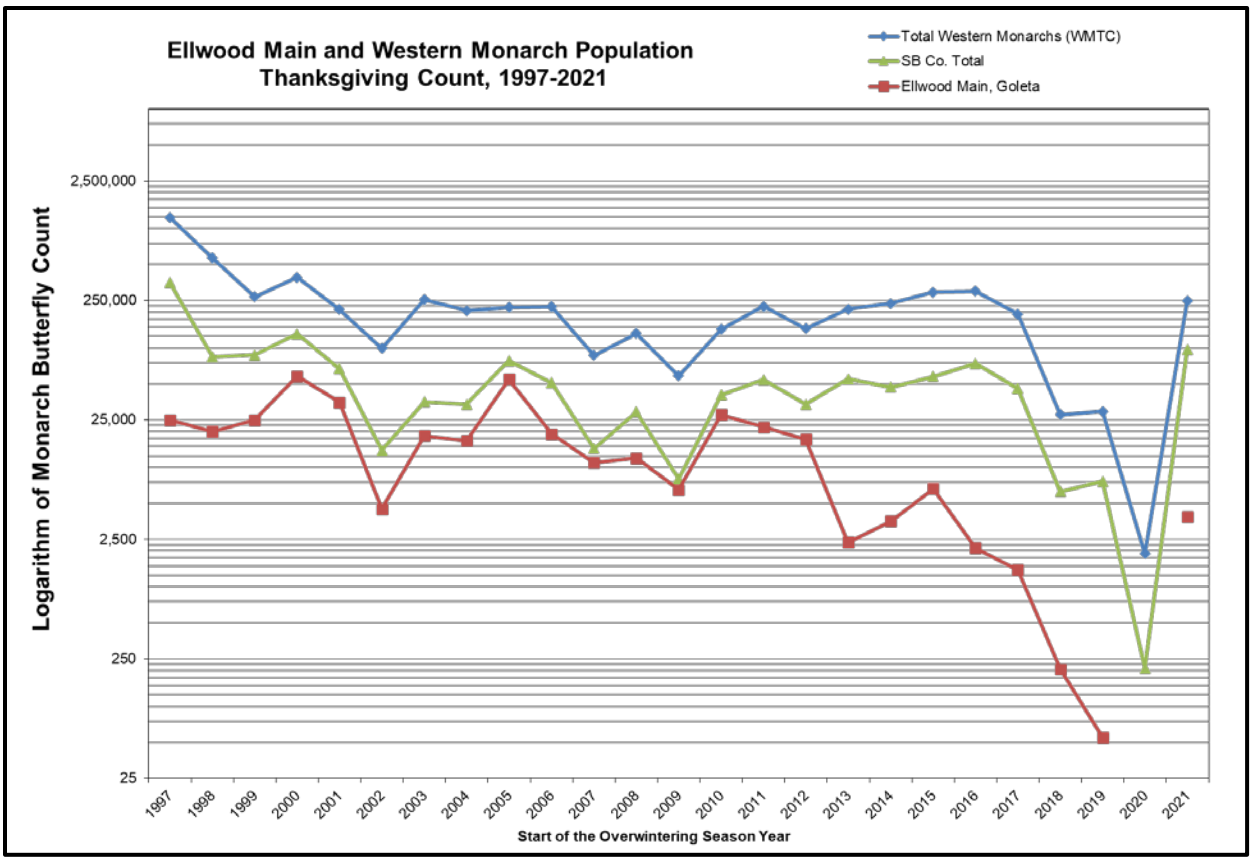
In addition to the Western Monarch Thanksgiving Counts, the City of Goleta conducts monarch counts at the six known aggregation sites every two weeks during the overwintering period, October 1st through March 15th. In 2019, the city included habitat-wide surveys for monarchs potentially roosting outside of the six known sites and two sites were added in 2019 after this

effort. These data show us how the monarchs are utilizing the sites every two weeks and we can infer habitat value from this numbers. In the 2015-2016 season (Graph 3), the monarchs maintained a consistent presence at Ellwood Main through the season and remained at Ellwood Main until mid-February. In the 2021-2022 season (Graph 4), the monarchs were present at Ellwood East in greater numbers than at Ellwood Main and my mid-January they had abandoned Ellwood Main in favor of Ellwood East. In the 2022-2023 season (Graph 5), we see that the monarchs were present at Ellwood Main and Ellwood East, and they had abandoned both sites by mid-January, likely because of the severe storms that occurred along the central coast in late December 2022 and early January 2023. This shows that the Ellwood Main habitat has declined to the point where it is no longer suitable habitat to protect monarchs from severe storms through January.



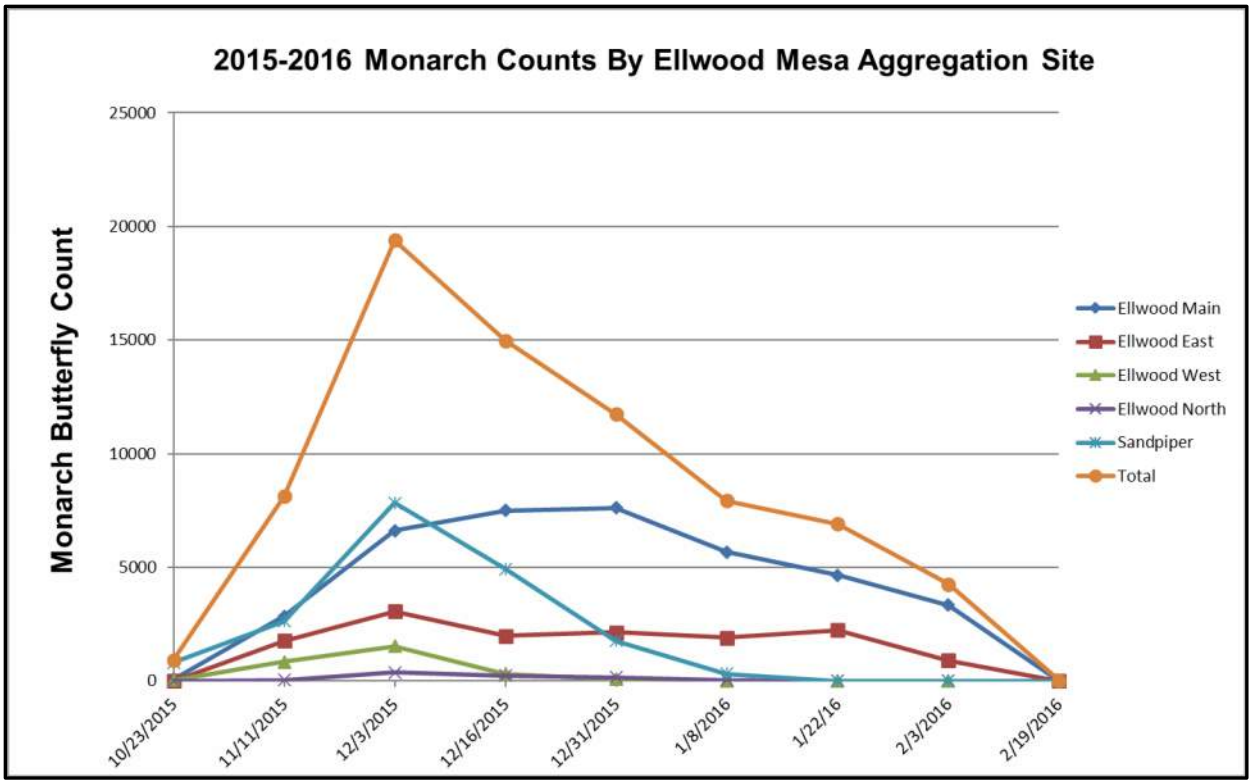
GRAPH 1. PEAK MONARCH POPULATION AT ELLWOOD MAIN FROM 1989 TO 2022

Data from Althouse and Meade Inc and Rincon Consultants Inc.



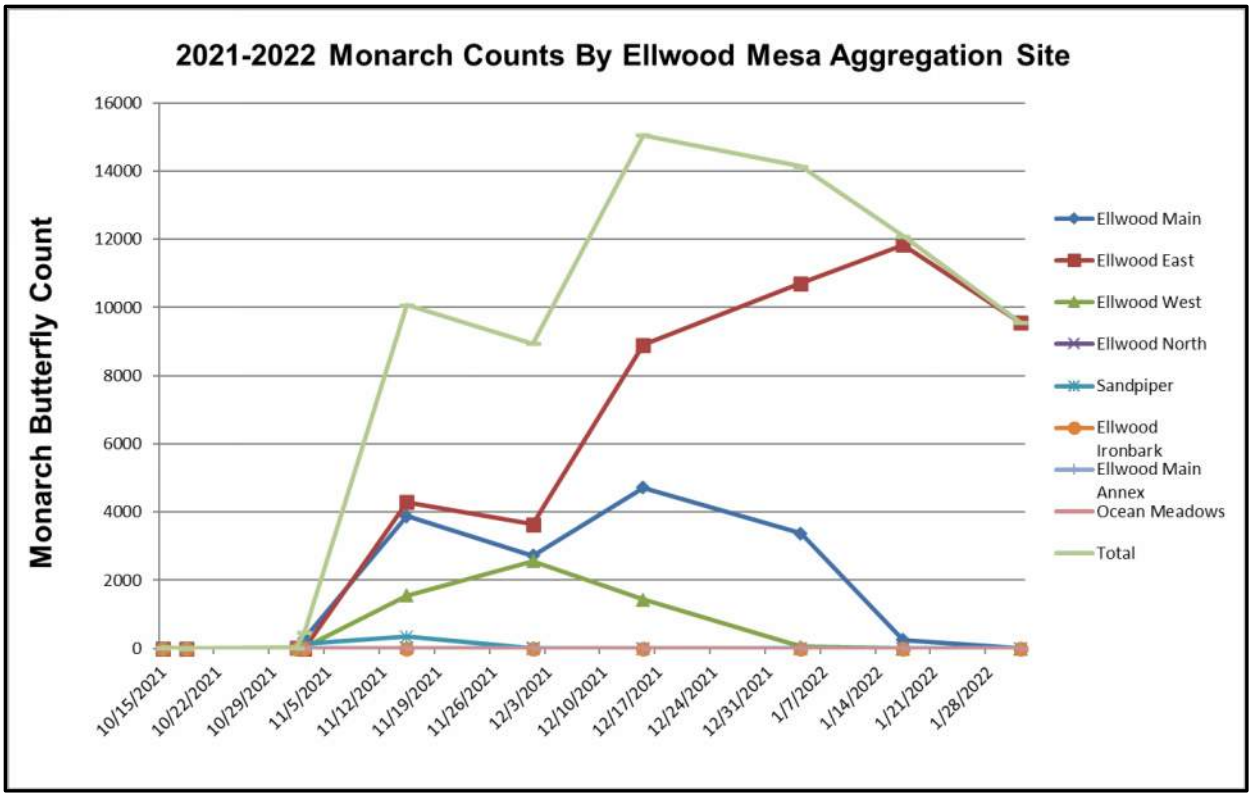
GRAPH 2. TOTALS OF WESTERN MONARCH POPULATION, SANTA BARBARA COUNTY MONARCH POPULATION, AND MONARCHS AT ELLWOOD MAIN IN LOGARITHMIC SCALE

Data source: Xerces Society for Invertebrate Conservation 2023.



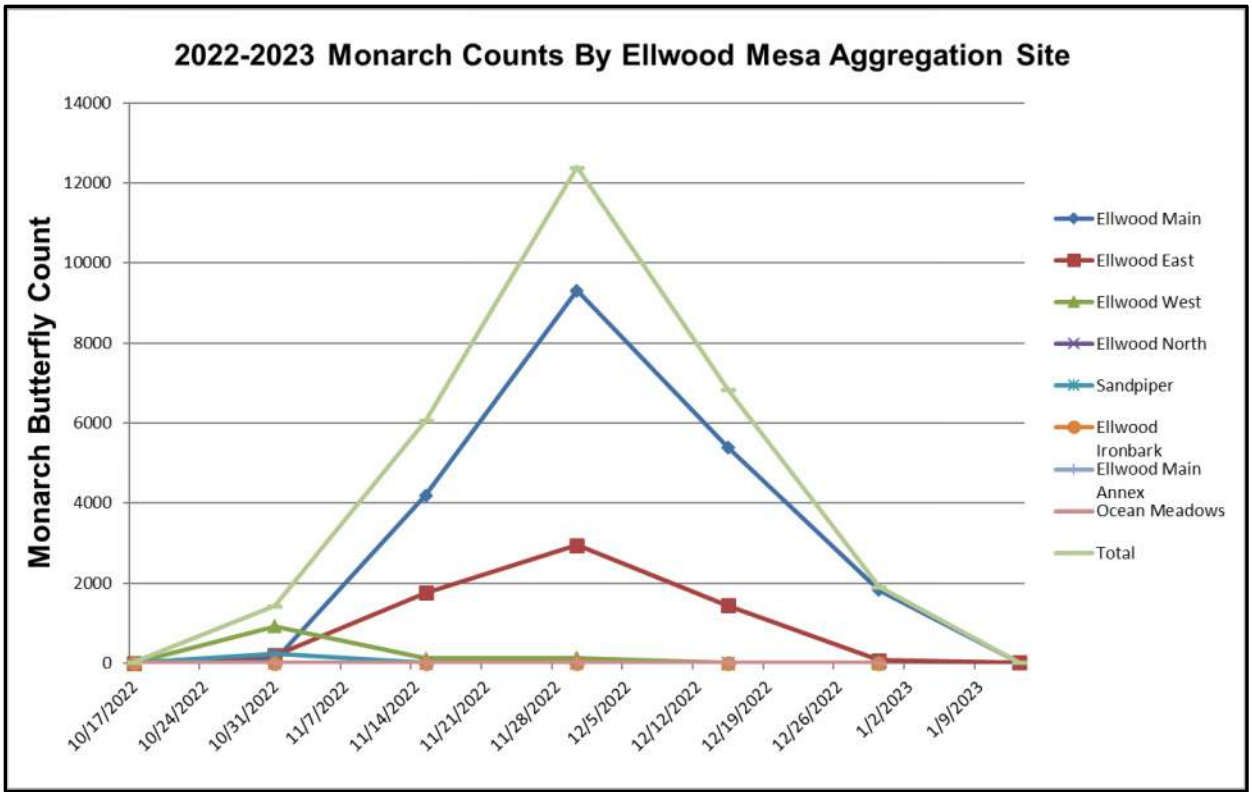
GRAPH 3. MONARCH COUNTS AT ELLWOOD MESA, 2015-2016 SEASON

Data from Althouse and Meade Inc and Rincon Consultants Inc.



GRAPH 4. MONARCH COUNTS AT ELLWOOD MESA, 2021-2022 SEASON

Data from Rincon Consultants Inc.



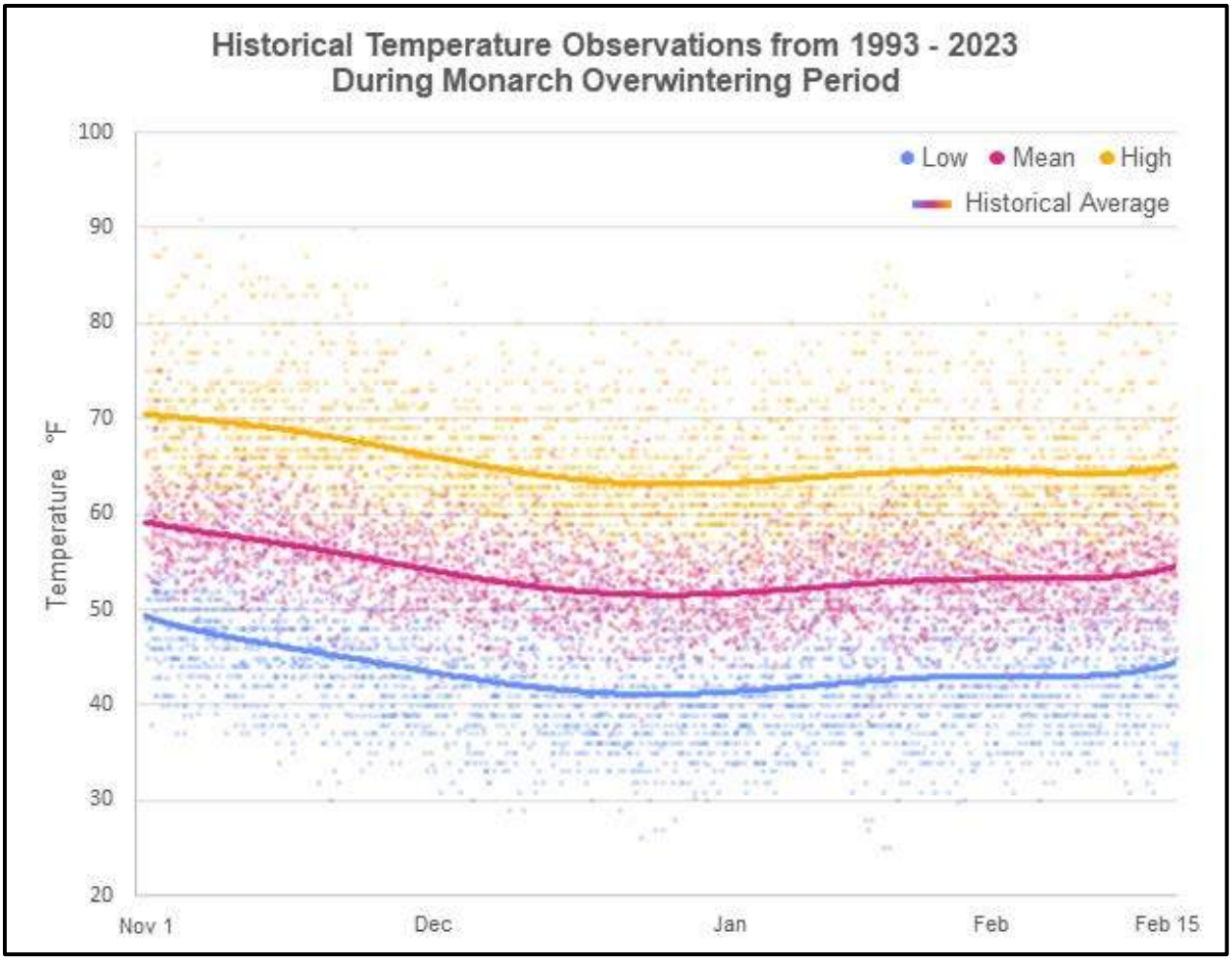
GRAPH 5. MONARCH COUNTS AT ELLWOOD MESA, 2022-2023 SEASON
Data from Rincon Consultants Inc.

4.3 Climate and topography at Ellwood Mesa

Ellwood Mesa has a Mediterranean climate, characterized by mild temperatures year-round. During the winter months when monarchs roost at Ellwood Mesa, temperature lows range from low to high 40 degrees Fahrenheit, highs from mid to high 60's, and mean temperature ranges from low to high 50's (Graph 6). Events outside this range are possible any time during the overwintering period, however, with a handful of uncharacteristically warm or cold days. November has the bulk of warmer than average days, occasionally exceeding 80 degrees. Only two days in the last thirty years were daytime highs above 90 degrees. Conversely, temperature lows can often go below 40 degrees, with a handful of incidents below 30 degrees (Graph 6).

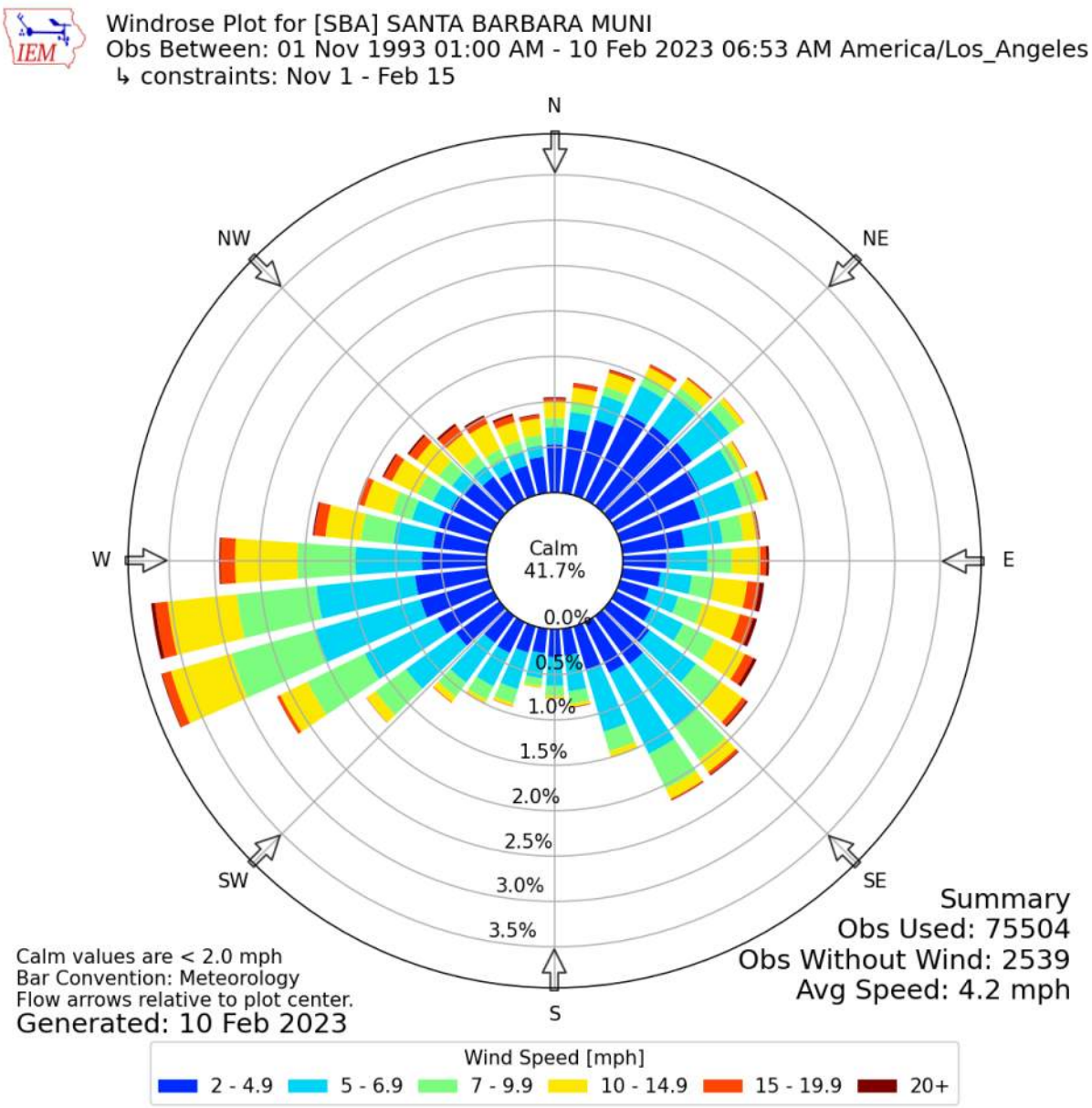
Wind conditions at Ellwood Mesa are generally suitable for monarch butterflies, with the majority of wind observations under 10 mph (blue, teal, and green areas in Graph 7). However, winter storms periodically bring strong winds throughout the overwintering period. These storms most frequently come from the southwest which bring wind speeds up to 30mph and heavy rain. While less common, all directions have records of strong storm events, particularly from the northeast and southeast (Graph 7).

The Ellwood Mesa contains topographic features that provide conditions supportive of the microclimate needs of migratory monarch butterflies. Overwintering monarch butterflies tend to cluster in specific areas where cold air is allowed to sink and drain away from the aggregation area. This mechanism allows for a warmer and better regulated microclimate to persist within the aggregation site. The low-lying channels formed by Deveraux creek allow for this removal of cold air at each of the show aggregation sites (Figure 3).



GRAPH 6. HISTORICAL TEMPERATURE OBSERVATIONS FROM 1993 – 2023

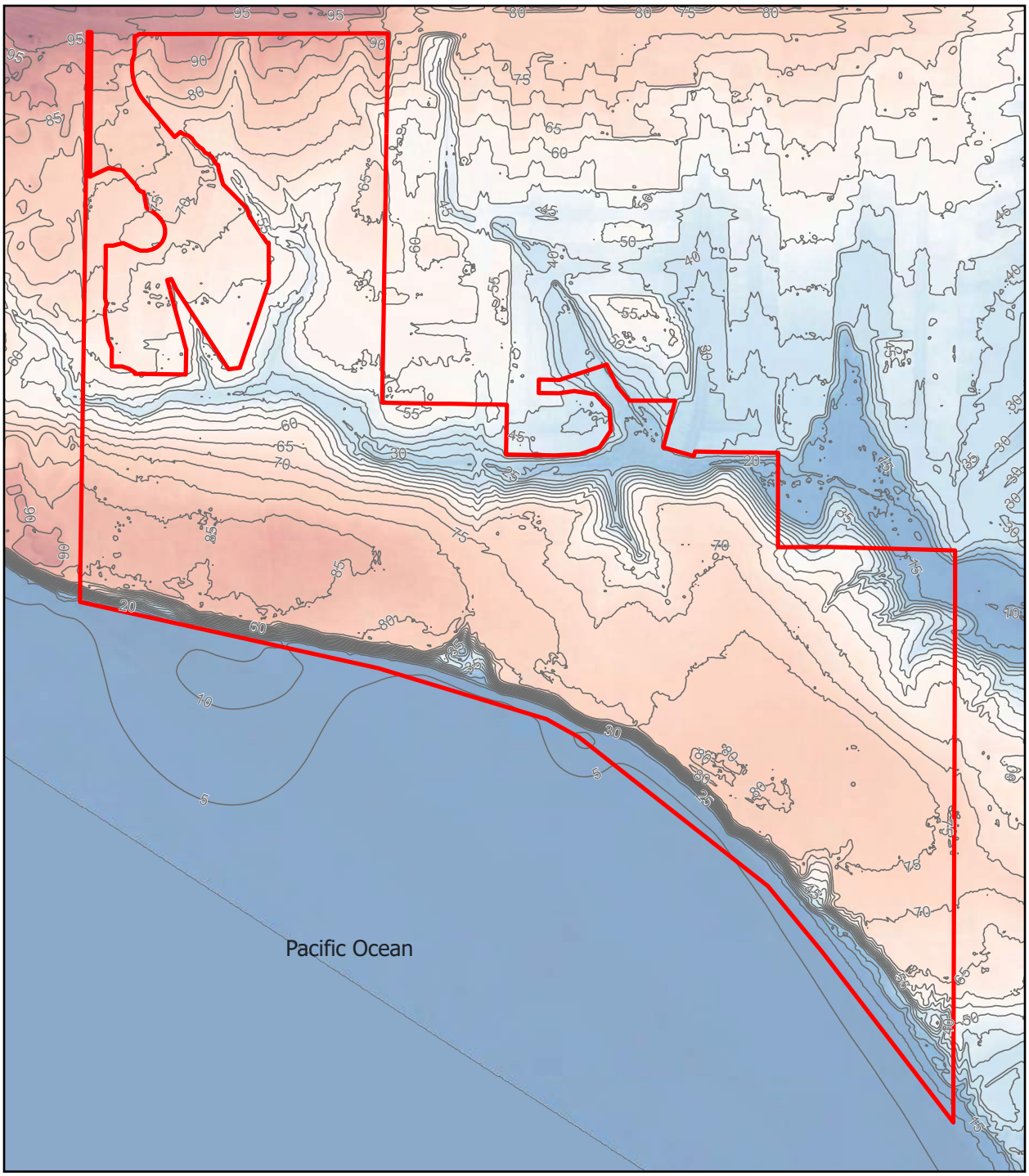
Data is during the monarch overwintering period. Temperature extremes and mean are plotted by date for each year. Averages for each temperature category are plotted across the time range.



GRAPH 7. WIND OBSERVATIONS FROM 1993 – 2023

Data is during the monarch overwintering period.

Figure 3. Ellwood Mesa Topography



Legend

Ellwood Mesa Open Space

Countour interval = 5 feet

Elevation

100

0

N

0 500 1,000 US Feet

Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42151°N 119.89267°W
Goleta, Santa Barbara County

Elevation data: 2018 USGS LiDAR

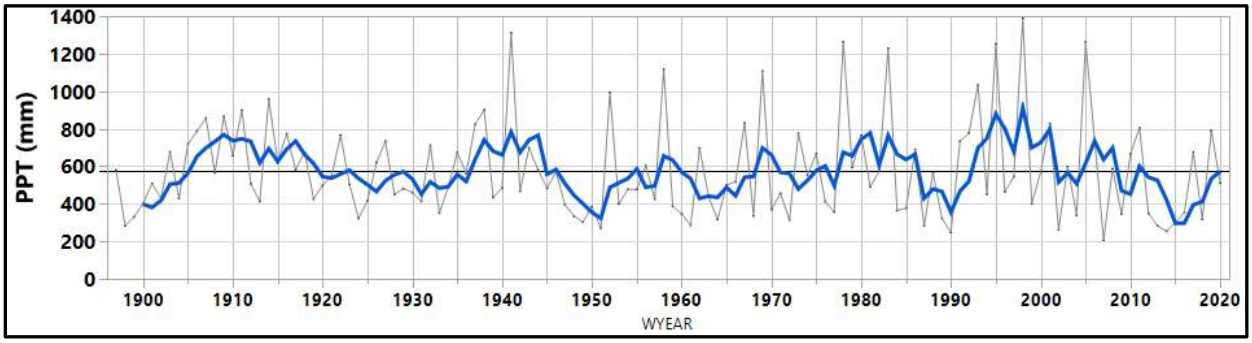
4.4 The 2012 – 2016 Drought: Unprecedented Event

4.4.1 Impacts of Drought on the Ellwood Forests

Forests exist in a dynamic equilibrium with available site water – growing more in wetter years and dying back in dry periods. The sustainable density of trees at a site results from dynamic processes. The first response to drought conditions is reduced annual growth, followed by loss of leaves and branches, and eventually death of entire trees as competition below ground for limited water pushes trees over their tolerances (Metcalfe et al. 1990, McJannet and Vertessy 2001). Insects and disease also can thrive under water stressed conditions, hastening tree mortality. For example, the eucalyptus long-horned borer (*Phoracantha* spp.) can more readily spread when trees do not have sufficient water to produce sap to repel the growing beetle grubs below the bark layer.

The Ellwood forests were established in the late 19th Century, during a relatively wet period. The tree spacing was typically around 2 meters (6'). The trees grew well in the mild climate and developed into the dense forests we associate with Ellwood. The monarchs occupied the suitable microclimatic niches – wind-sheltered gaps in the canopy (see Section 3.1) – as they developed across topography and by the recruitment and mortality of trees. For many decades, the forest was managed as a woodlot, where a certain amount of live and dead wood was removed, which maintained a sustainable forest density.

A historical reconstruction of the climate and water balance at Ellwood allows the current crisis to be put in perspective. The long-term (1895-present) precipitation (PPT) records by water year (October 1- September 30) for Ellwood shows high interannual variability, typical of the California climate (Graph 8). Mean PPT was close to 600 mm (23"). Maximum PPT was >1200 mm (47") in 1941 and 1998, and minimum PPT was <250 mm (7.9") in 1990 and 2007. Notable multi-year periods of low precipitation included the late-1920s and early-1930s, the late-1940s and early-1950s, the late 1980s-early 1990s, and 2012-2016.



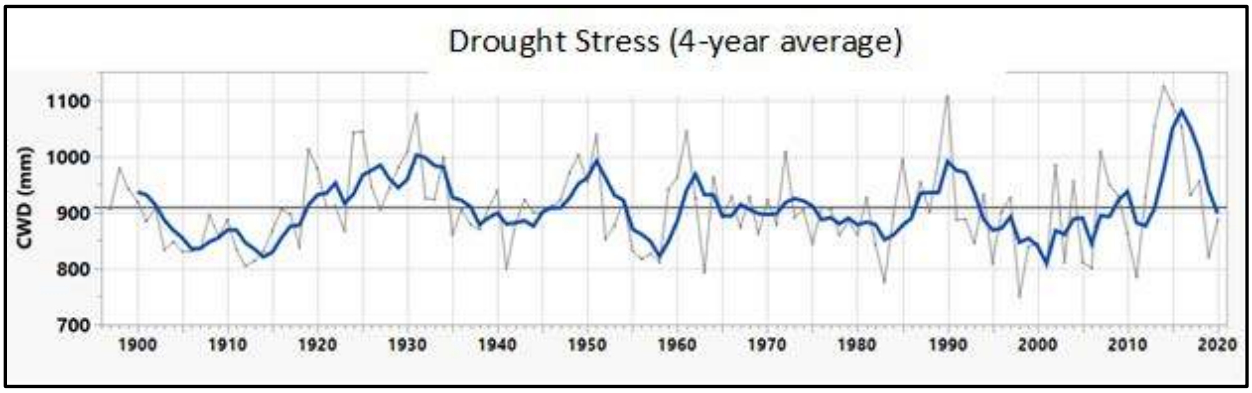
GRAPH 8. ANNUAL PRECIPITATION AT ELLWOOD MESA (OCT. 1 – SEPT. 30)
Long-Term Average=576 mm (22.7", Horizontal Line)

Annual precipitation (PPT) is not the only driver of drought – evaporative demand over the dry season, driven largely by temperature and the last date of soaking rains, depletes soil moisture until the rains return in fall. A water balance model, the Basin Characterization Model (Flint et al. 2021), keeps track of PPT, soil storage, and outputs including evapotranspiration, recharge, and runoff. Drought intensity is characterized by "Climatic Water Deficit" (CWD), which

integrates precipitation, evaporative demand (PET), and soil moisture storage monthly into a single number for the water year. The calculation is for a standardized site with available soil water capacity of 451 mm (17”), the Ellwood monthly climate, and occupied by a blue gum forest. This is a consistent measure of annual and multi-year CWD that characterizes the overall intensity of drought on the soil type mapped at Ellwood. It does not account for microsite differences in soil depth and topography (to be discussed later).

A single year of drought stress rarely has strong lasting effects. Some leaf fall in evergreen trees may be observed. Cumulative stress over several years leads to widespread forest decline with loss of entire branches and trees (Metcalfe et al. 1990, McJannet and Vertessy 2001).

Annual CWD values are shown in Graph 9 as the thin grey line. Mean CWD was approx. 900 mm (35”) – Mediterranean climates have relatively high CWD because of the summer dry season, but the vegetation is adapted to these average levels. Maximum annual CWD was >1100 mm (43”) in 1990 and 2014, and minimum CWD was <800 mm (31”) in 1963, 1983, and 1998. The 4-year running average is shown as the thicker blue line. The multi-year droughts in the 1920s and 1930s, 1940s, and from 1987- 1990 peaked at 1000 mm (39”). There was some observable canopy die off by the early 1990s, but was largely restricted to high branches (S.B. Weiss and D. E. Meade, pers. observ.). But these branches resprouted during the relative wet period in the 1990s and 2000s.



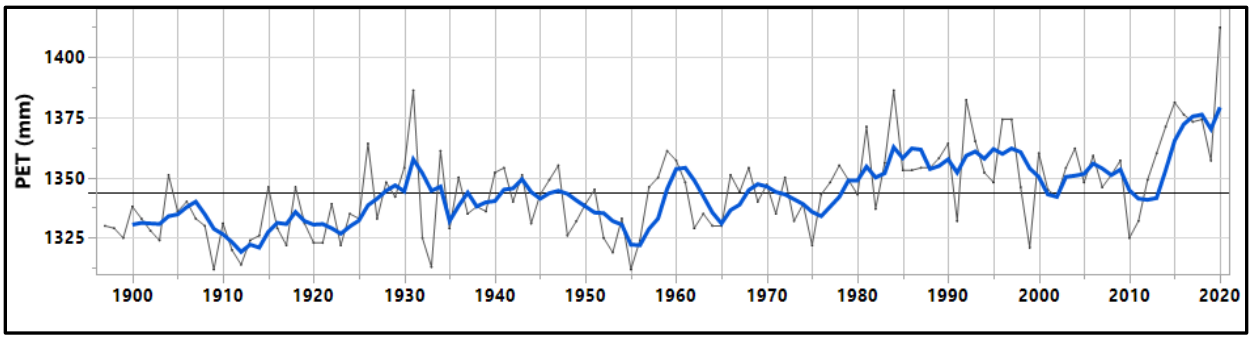
GRAPH 9. ANNUAL CLIMATIC WATER DEFICIT AND 4-YEAR RUNNING AVERAGE

A measure of annual Climatic Water Deficit (CWD) (grey line) and 4-year running average (thick blue line) at Ellwood Mesa. Long-term average = 907 mm (35.7”, Horizontal Line).

The other side of the equation is high productivity periods, characterized by low CWD and high PET. Notable periods of high forest productivity include 1905-1918, 1954-1959, and 1993-2005. The last high productivity period set up the catastrophic response to the recent drought, as trees grew according to site water availability with no removal of live biomass.

At the end of the latest drought from 2012-2016, CWD peaked at a 4-year average of 1081 mm (43”), nearly 100 mm greater than the historical highs in 1931 and 1990. The 2012-2015 California drought was not only the most severe in 1,200 years, but it also “has an almost incalculable return period and is completely without precedent” (Robeson 2015). Unlike much of California, Santa Barbara County received relatively little rain in 2016, extending the drought one more year.

The most important long-term climate trend at Ellwood Mesa has been an increase in evaporative demand – annual potential evapotranspiration (Graph 10). PET is a multiplicative function of air temperature and solar radiation, and accounts for summer fog. The long-term trend is driven by increasing air temperature, especially during the dry season. PET has increased by 50 mm (2") since 1900, with the sharpest increase since 2013. In 2020, PET hit an unprecedented 1412 mm (56"); however, the resultant CWD was not excessive because Mar-Apr rainfall was 285 mm (11") which saturated the soils at the beginning of the dry season. In contrast, in 2013 and 2015, the rains stopped early (January) so the CWD accumulated over an extended dry season. These examples highlight how the timing of precipitation is an important component of annual CWD.



GRAPH 10. ANNUAL POTENTIAL EVAPOTRANSPIRATION

A measure of evaporative demand (grey line) and 4-year running average (thick blue line) at Ellwood Mesa. Long-term average = 1344 mm (53-inch, horizontal line).

4.4.2 Tree Mortality

The impact of this unprecedented drought on Ellwood has been mass mortality of blue gums across much of the site (Photo 4 and Photo 5). As discussed elsewhere, Ellwood is too arid for blue gums to thrive over the long term – the tree comes from Tasmania and southeast Australia where there is regular summer rainfall. The whole tree mortality was exacerbated by the uncontrolled growth of dense stands during the wet periods in the 1990s and 2000s, after woodlot management ceased. The blue gums have "self-thinned" to restore some balance between forest density and water availability. The other eucalyptus species present at Ellwood, especially red ironbark, have not suffered drought mortality.

The extent of the tree mortality is captured in the LiDAR map of dead standing and downed wood (Figure 5 - Figure 12) (LiDAR is explained in Section 5.1.3). The figures show large swaths of the forest died off. We estimate that there was approximately 360,797cubic feet of dead standing and downed wood across the entire forest as of 2021 with major mortality hotspots in Ellwood North, Ellwood West, and parts of Ellwood Main (maps). Total volumes of dead standing and downed wood by monarch site area (Figure 4) is presented in Table 3.

TABLE 3. VOLUME OF DEAD STANDING AND DOWNED WOOD BY MONARCH SITE AREAS

Name of Monarch Site Area	Monarch Site Area Size (ac)	Volume of Dead standing and Dead downed Wood (cubic feet)	Number of Dump Trucks
Ellwood Main	13.86	95,377	252
Ellwood West	6.74	58,079	154
Ellwood East	8.33	32,802	87
Ellwood North	10.81	95,280	252
Ellwood Ironbark	8.14	66,652	176
Sandpiper	3.04	6,699	18
Ocean Meadows	2.09	5,908	16
Totals	53.01	360,797	954

4.4.3 Effects of Tree Mortality on Monarch Habitat

The loss of trees and canopy cover has opened the overwintering sites to increased wind exposure. At Ellwood Main, the depth of wind shelter has diminished with the mass mortality, so that there are "thin green lines" of remaining live trees to provide wind shelter from various directions. Critical redundancy in wind shelter is gone. The west-southwest exposure has opened into a wind gap. The dead trees tend to be on the convex shoulder of the drainage, where the soils are thin, and water drains away. Downslope, where soils are thicker and some water drains in from the slopes above, fewer trees have died, and the remaining row of live trees provide the last line of wind shelter for the cluster zone. On the southeast side, the outer edge row of trees is still intact, but the interior trees have died. The loss of trees north of the cluster zone, some still standing as of 2023, has opened that direction to more wind, and the cluster trees themselves provide the remaining shelter from the northwest, north, and northeast winds.

At Ellwood West and Ellwood East, the topography – the rise from Deveraux Creek to the mesa – has ameliorated the loss of tree canopy to the south. The cluster sites close to the riparian zone, in the flat or just up the slope, and the mesa, with an elevation difference of approximately 12 m (40'), provides additional shelter from SE, S, and SW winds. Shelter from E and W winds are provided by the great depth of forest cover along the riparian corridor, and these trees are relatively well watered and less susceptible to drought (although there have been individual trees that have died or uprooted).

)LJXUH 'HDG :RRG 9ROXPH =RQHV



/HJHQG

'HDG :RRG 9ROXPH RQ0RQDUFK 5RRVWLQJ 6LWH

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0DS &HQWHU f1 f:
*ROHWD 6DQWD %DUEDU

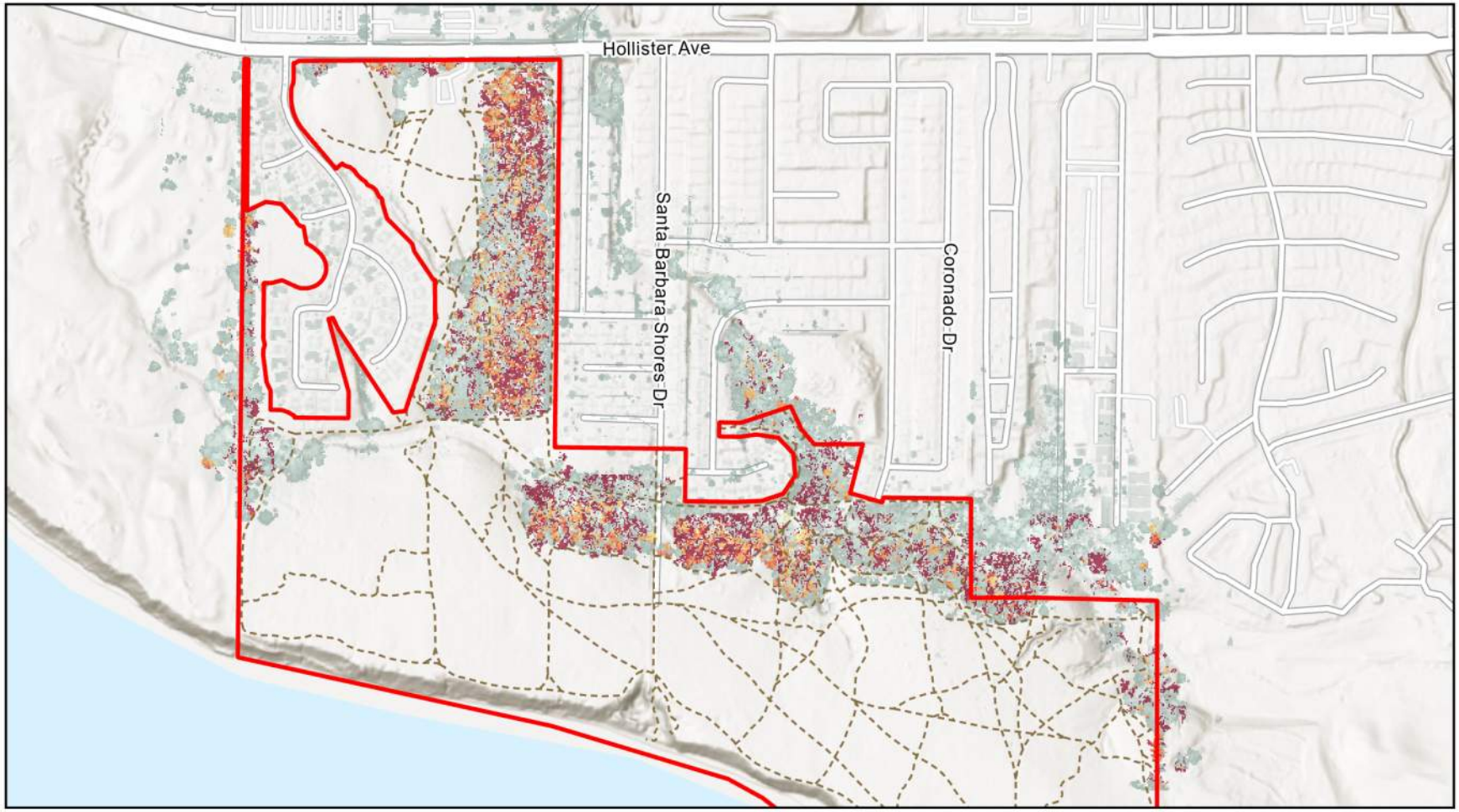
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)HEUXDU\ 30 E\ &'0

Figure 5. Classified Dead Wood - Overview



Legend

Ellwood Mesa Open Space

Existing Trails

Dead Stems

Height above ground

125 ft

0

N

0 500 1,000 Feet

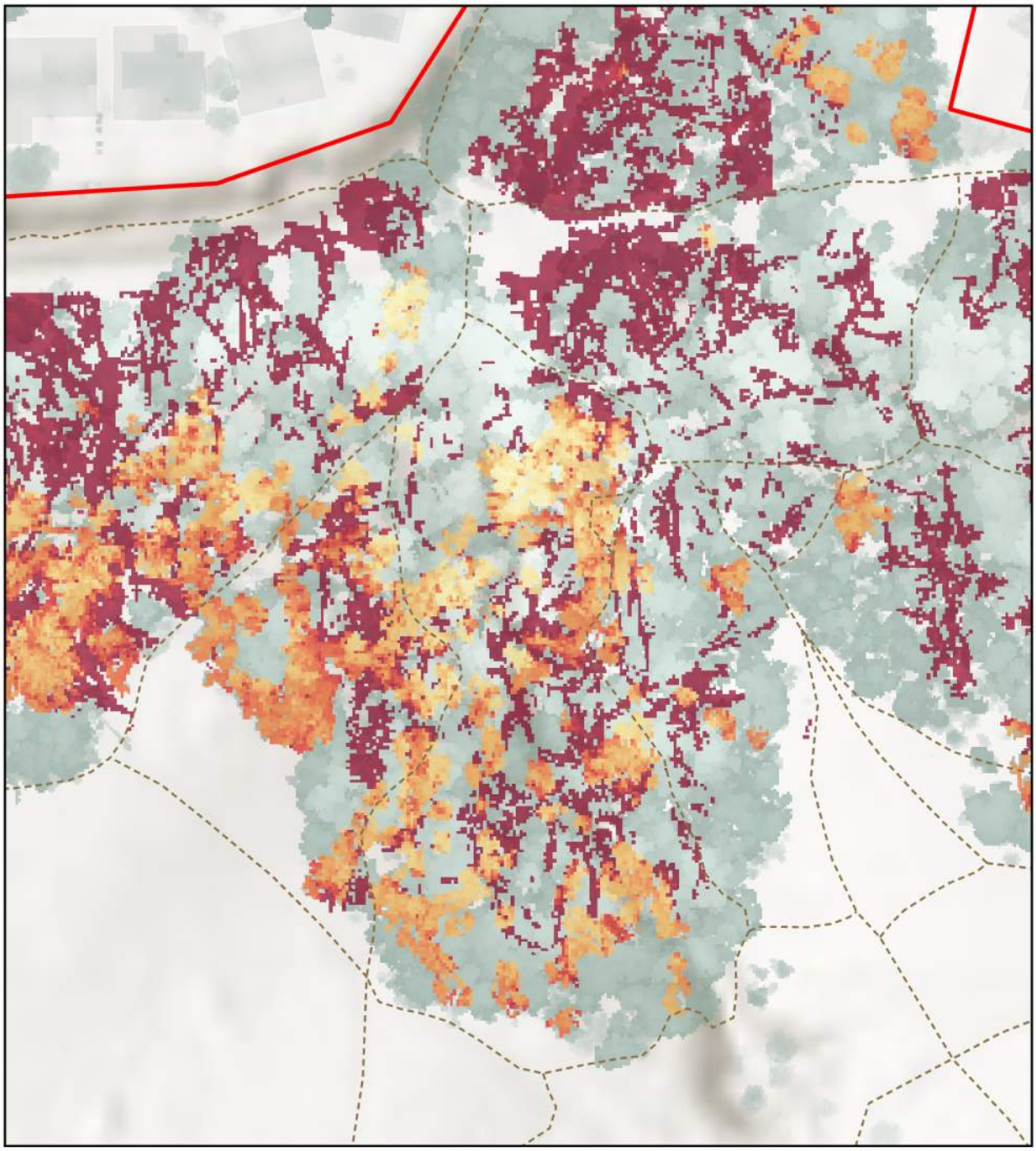
Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42479°N 119.89213°W
Goleta, Santa Barbara County

LiDAR Source: NV5, 09/27/2021

ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES

Map Updated:
February 21, 2023 01:33 PM by KRN

Figure 6. Classified Dead Wood - Ellwood Main



Legend

Ellwood Mesa Open Space

Existing Trails

Dead Stems

Height above ground

125 ft

0

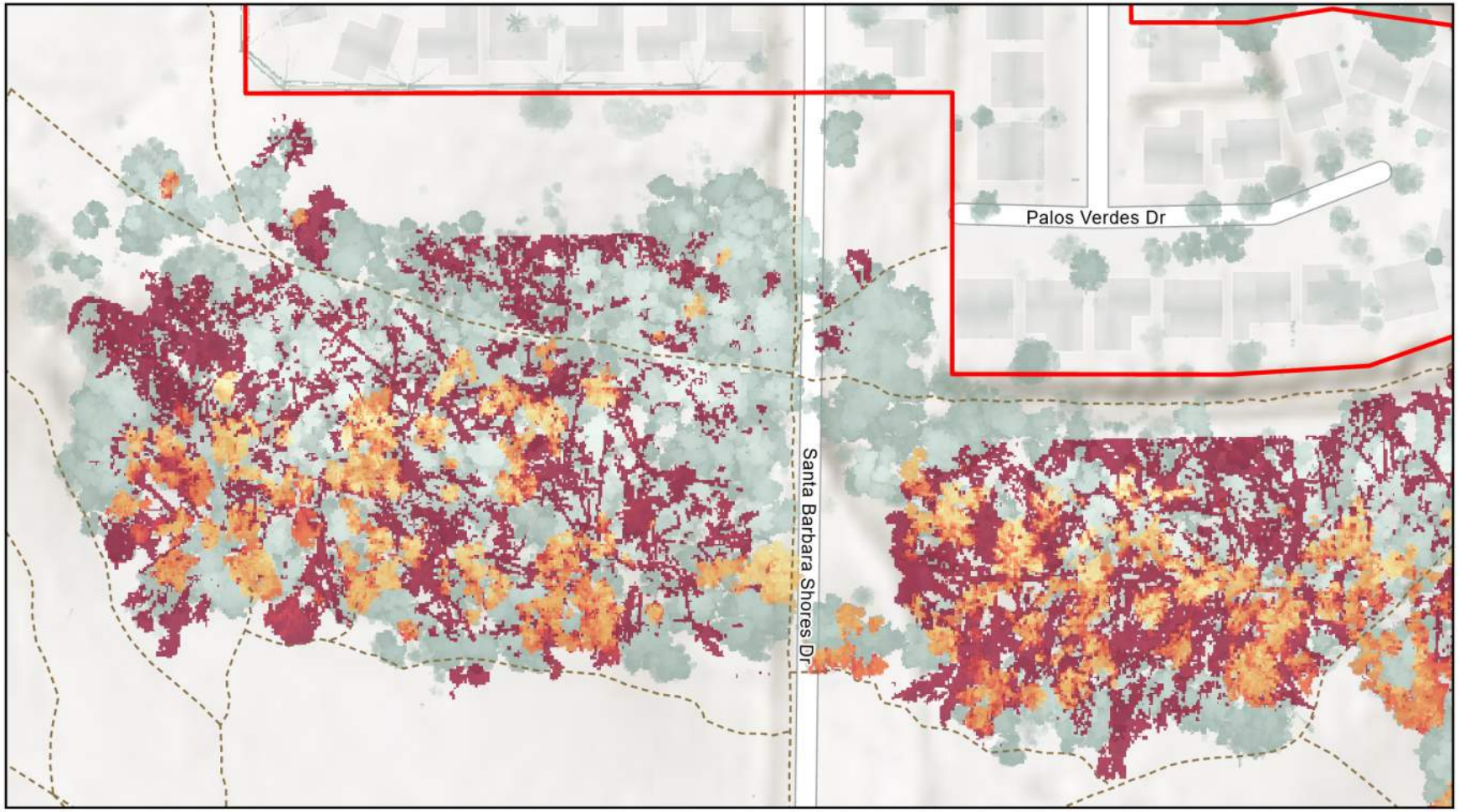
N

0 50 100 Feet

Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42283°N 119.89096°W
Goleta, Santa Barbara County

LiDAR Source: NV5, 09/27/2021

Figure 7. Classified Dead Wood - Ellwood West



Legend

Ellwood Mesa Open Space

Existing Trails

Dead Stems

Height above ground

125 ft

0

N

0 100 200 Feet

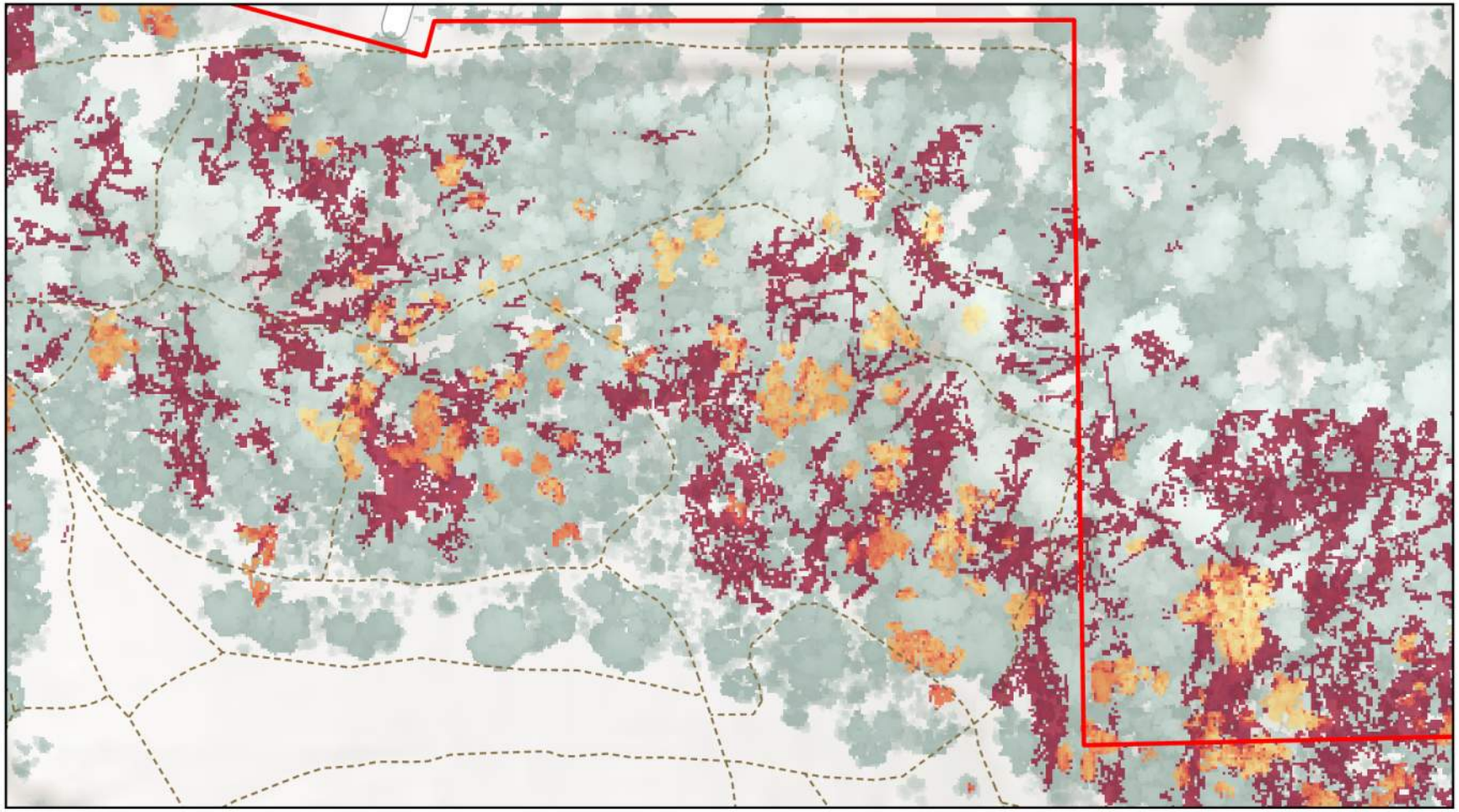
Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42338°N 119.89355°W
Goleta, Santa Barbara County

LiDAR Source: NV5, 09/27/2021

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Map Updated:
February 21, 2023 01:36 PM by KRN

Figure 8. Classified Dead Wood - Ellwood East



Legend

Ellwood Mesa Open Space

Existing Trails

Dead Stems

Height above ground

125 ft

0

N

0 100 200 Feet

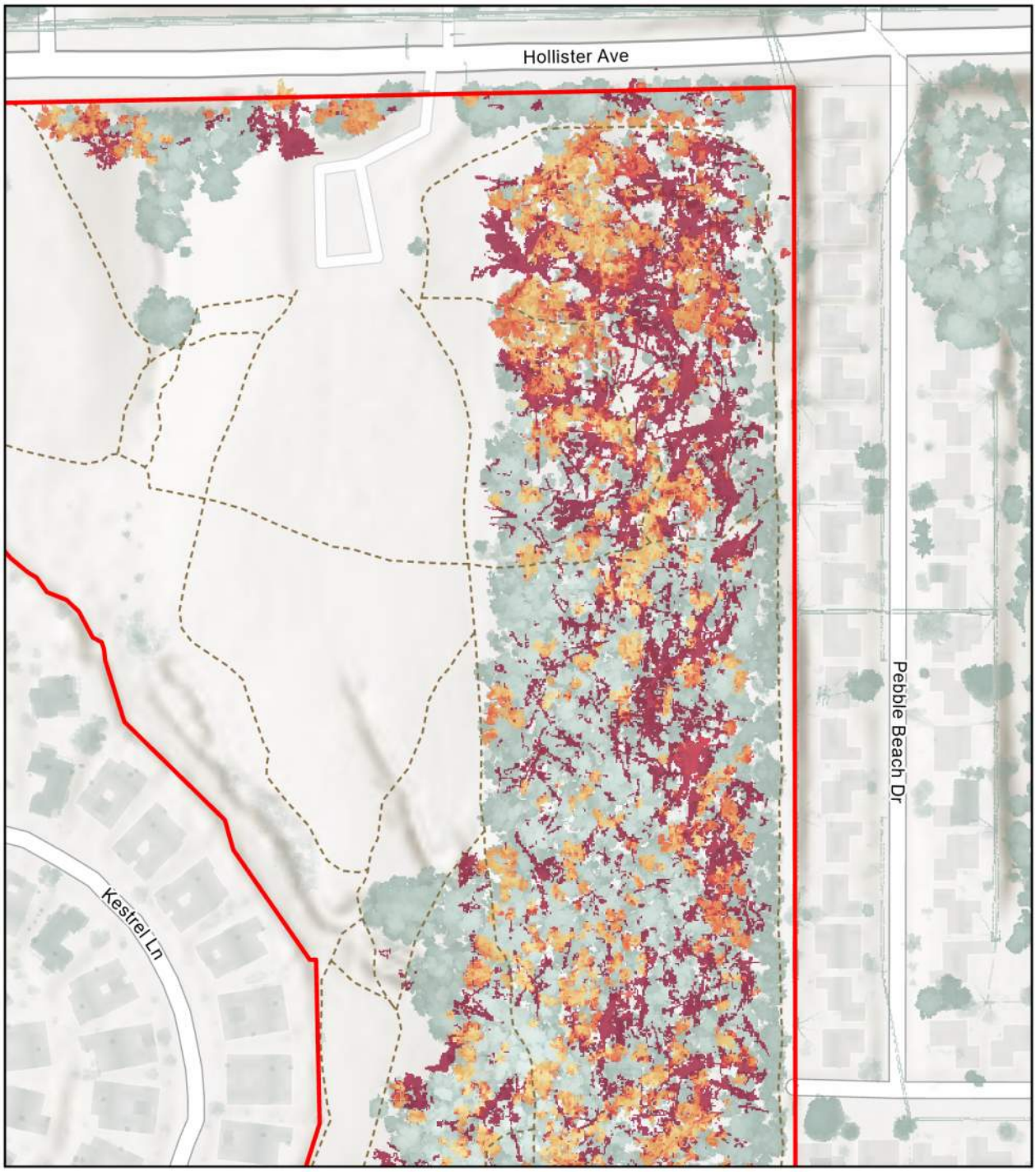
Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42283°N 119.88886°W
Goleta, Santa Barbara County

LiDAR Source: NV5, 09/27/2021

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Map Updated:
February 21, 2023 01:36 PM by KRN

Figure 9. Classified Dead Wood - Ellwood North



Legend

Ellwood Mesa Open Space

Existing Trails

Dead Stems

Height above ground

125 ft

0

N

0 100 200 Feet

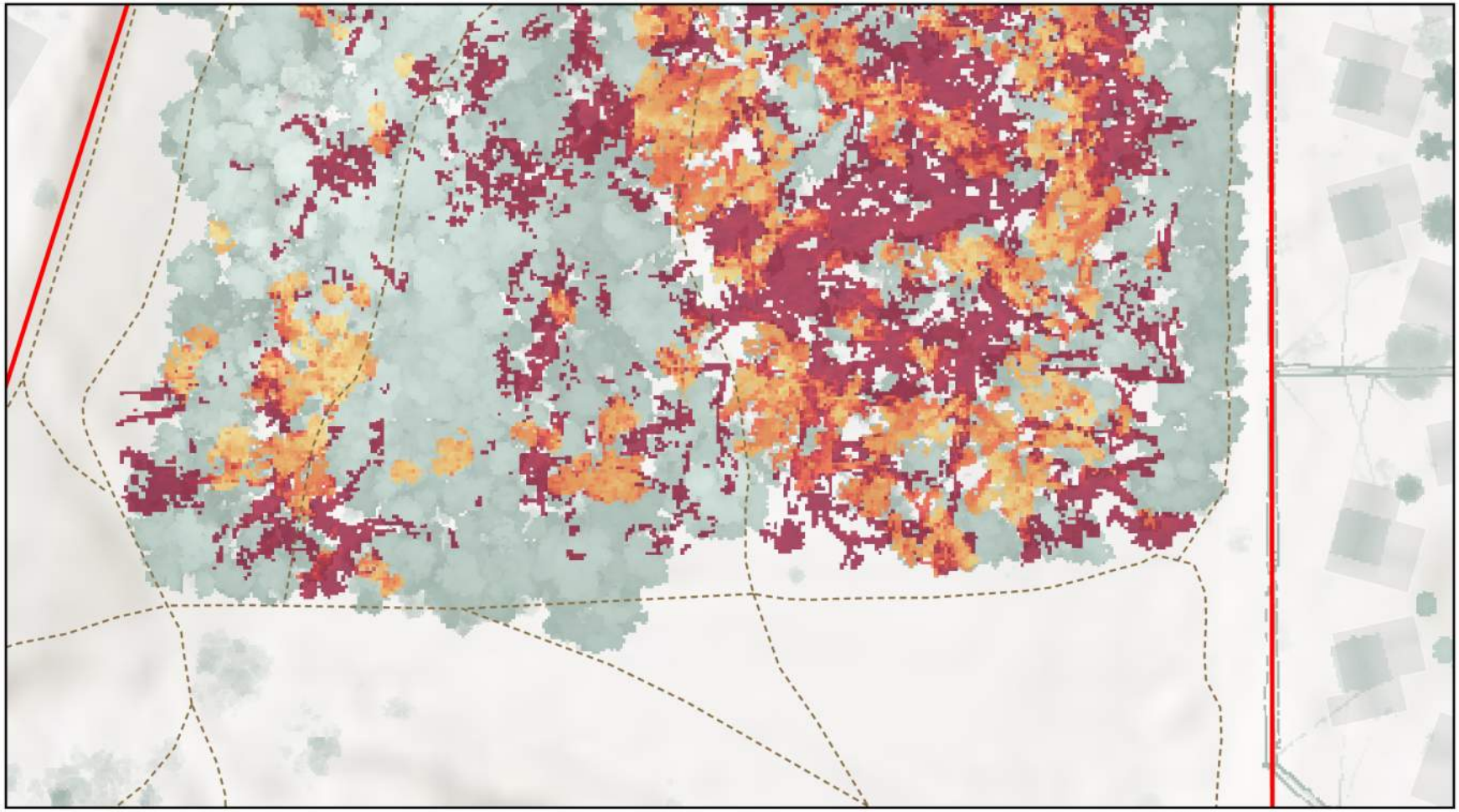
Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.4278°N 119.89625°W
Goleta, Santa Barbara County

LiDAR Source: NV5, 09/27/2021

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Map Updated:
February 21, 2023 01:36 PM by KRN

Figure 10. Classified Dead Wood - Ellwood Ironbark



Legend

Ellwood Mesa Open Space

Existing Trails

Dead Stems

Height above ground

125 ft

0

N

0 50 100 Feet

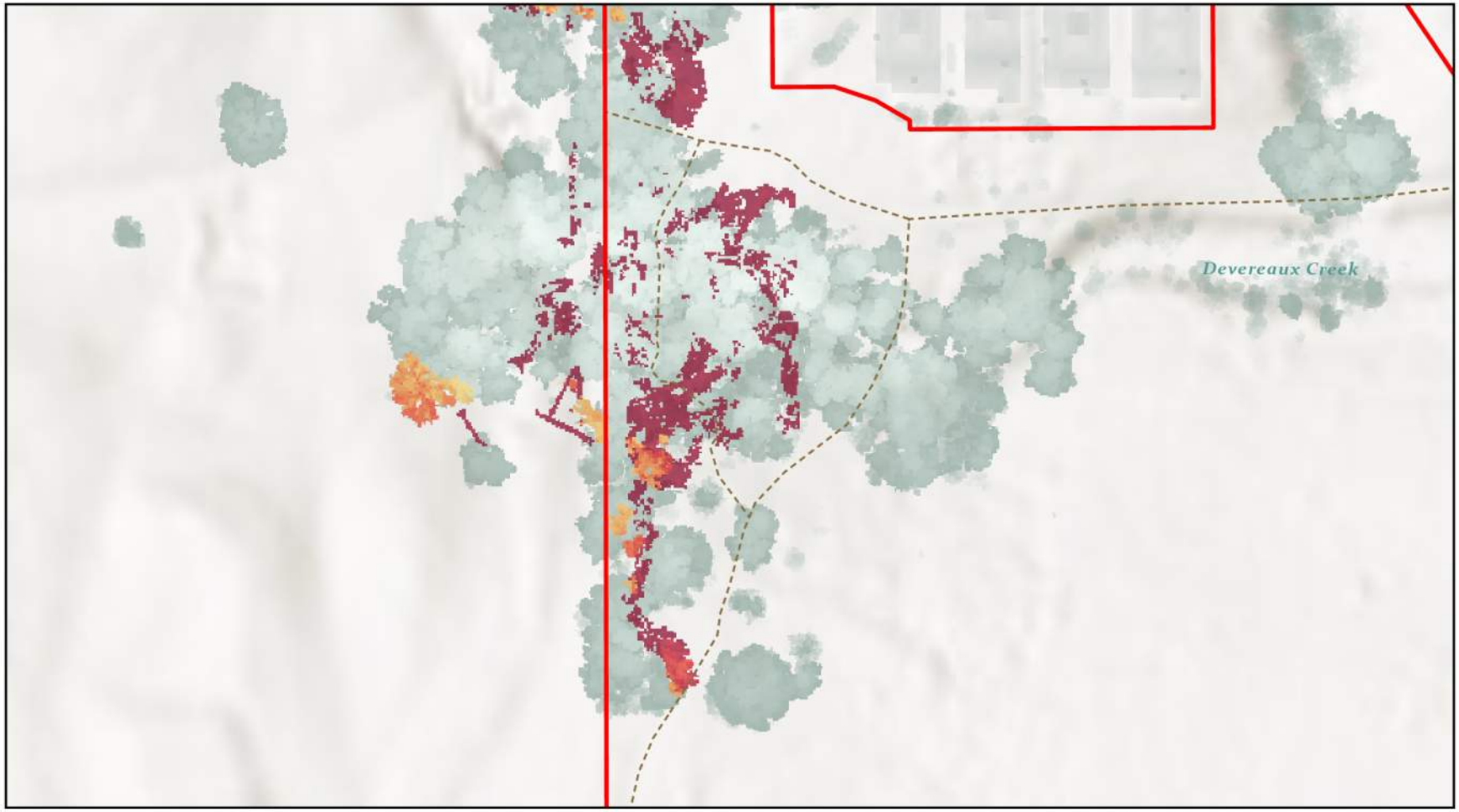
Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42486°N 119.89609°W
Goleta, Santa Barbara County

LiDAR Source: NV5, 09/27/2021

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Map Updated:
February 21, 2023 01:37 PM by KRN

Figure 11. Classified Dead Wood - Sandpiper



Legend

Ellwood Mesa Open Space

Existing Trails

Dead Stems

Height above ground

125 ft

0

N

0 100 200 Feet

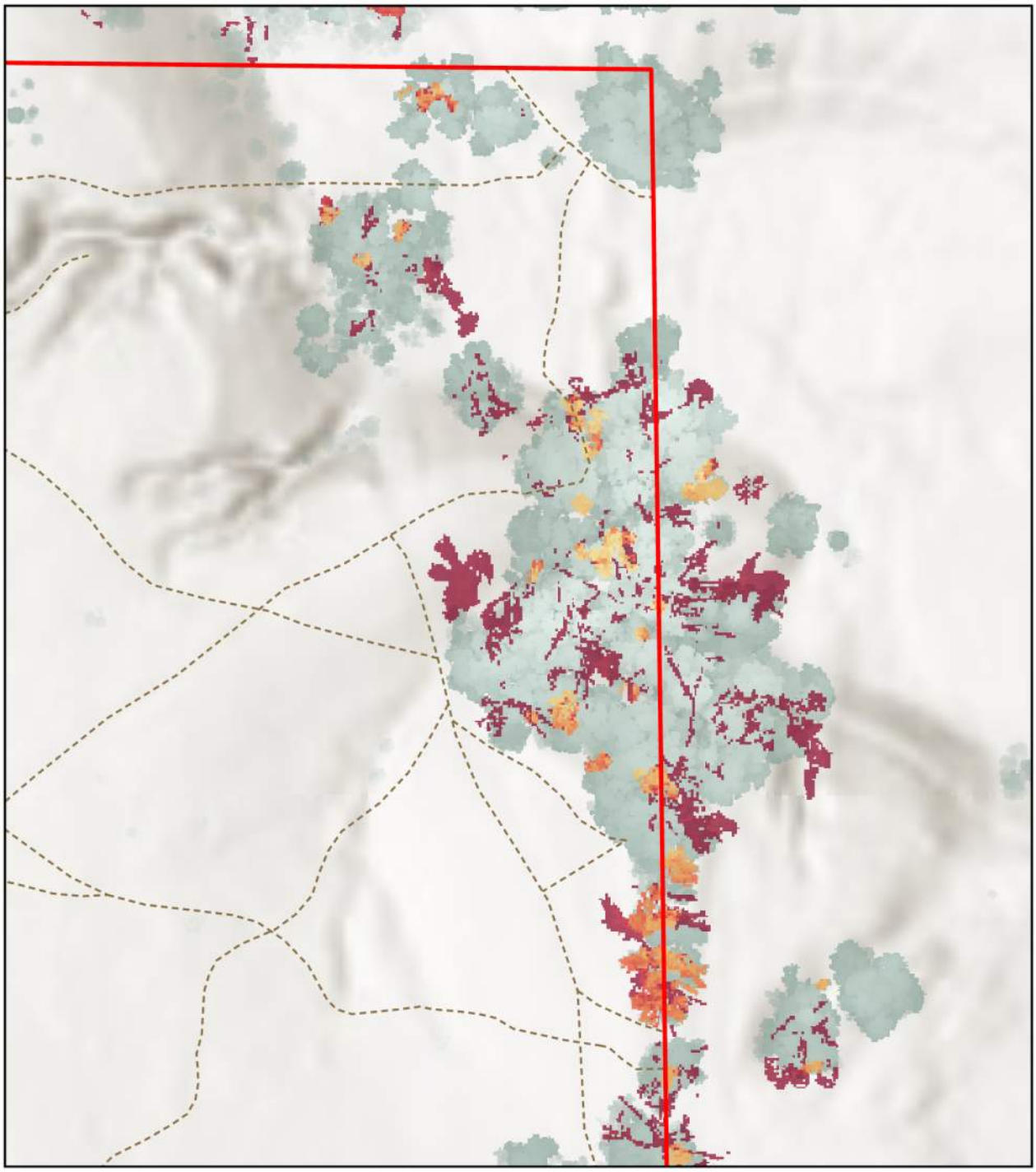
Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42385°N 119.89995°W
Goleta, Santa Barbara County

LiDAR Source: NV5, 09/27/2021

ALTHOUSE AND MEADE, INC.
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Map Updated:
February 21, 2023 01:37 PM by KRN

Figure 12. Classified Dead Wood - Ocean Meadows



Legend

Ellwood Mesa Open Space

Existing Trails

Dead Stems

Height above ground

125 ft

0

N

0 75 150 Feet

Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42098°N 119.8853°W
Goleta, Santa Barbara County

LiDAR Source: NV5, 09/27/2021



Photo 4. Mass mortality of blue gums at Ellwood North, view towards the east.



Photo 5. Mass mortality of blue gums at Ellwood Main, at viewing area looking southwest.

5 STATUS OF THE HABITAT AT ELLWOOD MESA

Professional experience integrates the technical analyses into a coherent assessment and plan that maximizes chance of success, if adopted and executed. Since 1989, the core scientists on this team have worked on dozens of formal and informal monarch habitat assessments/plans and have seen a full gamut of site characteristics, monarch behavior, and management successes and failures.

5.1 Overview of Methods

We are applying this best available science to diagnosing and restoring the monarch habitat at Ellwood Mesa. The tools we use to assess and manage overwintering sites include:

1) Direct observations
2) Hemispherical photography
3) LiDAR
4) Forestry
5) Wind modeling

These are methods that are used to quantify the amount of canopy and openness in the canopy in order to then infer the prevalence of wind and intensity of light. These techniques encompass the best available science, bolstered by collective decades of monarch experience at Ellwood Mesa and dozens of sites from Sonoma to San Diego.

5.1.1 Direct Observation

The direct observations of monarch distribution and abundance allows the butterflies to tell us what they like and do not like. The Western Monarch Thanksgiving Counts document numbers in late-November and early-December, and the New Year's Counts document numbers at a subset of sites in early-January. The difference between the two counts reflects site suitability in the face of whatever weather occurred between the counts. With strong storms, monarchs leave some sites completely, do a partial exodus, and many sites decline with ongoing mortality. Often, a large storm will reshuffle monarch distributions among close sites, or sites tens of kilometers away. In other years conditions are mild and little change in distribution occurs, only some mortality. In California as a whole, the change from Thanksgiving to New Year's ranged from –35 to –49 % but varied greatly from site to site and region to region.

Finer temporal resolution of monitoring (1-2 weeks, or even close to daily) reveals responses to individual weather events especially when the cluster locations are closely tracked by tree, branch, and height. Wind vulnerabilities become apparent when movements are linked to individual storms or storm sequences, and we can often observe the fine-scale shelter provided by individual branches. Also, monarchs prefer different insolation regimes at different times of the year conditional to wind, seeking afternoon sun after a day flying, or morning sun when early activity.

Direct observation of wind, temperature, and insolation can be valuable, but have limits. Spot observations can map instantaneous conditions across an entire site and have proven invaluable (Leong 1990, Leong et al. 1991). Continuous observations by automated equipment are limited to a few sites in any given grove.

5.1.2 Hemispherical Photography

Hemispherical photography (hemiphotos) is a well-developed technique for analyzing canopy structure at overwintering sites (Weiss et al. 1991). A 180 degree “fisheye” image pointed upward allows precise determination of canopy gaps, and their directional impacts on light and wind is determined by specialized image analysis software, such as Hemiview. The methodology for the hemispherical photography is included in Appendix A.

Canopy gaps along sunpaths allow for fine-scale estimation of monthly and half-hourly insolation, and gaps in different wind directions that are produced. These “site factors” can be mapped as points or as interpolated surfaces. The point data are presented as color-coded circles for ISFU (Visible Sky), DSFU (proportion of potential annual insolation), and monthly potential direct insolation.

The first-order approximation of wind penetration from hemiphotos is “directional exposure:” the proportion of open sky in 8 different directions. “Wind roses” for hemiphotos are created from different sized wedges in 8 directions that correspond to the proportion of open sky in that 45° sky sector. Low elevation angles are more highly weighted than overhead the hemispherical view (greater proportion of the hemisphere at low elevation angles). Hemiphotos are labeled for directional exposure with the wind rose below the photo number. The wind rose wedges are color coded: red is > 0.30 and indicates too much exposure, yellow is between 0.20 -0.30 which is marginal, and blue is < 0.20 which is generally well-sheltered.

At Ellwood Main, a dense enough array was taken so that interpolated surfaces could be generated in ArcGIS using the Geostatistical Analyst. The chosen technique (Thin Plate Spline) that is an exact interpolator – the surface goes through each observation, and directional bias (i.e., upwind/downwind) can also be considered.

More detailed methodology is included in Appendix A.

5.1.3 LiDAR

LiDAR is the newest tool for evaluating monarch sites, developed since 2019. A laser scanner, from drone or airplane, is flown over a site and the 3-D “point cloud” of reflections captures the fine-scale canopy structures across entire sites and adjacent areas. Lidar is an acronym of "light detection and ranging", a method for determining ranges by targeting a surface with a laser and measuring the time for the reflected light to return to the receiver. The full analysis report with methodology is included in Appendix G.

5.1.4 Arboriculture

Professional arborists were employed to assess current conditions and tree health and make recommendations for future maintenance. The foundational knowledge arborists provide is important to our understanding of forest dynamics and our ability to manage them into the future. In 2017 and 2018, an ISA Certified Arborist (Cory Meyer) assessed trees throughout Ellwood Mesa by documenting tree genus and species, diameter at breast height (DBH), tree height, canopy spread, health, and environmental conditions. Diameter was measured in Standard American English (SAE) units by running a Starrett 530JT-50 diameter tape measure around the trunk at breast height. Visual inspections were used to estimate canopy height and spread, health, structure (e.g., direction of lean), and defects. Notes were taken for environmental or site conditions, tree structural problems, or possible diseases and pests.

5.1.5 Wind Model

Recent software advances allow computational fluid dynamics to be applied to LiDAR point clouds to model wind within forest canopies. We applied Rhinoceros 3D 7 (McNeel et. al. 2010) with Eddy3D (a plugin for Rhino 7 that uses OpenFOAM), Volvox (Zwierzycki 2016), Lands Design (Asuni 2022). We created a 3-D map of wind speeds at fine scales, allowing for more detailed assessments than those based on inferred wind from canopy gaps. Detailed wind modeling methods are provided in Appendix B.

The effects of both proposed and existing forest management, such as planting shelterbelts, or the loss of trees, as well as the effects of nearby buildings were simulated to understand how wind dynamics are affected by various structure types and heights.

More detailed methodology is included in Appendix B.

5.2 Ellwood Main

Ellwood Main is a stand of primarily blue gums surrounding a north-south running side gully of Deveraux Creek. The core stand extends approximately 140 m (460 ft) north-south from Deveraux Creek to the end of the gully, and approximately 125 m (410 ft) east-west. Some outlying stands north across Deveraux Creek and east and west of the core stand provide outer wind shelter. The main cluster sites occupy approximately 30 m (100 ft) over the gully, starting approximately 30 m (100 ft) from the creek channel. Tree heights are up to 40 m (130 ft).

The stand of trees has a cathedral structure and the elongated north-south gap over the gully allows substantial insolation into the cluster sites. The trees on the shoulders of the gully and extending onto the mesa top provided multiple layers of shelter from southerly, easterly, and westerly winds. The south, west, and east edges of the stand are characterized by dense stands of saplings and pole-sized trees. Trees between the cluster site and Deveraux Creek and the trees north of the creek provided shelter from northerly winds. The gully itself provides a cold moist air pool at night and in the morning.

The combination of these features made Ellwood Main a premiere overwintering site that has attracted and maintained large numbers of monarchs thorough entire overwintering season for decades. In recent years, monarchs have utilized the trees along the gully for roosting and their cluster locations span the 100 m area, as shown on Figure 13.

The recent mass mortality of blue gums has greatly weakened the wind shelter for the monarch roosting areas. To visualize the canopy of Ellwood Main, we created a dissection of the profile of Ellwood Main in 25 m slices, shown in Figure 14. The profile starts on the north bank of Deveraux Creek and progresses due south through the cluster zones to the south end of the stand of trees. The V-shape is the north-south gully through Ellwood Main. Table 4 gives a description of each slice of the profile.

Figure 13. Monarch Observations - Ellwood Main



Legend

Ellwood Mesa Open Space Boundary

Monarch Cluster Observations by year

- 2022
- 2021
- 2020
- 2019

N

0 50 100 Feet

Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42283°N 119.89096°W
Goleta, Santa Barbara County

Imagery Source: NV5,10/29/2021

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Map Updated:
February 21, 2023 04:02 PM by CDM

FIGURE 14. A PROFILE THROUGH ELLWOOD MAIN: ANATOMY OF A MAJOR AGGREGATION SITE

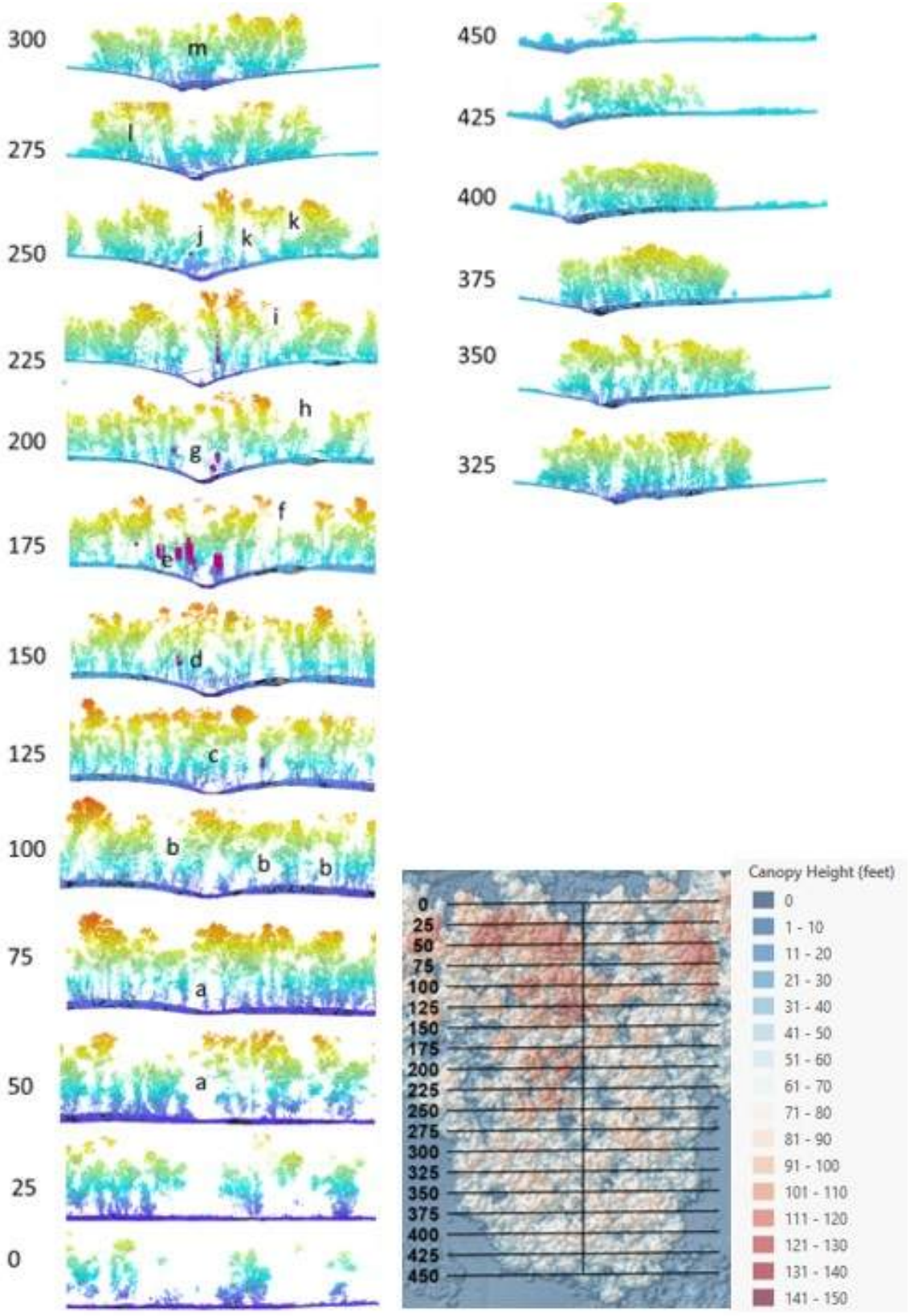


TABLE 4. DESCRIPTION OF ELLWOOD MESA CANOPY SLICES

Images of this Slices are shown in Figure 14.

Location	Description
0	North bank of Deveraux Creek, scattered trees
25	Creek Channel
50	South bank
75	Opening above gully [a], south-edge of riparian zone with tall dense trees
100	Openings east and west away from gully [b]
125	First small clusters on west bank (purple dots), substantial north wind shelter across gully [c]
150	Small clusters on east bank, immediate north wind shelter major cluster zone [d]
175	Major cluster zone. Mainly on east bank or bottom of gully. Viewing area on east bank [e]. West opening [f] is a major tree mortality zone (Photo) that opened a west-southwest wind vulnerability.
200	Cathedral structure apparent over gully [g], clusters are low. Large west-opening continues south [h]
225	Most southerly stack of clusters, on west bank. Large west opening continues [i]
250	Short south-wind shelter across gully [j], interior gaps to west of gully [k]
275	Tall canopy on east and west banks of gully [l]
300	Taller south-wind shelter across entire gully [m]
325-340	The stand narrows and densifies and the gully emerges east of the stand

Note: 25 ft slices were created in ARCGIS Scene, starting on the north bank of Deveraux Creek, and progressing due south through the cluster zones and to the south end of the stand. The V-shape is the north-south gully.

5.2.1 Historical Conditions at Ellwood Main: Hemiphotos 1990, 1998, and 2021

In January 1990, a 100 m transect was set up along the Ellwood Main gully, with hemiphotos taken every 10 m (Weiss et al. 1991). The transect was resampled in 1998 and in 2021, allowing for a quantitative comparison of site factors over time that document change in the canopy structure and habitat suitability for the monarchs.

The array of hemiphotos (Figure 15) shows the main cluster zone at Ellwood Main, at 60 m and 70 m along the gully, with hemiphotos taken in 1990, 1998, and 2021. In 1990, the forest had experienced 4 intense drought years so was relatively open with loss of tall branches and foliage. During the wet 1990s, the forest grew vigorously. By 2021, further drought had thinned the forest, and large numbers of whole trees died.

At 70 m, the canopy filled in from south through north-west between 1990 and 1998, primarily from south through north-west, while it opened to the north. By 2021, more openings appeared to the south, southwest, west, and northwest, and an overhead tree to the southeast died. But the tree almost due east filled in over that time. A similar pattern is seen at 60 m.

The major site factors (Table 5) show trends of key "site factors" across all three dates. ISFU[4] (fraction of visible sky in all directions) varies from 0.11-0.16 in the photos, and ranges by 0.03 through time at each site. ISFU increased from 1998 to 2021 at 60 m but decreased from 0.13 to 0.11 at 70 m over that period. ISFC[5] (visible sky corrected to a horizontal surface) is higher than ISFU and ISFU/ISFC ratio has a narrow range from 1.5-1.6, indicating that the canopy is relatively more open overhead than around the edges, i.e., the sites are in a substantial overhead gap. The Direct Site Factor Uncorrected (DSFU) is the fraction of potential annual insolation uncorrected for receiving surface – basically how open the canopy is along all of the yearly sunpaths. The DSFU values, and visual inspection, indicate that the sites are open enough toward the S that full or dappled sunlight is received several hours each day.

TABLE 5. MAJOR SITE FACTORS AT TWO HEMIPHOTO SITES IN CLUSTER ZONE FOR 1990, 1998, AND 2021

Site Factor	60m			70m		
	1990	1998	2021	1990	1998	2021
ISFU	0.15	0.13	0.16	0.14	0.13	0.11
ISFC	0.23	0.20	0.25	0.22	0.20	0.17
ISFU/ISFC	1.50	1.60	1.60	1.50	1.50	1.50
DSFU	0.23	0.15	0.28	0.20	0.15	0.17

The graphic assessment of canopy gaps is shown as polar plots in Figure 16 and Figure 17. The figures show directional exposure in 8 directions and show some complex behavior of the canopy gaps over time and space. For example, at 60 m north-exposure decreased from 1990/1998 to 2021; i.e., the canopy filled in in that direction. In contrast, at 70 m north-exposure remained relatively constant. At 60 m, south- and southwest-exposure decreased from 1990 to

[4] ISFU = Indirect Site Factor Uncorrected: the overall proportion of sky visible.

[5] ISFC = Indirect Site Factor Cosign corrected to a horizontal surface.

1998, then increased by 2021, reflecting the many trees that died from 1998 to 2021 in that sector. At 70 m, south-exposure decreased from 1990 to 1998, and slightly increased by 2021. And southwest-exposure decreased from 1991 to 1998 and increased back in 2021. Many more changes can be observed.

The differences between sites only 10 meters apart show that monarchs can move short distances to reduce wind exposure. For example, moving from 60 m to 70 m reduces south-exposure from 0.28 to 0.13, but moving to 80 m increases south-exposure to 0.25. The same move reduces southeast-exposure from 0.26 to 0.18 and to 0.11.

The main conclusion from this historical comparison is that the patterns of sky exposure in the cluster zone have shifted through time, to be expected in a complex dynamic forest. Throughout the 1990s and 2000s, Ellwood Main supported permanent season-long monarch aggregations, indicating that the site factors observed in 1991 and 1998 were well within the tolerance range and could protect monarchs from the most intense winter storms. The degradation of the forest starting in the mid-2010s has reduced the multiple layers of wind shelter, thereby increasing wind vulnerabilities, leaving “thin, green lines” as the remaining wind shelter.

As of 2021, the cluster zone remains relatively well-sheltered from most directions, but significant gaps have formed especially to the west and southwest. By 2021, the site factors in the cluster zone were suitable when monarchs arrived, and they remained at the site until strong windstorms exceed a threshold between 25 and 30 mph, as occurred in December 2021 and December 2022. As such, Ellwood Main may be acting as an “ecological trap,” attracting monarchs early in the season but leaving them vulnerable to strong storms that can be expected each year (as shown on the wind rose in Graph 7 in Section 4.3).

FIGURE 15. HEMIPHOTOS FROM THREE YEARS BETWEEN 1990 AND 2021 AT 60 AND 70 METERS INTO THE ELLWOOD MAIN GROVE

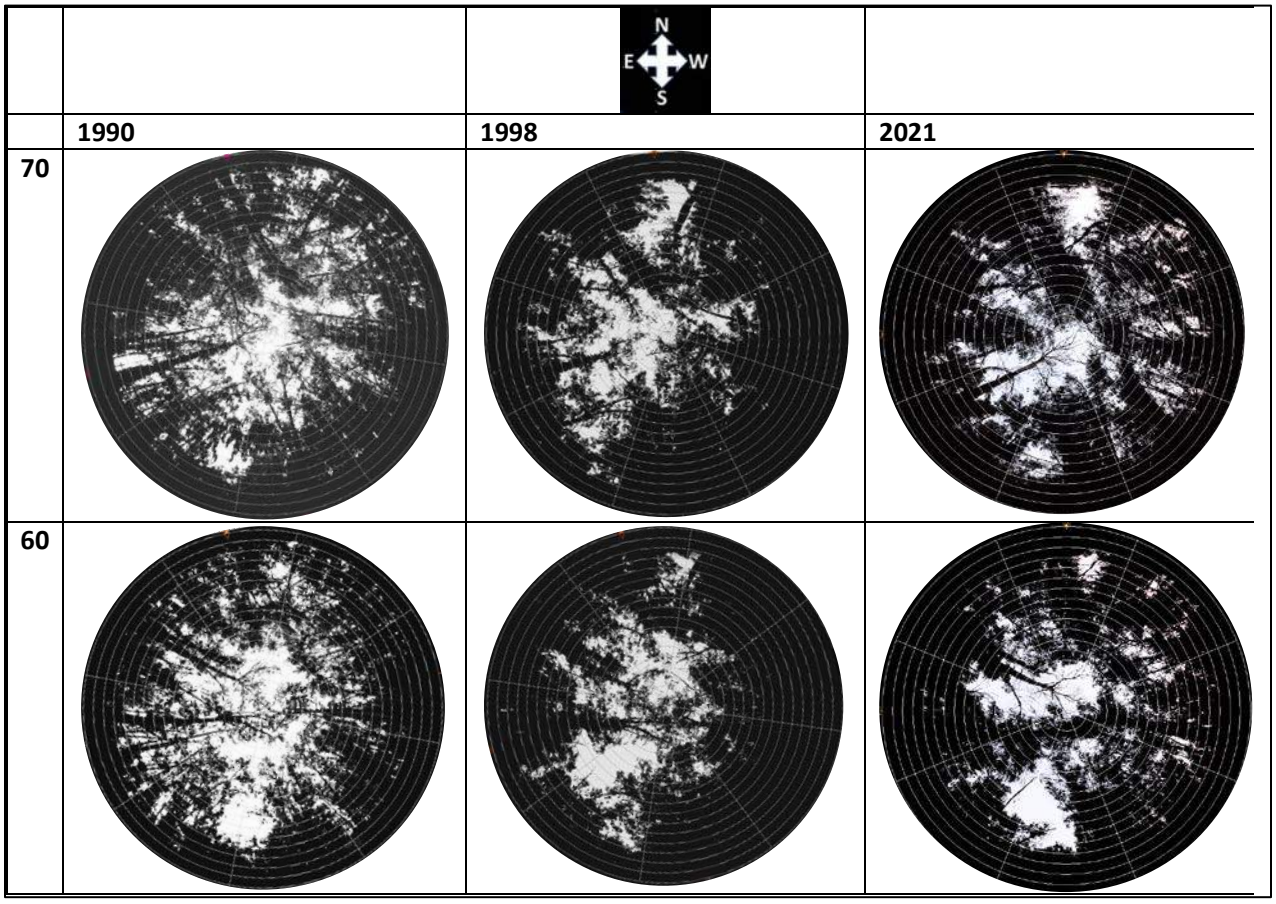


FIGURE 16. GRAPHIC ASSESSMENT OF CANOPY GAPS OBSERVED IN THE HEMIPHOTOS EACH OF THREE YEARS

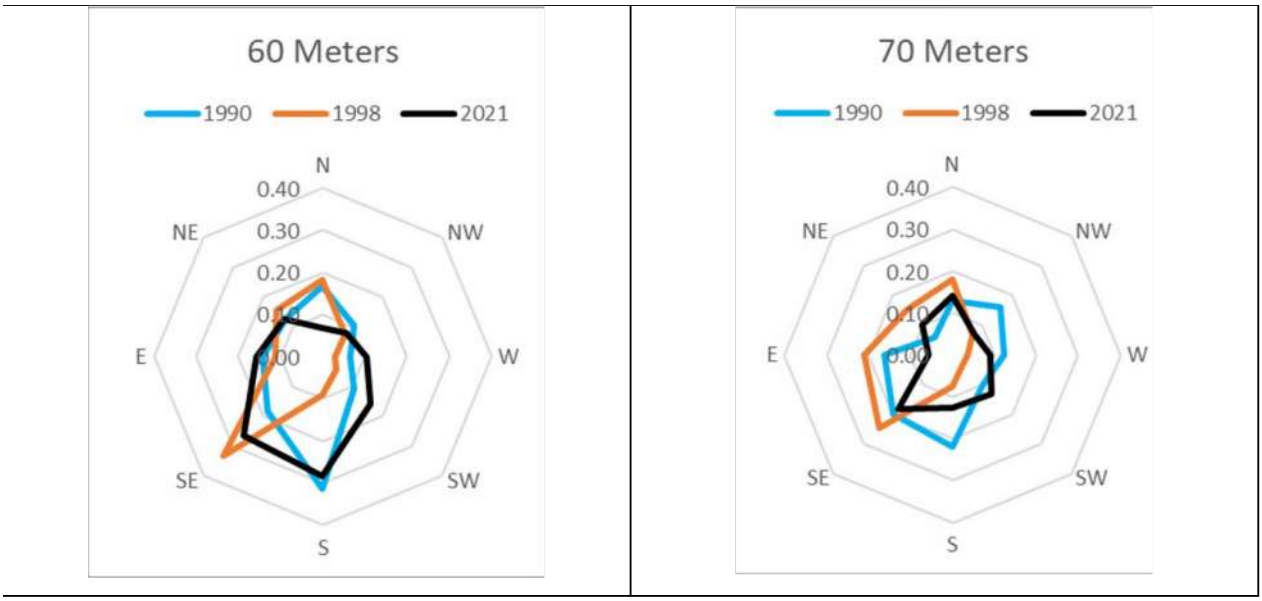
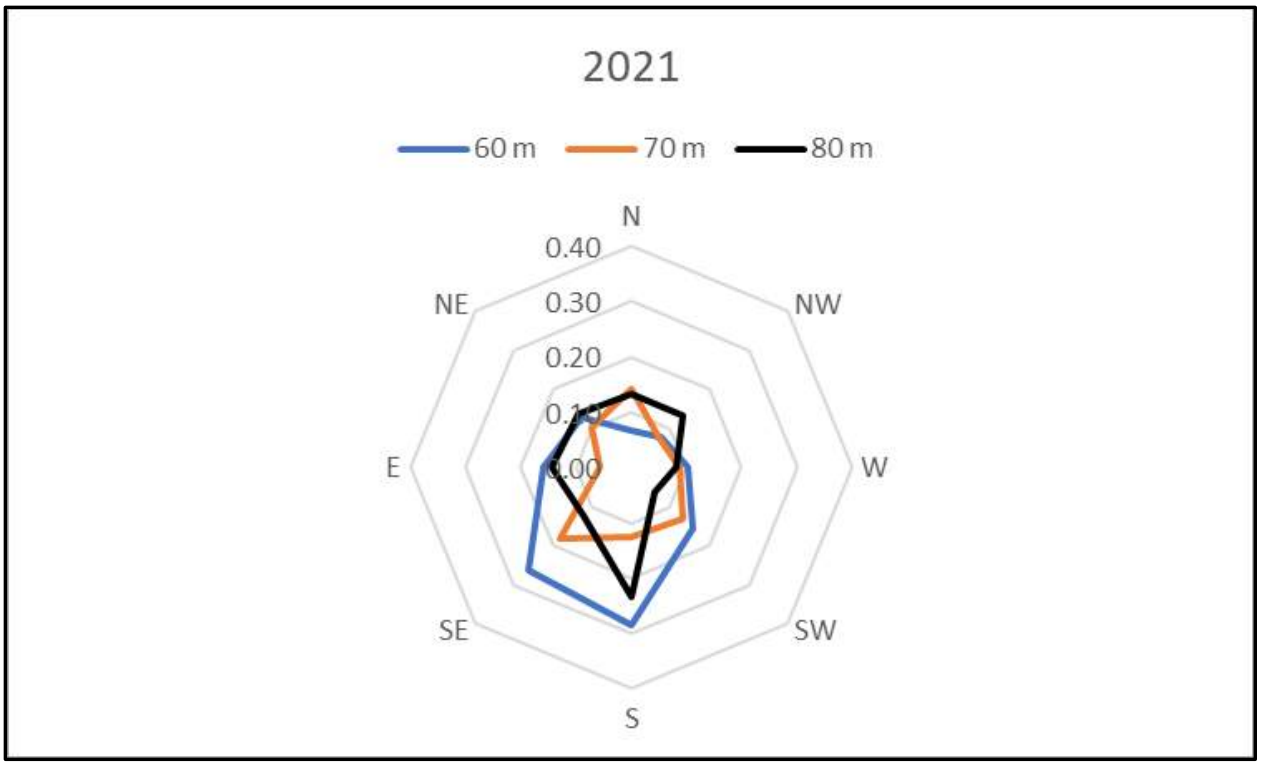


FIGURE 17. GRAPHIC ASSESSMENT OF 2021 DIRECTIONAL EXPOSURE AT THREE LOCATIONS 10 METERS APART IN THE CLUSTER ZONE



5.2.2 Current Conditions at Ellwood Main

At Elwood Main, hemiphotos were taken at 10 m (33 ft) increments along the gully bottom (recreating the 1990 and 1998 transects, see historical conditions in Section 5.2.1), and at 10 m increments along the trails on the east-side and west-side, and a few at the canopy edges. Photo locations are shown in Figure 18, overlaid onto the maps of standing and downed dead wood, and a color infrared (CIR) image with live canopy as bright red. The cluster zone of 2021 and 2022 is in the white oval.

5.2.2.1 Visible sky

The point map of Visible Sky (ISFU) at Ellwood Main (Figure 19) shows that the cluster zone is in the range of 0.125-0.20. The northern part is slightly more closed. Areas 20+ meters south of the cluster zone are less open, < 0.125. The ranges reported in Table 6 are from the four hemiphotos that overlap within the cluster zone oval.

5.2.2.2 Directional exposure

The maximum directional exposure and wind roses (Figure 19) show how exposure decreases from the edge (red) into the interior (yellow through blue), and there are "wind tunnels" where a bulge or streak of red or yellow extend into the interior. The individual wind roses show which and how many directions are vulnerable. Maximum directional exposure shows that much of the northern half of Ellwood main has marginal (yellow) exposure from one or more directions. The only 360° sheltered areas in the grove are in the southern half, but those areas have too much canopy cover and lack sufficient insolation.

Directional exposure (Figure 20) shows an array of 8 directions. The penetration of wind into the grove is illustrated as the gradient from red (>0.30) at the edge, through yellow (0.20-0.30), and into blue (<0.20). Descriptions of key features from each direction are in Table 6. Note some extremely sharp gradients near the gully transect; these are the "thin green lines" of remaining live foliage that are the last live shelter for the cluster zone.

The most vulnerable directions in the cluster zone are W, SW, S, SE. The depth of wind shelter in these directions has been compromised by the tree mortality in the interior, extending all the way to the edge in the southwest gap (see Figure 18 for dead trees) – prior to the mortality, many more trees provided redundant wind shelter in these areas. The thin green lines of live trees that provides the critical wind shelter are just below the E-trail and along the SE edge. The high S-exposure is a natural consequence of the cathedral structure over the gully and is also what allow insolation into the cluster zone (see below). Monarchs could move about 10 m north along the gully axis, cluster behind some branches, and reduce their S-exposure. But then they will increase their N exposure. The N-exposure in the cluster zone is attenuated by the remaining thin green line running E-W across the gully just N of the cluster zone. N-exposure has increased from tree mortality and canopy thinning.

The array of photos around the primary cluster zone (Figure 21) shows these structures from the ground. Each photo is discussed in Table 7.

5.2.2.3 Insolation

Maps of ground-level DSFU (Figure 22) show that the cluster zone is in a higher insolation belt (white. 0.23-0.29) running E-W across the gully. Other parts of the grove (the gully floor N of the cluster zone) are deeply shaded all year long (darker blue, < 0.13). Note that DSFU assess all

sunpaths through the year and includes the high sun angles of summer (see Methods). But DSFU is relevant as an approximate measure of southern sunpath exposure higher in the canopy, i.e., the values for summer from ground level are relevant for winter values higher in the canopy.

The point maps of monthly insolation at ground level show that the cluster zone is in a higher Oct- Feb insolation area compared with areas further south, the result of the elongated gap over the gully that creates the cathedral structure. The gap can be clearly seen in Photos 314 and 315 (Figure 21). Insolation in the cluster zone decreases from October to December and increases again through February (a natural consequence of seasonal sun angles). In October. most of the forest floor is not in deep shade, but the deepest shade (darkest blue) increases in November and December, especially in the southern interior of the grove. By December, the ground-level shade extends to the S end of the cluster zone. The S-edges receive nearly all potential radiation (reds).

An array of hemiphotos around the primary cluster zone show some of the canopy structures described above (Figure 21). The descriptions (Table 7) include presence of gaps and thin green lines in various directions.

5.2.2.4 Ellwood Main Summary of Findings

Between the LiDAR, current and historical hemiphotos, and experience, we have a comprehensive view of current conditions at Ellwood Main. The key southwest, south-southeast and north vulnerabilities are presented as oblique LiDAR views with hemiphotos from below (Figure 23 - Figure 25). If the darker blues (ground) are visible, it means that a deep canopy gap exists in that view. Accompanying hemiphotos give the view from the ground inside the grove.

Key conclusions and observations include:

1. The primary cluster zone has relatively higher insolation than surrounding areas, created by the cathedral structure and elongated gap over the gully.
2. The primary cluster zone has low directional exposure from most sides, but with moderate wind vulnerabilities from SW, S, SE, and N.
3. Mass tree mortality has opened the canopy, leaving only thin green lines of live trees in key directions as the remaining wind shelter. Gaps in those lines create specific vulnerabilities shown in Figure 23 - Figure 25.
4. Even where some wind shelter remains, redundancy in wind shelter has been lost.
5. Monarchs were attracted to Ellwood Main in October and November 2021 and 2022, but then abandoned the site following strong storms, confirming substantial loss of wind shelter.
6. Further tree mortality and treefall will reduce remaining wind shelter.
7. Some vulnerabilities are compensated by short movements (10-20 meters) to other trees/branches, but then wind shifts can drive monarchs back to original cluster sites.
8. Many standing dead trees threaten nearby cluster and windbreak trees.

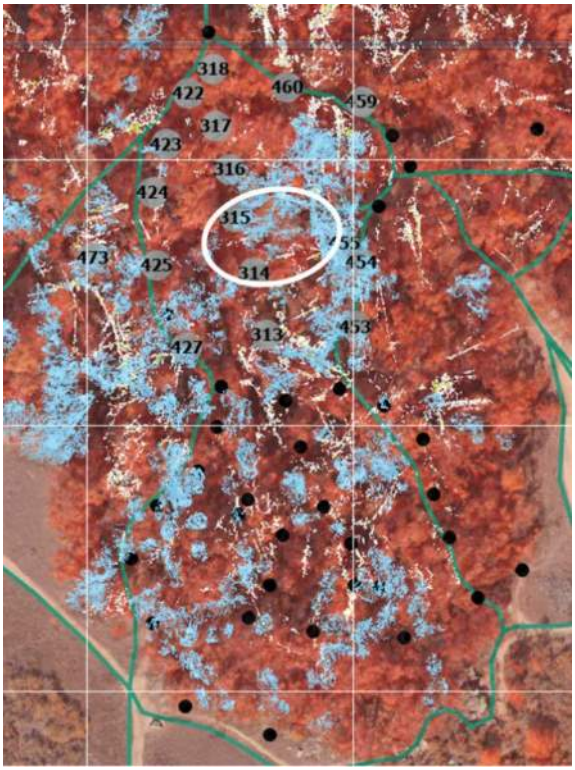
The restoration recommendations (Figure 26) show the primary cluster zone, the main dieback zones, and the vulnerabilities described above.

5.2.3 Recommendations for Ellwood Main Restoration Actions

The following are our recommendations for the restoration of Ellwood Main and correspond with Figure 26:

- Replace/replant dead monarch aggregation trees with blue gum eucalyptus.
- Encourage the recruitment and establishment of blue gum saplings and existing trees.
- Retain tall trees north of creek for north-northwest shelter.
- Be very surgical with fuels reduction in areas 18A-B-C-D.
- Fuel reduction areas 21B-C and 22A are important northeast shelter trees.
- Remove standing dead trees (shown in black on Figure 26).
- Remove high fraction of downed wood, especially finer fuels <10 inches diameter that prevent new growth.
- Separate large logs on the forest floor as practical.
- Plant shelterbelts of red ironbark on open edges, or inside behind the first row of blue gums.
- Fill the west gap with red ironbark (white oval on Figure 26).
- Plant karri (*E. diversicolor*) within interior of grove around the aggregation area for tall canopy and wind shelter trees.
- Plant California bay trees along the south side of Devereaux Creek.

FIGURE 18. HEMIPHOTOS TRANSECT LOCATIONS AT ELLWOOD MAIN



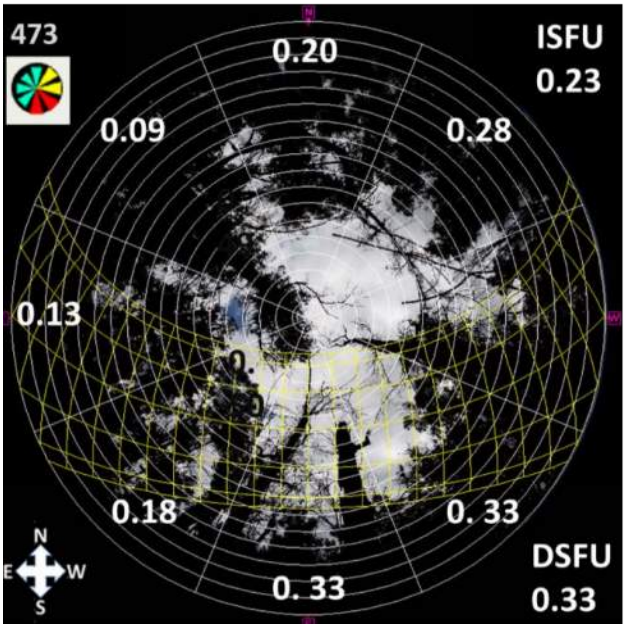


Photo locations on left, on top of a CIR image and dead standing (blue) and dead downed (white) wood. Example photograph (473) in high mortality zone with directional exposure in each octant, as a reference. Maximun expoure to S, SW, and W, lowest NE. Monthly sunpaths are in yellow, from December (most southerly) through June (nearly overhead at noon). The most southern 3 bands are the overwintgering season (Oct-Dec-Feb). Many dead standing trees in photo. Gap to W is same as in Photo 6 taken from outside forest.



Photo 6. Dead snag in west gap at Ellwood Main taken from the outside of the canopy (Photo by Stu Weiss).

FIGURE 19. VISIBLE SKY

Green is in the most frequent zone (0.15-0.30) of overwintering microsites, blue is too closed (<0.15), and white-red is too open (>0.30). For Directional Exposure blue is low exposure (<0.20), yellows are marginal (0.20-0.30, and red is high (>0.30).

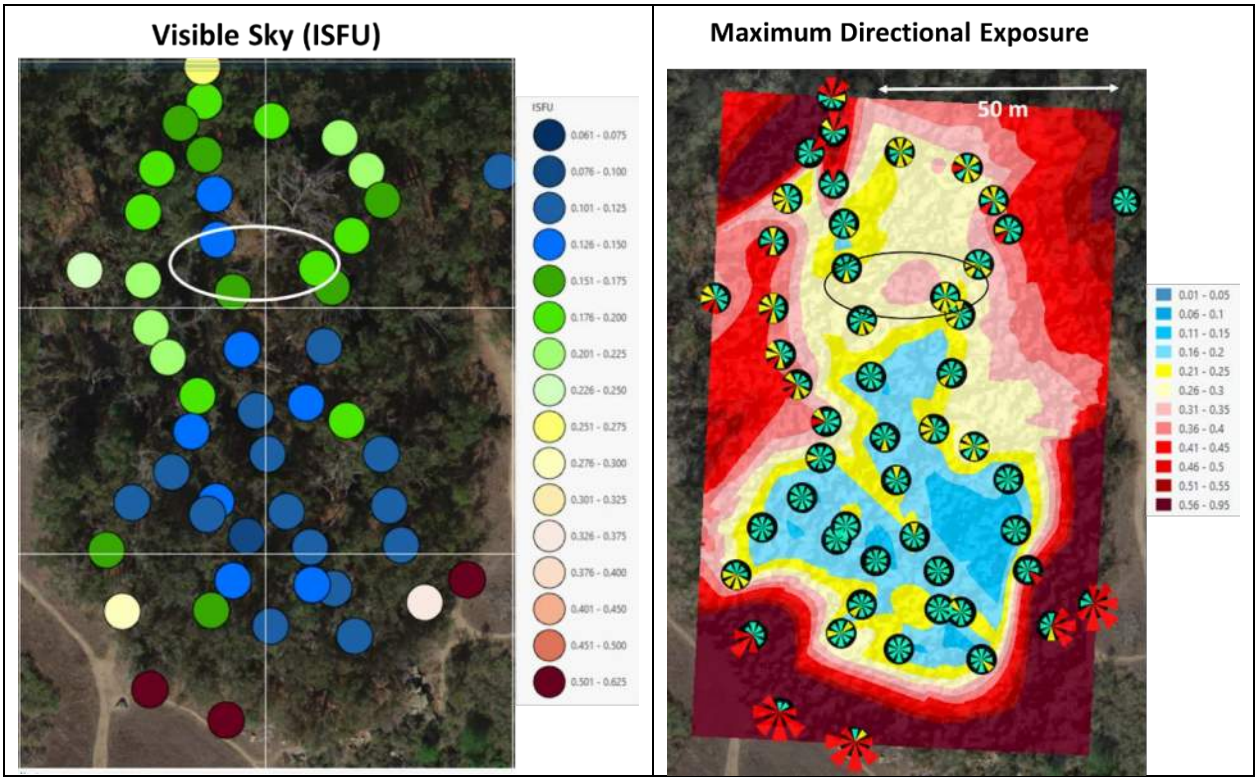


FIGURE 20. DIRECTIONAL EXPOSURE FROM 8 DIRECTIONS

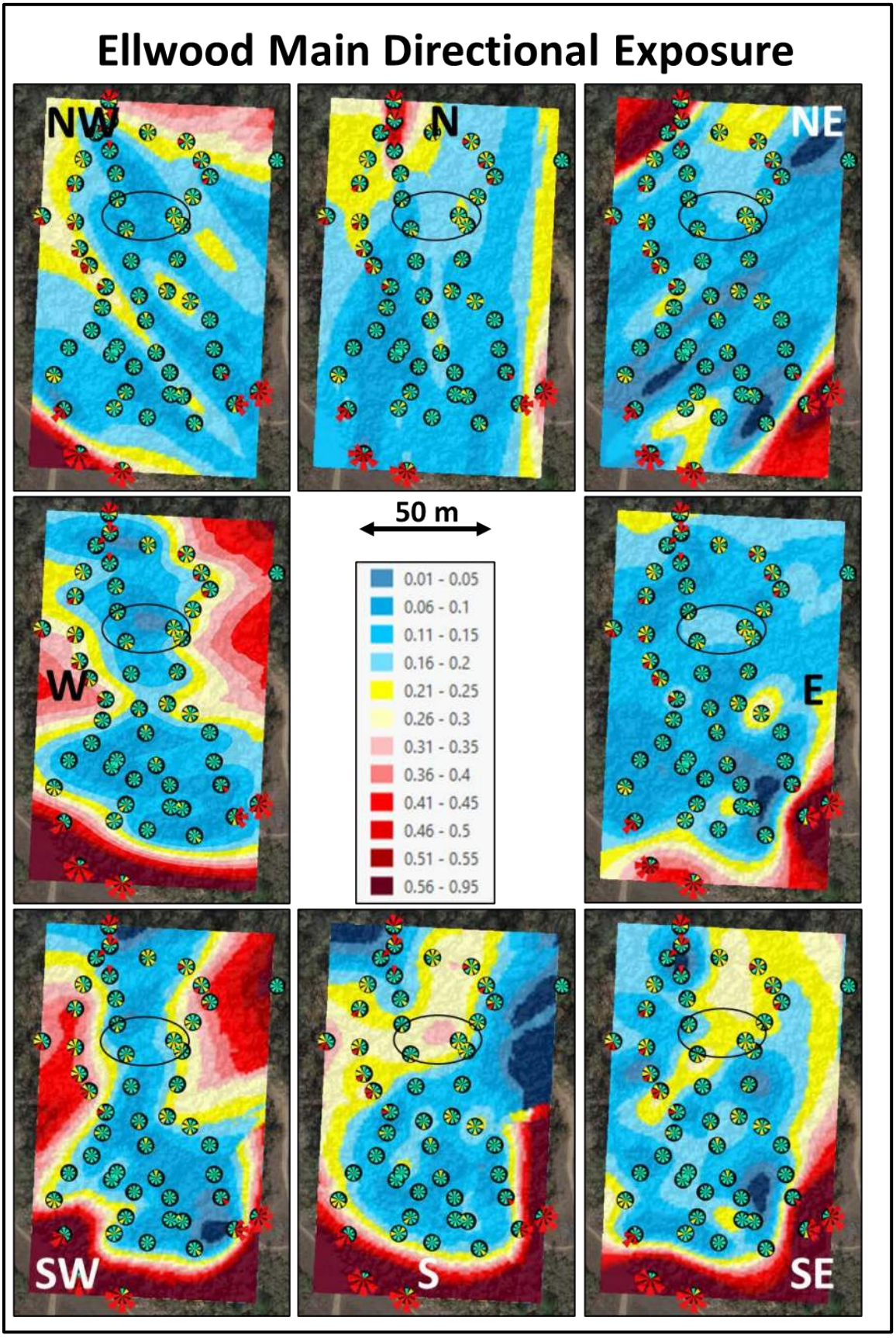


TABLE 6. DETAILS OF 4 HEMIPHOTOS WITHIN PRIMARY CLUSTER ZONE

Direction	Cluster Zone	Comments on pattern
NW	0.06-0.15	Penetration into the southern section of the grove through tree mortality zone on W side.
N	0.13-0.21	Small patch >0.20, high penetration into zone from gap to north (red), attenuated 10 m N of cluster zone by a thin green line E-W across gully (drawn in)
NE	0.13-0.19	Moderate penetration (yellow) on N-border, and high (red) in NW corner
E	0.08-0.16	Patch of moderate (yellow) exposure in interior on E-side, SE of cluster zone. Thin green line of live trees along SE and E border,
SE	0.13-0.28	Much of cluster zone is > 0.20, storm wind direction. The SE edge is a thin green line with high mortality in the interior, gaps in this dense edge would have disproportionate effects.
S	0.15-0.28	Highest interpolated exposure (0.32) in center of cluster zone, reduced to 0.05 past N-end of zone behind live trees. 0.2-0.25 within the W tree mortality patch. This is a natural consequence of the position of the clusters at the N-end of an elongated gap over the gully (cathedral structure).
SW	0.07-0.30	Penetration into high mortality zone (red), rapid attenuation at W-side of cluster zone, thin green line below trail (drawn in). Highest exposure at E end of cluster zone on E shoulder of gully
W	0.07-0.24	Penetration into high mortality zone(red), thin green line below trail (drawn in), higher exposure (yellow) on far E side of cluster zone on E shoulder of gully

TABLE 7. DESCRIPTIONS OF HEMIPHOTOS IN FIGURE 21

Photo	Comments
318	End of gully at Deveraux creek. Large opening to N, dense canopy to S blocks insolation.
317	10 m S of 317, opening appears smaller, some dappled insolation from S
316	N-end of main cluster zone, small gap N, some gaps SW and W, dappled insolation. Dead tree to SE.
315	Main cluster area, thin green line between here and 424/425, blocking W and SW. S gap for direct insolation mid-day. Dead tree to NE.
314	Large gap S, some gaps SW. Thin green line W to 425 427, full mid-day, dappled afternoon insolation
423	W-shoulder of gully, gap to NE and SW. insolation in afternoon, Thin green line to E toward 317
424	Large gap SW (mortality zone w/ dead trees). Thin green line E to 316
425	Large gap SW w/ dead trees, low exposure elsewhere Thin green line to 315 and 314
427	Large gap S and SW w/ dead trees, direct insolation late-morning to mid-afternoon.
460	Dappled insolation late morning
459	Gap to NE, direct insolation mid-day.
455	Viewing area, few large gaps dappled light early afternoon
454	Viewing area, large gap SSW, direct insolation for 2 hrs.
453	Gap to SW across gully to high mortality zone

FIGURE 21. ELLWOOD MAIN CORE HEMIPHOTO EXAMPLES

Photo locations above, note that east and west are reversed in upward looking hemiphotos. Discussion of photos in Table 7.

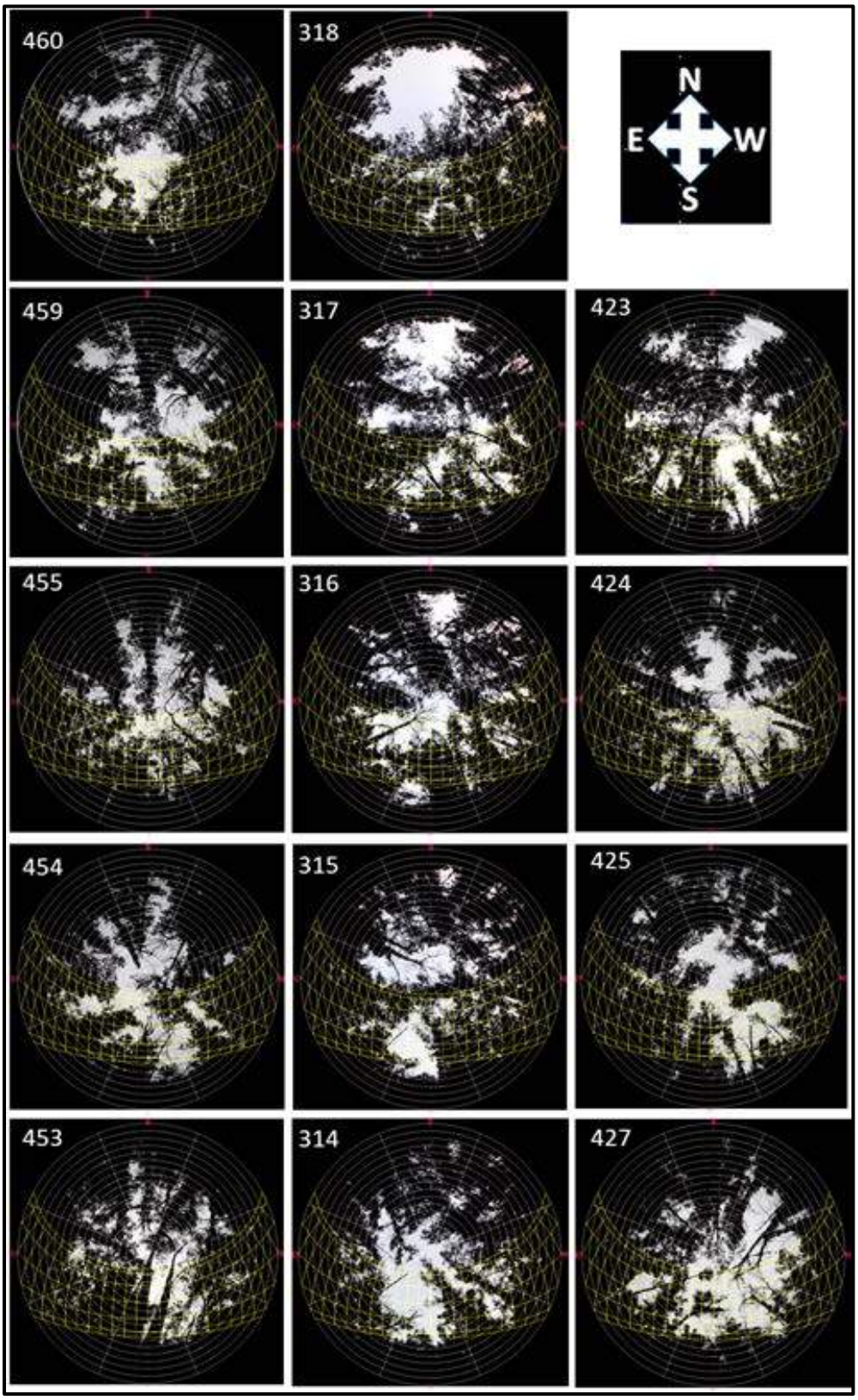


FIGURE 22. INSOLATION AT HEMIPHOTO SITES

Upper legend only applies to DSFU

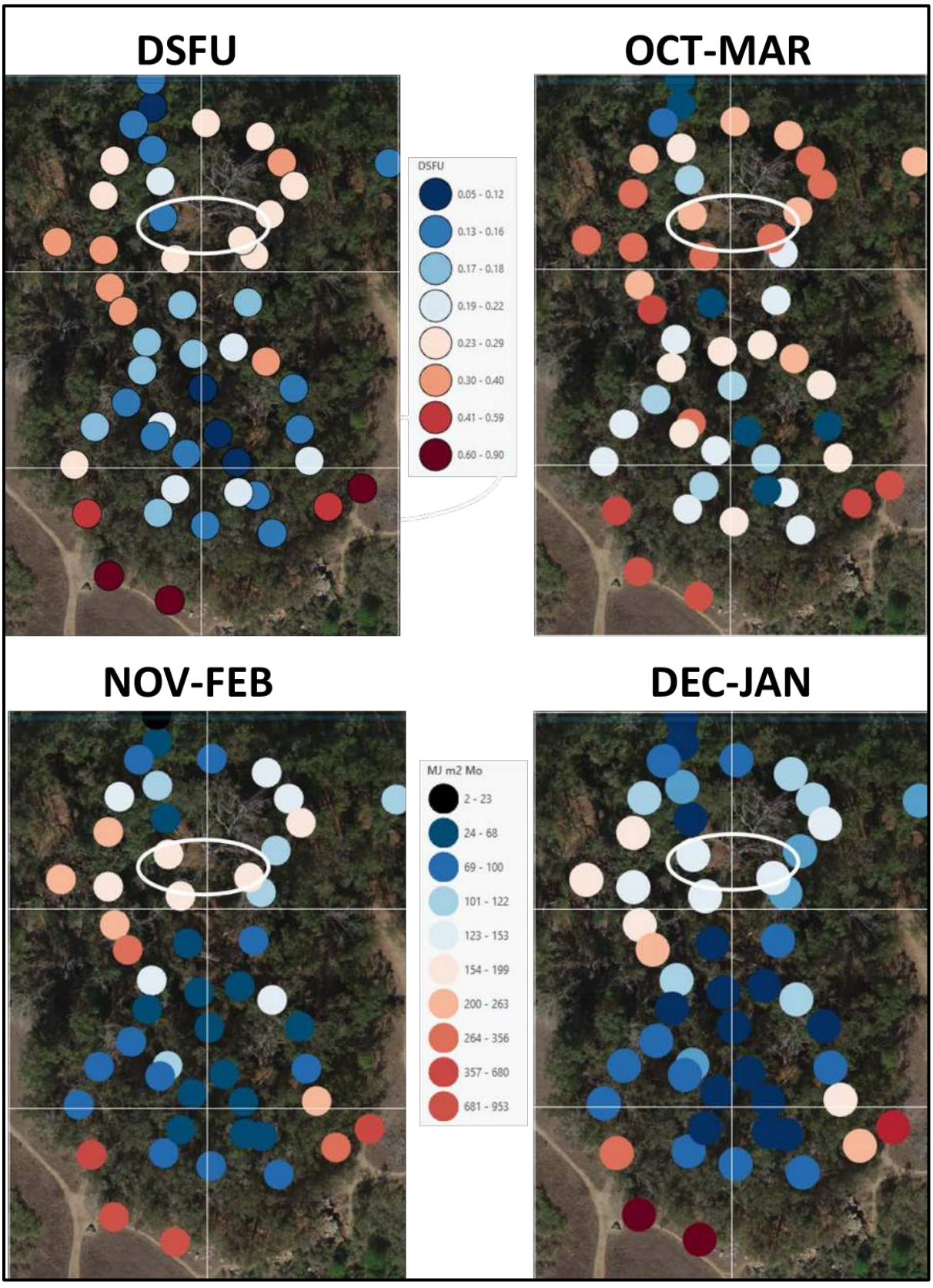


FIGURE 23. OBLIQUE LIDAR VIEW FROM SOUTH WITH EXAMPLE HEMIPHOTO

Dead standing trees in northeast sector and protruding into south gap.

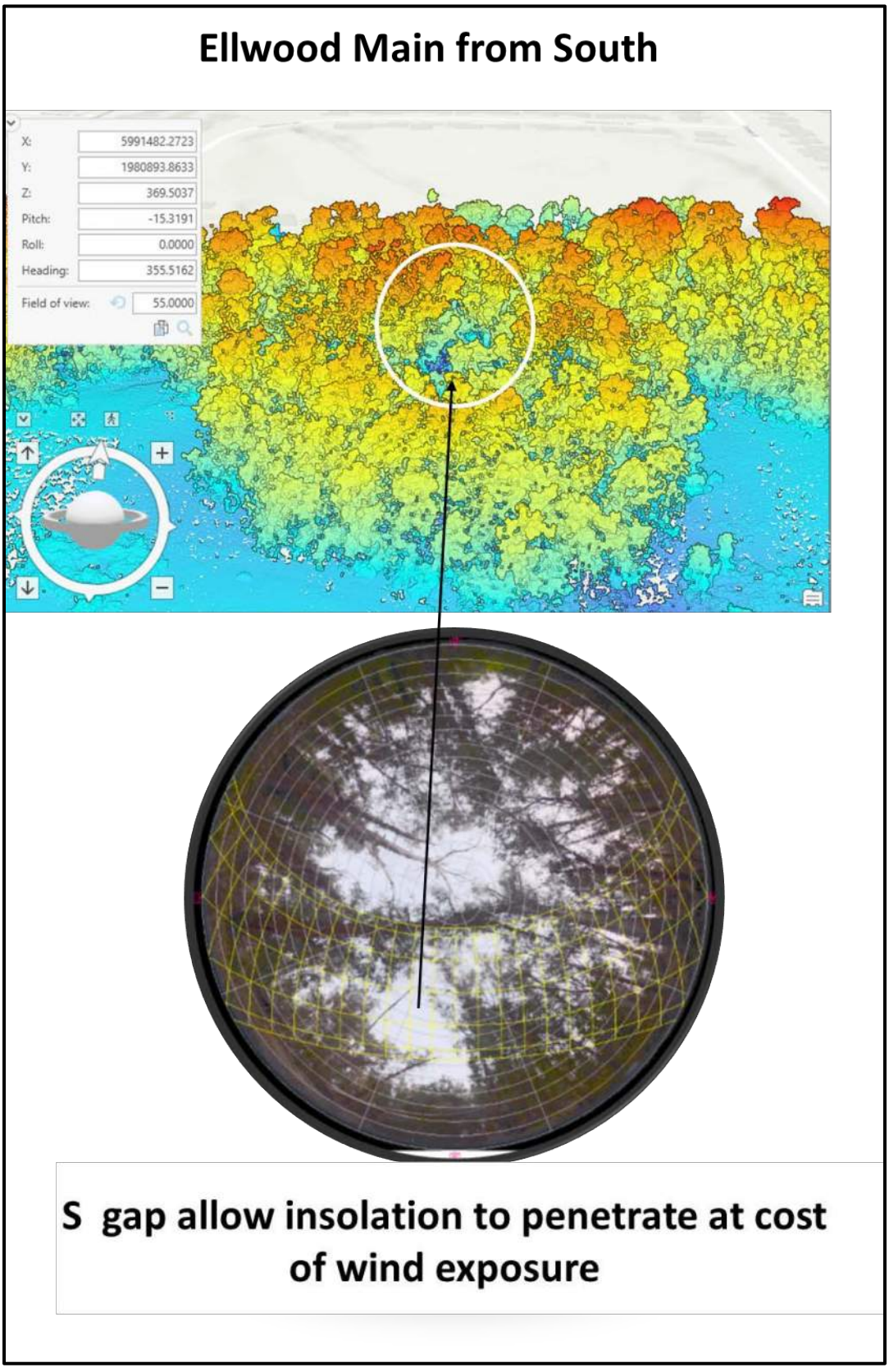


FIGURE 24. OBLIQUE LIDAR VIEW FROM SOUTHWEST WITH EXAMPLE HEMIPHOTO

Thin green line is at top of photo between the photo and the cluster zone.

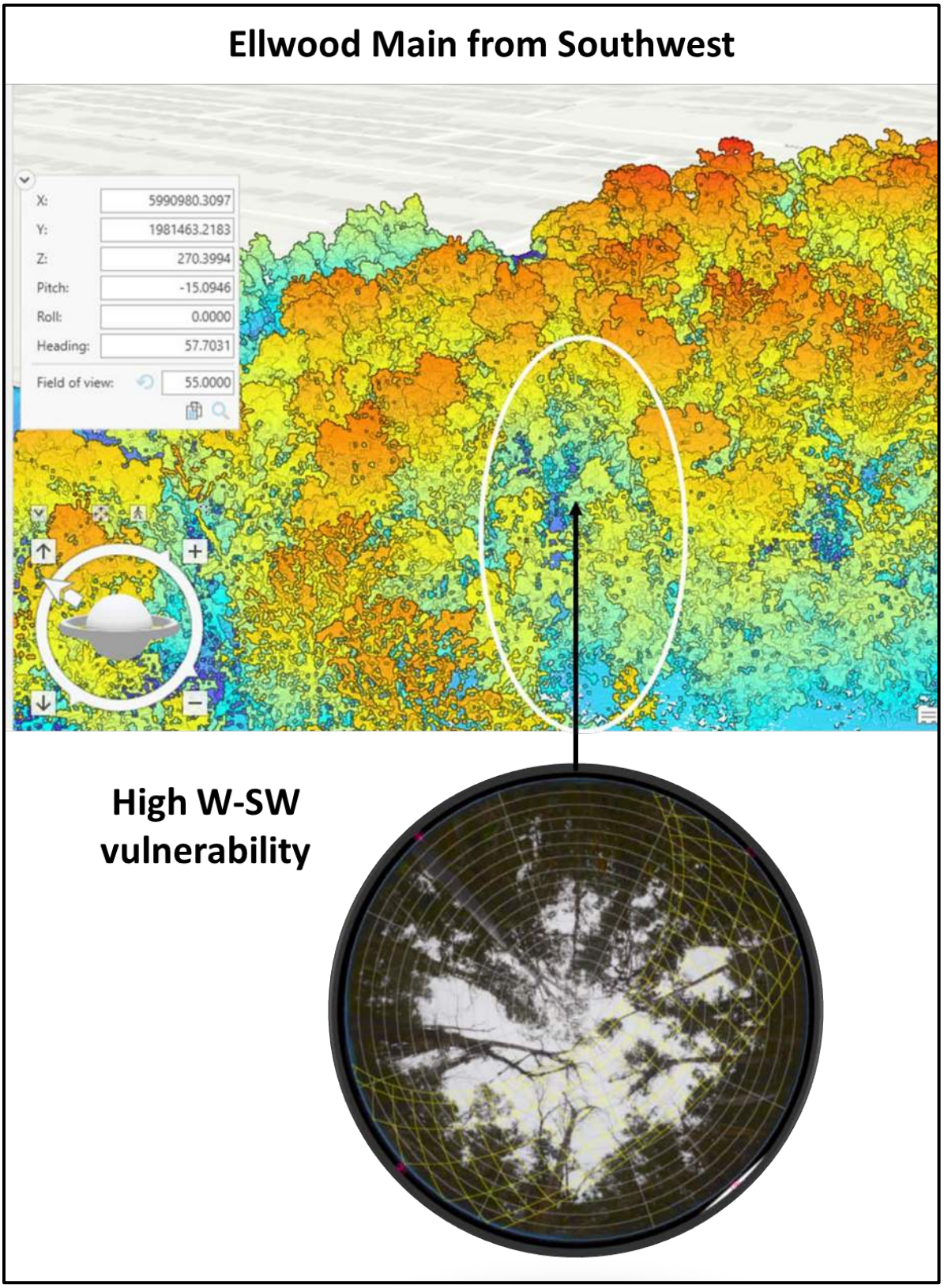


FIGURE 25. OBLIQUE LIDAR VIEW FROM N, WITH TWO HEMIPHOTOS ALONG GULLY
90m and 70m with thin green line of remaining wind shelter in between the photos.

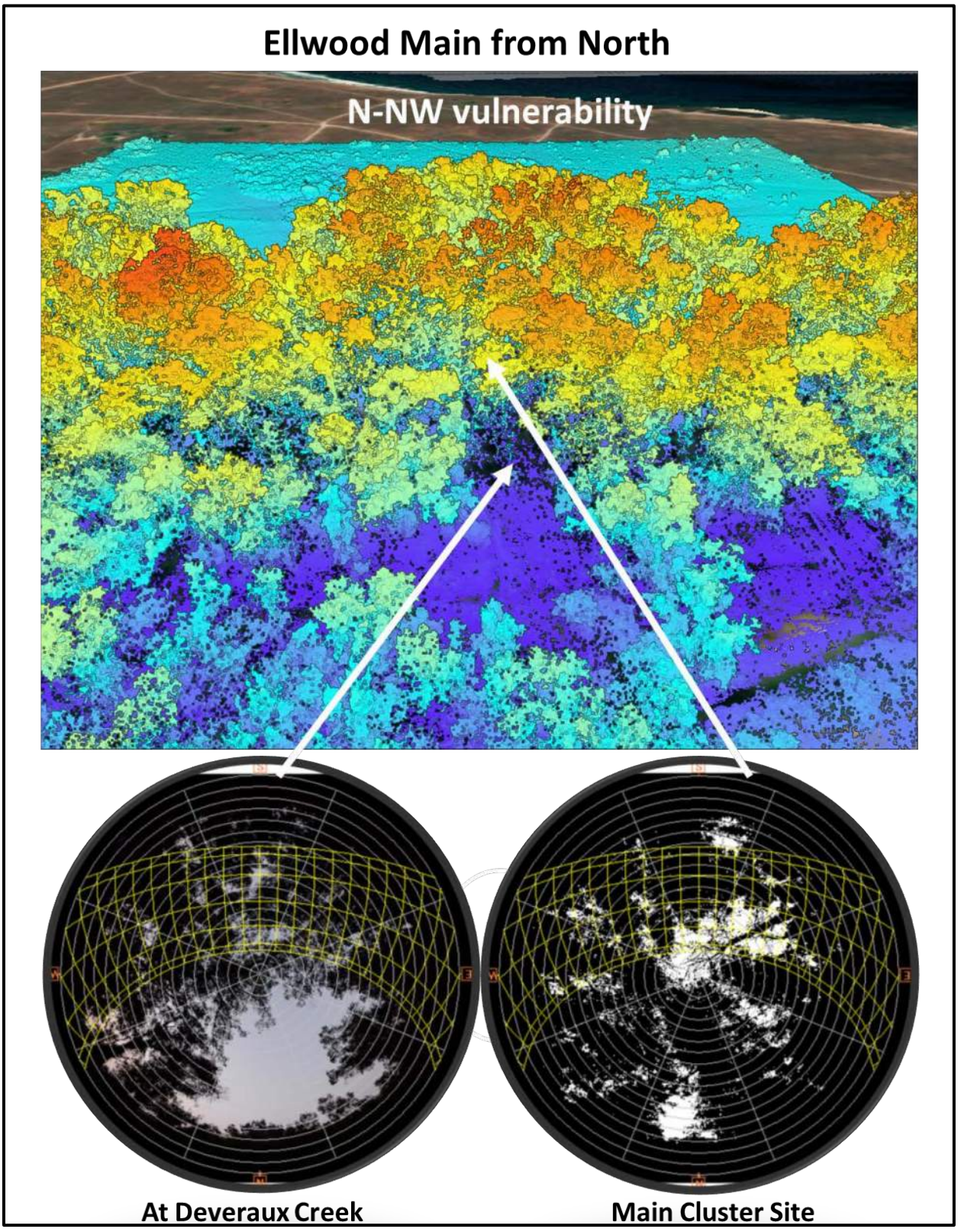


FIGURE 26. ELLWOOD MAIN VULNERABILITIES AND RECOMMENDATIONS FOR RESTORATION

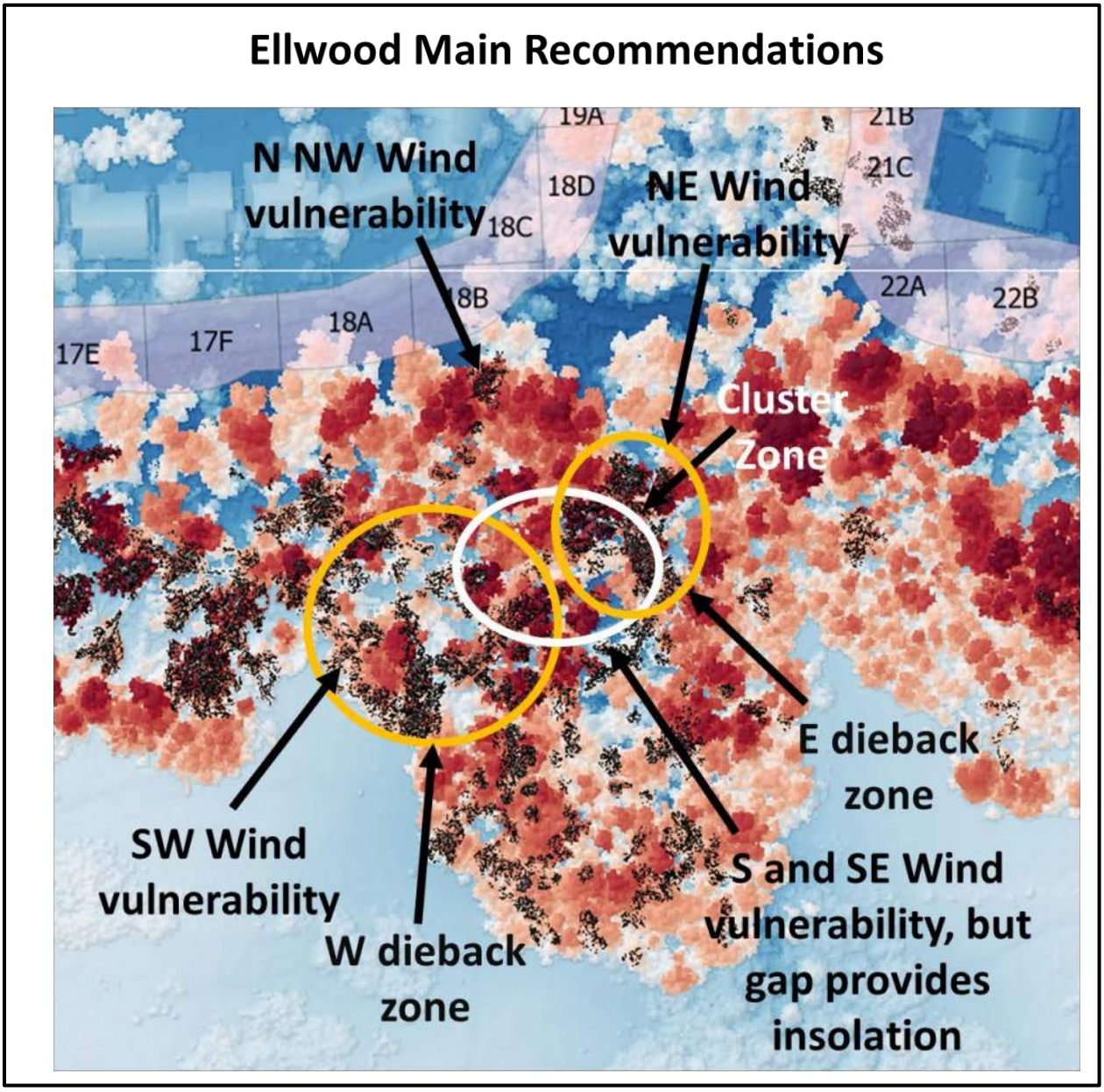


Figure 27. Monarch Observations - Ellwood West



Legend

Ellwood Mesa Open Space Boundary

Monarch Cluster Observations by year

- 2022
- 2021
- 2019

N

0 100 200 Feet

Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42338°N 119.89355°W
Goleta, Santa Barbara County

LiDAR Source: NV5,10/29/2021

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Map Updated:
February 21, 2023 04:07 PM by CDM

5.3 Ellwood West

5.3.1 Current Conditions at Ellwood West

A similar set of hemiphoto and LiDAR analyses were applied to Ellwood West. Ellwood West has been a subsidiary overwintering site, sometime supporting a large fraction of butterflies at Ellwood Mesa as a whole, but in recent years has been occupied early in the overwintering season, and then largely abandoned.

The monarchs roost at Ellwood West in a cathedral opening along Deveraux Creek, shown in Figure 27. From the center of the Ellwood West site, the Mesa rises approx. 12 m (40 ft) in elevation to the south, with forest edges approx. 65 m (213 ft) south and approx. 65 m (213 ft) north, and the neighborhood border approx. 90 m (295 ft) north. There has been massive tree mortality in this area (Figure 28). Many trees south of the creek on the slope have recently died and are still standing, and much dead wood lies on the forest floor. In recent seasons, the monarchs began roosting in small open areas on the slope south of the creek, however these roosts are temporary given the loss of protective canopy.

A transect of hemiphotos at 10 m spacing was taken through the historical cluster zone extending along the creek (Figure 28A). Four example hemiphotos (Figure 28B) illustrate key features of the cluster zone. Photos 217 and 218 are in the most recent cluster zone and are at the east end of the transect. Photo 214 is in the center, and 212 is at the west end. These sites have maximum directional exposure to the east. The hemiphotos in Figure 28B show how most of the sunpaths are covered by foliage, leading to low insolation.

In general, the canopy is closed at Ellwood West, with ISFU < 0.15 across the transect (range 0.10 to 0.14), see Table 8. DSFU is low (0.11-0.19) as well – the rise of the Mesa adds to the effective height of trees along the sunpaths. While some sites receive substantial insolation in October, by December much of the transect is in deep shade (darker blues in Figure 29). The maximum directional exposure in the two cluster sites is east (0.24 to 0.29) (yellow wedges, also see Table 8). In the middle of the transect, there is a site with high E-exposure (0.31), and one site with moderate NE exposure (0.22).

TABLE 8. EXAMPLE HEMIPHOTO DATA AND COMMENTS AT ELLWOOD WEST

Photo	Cluster	ISFU	DSFU	Max Exposure	Comments
418	Current	0.14	0.17	0.24 E	East end of transect
417	Current	0.12	0.16	0.29 E	Dead canopy visible ENE
412	Historic	0.13	0.19	0.26 W	West end of transect
414	Historic	0.14	0.19	0.22 NE	Dead standing visible SE

Ellwood West tends to be abandoned mid-season. Early in the 2022 season (Oct 31), Ellwood West attracted 924 monarchs (out of 1431 at Ellwood, 65%), but numbers fell to 120-130 (1-2%) through November, and the site was largely abandoned by Dec 15. In 2021, Ellwood West supported 2,564 butterflies (29% of the overall Ellwood Mesa aggregation) on Dec 1, but only 3 were observed by Jan 4, 2022.

The low insolation and east exposure may be factors in the relative low use of Ellwood West by December, and the abandonment by mid-season. The east exposure may be a problem during

storms, east is a common wind direction with occasionally strong winds (see Section 4.3). By December, all the hemiphoto sites are quite dark at ground level, so the site may just be unattractive for monarchs in mid-winter. Some thought should be given to opening the overhead canopy, once the dead standing wood is cleared, but a detailed study is desirable for removing more than the standing dead trees.

Prior to the mortality of so many trees on the slope, the site was undoubtedly even more shaded. Sealing up the southern edge with a double ironbark row would ensure wind shelter along the Mesa edge (Figure 31), but minimally affecting insolation. Sealing up the northern exposure would reinforce the thin green line between the trail and the edge. And, selectively planting tall growing eucalyptus east of the cluster site would address the east-wind vulnerability.

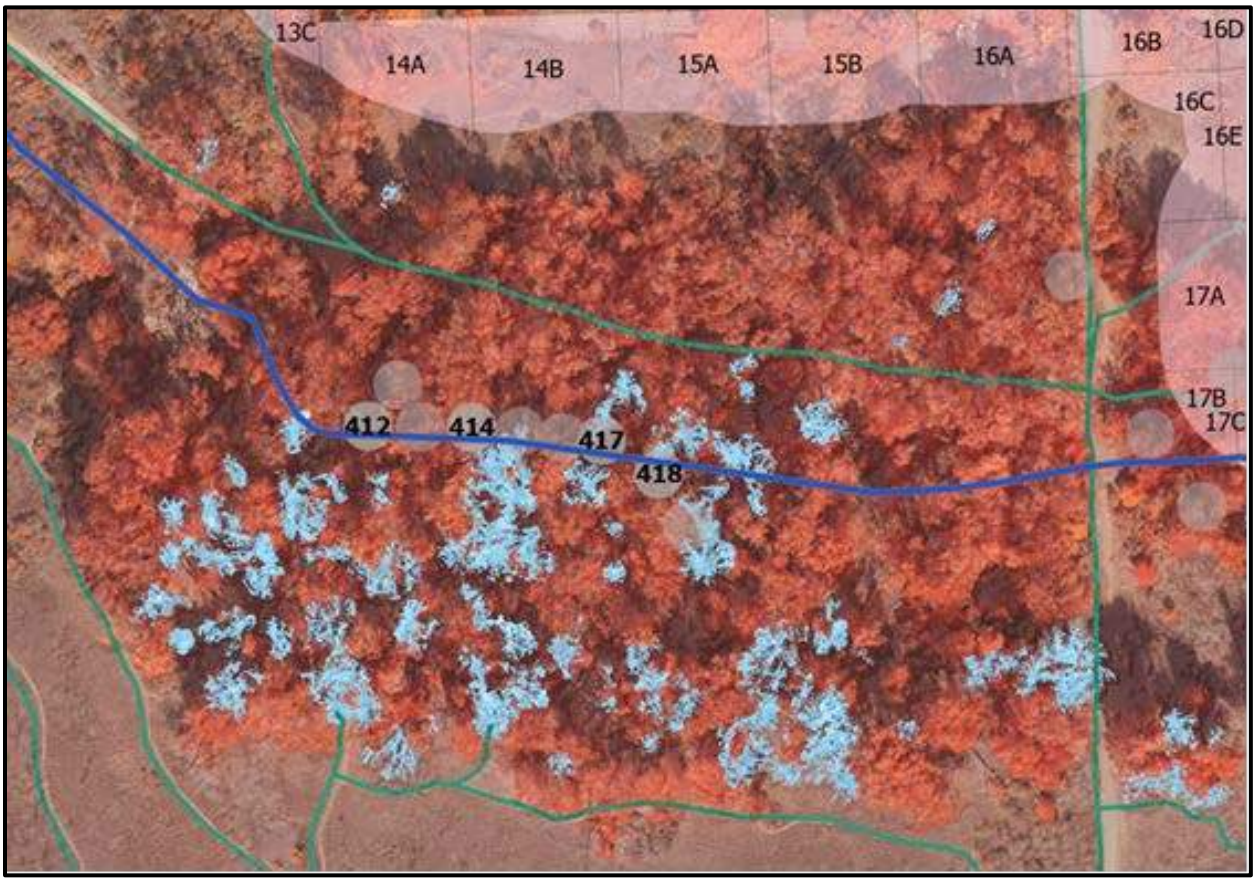
5.3.2 Recommendations for Ellwood West Restoration Actions

The following are our recommendations for the restoration of Ellwood West:

- Replace/replant dead monarch aggregation trees with blue gum eucalyptus.
- Encourage the recruitment and establishment of blue gum saplings and existing trees.
- Removal dead standing trees (black in Figure 31)
- Remove high fraction of downed wood, especially finer fuels <10 inches diameter that prevent new growth.
- Separate large logs on the forest floor as practical.
- Plant red ironbark trees in the openings on south-edge.
- Plant ironbark/karri (*E. diversicolor*) between Santa Barbara Shore Drive and cluster zone to address east wind vulnerability.
- Plant double ironbark row on north-side.
- Plant low density karri (*E. diversicolor*) within tree mortality zones to diversify canopy and add to the wind shelter zone.
- Plant native trees in riparian zone along Devereux Creek, do not fill in the open interior under monarch roost trees to maintain cathedral structure.
- Plant understory native shrubs and oaks
- Once dead wood removed, consider opening the overhead canopy after additional study.

FIGURE 28A. HEMIPHOTO TRANSECT LOCATIONS AT ELLWOOD WEST

In map with 50 m grid, CIR and dead trees, trails (green line), Devereux Creek (blue line), grey polygons (fuel management treatment areas).



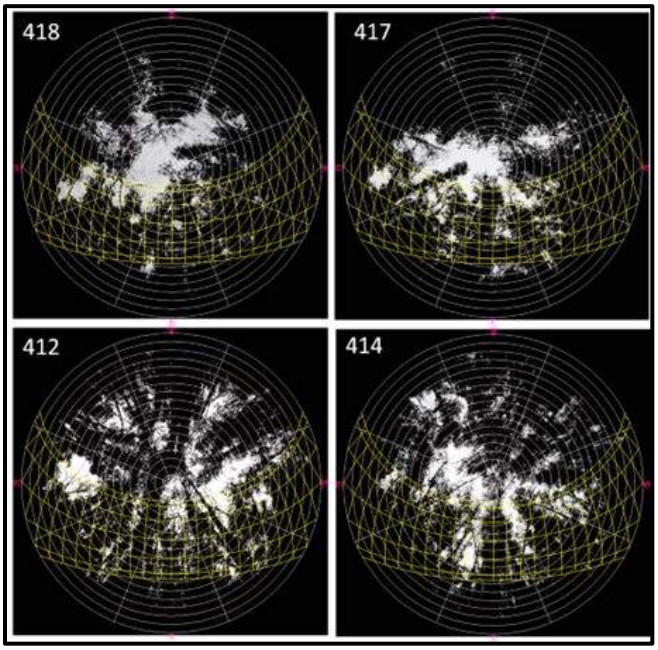


FIGURE 28B. EXAMPLE HEMIPHOTOS AT ELLWOOD WEST

Photos 418 and 417 are the cluster site.

FIGURE 29. POINT MAPS OF HEMIPHOTO RESULTS AT ELLWOOD WEST

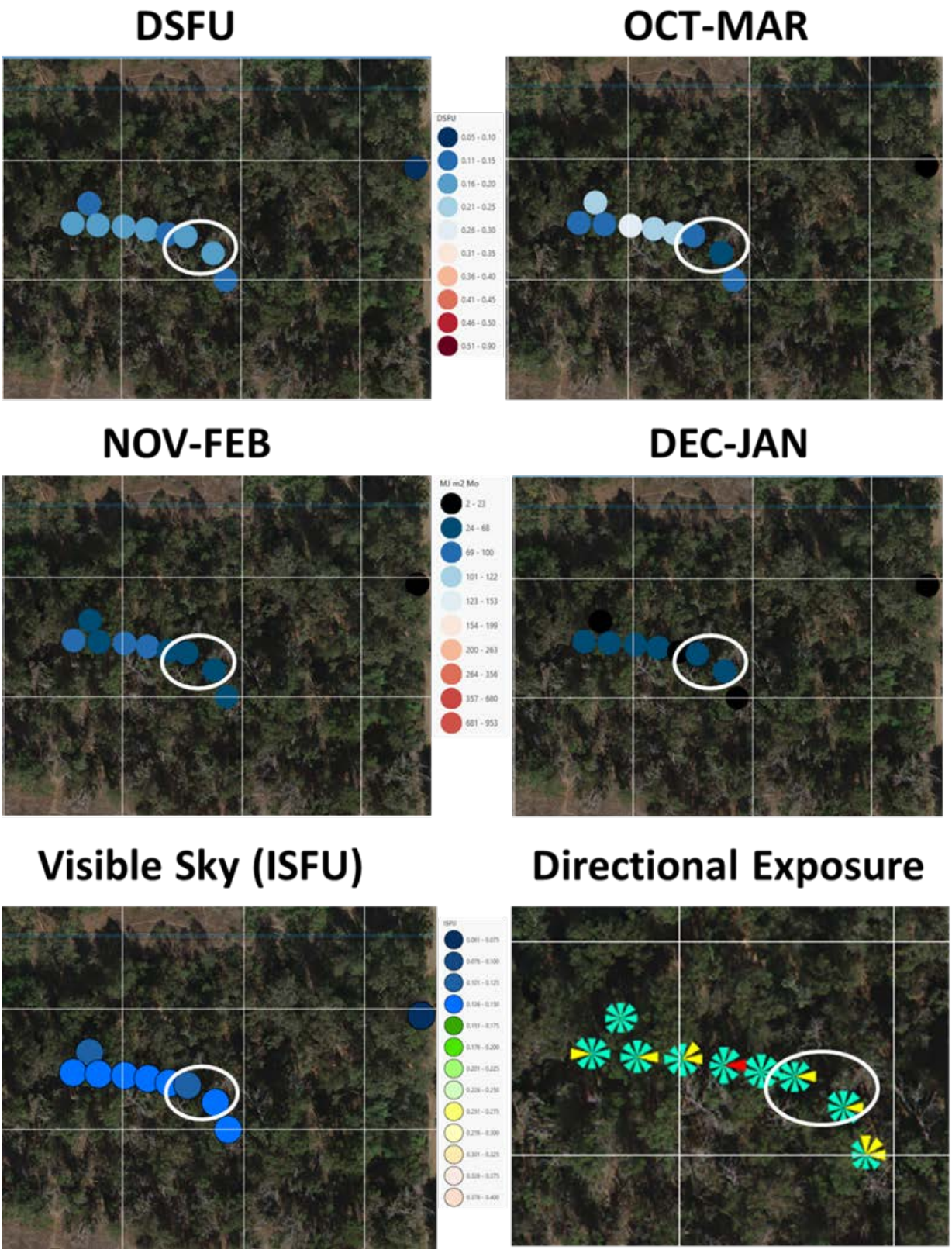
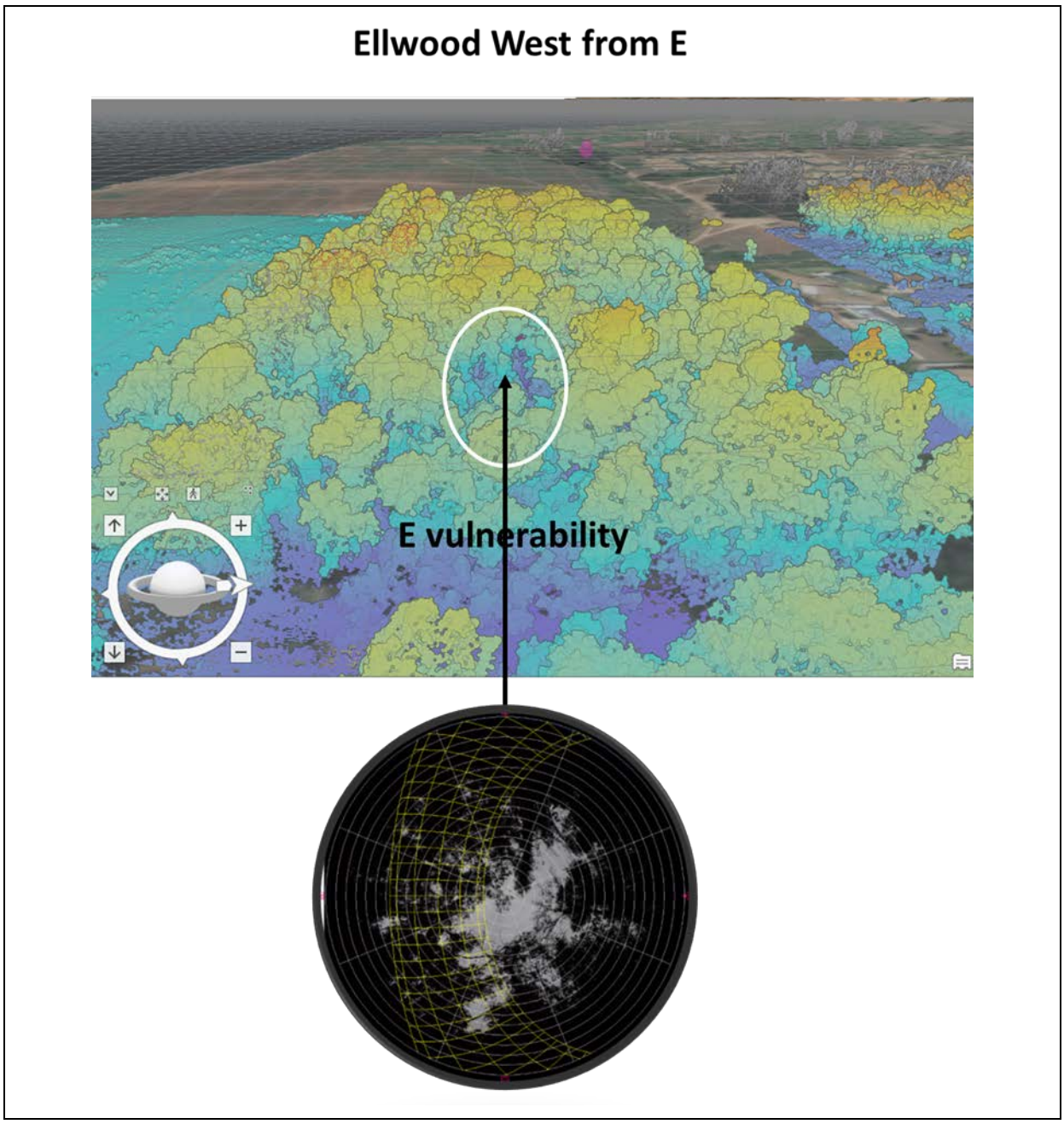


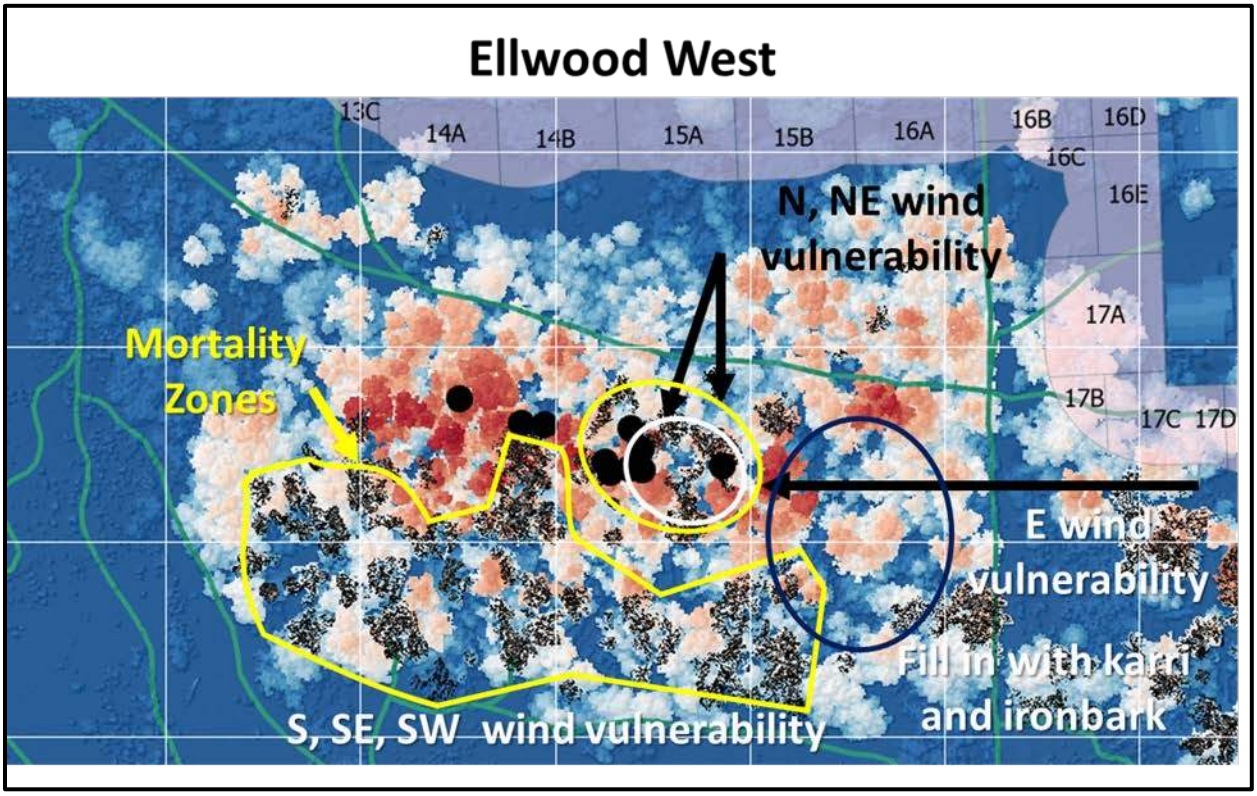
FIGURE 30. OBLIQUE VIEW ELLWOOD WEST VULNERABILITIES



Descriptive comments about Figure 30 of Ellwood West:

- Black dots are historical cluster sites, E end of transect occupied in 2021 and 2022.
- Cathedral structure along creek.
- The hillslope to the Mesa provides intrinsic wind shelter. Reduces impact of tree mortality.
- E and N wind vulnerabilities, thin green line N of trail
- Fuels management – only 17A, B, and C (shown on Figure 31) have potential impacts, but far from cluster zone, stand of red ironbark. Other fuel grid cells along N-edge do not have tall trees.

FIGURE 31. ELLWOOD WEST VULNERABILITIES AND RECOMMENDATIONS FOR RESTORATION



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5.4 Ellwood East

5.4.1 Current Conditions at Ellwood East

Ellwood East is in the eastern portion of the eucalyptus stand on Ellwood Mesa, south of Deveraux Creek in a topographic bowl at the base of the Mesa slope. The bowl wraps around from east to south and southwest and rises approximately 12 m (40 ft). The bowl itself provides some intrinsic wind shelter from east through southwest. Monarchs historically clustered along a 80 m (260 ft.) stretch in the bottomland flat, shown in Figure 32. In 2021, monarchs clustered 10-15 m south of the previous cluster zone at the very base of the Mesa slope. The Ellwood East stand has several species of eucalyptus in addition to blue gums – red river gums (*E. camaldulensis*), and a small stand of red ironbark at the Mesa rim.

The bottomland flat is occupied by numerous non-native, evergreen ash (*Fraxinus uhdei*) trees, some of which are >30 m (100 ft.) tall. A stand of evergreen ash is present in the western side of the bottomland flat, west of the historical cluster zone, and monarchs also roosted in these trees in 2021-2022 season. The edge of the forest at the Mesa rim consists of small dense trees on highly compacted soils, with many small gaps that lead to the larger trees on the slope. Substantial mortality of blue gum on the Mesa slope and in the flat opened the forest and dead downed wood (especially large trunks) is strewn across the forest floor.

Ellwood East has been heavily used in recent years (see Section 4.1 and Appendix C). In 2021-2022, monarchs abruptly abandoned Ellwood Main in late December, and many moved to Ellwood East for the remainder of the season. A similar, less abrupt movement from Ellwood Main to Ellwood East occurred in 2022-2023. But unlike 2022, Ellwood East was abandoned as monarch numbers at Ellwood crashed following a series of intense winter storms in late-December and early-January (see Section 4.1 and Appendix C).

A transect of hemiphotos spaced ~10 m (33 ft.) apart was taken northwest to southeast through the historical cluster zone (Figure 33A). Another set of hemiphotos was taken in a 2021 cluster area, slightly up the Mesa slope. Some photo data are presented in Table 9. Photos 702, 709, and 708 are in the slope cluster zone (Figure 33B). The Mesa slope rises to the S. Photo 702 is well sheltered from all directions, Photos 708 and 709 have gaps to the NE and SW. All three photos receive some dappled light at ground level for a few hours during the overwintering season. Photo 707 is upslope from the cluster zone, and a substantial gap appears to the SSW – note that there is only one clump of trees in the SE octant. This is the area of substantial tree mortality. Photos 468 and 462 are along the historical cluster zone; 468 has a large overhead gap and moderate N and NW exposure.

The point maps of hemiphoto data (Ellwood East has relatively high overall canopy cover. ISFU ranges from 0.075 to 0.15. The DSFU map shows a higher insolation (0.16-0.25) zone on the slope, and the monthly insolation is higher in the slope area. S, SW, and W exposure increase on the slope (Figure 34). One slope site (Photo 708) has high NE exposure. The E end of the lower transect has moderate NW and N exposure, and one site in the middle of the transect has high E exposure. The outlying hemiphoto site to the SW is in the ironbark stand and has all around low directional exposure.

TABLE 9. EXAMPLE HEMIPHOTO DATA AND COMMENTS AT ELLWOOD EAST

Photo	Cluster	ISFU	DSFU	Max Exposure	Comments
702	Cluster	0.10	0.14	0.14 E	2021 slope location
708	Cluster	0.12	0.14	0.34 NE	2021 slope location
709	Cluster	0.11	0.12	0.25 N	2021 slope location
707	Upslope	0.12	0.25	0.24 S	Upslope above cluster zone
468	Cluster	0.14	0.13	0.28 NW	East-end of zone
462	Cluster	0.12	0.16	0.27 N	West-end of zone

Overall Ellwood East has an array of microsites that provide moderate insolation and low directional exposure within short distances within the site. The shift to the 2021 cluster sites appears to be driven by insolation, but moving farther up the slope would increase wind exposure.

Ellwood East combines generally low directional exposure with higher insolation on the slope. The extensive drought mortality of blue gums (dieback zones) on the slope has opened the forest, allowing insolation to penetrate at the cost of increasing SE-S-SW wind vulnerabilities. Planting a red ironbark shelterbelt along the rim, where soils become deep enough to support larger trees (north of the stunted stands that occupy the compacted soils), will address this vulnerability. The sheltering effect of the windbreak at the Mesa rim will extend across the entire cluster zone. A healthy stand of ironbark already occupies part of the Mesa rim.

The forest on the slope has self-thinned to a more sustainable density of blue gums. Removing fine fuels and dispersing large fallen trunks will prepare the slope for new plantings of native understory shrubs and oaks, as well as a few karri (*E. diversicolor*), near the top of the slope to diversify the canopy. But planting tall trees on the mid- and lower slope would reduce insolation at the base of the slope so should be mostly avoided.

On the northern edge, the fuels management grid cells 23A, 24A, and 24B are sensitive areas and maintaining the taller vertical structure is imperative. Closer to the cluster zone, canopy gaps that create N and NW vulnerabilities can be closed by large trees. Riparian restoration along Deveraux Creek can establish sycamores, cottonwoods, and willows on that stretch, once the ash trees are selectively removed. Adding California bay to the mix would provide an evergreen species. Between the riparian zone and the cluster zone, planting well-spaced tall eucalyptus, especially karri (*E. diversicolor*), will eventually fill these gaps – the trees should grow well on the bottomland soils.

These recommendations consider the whole site with regard to monarch habitat. However, the cluster site is bisected by a property line – City of Goleta owns the western section, and the Rancho Estates owns the eastern section. We recommend that actions – primarily the rim ironbark shelterbelt - be taken on the Goleta property now and that the other actions in the bottomland be taken with permission from property owner.

5.4.2 Recommendations for Ellwood East Restoration Actions

The following are our recommendations for the restoration of Ellwood East and corresponds with Figure 39:

- Replace/replant dead monarch aggregation trees with blue gum eucalyptus.
- Encourage the recruitment and establishment of blue gum saplings and existing trees.
- Fuel treatment grids 23B, 24A, 24B are most sensitive and include riparian corridor (blue line in Figure 35)
- Remove most dead standing trees (shown in black in Figure 35)
- Remove high fraction of downed wood, especially finer fuels <10 inches diameter that prevent new growth.
- Remove accumulated small (<10 in.) branches for fuel reduction. Raking out the accumulated debris.
- Separate large logs on the forest floor as practical.
- Plant an ironbark shelterbelt along the crest of the Mesa slope (thick blue line in Figure 35) in an arc from southwest to south to southeast. The western part on Goleta property can be planting now, the south and southeast sections depend on agreement with the adjacent property.
- Plant red ironbark and karri (*E. diversicolor*) within orange oval north of cluster zone to address north-northwest vulnerability.
- Manage blue gums at current drought-thinned density on slope above cluster zone.
- Fill in understory on slope with coast live oaks, toyons and other native shrubs.

FIGURE 33A. HEMIPHOTOS TRANSECT LOCATIONS AT ELLWOOD EAST

Dead standing (blue) and downed (yellow) shown over a color infrared photo. White oval is the cluster zone over the last decade.

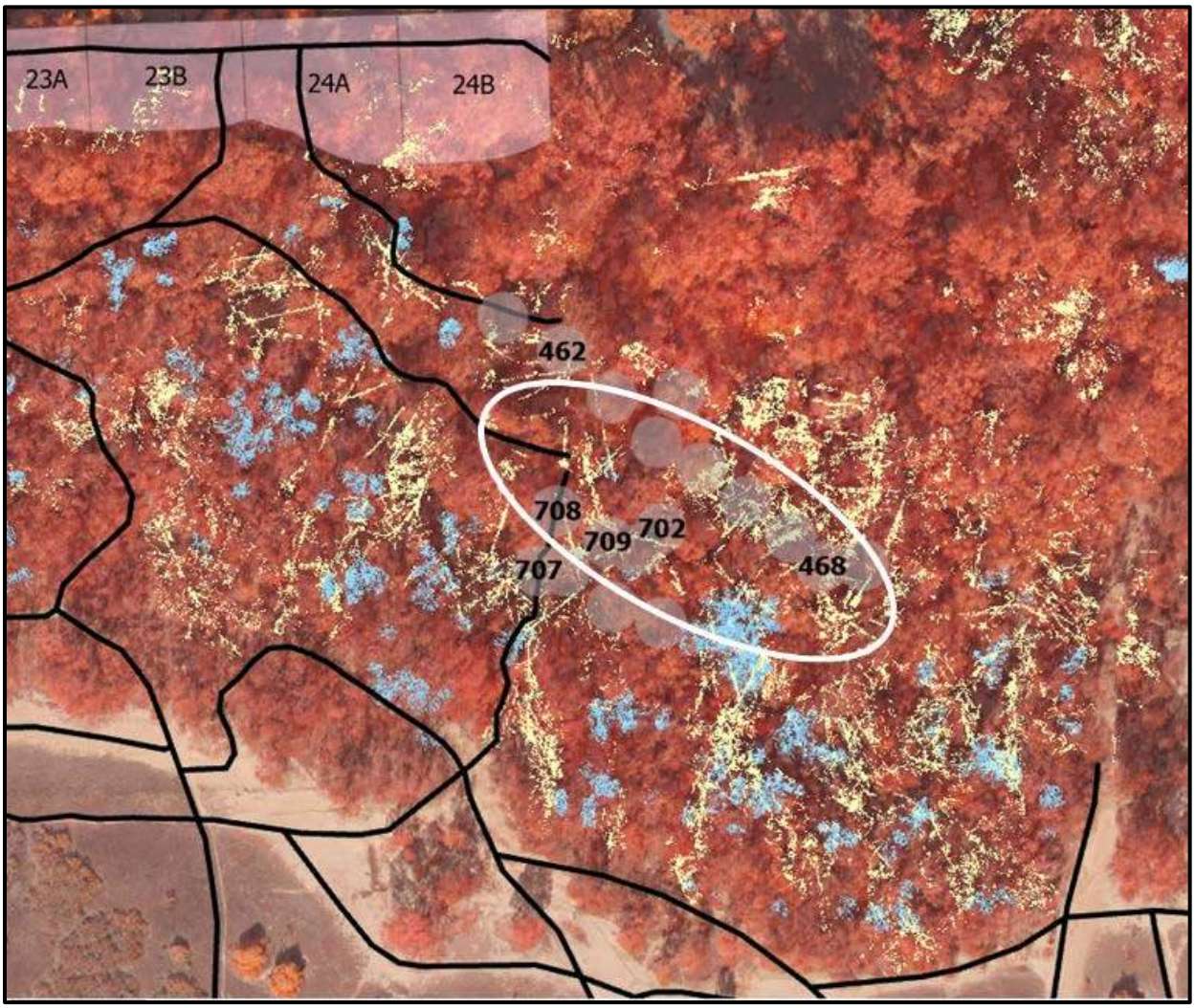


FIGURE 33B. EXAMPLE HEMIPHOTOS FOR ELLWOOD EAST

Hemiphotos 702,708,709, and 468 are in the cluster zone.

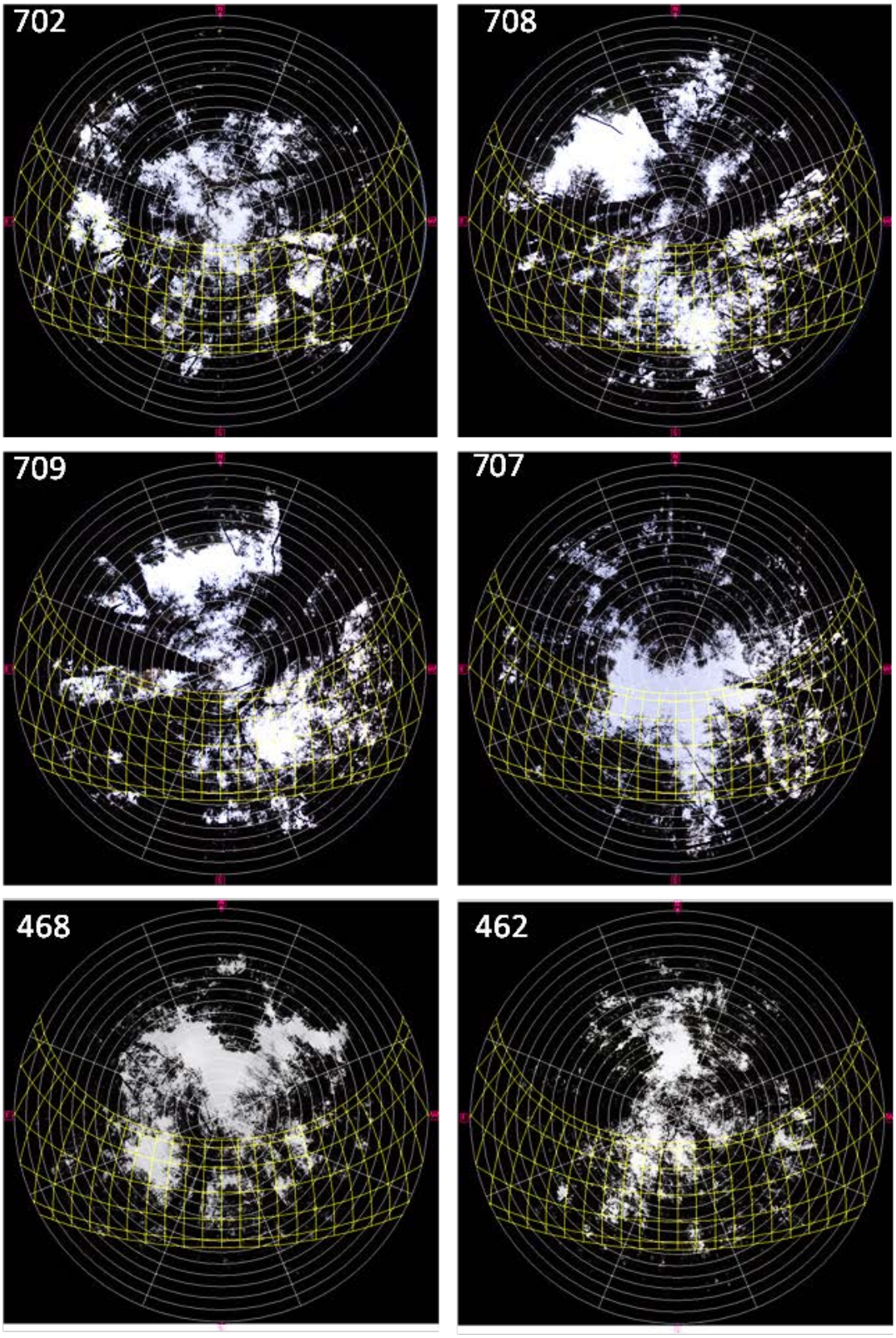


FIGURE 34. POINT MAPS OF HEMIPHOTO RESULTS AT ELLWOOD EAST

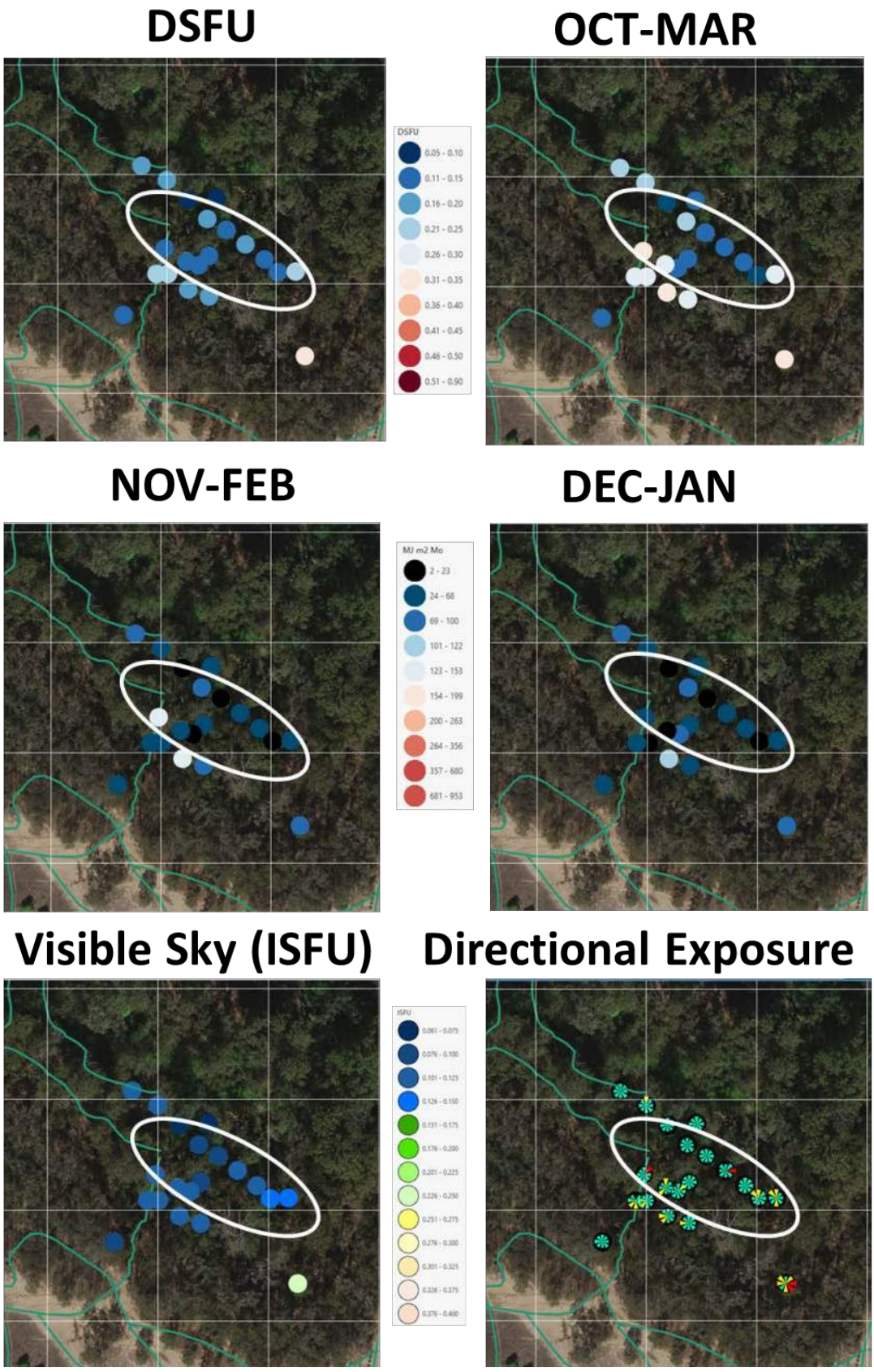
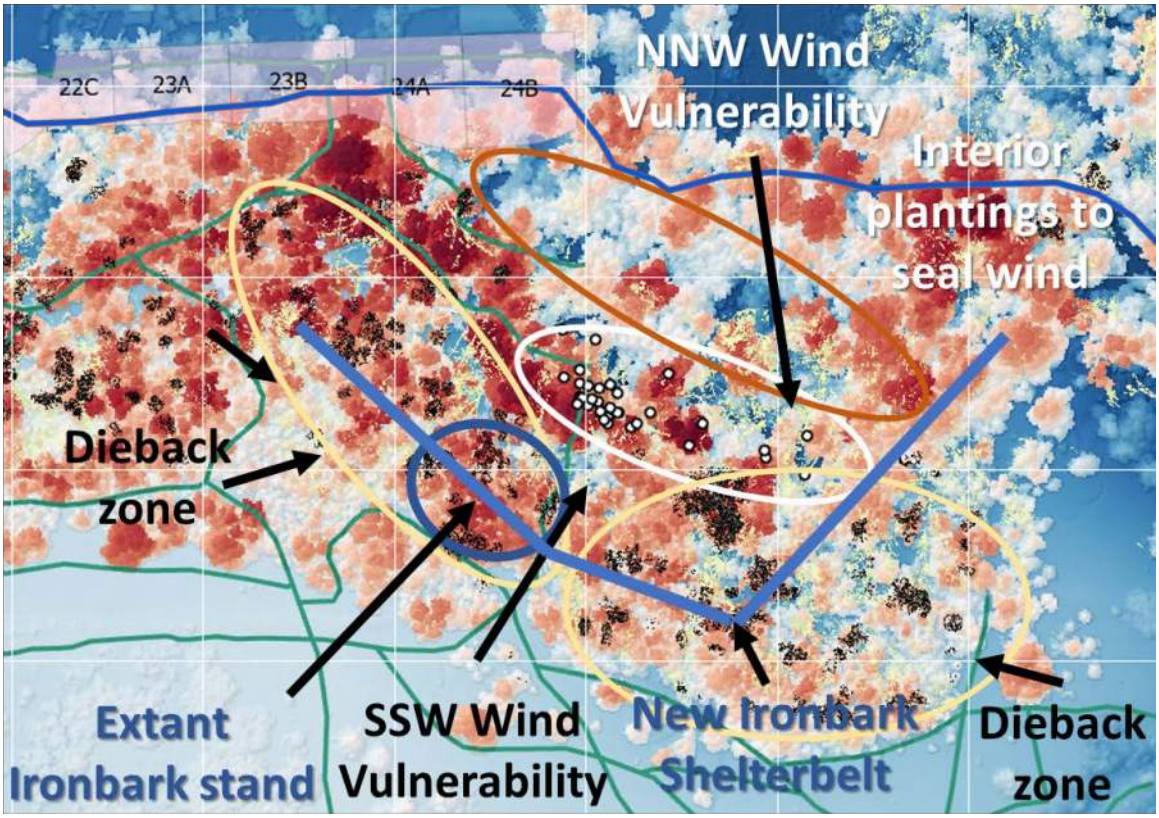


FIGURE 35. ELLWOOD EAST VULNERABILITIES AND RECOMMENDATIONS FOR RESTORATION
Cluster sites are small white circles within the larger ellipse.



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5.5 Ellwood North

Ellwood North is a large rectangle of eucalyptus forest. Monarchs have aggregated historically in the northern portion of this area and more recently closer to the center of the area, as shown on Figure 36. We have examined both locations and refer to them as Ellwood North-North (the northern location) and Ellwood North-Central (the central location).

5.5.1 Current Conditions at Ellwood North-Central

Ellwood North-Central (NC) is the area south of the cross trail in Ellwood North and has the most current potential for cluster sites within Ellwood North area. Monarch clusters greater than 20 individuals were last observed during the 2017-2018 season. Since then, only single butterflies or groups of a few individuals have utilized the Ellwood NC site, see Figure 36 and Appendix C for monarch count data. The entire Ellwood North has experienced the most tree mortality, especially north of the cross trail in Ellwood North-North (NN). There are substantial areas of tree mortality within Ellwood NC, especially along the cross trail, but also scattered within the forest.

Photo 481 is located closest to the last historical cluster site and is approx. 33 m (108 ft.) south of the cross trail in an area that has not suffered as much tree mortality as further north, shown in Figure 37 A and B. This site is more exposed to the northwest (0.27 DSFU) than is optimal, see the data from the hemiphotos in Table 10. Photo 345 is located along the cross trail and clearly shows the extensive tree mortality to the north. Photo 342 is located along the inner edge of the eastern 100 ft fuels management buffer and is an example of the type of gaps along that edge that create wind vulnerabilities – in this case the key direction is southeast (0.36 DSFU).

TABLE 10. EXAMPLE HEMIPHOTO DATA AND COMMENTS AT ELLWOOD NORTH-CENTRAL

Photo	Cluster	ISFU	DSFU	Max Exposure	Comments
481	Historic	0.18	0.27	0.27 NW	Near center of cluster zone
345	Historic	0.22	0.25	0.33 NW	North-edge along trail, dead trees N
342	Shelter zone	0.21	0.32	0.36 SE	West-edge at 100’ fuels border
350	Shelter zone	25	0.21	0.49 W	West-edge

Unlike the other sites (Ellwood Main, West, and East) Ellwood North-Central does not have an obvious cathedral structure over a creek or gully. The historical cluster sites have been in small gaps in the forest. Overall ISFU within the cluster zone ranges from 0.13 to 0.23 (Figure 38). DSFU ranges from 0.19 to 0.30, indicating good exposure to insolation on an annual basis. In October and November, strong insolation (white/red) penetrates to the forest floor at several sites within the cluster zone. Directional exposure is varied, but most sites have one or more directions with excessive exposure; a few sites have low or moderate exposure in all directions.

Sites like Photo 481 appear suitable for clustering. But few monarchs appear or stay in Ellwood North (any part of it) and it has always been a secondary site among the Ellwood complex.

The main vulnerabilities at Ellwood North-Central are northeast, north, and northwest wind penetrating through the mortality zone north of the cross trail. The trail itself creates east and west vulnerability at either end. Mismanagement of the fuels buffer zone to the east could open the forest to northeast, east, and southeast winds.

Removal of the dead standing trees is a high priority. Management of the downed fuels – removal of finer fuels (less than approx. 10-inch diameter) and spreading out of the large, downed trunks will prepare the ground for plantings. The main plantings to address the wind vulnerabilities are to seal up the edge just south of the cross trail with a red ironbark shelterbelt (double row), establish an inner red ironbark shelterbelt on the east side at the 100 ft fuel management line, and establish an inner red ironbark shelterbelt along the west side. In the interior of the forest, it will be important to maintain the existing blue gum trees, encourage blue gum saplings, and plant some well-spaced karri (*E. diversicolor*) to add diversity. There is sufficient depth of forest south of the cluster zone for wind shelter. Maintenance of some gaps within the sheltered area may be necessary in the long term.

The vulnerability of the blue gum forest in Ellwood North in general to drought resulted from tight spacing (approx. 6 ft.) of trees, and exuberant growth of coppiced (multi trunk) trees during wet periods. When the 2012-2016 drought intensified, these areas were primed for mass mortality because of the dense growth, thinner soils, and upland topographic position. The forest has thinned to a density commensurate with the drought intensity, so future management should aim to avoid densification of the blue gums. There is plenty of room in the understory for native shrubs (toyon grows well in this area) and live oak trees.

5.5.2 Recommendations for Ellwood North-Central Restoration Actions

The following are our recommendations for the restoration of Ellwood North-Central and corresponds with Figure 39:

- Replace/replant dead monarch aggregation trees with blue gum eucalyptus.
- Encourage the recruitment and establishment of blue gum saplings and existing trees.
- Fuels management (10 A, B, C, 11A, B) is very sensitive area.
- Removal of most dead standing trees (shown in black in Figure 39)
- Remove high fraction of downed wood, especially finer fuels <10 inches diameter that prevent new growth.
- Separate large logs on the forest floor as practical.
- Plant shelterbelts at 100’ limit of fuels management grid. Multistoried with red ironbark as canopy and understory native shrubs and oaks
- Reinforce western edge shelterbelt as needed.
- Reinforce northern edge (just south of cross trail) with double ironbark row.
- Plant karri (*E. diversicolor*) within interior to diversify the overstory.
- Maintain lower density of blue gums established after drought.

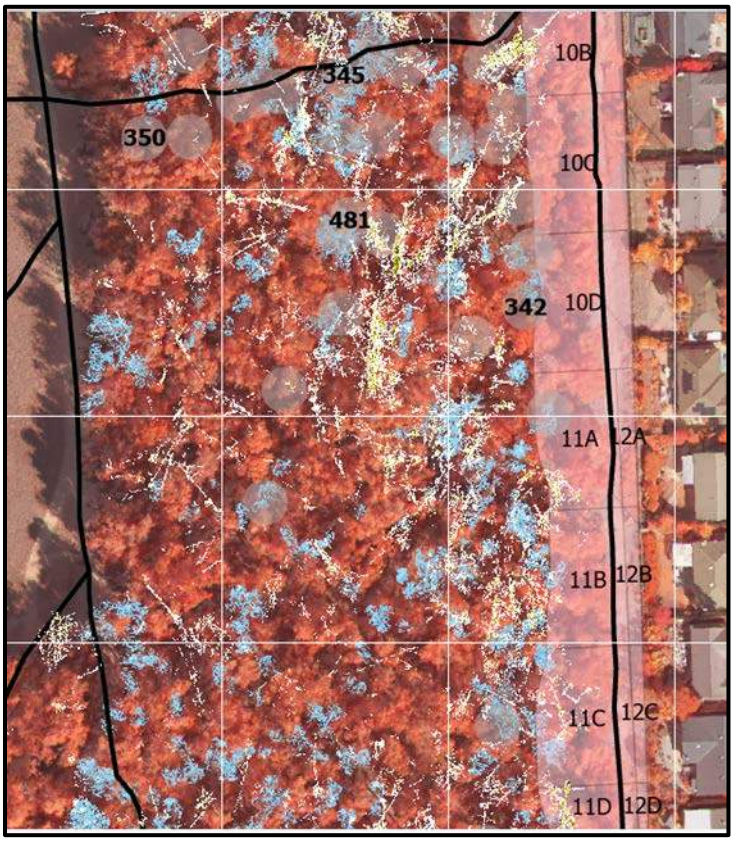


FIGURE 37A. HEMIPHOTO TRANSECT LOCATIONS AT ELLWOOD NORTH CENTRAL

Map with 50 m Grid. Dead standing (blue) and Downed (yellow) shown over a color infrared photo. Lighter shaded grids are fuel management areas.

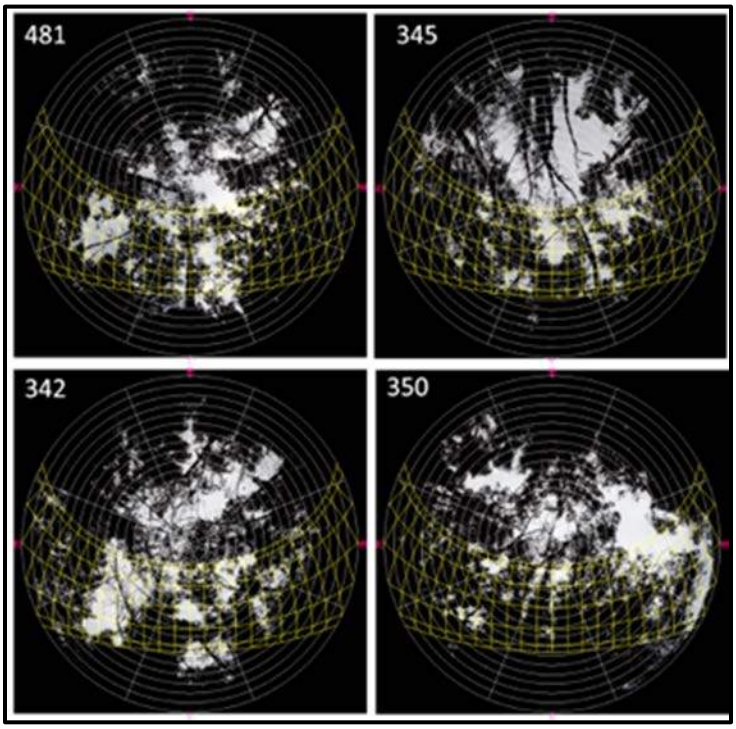


FIGURE 37B. EXAMPLE HEMIPHOTOS AT ELLWOOD NORTH CENTRAL

FIGURE 38. POINT MAPS OF HEMIPHOTO RESULTS AT ELLWOOD NORTH-CENTRAL

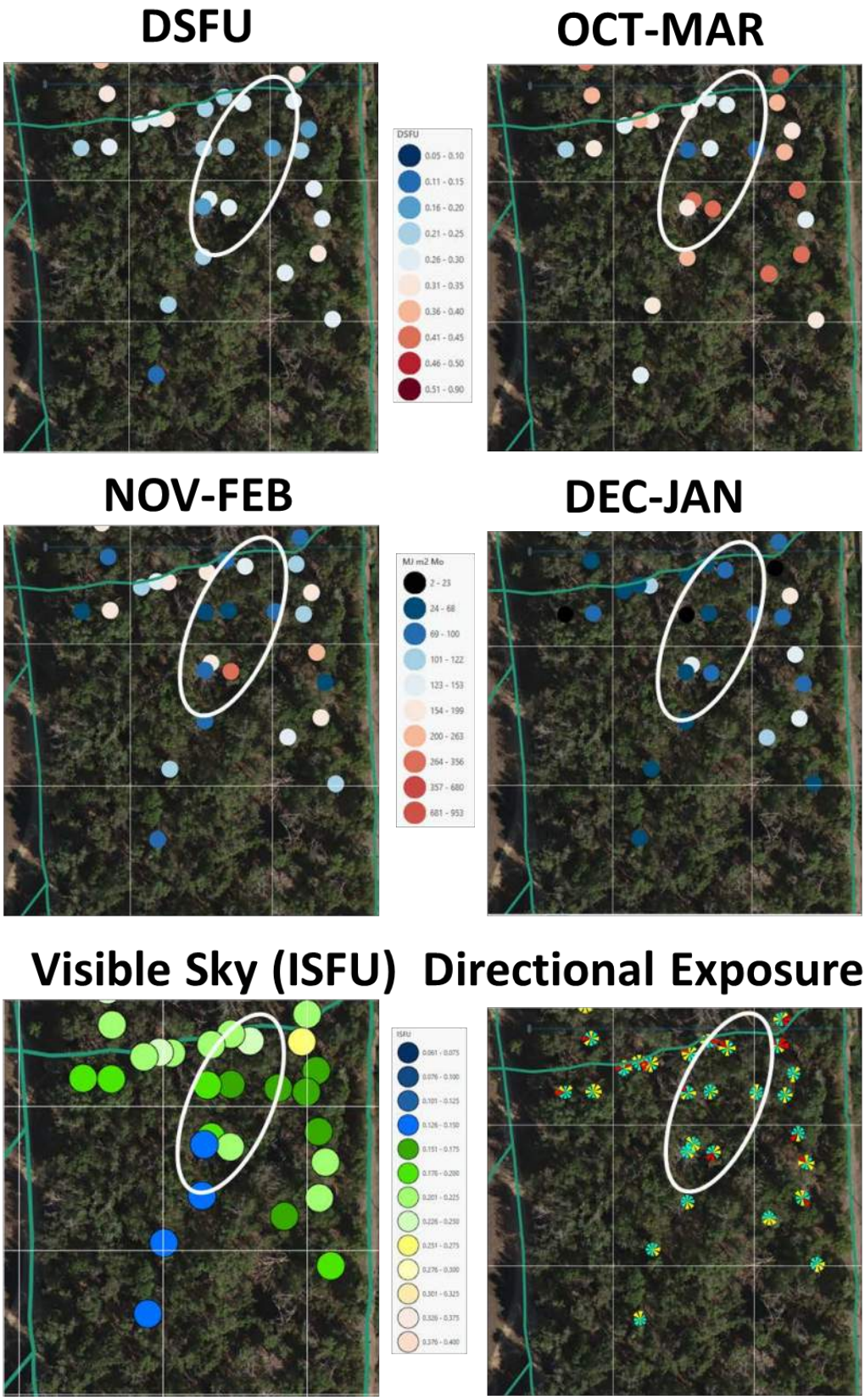
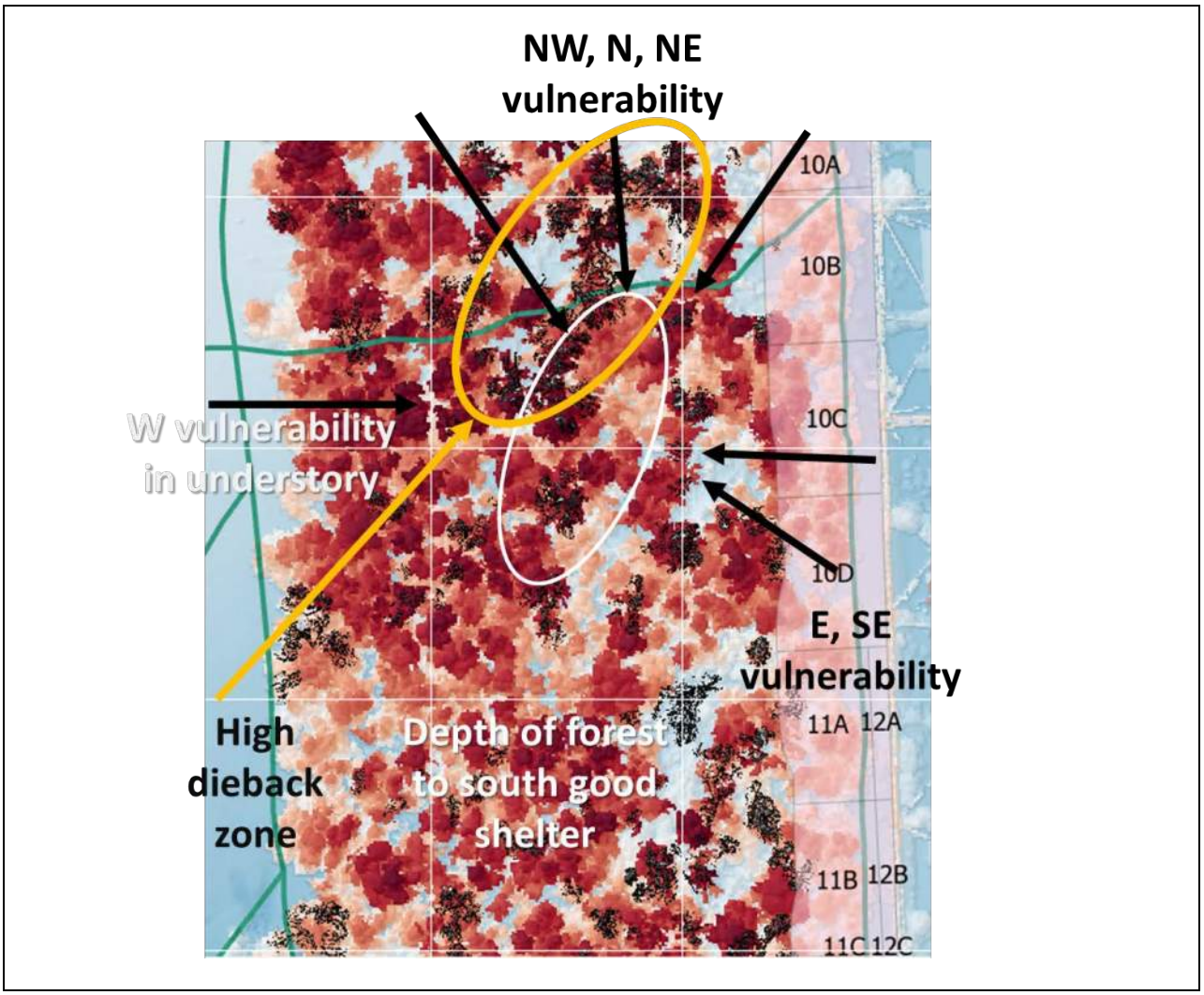


FIGURE 39. ELLWOOD NORTH-CENTRAL VULNERABILITIES AND RECOMMENDATIONS FOR RESTORATION



5.5.3 Current Conditions at Ellwood North-North

Ellwood North-North (NN) is the area north of the cross trail in Ellwood North and is one of the epicenters of tree mortality (Figure 40A). Monarchs were last observed roosting north of the cross trail over 10 years ago, see Figure 36 and Appendix C for monarch count data. Ellwood North-North has lost virtually all habitat value for overwintering monarchs that once clustered in the southern part of this zone because the forest has opened to the point where wind vulnerabilities from most directions are widespread. Because of this, Ellwood North-North has a lower potential to become overwintering habitat and is therefore a lower priority for restoration; the adjacent area at Ellwood North-Central has much higher restoration potential. The Ellwood North-North area has better nectar habitat potential and can be managed with an open eucalyptus overstory with a diverse native understory, including nectar plants in open areas.

Hemiphotos were taken primarily along the east and west edges, and along the cross trail at the south end of this area. Four examples are shown in Figure 40B with dead standing trees (blue) and downed trees (yellow) shown over a color infrared (CIR) photo; note the dead standing trees in Photos 356 and 362. Photo 332 is in the middle of a large clearing. There are wind vulnerabilities in many directions in these photos.

The point maps of the hemiphoto results show the openness of the canopy at site, see Figure 40B and Figure 41. The majority of the ISFU values are above 0.30 (shown in white-red), except at the southern boundary along the cross-trail (which is considered more deeply in Ellwood North-Central account). There is high annual insolation (DSFU), again except for the denser forest along the cross trail and very high insolation at ground level October-February throughout the site, with a few exceptions. All of these results point to a very open site with very little habitat suitability for overwintering monarchs. Directional Exposure is high in most direction at most sites (red wedges predominate), again only at the cross trail are there less exposed sites, see values in Table 11.

TABLE 11. EXAMPLE HEMIPHOTO DATA AND COMMENTS AT ELLWOOD NORTH-NORTH

Photo	Site	ISFU	DSFU	Max Exposure	Comments
332	Shelter zone	0.46	0.64	0.58 N	Near center of stand
333	Shelter zone	0.41	0.70	0.60 W	On east-end, at 100’ fuels border
356	Shelter zone	0.32	0.41	0.52 N	Near west-edge
362	Shelter zone	0.25	0.19	0.42 NE	Northwest section

No detailed vulnerability map was produced because there are so many vulnerabilities that can be seen in the point maps in Figure 41. Widespread tree plantings for monarchs at this site should be delayed until the other higher priority sites are planted. The recommended plantings of an ironbark shelterbelt south of the cross trail are primarily for Ellwood North-Central. Nectar plants in the understory at Ellwood North-North could help attract butterflies to Ellwood North-Central.

A limited area within this site could be designed with a circular shelterbelt to create a wind-protected gap, but that detailed design should wait until Phase 2.

5.5.4 Recommendations for Ellwood North-North Restoration Actions

The following are our recommendations for the restoration of Ellwood North-North:

- Replace/replant dead monarch aggregation trees with blue gum eucalyptus.
- Encourage the recruitment and establishment of blue gum saplings and existing trees.
- Fuels management (9A, B, C, D, 10A on Figure 40A) are less sensitive than in other fuel management areas.
- Removal of most dead standing trees
- Remove high fraction of downed wood, especially finer fuels less than 10-inches diameter that prevent openings for plantings and new growth.
- Separate large logs on the forest floor as practical.
- Ellwood North-North is an excellent place to practice wood removal because it is not a high sensitivity area.
- Plant native shrubs and forbs, with nectar plants in sunny interior areas. Take advantage of some swales where goldenrods (*Solidago* sp.) are already established as a native fall-blooming nectar source.
- Nectar plants at Ellwood North-North would help attract butterflies that might cluster at Ellwood North-Central.

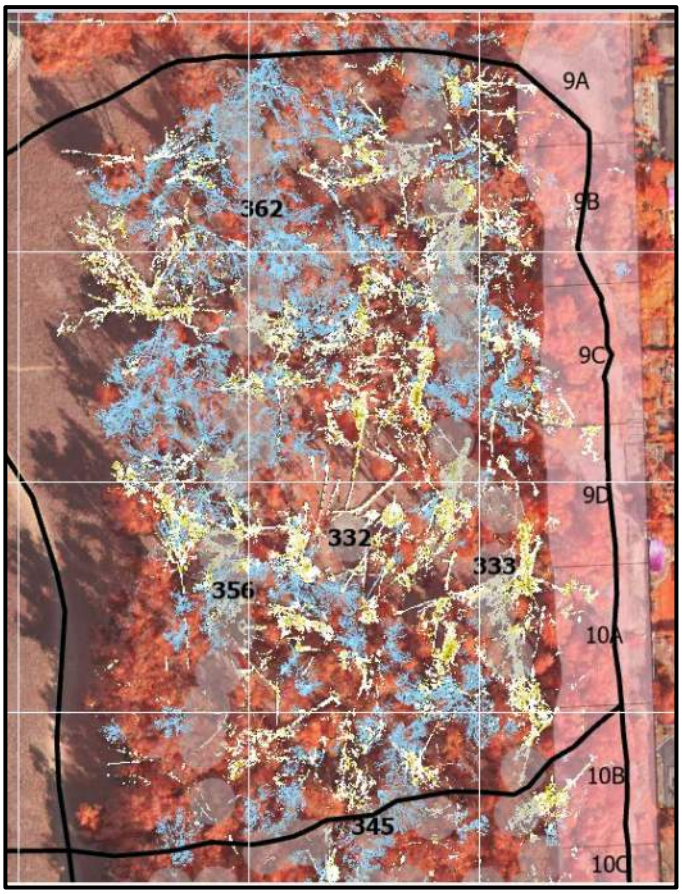


FIGURE 40A. HEMIPHOTO TRANSECT LOCATIONS AT ELLWOOD NORTH-NORTH

Hemiphoto is shown over a color infrared photo. Map with 50 m Grid. Dead standing trees are indicated in blue and downed trees are indicated in yellow.

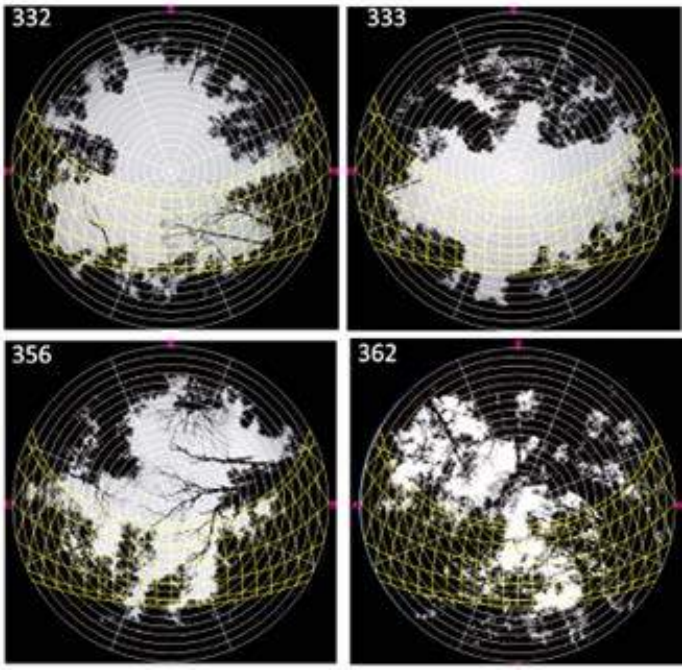
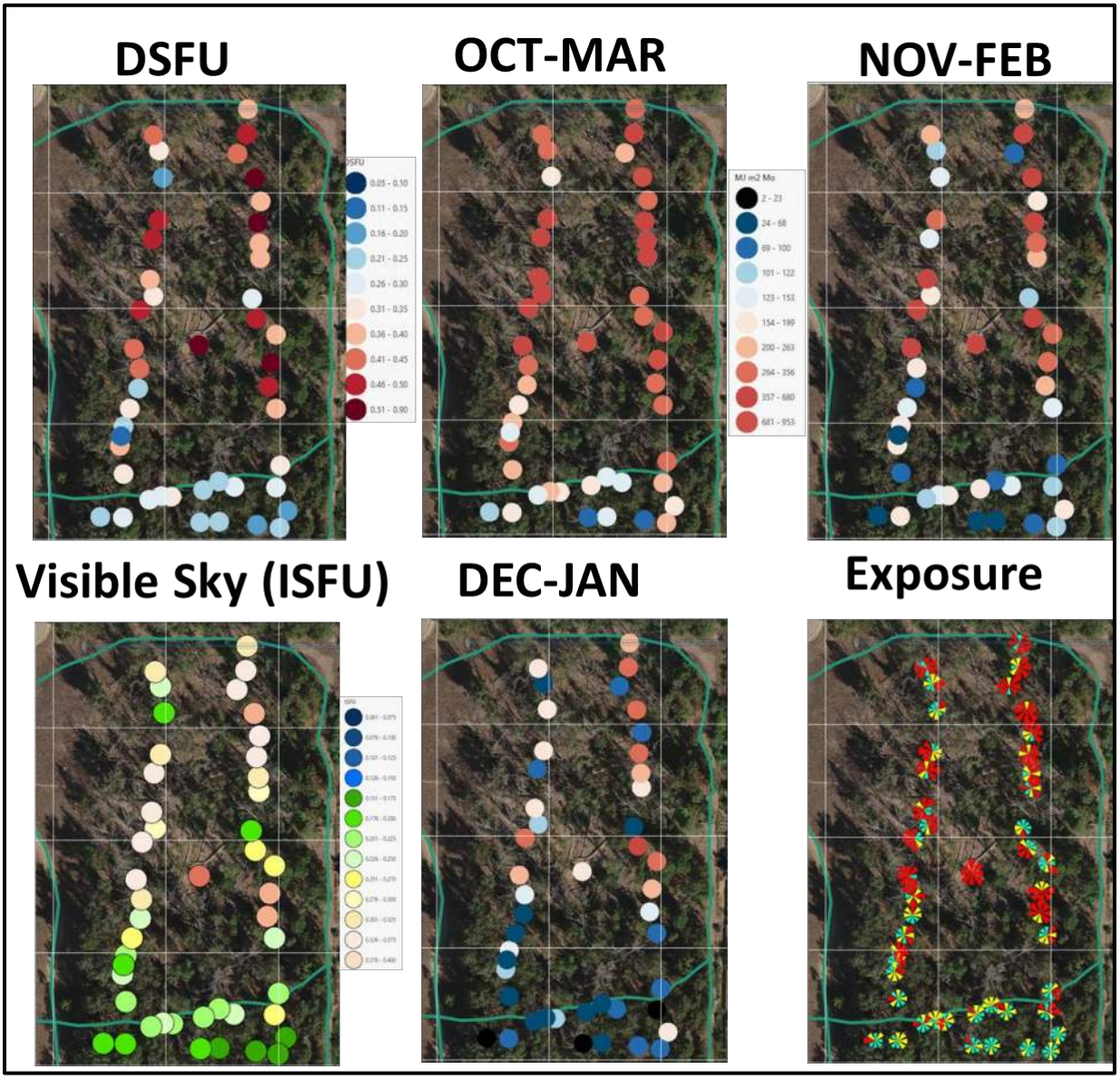


FIGURE 40B. EXAMPLE HEMIPHOTOS AT ELLWOOD NORTH-NORTH

FIGURE 41. POINT MAPS OF HEMIPHOTO RESULTS AT ELLWOOD NORTH-NORTH



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5.6 Ellwood Ironbark

5.6.1 Current Conditions at Ellwood Ironbark

The Ellwood Ironbark area is at the southwest corner of Ellwood North. A stand of red ironbark (*Eucalyptus sideroxylon*) is between a grove of blue gums along the drainage channel to the west, and a stand of blue gums to the east (Figure 43A). A few monarch observations were recorded in 2019, see Figure 42 and Appendix C for monarch count data. The area east of the major trail suffered massive tree mortality. All the dead standing trees (shown in blue) and downed trees (shown in yellow) in the map are blue gums; no whole-tree ironbark mortality was noted. The red ironbark trees are planted close together (3-6 ft), and many stumps have multiple stems and form very dense stands that are highly effective at blocking the wind. But the dense canopy blocks insolation, except in narrow gaps along trails (Photos 393 and 394, Figure 43B). There is a double row of ironbarks running east-west at the south end of the stand, with a narrow trail on the north-side. Photo 387 shows how effective this double row is for reducing south exposure, as well as the narrow east-west gap along the trail. The interior is very dark (Photos 393 and 394), and Photo 394 shows an elongated gap along the narrow north-south trail through this area. Along the drainage in the blue gums, dead standing trees are visible to the southwest (Photo 400) and the elongated gap along the creek runs southwest to northeast. Table 12 shows the ISFU and DSFU values and comments for the four example hemispherical photos.

Hemiphotos were taken in 3 transects, shown in Figure 44. One transect ran east-west along a narrow trail behind a double row. A second transect ran north-south through the ironbark stand along a narrow trail. The third transect ran along the drainage bottom toward the west end. The hemiphoto point maps show that the interior is very dark. ISFU values are all less than 0.125, and some less than 0.10 (Figure 44). There is a relatively higher insolation site just south of the proposed gap, a result of the narrow north-south trail. The south-edge transect shows higher ISFU and insolation at the west and east ends, where the trail opens. The interior has low directional exposure in nearly all directions (note the preponderance of blue wedges along the north-south trail). The low south exposure along the east-west trail is the basis for proposing a double row of red ironbarks as the basic shelterbelt design. Note that exposure is high (red) at the ends of this trail where it opens, and moderate (yellow) at 20 m (70 ft) into the stand along the trail. This pattern emphasizes that trail openings need to be carefully designed to avoid wind tunnel effects. The transect along the drainage channel has one site in the optimal ISFU range (shown in green) but that site has moderate to high southwest, south, and west exposure. The sites farther south have lower ISFU, as well as moderate south exposure. This drainage channel site has only a thin green line west of the channel to provide shelter.

TABLE 12. EXAMPLE HEMIPHOTO DATA AND COMMENTS AT ELLWOOD IRONBARK

Photo	Cluster	ISFU	DSFU	Max Exposure	Comments
393	Shelter zone	0.10	0.16	0.20 S	W side of proposed opening
394	Shelter zone	0.08	0.14	0.60 W	S of proposed opening
387	Shelter zone	0.12	0.19	0.20 W	S-edge interior
400	Shelter zone	0.12	0.23	0.23 W	Along drainage channel

5.6.2 Recommendations for the Creation of a New Site at Ellwood Ironbark

The major recommendation for Ellwood Ironbark is the creation of a new gap in the well-protected interior of the ironbark stand where insolation is currently too low to be suitable for roosting monarchs. In 2022, Weiss and a crew from Rincon Consultants tagged 17 trees for potential removal to initialize a gap that is approximately 10 x 15 m (33 by 50 ft). This is viewed as an experiment – the effects on canopy cover and insolation will be evaluated and further removal considered. Such gap creation has been executed at 3 other sites – Monarch Lane (Los Osos, SLO County) in the 1990s, Point Pinole (Richmond, Contra Costa County) and Andrew Molera State Park (Big Sur, Monterey County), both in 2022. At Monarch Lane, the monarchs use the gap, and it has been successful over time in providing a wind-sheltered, high insolation site.

As part of the gap creation, another recommendation is to fill in the forest just to the east with red ironbark and karri, as replacements for the dead trees and to bolster wind shelter from that direction. This is consistent with some previous mitigation requirements that are described in the planting plan.

The following are our recommendations for the restoration of Ellwood Ironbark:

- Remove most dead standing trees (shown in black in Figure 45)
- Remove high fraction of downed wood, especially finer fuels <10 inches diameter that prevent new growth.
- Remove some accumulated litter within ironbark stand for fuel reduction.
- Separate large logs on the forest floor as practical.
- Create a small gap as indicated, removal of ~17 trees initially.
- Maintain the double wind row of ironbark trees for a wind shelter zone.
- Plant ironbark and karri (*E. diversicolor*) within blue circle for wind shelter.
- Maintain lower density of blue gums established after drought.
- Manage massive dieback zone for native understory, live oaks.

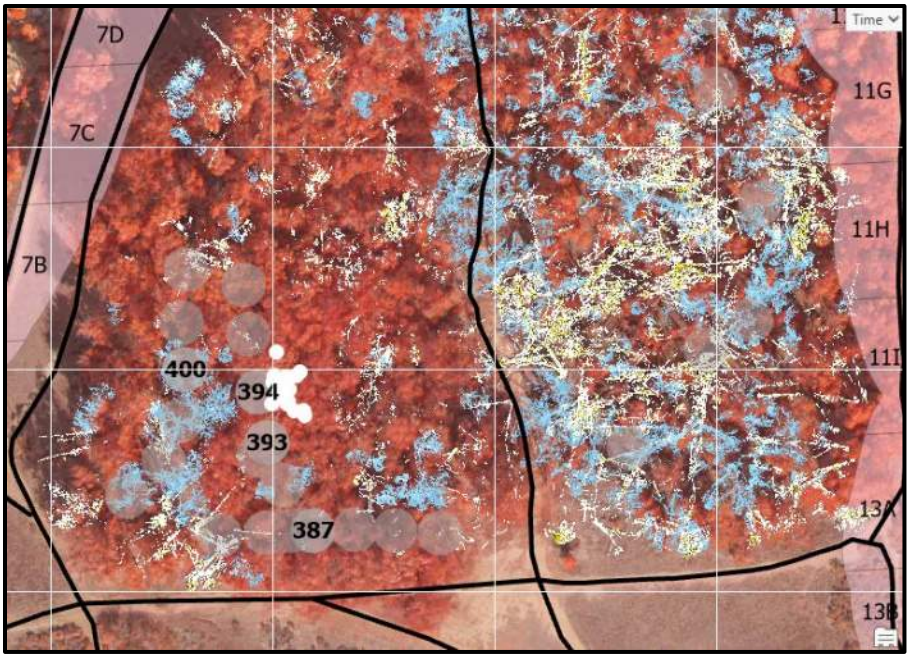


FIGURE 43A. HEMIPHOTO TRANSECT LOCATIONS AT ELLWOOD IRONBARK

Dead standing (blue) and downed (yellow) shown over a color infrared photo. The bright white dots are the locations of trees marked for potential removal to create a hospitable gap for monarchs.

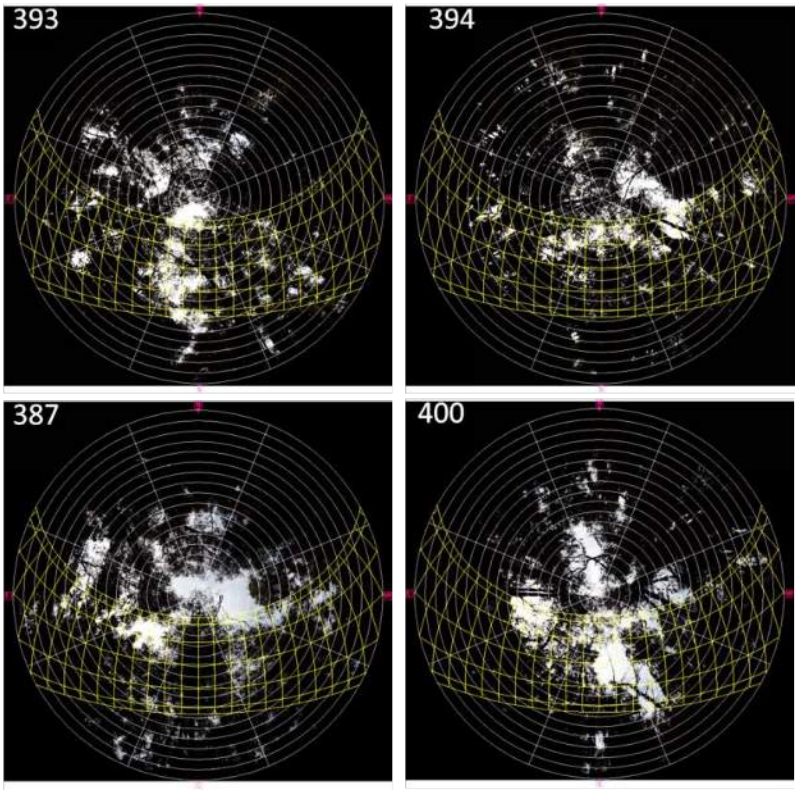


FIGURE 43B. EXAMPLE HEMIPHOTOS AT ELLWOOD IRONBARK

FIGURE 44. POINT MAPS OF HEMIPHOTO RESULTS AT ELLWOOD IRONBARK

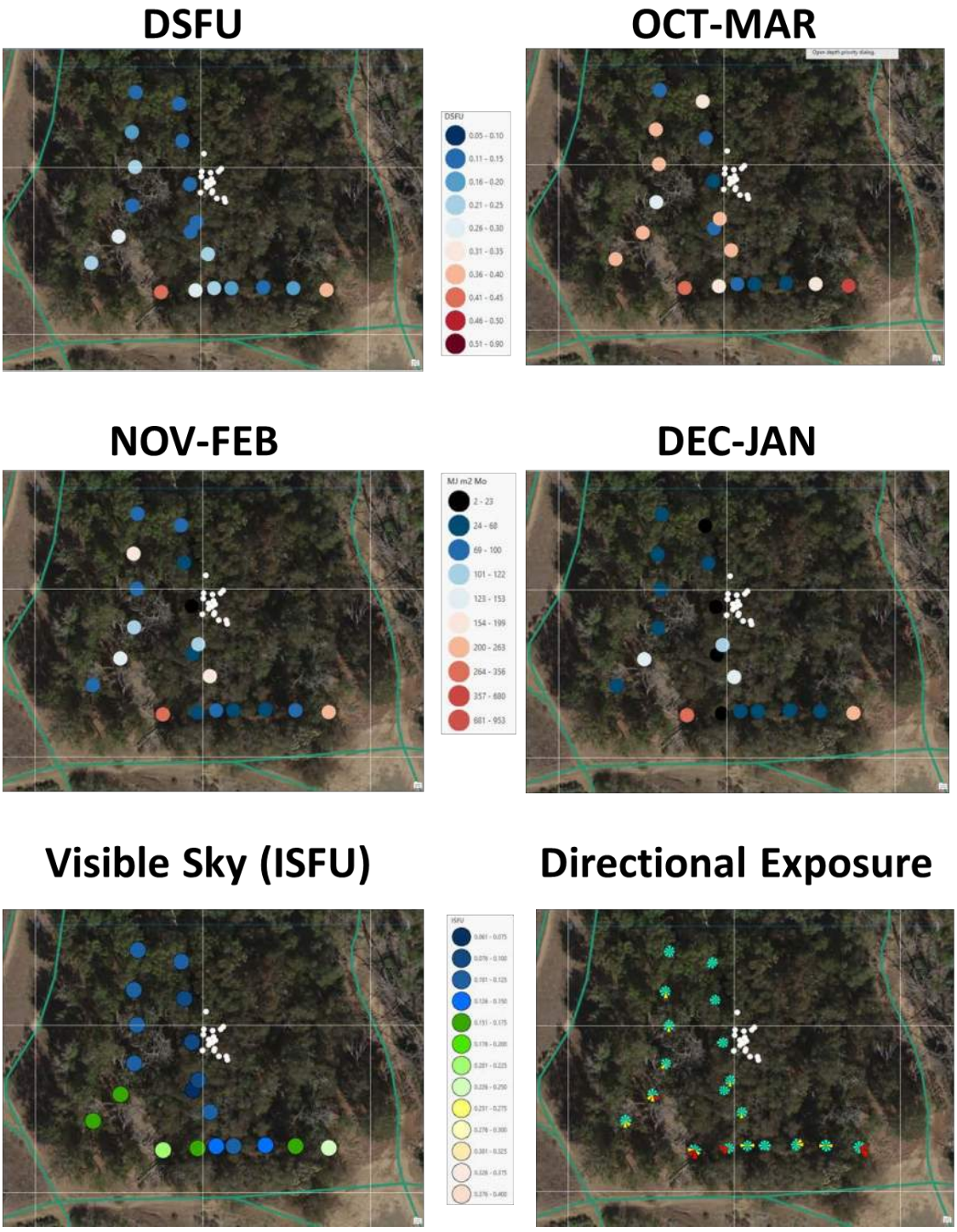
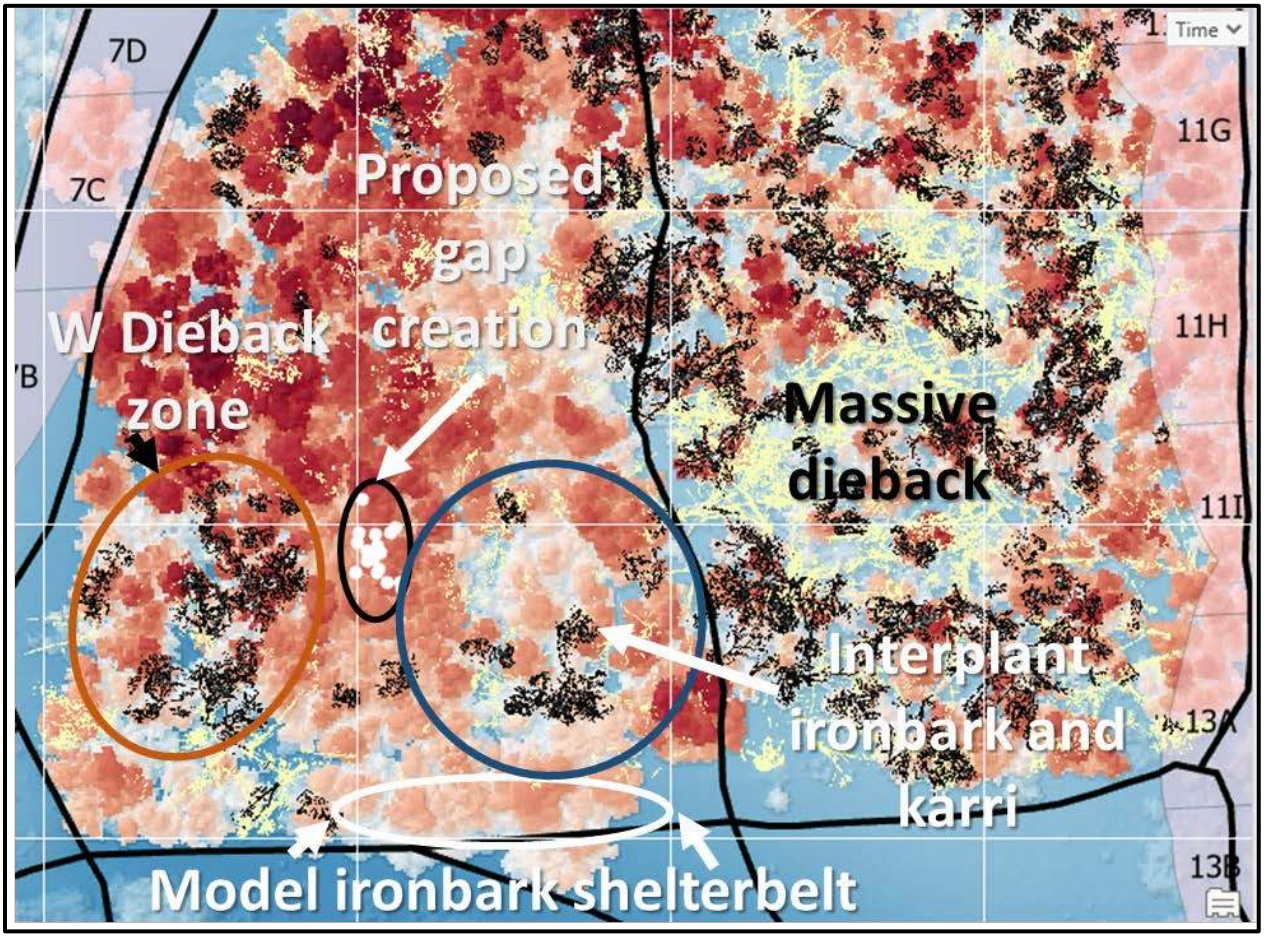


FIGURE 45. ELLWOOD IRONBARK RECOMMENDATIONS



5.7 Sandpiper

Restoration of the Sandpiper monarch site will be included in MBHMP Implementation Phase 2. We will discuss analysis and restoration recommendations in a future update for future reference and planning.

5.8 Ocean Meadows

Restoration of the Ocean Meadows monarch site will be included in MBHMP Implementation Phase 2. We will discuss analysis and restoration recommendations in a future update for future reference and planning.

5.9 Extent of Forest Death

Comparative photographs from 2011 and 2017 illustrate the significant canopy loss throughout the eucalyptus forest at Ellwood Mesa (Photos 7-16) (Meade et al. 2017). The 2011 photos show the tree canopy during conditions with plentiful rainfall and extensive growth. The 2017 photos show the same location after several years of extended drought. Thick canopies are present in the 2011 photos, while dead trees and/or sparce trees with epicormic growth are visible in the 2017 photos.

A health assessment was conducted in 2017 on the trees in the five monarch aggregation sites (Meade et al. 2017). The assessment assigned a health rating to each tree: 0 - dead, 1 - dying or hazard tree (should be removed), 2 - distressed trees, poor structure and health (some may need to be removed depending on their importance to aggregation site), 3 - tree with decent structure and health (should remain), 4 - tree with good structure and overall health (should remain; Table 13).

TABLE 13. RESULTS OF 2017 TREE HEALTH ASSESSMENT AT ELLWOOD MESA

	North	West	Main	East	Sandpiper
Total trees assessed	94	54	184	33	47
Health rating (Average)	1.6	1.75	1.6	1.75	2.55
Dead (0)	22 (23%)	5 (9%)	32 (17%)	3 (9%)	0
Remove (0-1)	34 (36%)	10 (19%)	63 (34%)	8 (24%)	0
Dead or distressed (0-2)	73 (78%)	49 (91%)	165 (90%)	28 (84%)	23 (49%)
Height of dead trees (Average)	65 ft.	70 ft.	67 ft.	67 ft.	n/a

Data source: Meade et al. 2017



Photo 7. Ellwood North monarch roost location, 2011 (photo by Daniel E. Meade).



Photo 8. Ellwood North monarch roost location, 2017 (photo by Daniel E. Meade).



Photo 9. Viewing area at Ellwood Main, 2011 (photo by Daniel E. Meade).



Photo 10. Viewing area at Ellwood Main, 2017 (photo by Daniel E. Meade).



Photo 11. Monarch clusters at Ellwood Main, 2011 (photo by Daniel E. Meade).



Photo 12. Monarch clusters at Ellwood Main, 2017 (photo by Daniel E. Meade).



Photo 13. Trail to bluffs east of Ellwood Main, 2011 (photos by Daniel E. Meade).



Photo 14. Trail to bluffs east of Ellwood Main, 2017 (right) (photos by Daniel E. Meade).



Photo 15. Trail to bluffs west of Ellwood Main, 2011 (photo by Daniel E. Meade).



Photo 16. Trail to bluffs west of Ellwood Main, 2017 (photo by Daniel E. Meade).

5.10 Wind and Monarch Movement between Ellwood Aggregation Sites

Overwintering monarch butterflies require specific habitat conditions that offer them buffering potential from negative wind and temperature effects. Cool moist air that is sheltered from strong winds offer ideal habitat. Such conditions have historically been met in Ellwood Mesa, however, widespread forest dieback has jeopardized ideal habitat conditions and now pose a threat to overwintering monarch populations.

In Santa Barbara California, monarchs can typically be found in overwintering mode from October-February. In these months, warmed air escaping from the land interior means that the prevailing winds tend to blow from the north and/or east. Winds coming off the ocean, that blow from the south and/or west, tend to be cooler.

In the 2021/2022 season, overwintering sites were subject to strong and prolonged wind events from the east/southeast between December 13-14 in 2021. This event lasted for around 36 hours, and although average wind speed was only around 15 mph, wind gusts averaged 27 mph for up to 16 hours. These winds did not however, result in notable alterations to temperature and

humidity. In the same season, at midnight on January 21, an unusual wind blew in from the northeast at 18 mph. This relatively isolated event increased the temperature by 15 degrees and decreased humidity by over 50%.

In the 2022/2023 season, overwintering sites were subject to strong and prolonged wind events from east/southeast between January 4-5. This event lasted for up to 40 hours but was especially severe between 8pm (Jan 4) – 5am (Jan 5). In these 9 hours, the average wind speed was around 16 mph, and gusts averaged 30 mph, with some gusting up to 38 mph. Temperature and humidity did not appear to be affected by this wind event. However, on January 22-23, unusual north/northeast winds blew throughout the night with gusts up to 29 mph. The winds appeared to keep the temperature elevated and humidity low throughout the night. Upon cessation of the winds around 4am (Jan 23), the temperature quickly dropped, and humidity increased.

The winter months in Ellwood generally have tame winds, and although events of extended duration and gust strength, or of unusually warmth and dryness are infrequent, they appear to occur with some regularity from season-to-season. Historically, the topography of Ellwood, and habitat structure provided by eucalyptus and other trees have allowed some buffering capacity for the monarch butterflies.

Monarchs are sensitive to dehydration and seek areas of high humidity where available. They will avoid warm temperatures and seek the protection of cool moist post of air pools in the forest interior, where microsite conditions buffer them from warm dry air blowing from inland. Monarchs are also sensitive to the cold and may freeze under certain conditions. If situations allow, monarchs may move around their roosting trees to find areas most suited to their needs. However, the level of forest degradation that we currently see has little buffering capacity and now may be incapable of protecting monarch populations from large weather fluctuations.

Wind data is included in Appendix E.

6 RECOMMENDATIONS

6.1 Perform Deferred Maintenance

6.1.1 Strategic Fuel Reduction

The City of Goleta prepared the Community Wildfire Protection Plan (CWPP) in 2012 and acquired a Cal Fire grant to fund the implementation of the fuel reduction strategy in 2022. The goal of the CWPP is to minimize the risk of wildland fire to life, homes and infrastructure, and natural resources. Our habitat analysis supports the recommendation to remove dead wood and downed debris outlined in the CWPP. The removal of dead wood and downed debris will reduce the fire risk to the forest, and this is crucial for the protection and longevity of the monarch habitat at Ellwood Mesa.

Dr Daniel E. Meade and Dr. Stu Weiss prepared a letter report titled "Dead wood removal and monarch butterfly habitat effects" dated March 9, 2022, which is included in Appendix F. This letter emphasizes the importance for the management of monarch overwintering habitat and the removal of dead standing and downed wood. The Xerces Society guidelines for managing monarch groves stress the importance of removing hazard trees and felled debris (The Xerces Society 2017a). The 1993 Monarch conservation and management guidelines similarly state the importance of removing hazardous trees and the forest floor should be maintained to prevent the accumulation of dead plant materials (Bell et al. 1993).

The Meade and Weiss 2022 letter continues to explain that historically, Ellwood forests were managed to remove dead wood and maintain healthy stands of trees through normal forestry practices (Santos 1997, Meade personal observation). Failure to manage a grove results in over recruitment of trees during periods of higher rainfall and then death of trees during times of water stress (droughts). Appropriately managing tree density based on water demand creates a more stable grove and is a fundamental tenet of forestry management, even for groves managed for wildlife (Grebner et al. 2021, Taylor 2018).

The accumulation of bark and dead wood on the ground and leaning into the tree canopy creates a major fire hazard to monarch habitats (Xerces Society 2017a). Ignition from campfires and other human sources can feed on ground debris and quickly escalate into a catastrophic fire event. This risk can be managed by reducing fuel load through removal of dead branches, trunks and highly flammable vegetation that can create fire ladders into the forest crown. The Ellwood groves, once managed for wood production, now present a tangle of downed wood, dead leaning trunks, and over abundant understory shrubs. The City of Goleta Community Wildfire Protection Plan (2012) provides management recommendations to reduce, "potential fire intensity, rate of spread, and severity of effects" (pg. 58). Management prescriptions in the CWPP when implemented will help to protect life, property, and natural resources including monarch butterfly habitat.

The presence of large quantity of dead wood at Ellwood results in:

- Increased wind penetration and speed at aggregation locations due to downed trees,
- Higher tree-fall risk to remaining live trees,
- Reduction in shade at aggregation sites,
- Loss of cover for butterflies from predators,
- Poor recruitment and growth of replacement trees,

- Increased wildfire risk - intensification of fires and a fire ladder to canopy, and
- Public safety hazard from dead standing and leaning trees and ground debris.

Removal of dead wood from the Ellwood forests and monarch groves will have positive effects for monarch butterflies. The benefits include:

- Removal and replacement of dead trees will increase humidity and shade and boost protection of monarchs as they grow to maturity in the next decade.
- Removal of downed trees and branches eliminates debris tangles that interfere with recruitment of saplings and growth of trees with good form.
- Space for planting trees and shrubs will be opened by removing dead wood.
- Removal of leaning dead trees and branch and debris tangles will improve patrolling and clustering habitat for monarch butterflies.
- Reduction of hazards for visitors to the grove
- Preservation of habitat by reducing intensity and rate of spread of fires.

Maps showing the abundance of dead wood is shown in Figure 5 - Figure 12 in Section 4.4.2.

6.1.2 Prepare Restoration Areas

Removing the standing dead trees and downed wood, discussed in Section 6.1.1, will open up space for new plantings. Downed wood on the forest floor takes up a large area and we would have difficulty finding available open ground for new plantings. Photo 17 shows the grandeur of the downed wood in the Ellwood Mesa forest. After the removal is conducted, care may be necessary to prepare the recommended areas for plantings. These actions may include removing litter, removing non-native and invasive weeds, and smoothing out disturbed soil surface.

Eucalyptus debris does not break down as quickly as native vegetation and bark debris that accumulates on the ground retains nutrients and can inhibit new growth. Fallen blue gum eucalyptus trees decompose very slowly (DiTomaso et al. 2013), especially in dry climates. The high level of phenolics in eucalyptus inhibits fungi from breaking down the wood and allows accumulation of fire fuel (Reid et al. 2005). Chipping will aid the release of nutrients from woody debris by converting coarse wood to fine pieces (Russell et al. 2015). Mulching around new forest plantings can increase planting survival and growth rate (Cahill et al. 2005, Chalker-Scott 2007).



Photo 17. Extensive area with mass of dead, downed trees (Photo by Kyle Nessen).

6.2 Restore Aggregation Trees and Wind Protection

After the dead standing trees are removed, the restoration of the monarch aggregation locations and the surrounding wind protection zones is crucial for the longevity of the monarch habitat.

6.2.1 Restore Aggregation Trees

The monarchs have chosen specific recurring locations in Ellwood Mesa and the trees they return to year after year are very important for their overwintering roosting success. In areas where the monarch aggregation trees have died and have been removed, we recommend replacing these trees with blue gum eucalyptus plantings. Specific locations of these aggregation tree replacement plantings should be identified by a monarch butterfly biologist on the ground. Care should be taken to retain and protect the integrity of the open interior within the monarch aggregation sites.

6.2.2 Protect and Support Existing Live Trees

The existing tree canopy is vital to the continued health of the Ellwood Mesa forest for overwintering monarchs. We recommend encouraging seedlings and saplings, especially of blue gum eucalyptus trees, within the monarch aggregation sites. This will require the removal of dead and downed wood for fuel management to be conducted carefully to avoid unintentional impacts to existing young trees and clearing away the debris around seedlings and saplings. We recommend consultation with an arborist to explore methods of irrigation and fertilization to maximum the survival of existing trees.

6.2.3 Double Wind Row Design

The wind vulnerabilities throughout the Ellwood Mesa require reinforcement in order to provide adequate wind protection and maintain suitable wind speeds in monarch butterfly aggregation areas. Reinforcement of these areas is determined by the distribution and density of the existing foliage and the terrain around the aggregation sites, and the characteristics of species included in the reinforcement.

We designed a layout of tree planting that includes two rows of red ironbark with a row of toyon in front of it. This layout is referred to as the 'double row'. The intention of the design is that the red ironbark will provide most of the wind protection while the toyon plugs any gaps in the lower canopy. This will create a continuous wall of canopy from the ground to the top of the canopy and thus a solid wall of wind protection. The red ironbark is spaced out with 20 feet between each tree's center, one row staggered from the other, with toyon also spaced 20 feet from one another in a row 40 feet in front of the back row of red ironbark (Figure 47). The 20-foot spacing is intended to limit competition amongst trees in the double row, allowing for sufficient resources to grow to the desired mature size. This design can be used in areas where existing foliage and terrain are the thinnest, requiring substantial reinforcement to maintain suitable aggregation site conditions.

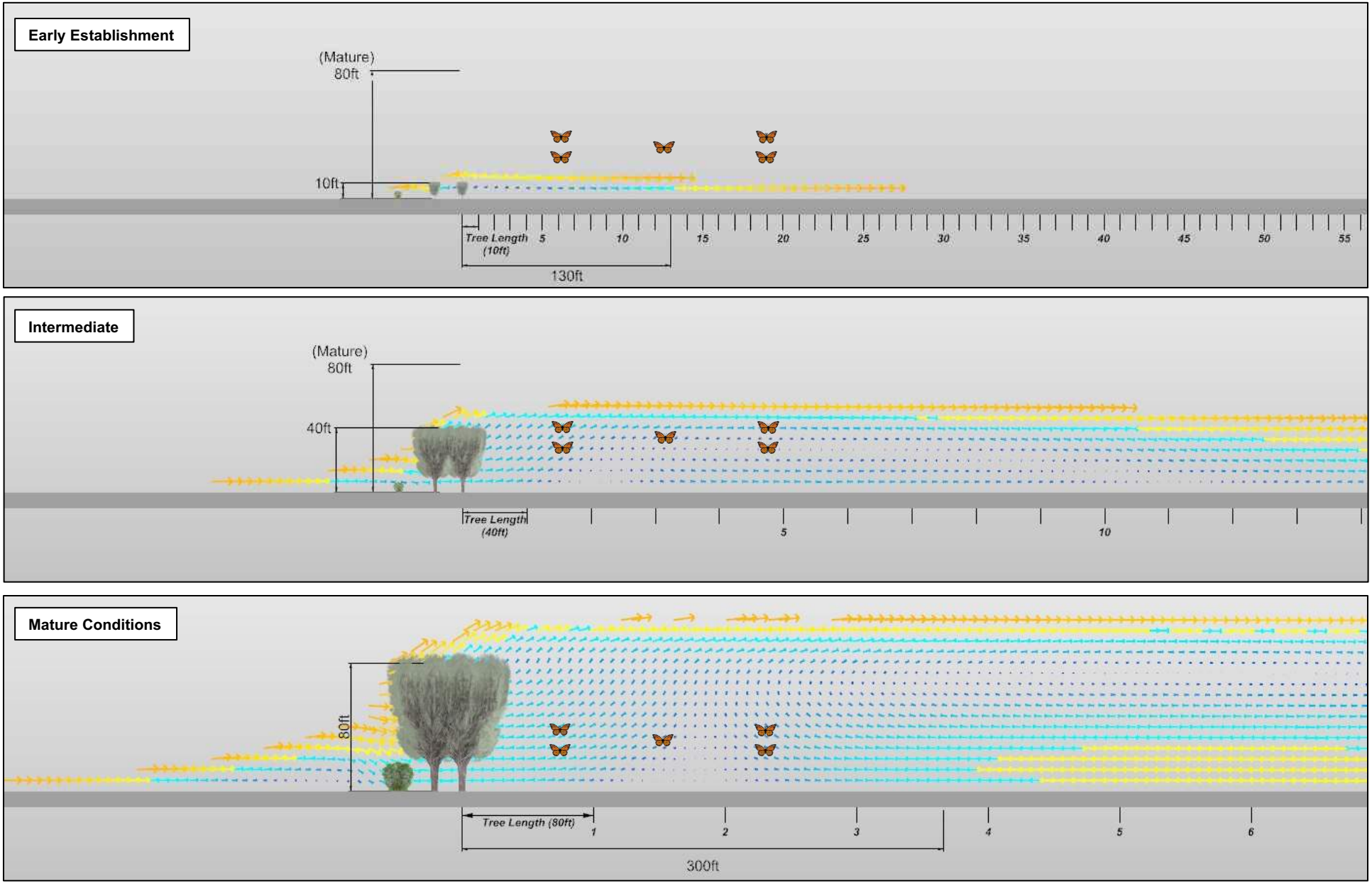
Red ironbark is favorable for the design because of its observed success on Ellwood Mesa, drought tolerance, fast growth rate, dense canopy, and mature canopy height of approximately 80 ft (approx. 24 m). Toyon is a favorable compliment to red ironbark because it is also established on Ellwood Mesa and grows to a mature height of 20 ft (6 m), which covers areas in red ironbark's lower canopy that naturally thin in maturity.

To quantify the wind protection provided by this design we simulated an ideal version of the layout in an isolated environment. We simulated the effects of winds encountering the double row head on and the resulting wind shadow on the leeward side of the double row (Figure 46). We ran iterations of this test with the double row plants at three different ages and thus heights: early establishment, intermediate, and mature (Table 14).

TABLE 14. DOUBLE ROW GROWTH CHART

Species Height	Early Establishment	Intermediate	Maturity
Red ironbark	10 ft (3.05 m)	40 ft (12.2 m)	82 ft (25 m)
Toyon	3.3 ft (1 m)	6.6 ft (2 m)	20 ft (6 m)

Figure 46. Ideal Double Wind Row Simulation



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Figure 47. Double Row Layout

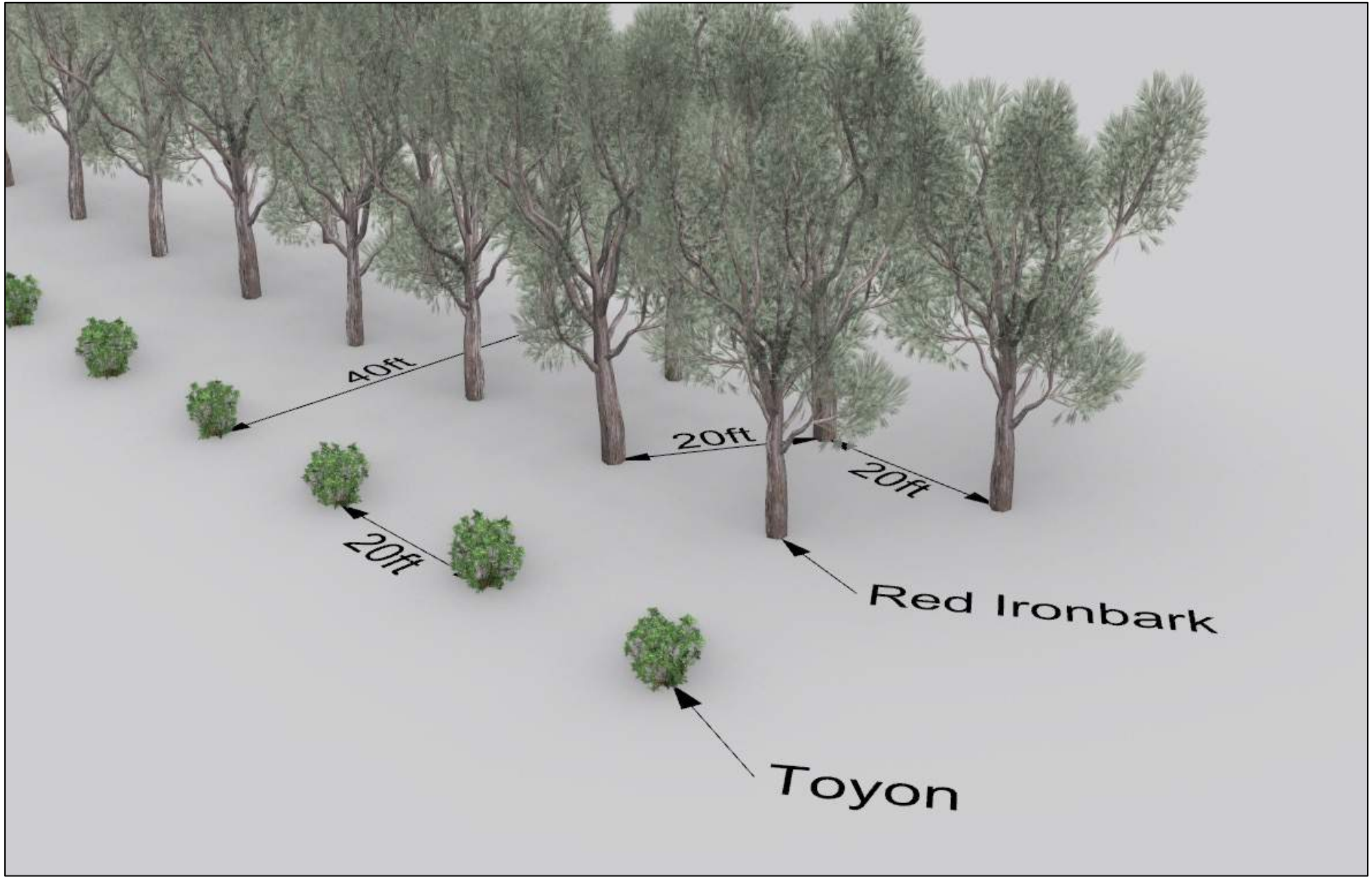
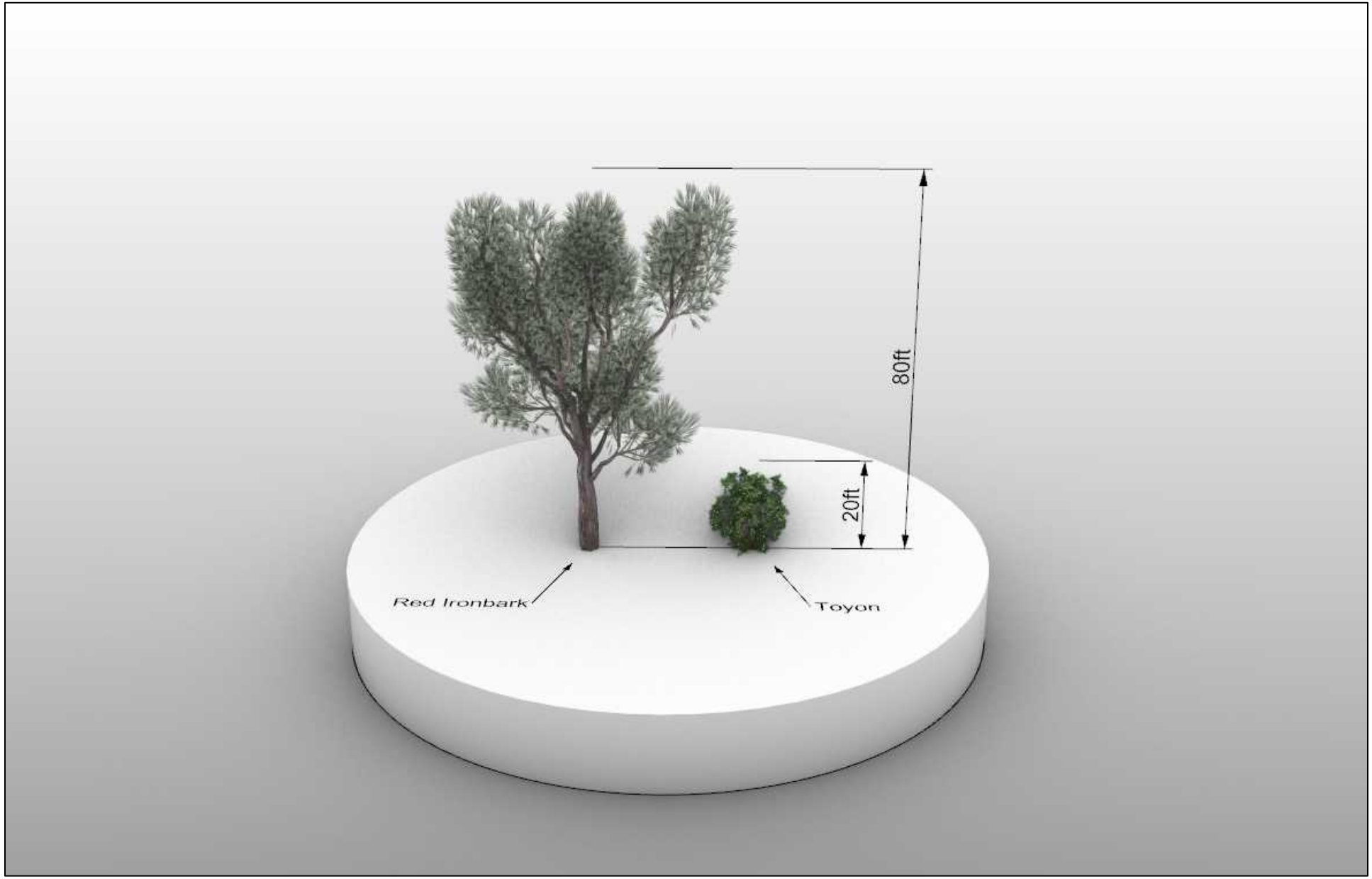


Figure 48. Double Row Species Models



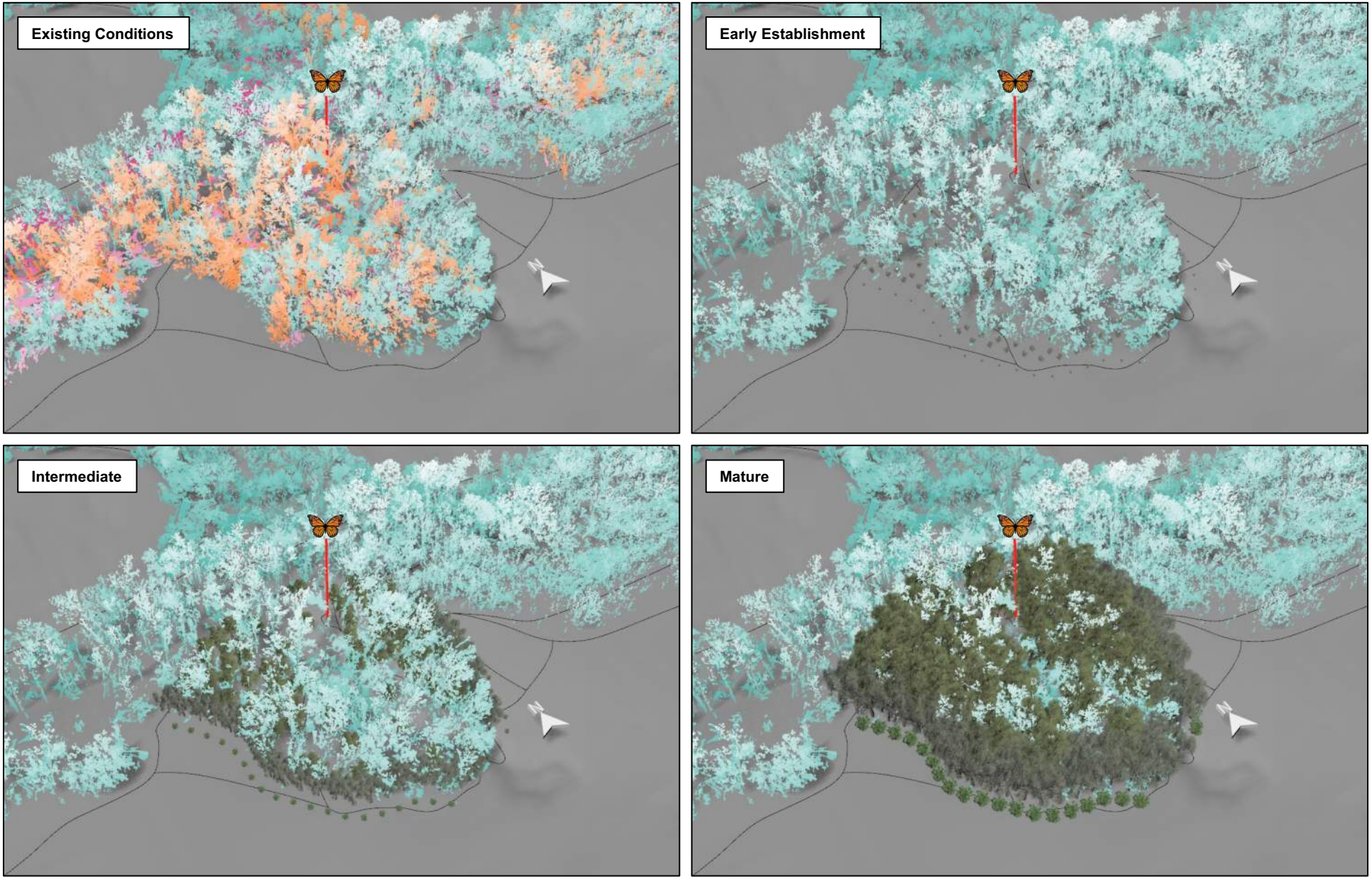
6.2.4 Wind Modeling at Ellwood Main

We conducted simulations of microclimate wind conditions at Ellwood Main during a southwest storm event in order to assess the efficacy of our restoration plans. We evaluated four scenarios: Existing Conditions, Early Establishment, Intermediate Conditions, and Mature Conditions (see Figure 49). Existing scenarios included three stem categories (living, standing dead, and dead downed), as well as vegetation not classified as stems (See Figure 50). All other scenarios included only living stems (See Appendix B for more details). The Early Establishment scenario represented 0-5 years after planting, when trees are allowed to grow to 10 ft in height and dead wood has been removed to make space for new plantings. Intermediate Conditions scenario is when trees reach 40 ft in height, approximately 10-15 years after planting. Finally, Mature Conditions are when tree heights have reached existing conditions and replaced lost forest canopy.

Figure 51, Figure 52, and Figure 53 shows wind conditions within the monarch clustering area for the four simulated scenarios. Existing conditions show mostly marginal conditions with some pockets of favorable wind speeds. Early Establishment, however, reveals a decrease in habitat quality primarily due to the removal of standing dead wood. While this result is not ideal in the near term, any protection from dead standing wood is temporary and poses a safety risk to hikers and remaining living trees. Any restoration plantings will also be inhibited by existing dead wood, and inevitable felling could damage newly planted trees. Thus, we recommend removing the dead wood now so that we can address the issues previously mentioned and begin restoring Ellwood Main for the long-term management of monarch butterfly habitat. See Section 5.10 for a discussion on the adaptability of monarch butterflies and how they have historically used other parts of the forest when conditions have turned unfavorable at Ellwood Main.

Intermediate Conditions show when wind favorability meets or exceeds Current Conditions within the clustering area, as well as an improvement in habitat quality along the eastern edge of Ellwood Main. Finally, at Mature Conditions, the clustering area is almost entirely in suitable wind conditions, suggesting that when fully implemented, restoration activities will improve habitat conditions for monarch butterflies for many decades to come.

Figure 49. Wind Modeling Scenarios



Monarch viewing area

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Figure 50. Existing Conditions Classified Stems

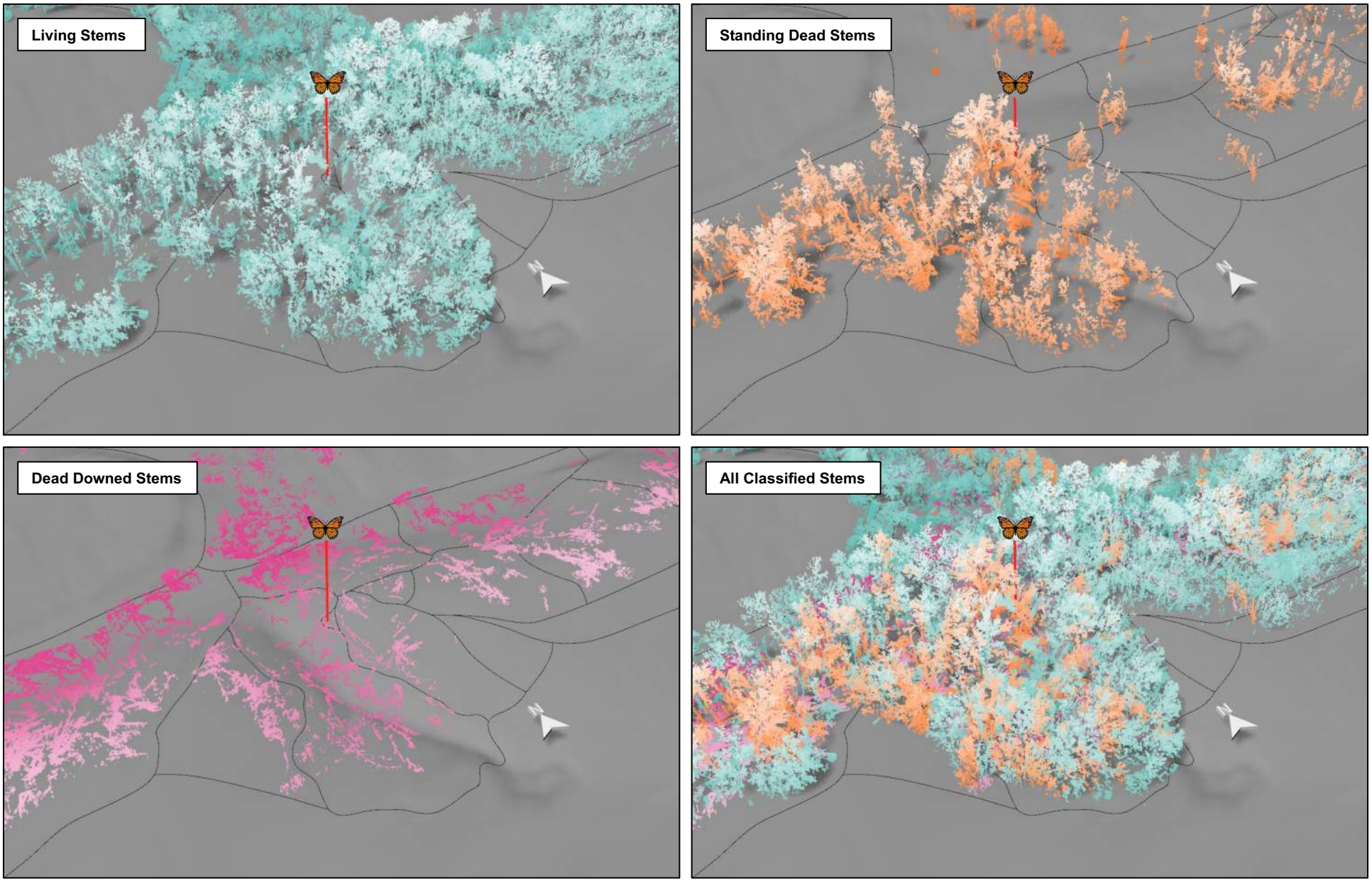


Figure 51. Above Ground Wind Conditions (30 ft)

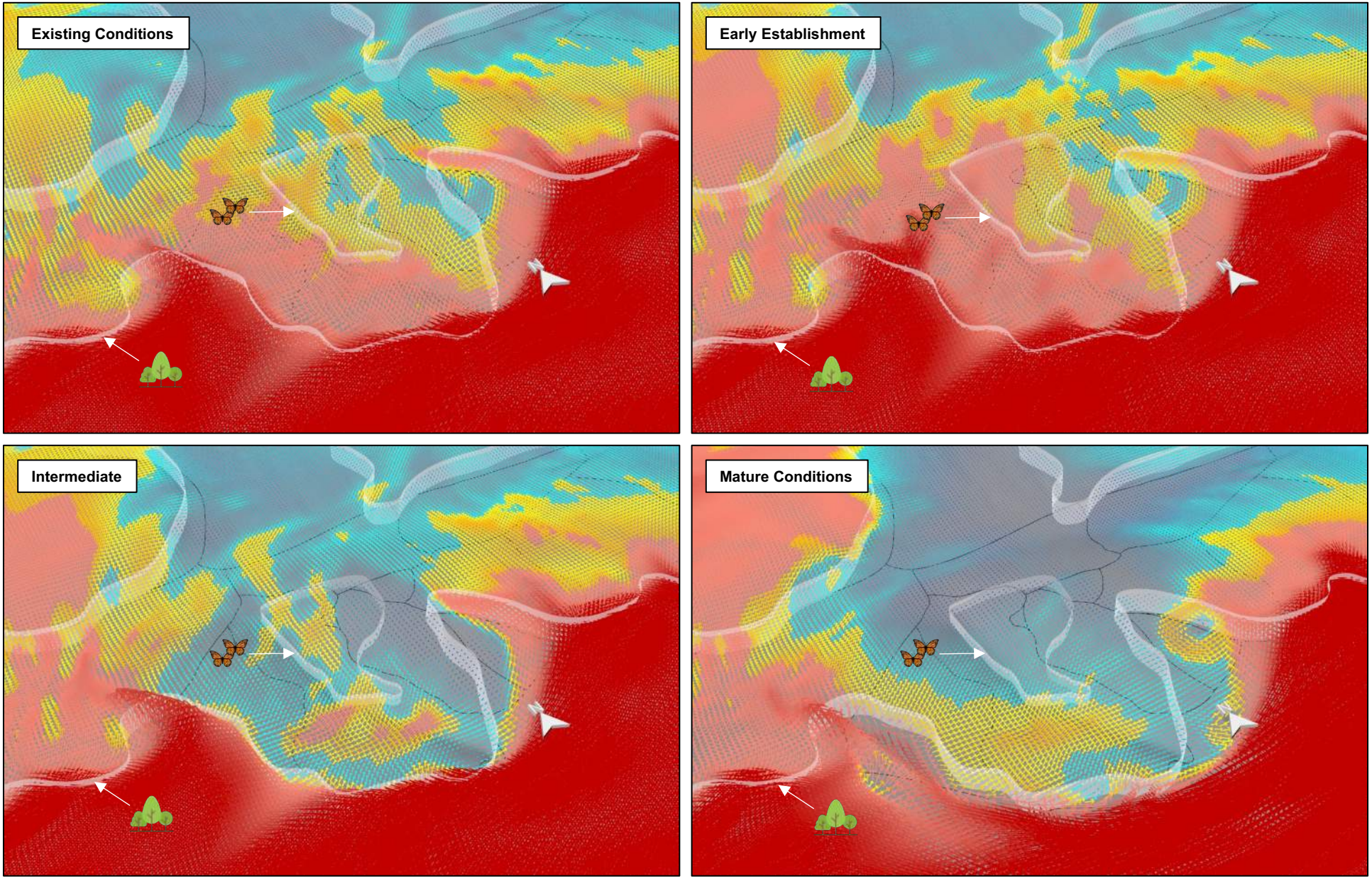
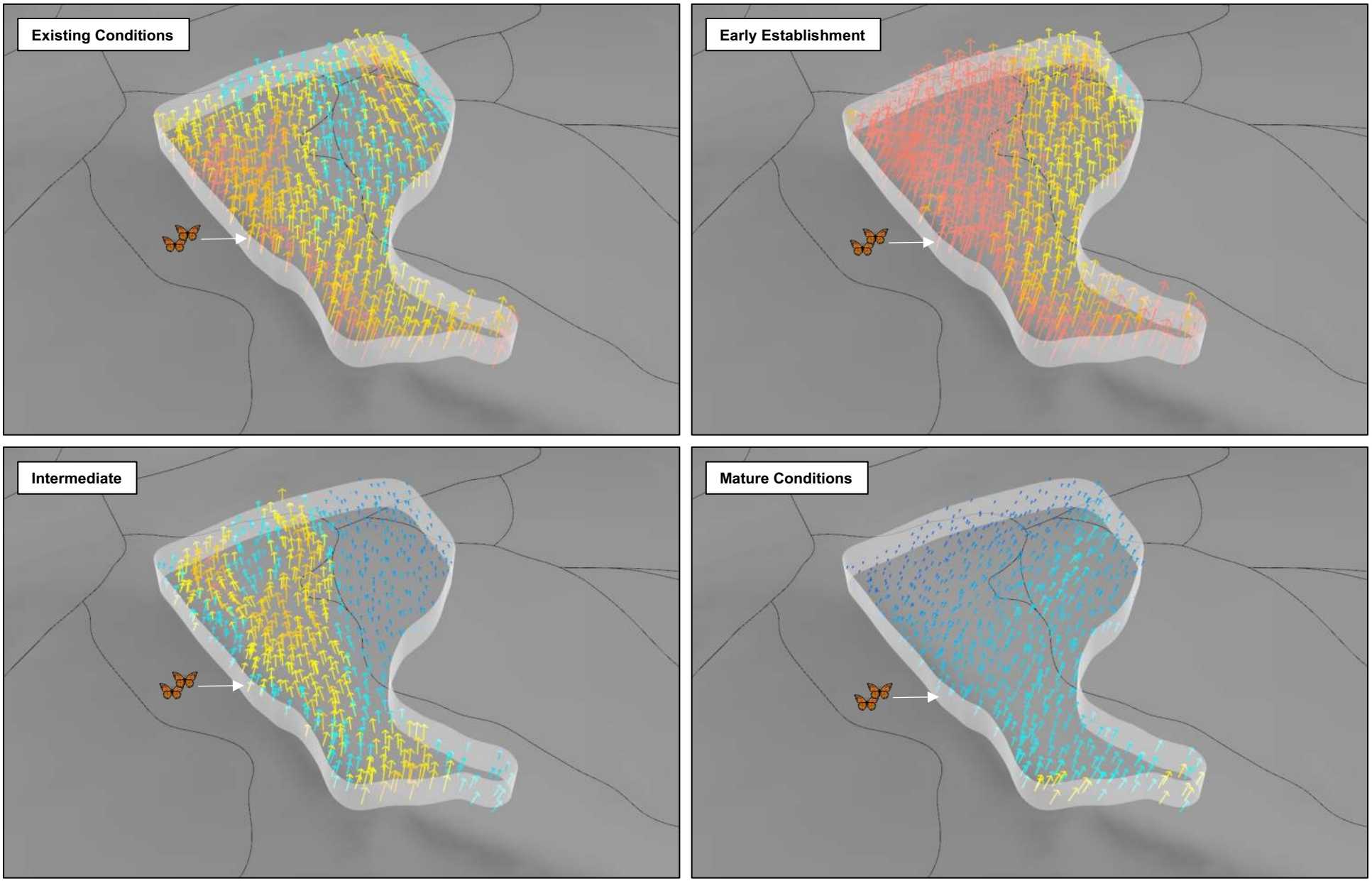
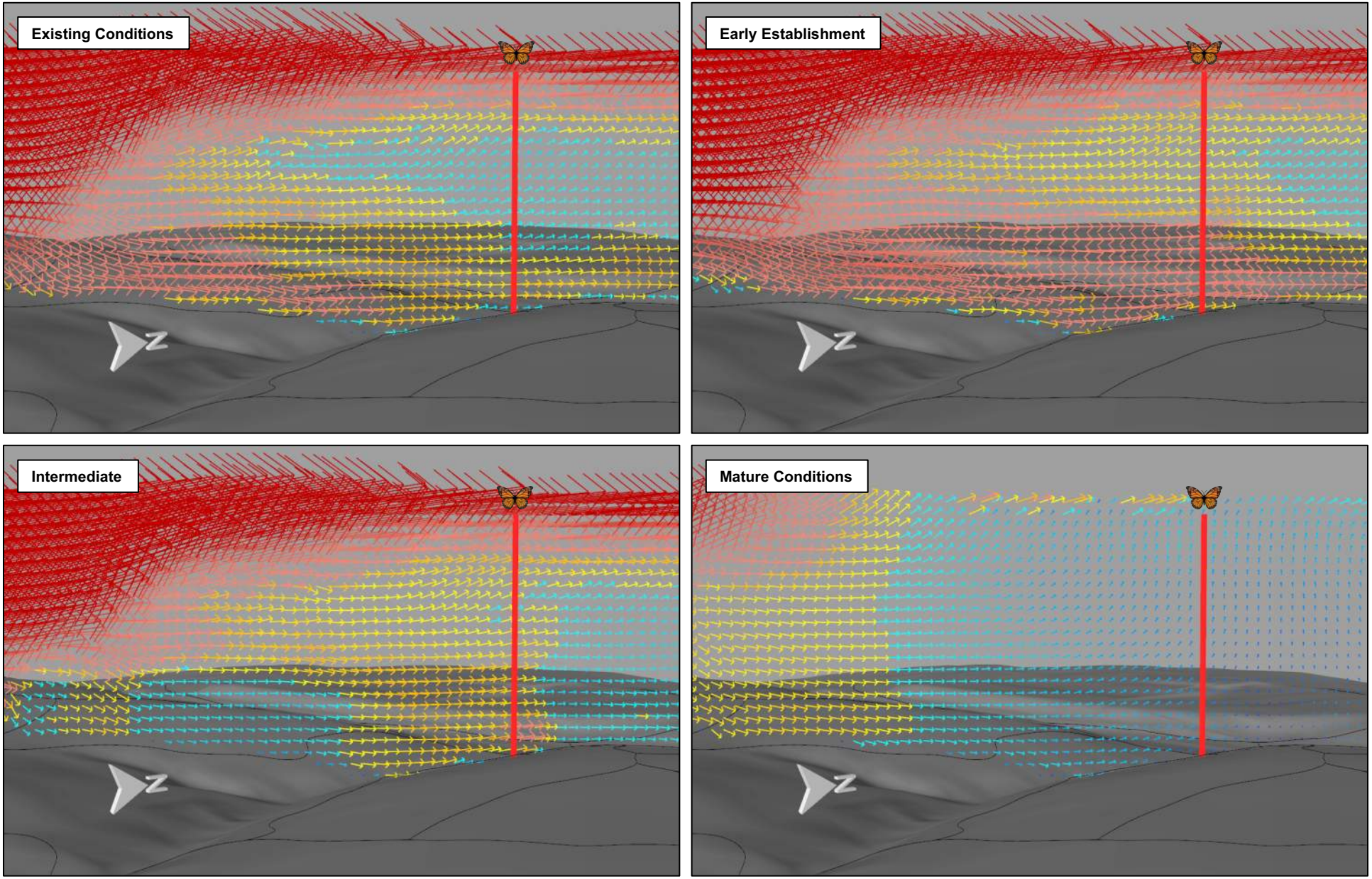


Figure 52. Wind Conditions within Clustering Area



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Figure 53. Vertical Profile of Wind Conditions at Viewing Area



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6.2.5 Ellwood Main Prescriptions

To address the vulnerabilities identified in this report (See section 5.2), additional tree planting is recommended around Ellwood Main. Figure 54 shows specific planting areas and outlines the recommended species and spacing of these trees.

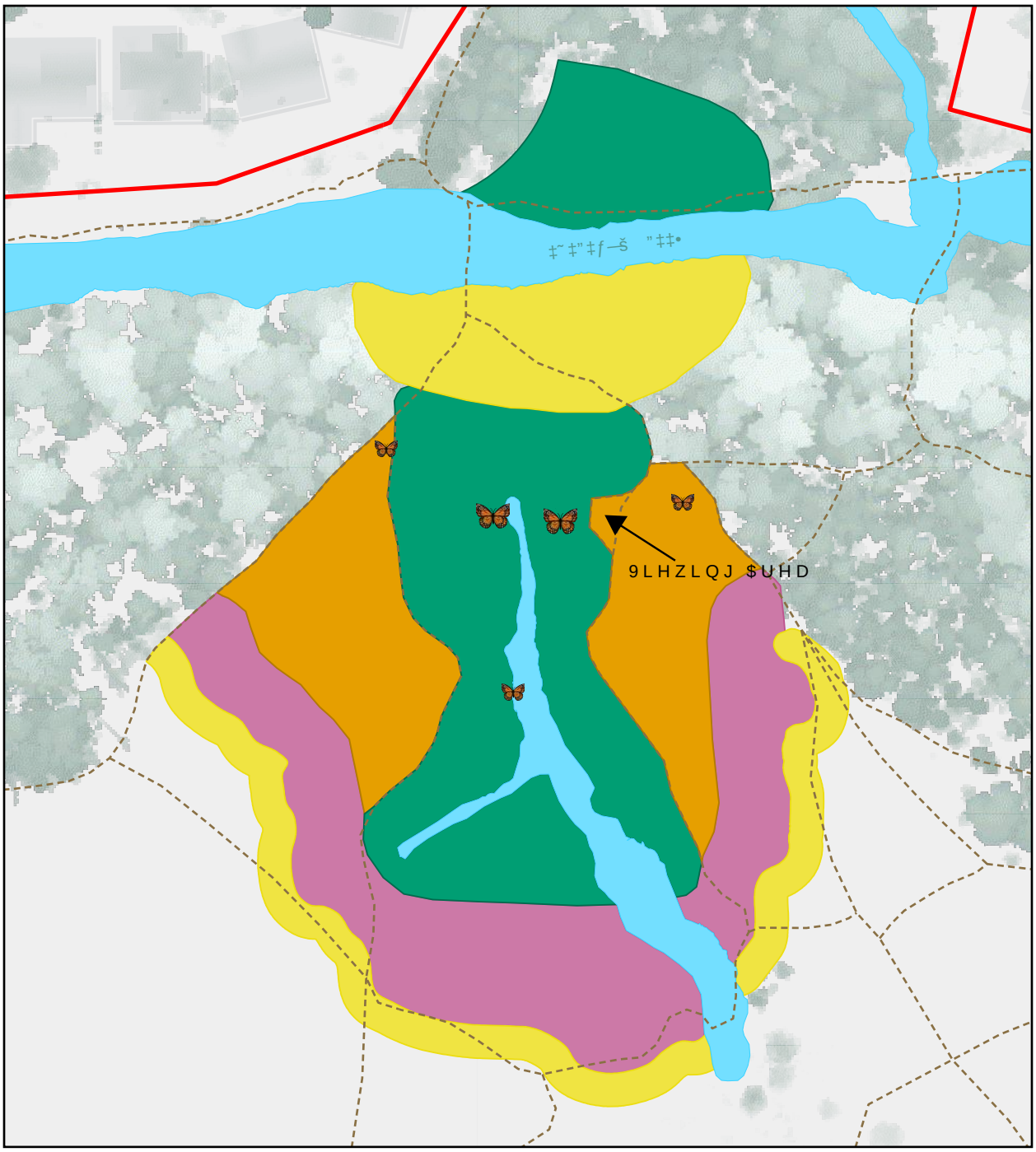
Along the southern edge of Ellwood Main, a double row planting of red ironbark (*Eucalyptus sideroxylon*) should be implemented within the boundaries of the existing canopy. Tree planting should generally follow the design outlined in Section 6.2.3; however, conditions on the ground will determine final planting locations and deviations from the idealized plan. Outside the southern existing canopy, toyons (*Heteromeles arbutifolia*) should be planted roughly 20 ft apart to act as an understory buffer as the red iron bark grow out. Inside the double wind row and edge of canopy, karri (*Eucalyptus diversicolor*) should be planted to replace blue gum loss. This species has been identified as having several advantages in this environment (See section 3.4 for additional details).

The monarch aggregation trees are blue gum (*Eucalyptus globulus*) trees along the west and east slopes of the gully at Ellwood Main. Several of the recurring aggregation blue gum trees have died and the loss of roosting substrate is substantial. These aggregation trees should be replaced with blue gum eucalyptus trees in similar locations along the west and east slopes and the blue gums should be planted at 20 ft spacing. Along the higher slopes of Ellwood Main that occur outside of the recurring aggregation trees, karri should be planted at 50 ft spacing. Wherever possible, blue gum regrowth should be encouraged, and planting should consider this potential. This is shown in the Sparse Planting polygon on Figure 54.

North of the Ellwood Main and adjacent to Devereux Creek, several native species should be planted, specifically sycamore (*Platanus racemosa*), California bay laurel (*Umbellularia californica*), and cottonwood (*Populus fremontii*), to seal the north gap vulnerability. In areas of fuel removal along the neighborhood boundary, special care should be taken around existing large trees that provide critical protection. Across the creek, karri should be planted at 40 ft spacing.

Finally, in the grove west of Ellwood Main, blue gum regrowth should be encouraged where possible and karri and blue gum should be planted to fill in gaps. Planting should be no closer than 50 ft apart. Separate fallen logs where applicable, and remove high fraction of downed wood, especially finer fuels that are less than 10 inches in diameter.

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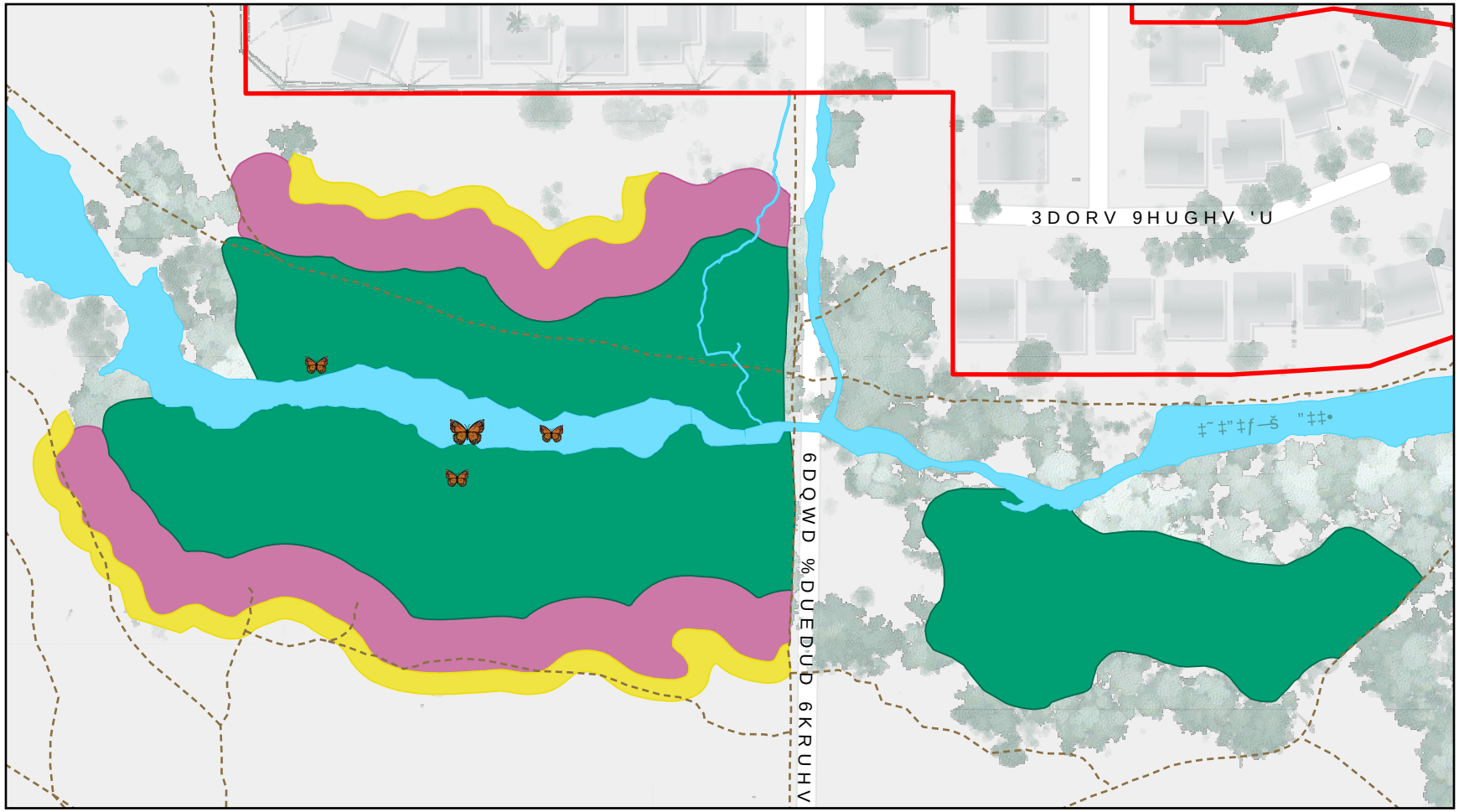
6.2.6 Ellwood West Prescriptions

The Ellwood West aggregation site sits above Devereux Creek and is composed of blue gum trees to the north and south of the creek. Due to extensive die-off, particularly on the south side of Devereux Creek, there are now vulnerabilities in wind protection. To remedy this, we recommend removing the existing dead wood, replacing dead aggregation trees with blue gum, and planting karri sparsely to fill in the area surrounding the aggregation trees. Tree planting should be 50 ft spacing where large gaps in the canopy exist. Finer fuels, less than 10 inches in diameter, should be removed to promote new growth. Existing blue gum eucalyptus regeneration should also be encouraged wherever possible.

At the edge of canopy, double wind rows are recommended for the north and south face of Ellwood West. On the north face, coast live oaks (*Quercus agrifolia*) and toyons are encouraged outside of existing canopy at approximately 20 ft spacing. On the south face, only toyons are recommended outside of existing canopy, also at 20 ft spacing. East of Santa Barbara Shores trailhead, we recommend maintaining the density of existing red iron bark stand with karri.

Along Devereux Creek, native trees should be planted but not within 50ft of monarch aggregation trees. Care should be take to protect and maintain the open interior along the creek near the monarch aggregation trees. All plantings shall stay out of jurisdictional wetland delineations. Specific planting areas and recommendations are detailed in Figure 55.

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6.2.7 Ellwood North Prescriptions

Based on our analysis of Ellwood North, we recommend a significant restoration effort to restore Ellwood North to its historic overwintering conditions. Fuel management in the area is less sensitive, and removal of dead standing, dead downed, especially finer fuels, is recommended wherever practical. Separate large logs and remove fine fuels as needed. Ellwood North is an excellent opportunity to refine fuel management within the groves as it currently offers the least habitat quality for overwintering monarchs.

Along the western face, we recommend a double row windbreak spanning approximately 1,200 ft. Plantings should include red iron bark within existing eucalyptus canopy where space exists, and oaks and toyon outside of eucalyptus canopy.

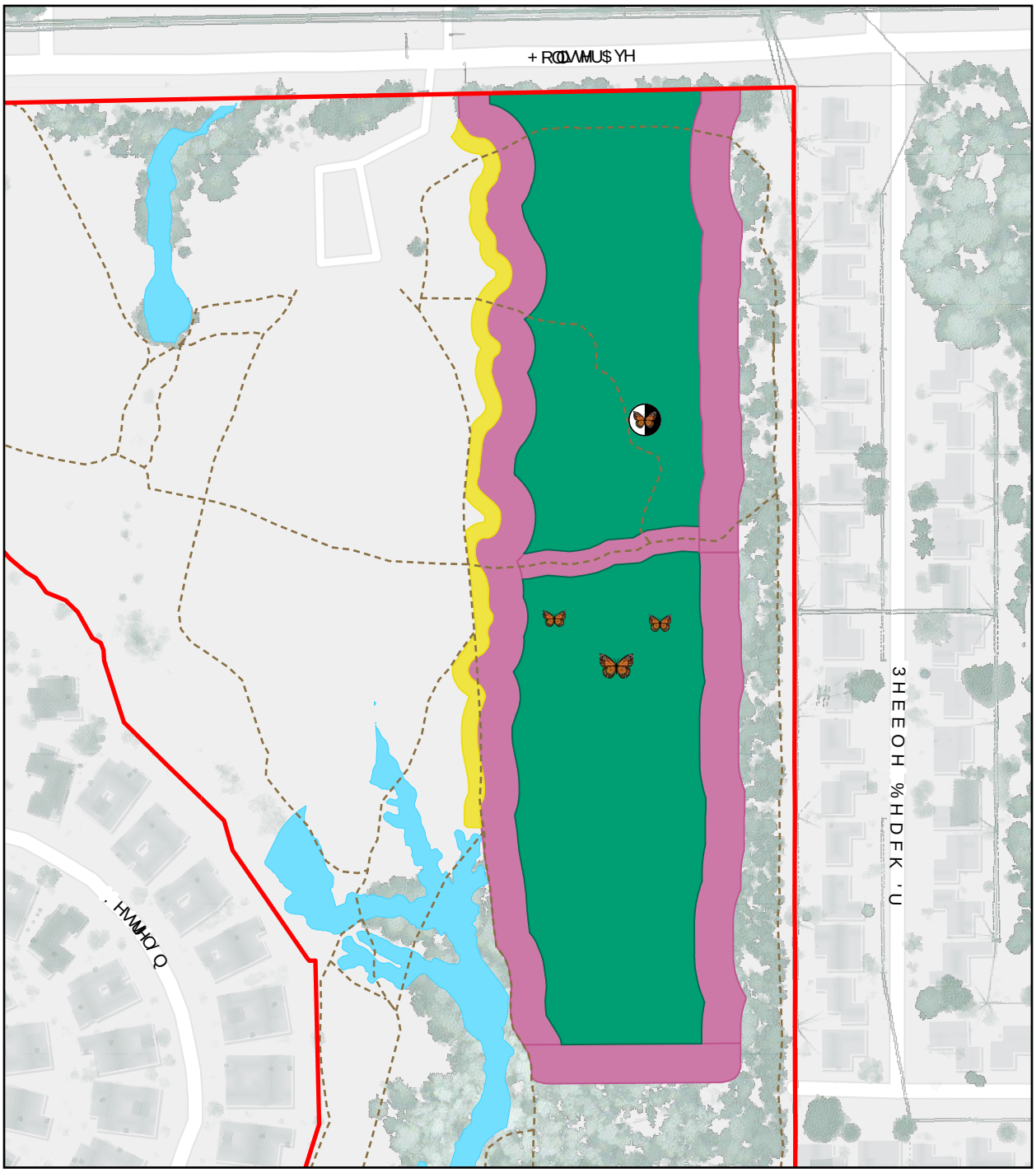
Along the eastern face, a double wind row as described above is recommended for the northern half, beginning at the trail that bisects the habitat from west to east. South of the trail on the eastern side, we recommend planting karri and red iron bark to close the wind vulnerabilities. Toyons and oaks are recommended outside of existing canopy as described in the double row design. All plantings on the eastern side of Ellwood North shall occur outside the 100ft fire safety perimeter.

Along the bisecting trail mentioned previously and the similar trail further south, we recommend planting red iron bark carefully placed at the direction of restoration experts to fill gaps.

In the interior spaces created by the windbreaks, replace dead monarch aggregation trees with blue gum eucalyptus and create or retain open interiors. Sparsely planted karri trees are recommended where canopy is thin. Plantings should be no closer than 50ft. Wherever possible, existing blue gum eucalyptus regeneration should be encouraged, as well as natives such as coast live oak and toyon. Interior open spaces should encourage native forbs and nectaring plants. Encourage existing plants where available, such as (*Solidago* sp.).

See Figure 56 for specific planting area recommendations.

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6.2.8 Ellwood East Prescriptions

We recommend replacement of dead monarch aggregation trees with blue gum eucalyptus. Existing live trees should be supported, and regeneration should be encouraged. We suggest planting karri sparsely around the monarch aggregation trees, no closer than 50ft apart in these areas. Additionally, we recommend planting a double wind row of red ironbark on the south side of the eucalyptus canopy to close the south wind vulnerability and planting red ironbark and karri north of Devereux Creek to address the north-northwest wind vulnerability. Coast live oaks, toyons and other native shrubs can be used to fill in the understory.

All fuel treatment should take careful consideration on the north side of Devereux Creek and along neighborhood boundary. Remove dead standing wood and reduce fuels on the ground wherever practical. Because Ellwood East aggregation sites only partially occur on city property, restoration activities are limited to the western extent.

See Figure 57 for specific areas where planting is recommended.

See Section 5.4 for a full description of the current status of Ellwood East and identified vulnerabilities.

6.2.9 Ellwood Ironbark Prescriptions

See Section 5.6 for a full description of the current status of Ellwood Ironbark Site.

6.2.10 Sandpiper Prescriptions

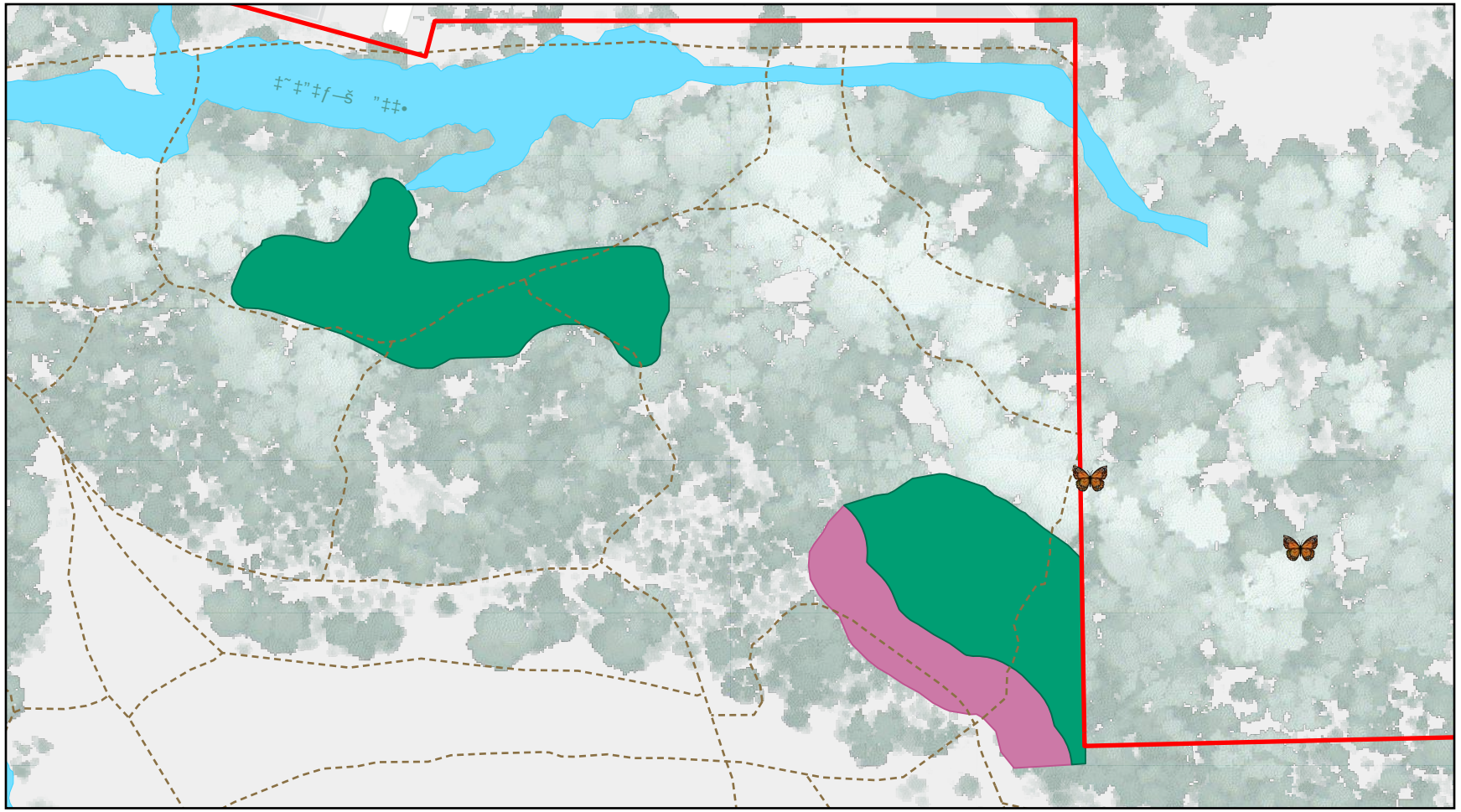
The restoration of the Sandpiper site will be addressed further in Phase 2 of the Implementation. To inform restoration efforts, a double wind row with red ironbark should be planted along the trail on the north side of Devereux Creek. Native trees, such as oak and toyons can be planted to reinforce the boundary. On the south side of the creek where the two trails converge, additional red ironbark planting is recommended, along with native trees and shrubs.

The most important area of restoration is along the western boundary of Ellwood Mesa and Sandpiper Golf Course. Loss of trees has resulted in significant vulnerabilities to wind protection. We recommend planting red ironbark along the western boundary of Ellwood Mesa and work with Sand Piper Golf Course to plant additional trees for greater resiliency. We recommend that dead monarch aggregation trees be replaced with blue gum eucalyptus and the existing blue gum should be supported and regeneration encouraged.

Fuel management should focus on removing dead downed wood and reducing fuel loads. Large logs can be left on site but moved as practical to allow for tree planting. Fine fuels (less than 10 inches in diameter) shall be either mulched or removed from site.

See Figure 59 for recommended planting areas.

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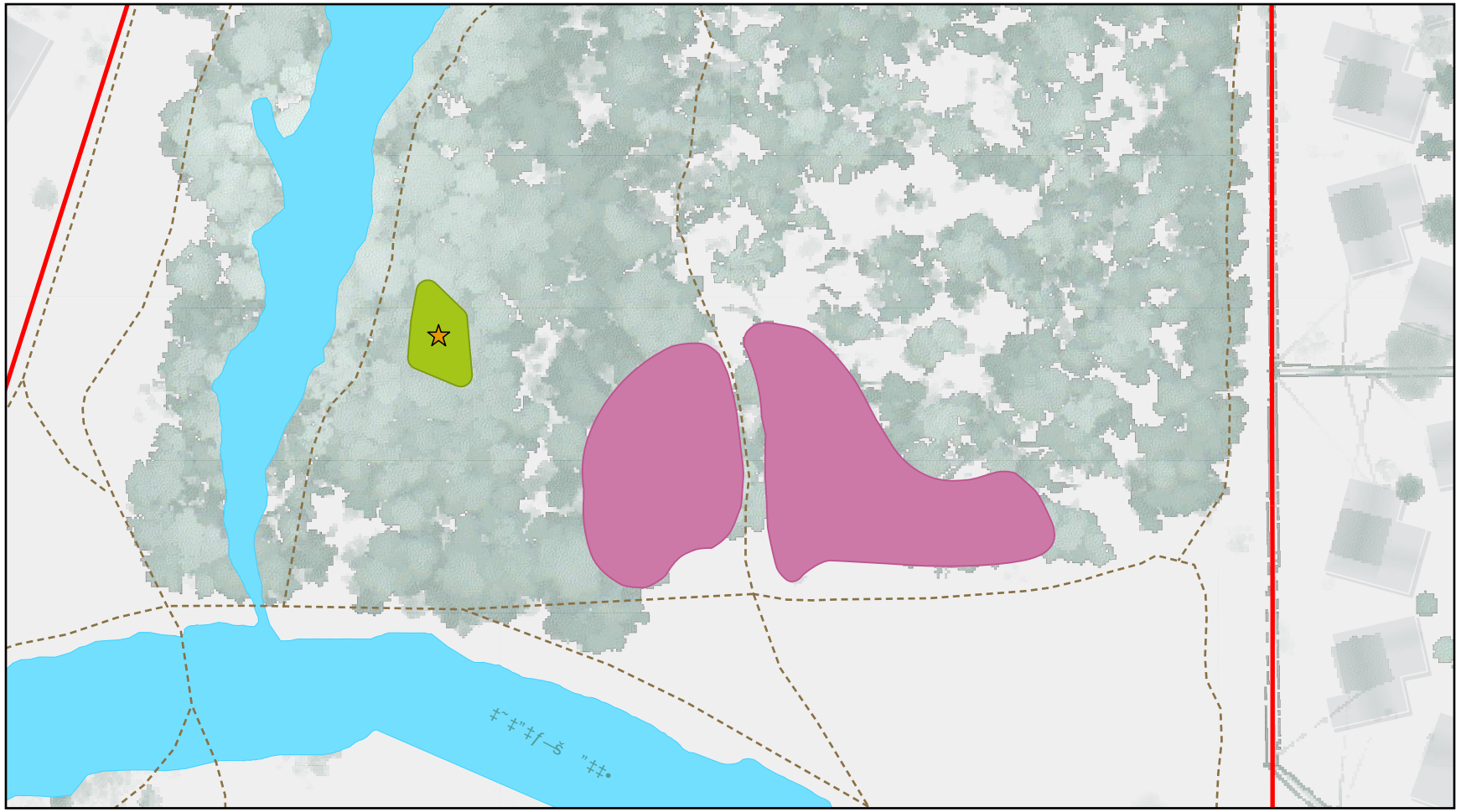
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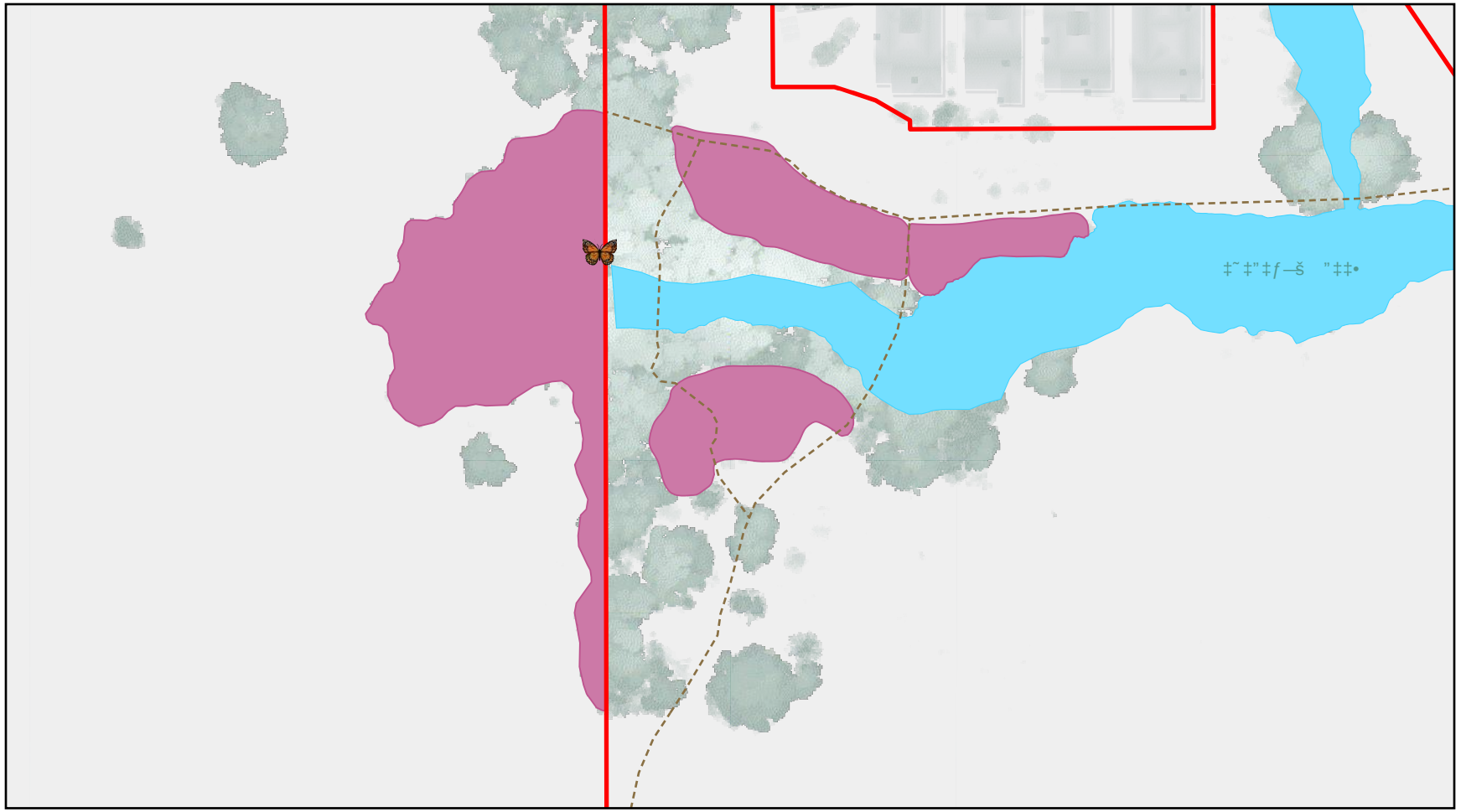
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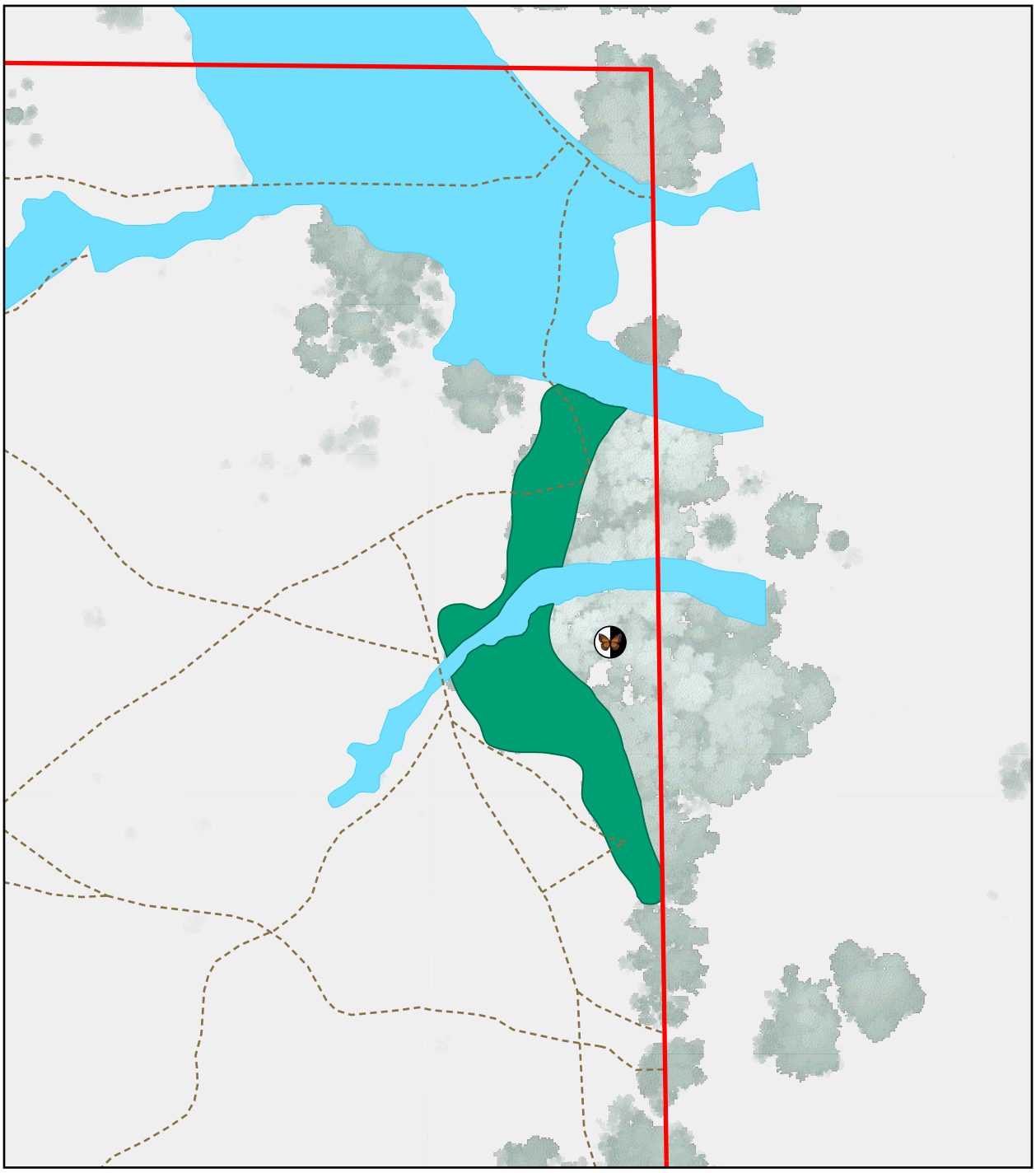
6.2.11 Ocean Meadows Prescriptions

The restoration of the Sandpiper site will be addressed further in Phase 2 of the Implementation. To inform restoration efforts, tree planting shall focus on the western side of the aggregation site that occurs on Ellwood Mesa. We recommend filling holes on outer edge of canopy with red ironbark where necessary. Encourage regeneration of existing blue gums where possible and use native trees and shrubs within and outside the existing canopy to reinforce wind protection. Planting shall not occur in jurisdictional wetlands.

Fuel management should focus on removing dead downed wood and reducing fuel loads. Large logs can be left on site but moved as practical to allow for tree planting. Fine fuels (less than 10 inches in diameter) shall be either mulched or removed from site.

See Figure 60 for tree planting locations.

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7 DISCUSSION

The multi-generational journey of monarch butterflies is one of the most famous examples of migration in the animal kingdom (National Geographic Society 2022). Every year, monarch butterflies in western North America travel up to thousands of miles from their summer breeding grounds to gather in dense clusters along the California coast. One of the best places to view this natural phenomenon was Goleta Monarch Butterfly Grove at Ellwood Mesa, a widely recognized site of importance for overwintering butterflies. For decades, residents and visitors enjoyed the opportunity of observing the butterflies up close and in tremendous numbers, evoking feelings of appreciation and fostering calls for conservation.

Historically, the eucalyptus groves at Ellwood Mesa created ideal habitat conditions for monarchs. Large trees with varied canopies allow for "dappled light," where monarch butterflies can seek either shade or sun to moderate their body temperature throughout the day. Dense foliage acts to increase humidity within the grove, slowing the rate of desiccation of the butterflies and reducing the need for them to seek out water. During strong storm events, the trees provide critical wind protection that would otherwise cause butterfly mortality. This extensive forest was, at one time, the largest plantation in California (Farmer 2013), leading to numerous named overwintering sites both presently and historically.

Until the 1990s, Ellwood Mesa was actively managed through forestry practices, such as felling dead trees, harvesting firewood, and thinning live branches (Santos 1997). However, when the City of Goleta acquired the property in 2005, forestry activities ceased, leaving the grove largely unmanaged. Since then, periods of wet and dry seasons have caused stretches of growth and dieback of the forest canopy. The most significant of these periods was between 2012 and 2016, when unprecedented drought conditions led to a dramatic loss of trees throughout the Mesa. Thousands of trees died and remain on site today. Deferred maintenance of dead and downed wood at Ellwood Mesa create imminent danger to human safety, neighboring homes, and monarch overwintering habitat. High fuel loads present an extreme fire hazard while standing dead trees pose a risk to the thousands of hikers who visit this area each year. Additionally, fallen wood inhibits restoration activities, and risk of tree fall from standing dead trees threaten live trees and future planting efforts.

Our findings document that the loss eucalyptus trees at Ellwood Mesa caused a marked decline in the quality of overwintering monarch habitat. At all aggregation sites, reduced canopy cover corresponded with fewer overwintering monarchs, as well as increased instability in movement between sites - indicating a heightened vulnerability to adverse weather conditions.

To restore habitat quality, we recommend first strategic removal of existing fuel loads around identified aggregation sites. Second, we recommend planting additional trees and encourage regeneration of existing blue gums (*Eucalyptus globulus*) wherever possible. We recommend strategic removal of dead wood, removal of ground fuels, and planting of specific species in designed and tested configurations. Chipping and mulching downed wood and planting new trees will all aid in the process of restoring a healthy forest and ensuring resilient wind protection zones.

For an effective wind break along the periphery of the existing canopy, we propose a new tree planting design—the double wind row—with drought-resistant red ironbark (*Eucalyptus sideroxylon*). Within the interior of the groves and where blue gum regeneration is not present, we recommend planting karri (*Eucalyptus diversicolor*). This species of eucalyptus is

comparable in size and structure to blue gum and has two distinct advantages: it is adapted to Mediterranean climates, and does not reproduce spontaneously in California, mitigating invasive potential that blue gums bring. While we recognize blue gums characterize much of Ellwood Mesa, they were overwhelmingly impacted by the 2012-2016 drought. A diversity of tree species will minimize the potential of a future mass die-off.

Trees are our best tool for restoring monarch overwintering habitat. In arid southern California, eucalyptus species are especially useful for their ability to grow large quickly. Unfortunately, given the imperiled state of monarch populations, the time window for restoration through trial and error is gone and the time for iteration is minimal. time to act is now to address this challenge, our wind simulations informed our planting designs for Ellwood Mesa to ensure new trees and shrubs, when mature, will offer sufficient wind protection. Although our simulations are specific to Ellwood Mesa, our planting principles can be applied to other overwintering sites in California. Ultimately, we hope this report serves as a starting point for land managers seeking to restore damaged overwintering monarch habitat.

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9 APPENDICES

Appendix A. Hemispherical Photography Methods

Appendix B. Wind Modelling Methods

Appendix C. Ellwood Mesa Monarch Counts 2015-2023

Appendix D. Monarch Butterfly Habitat on the Razor's Edge

Appendix E. Ellwood Wind Data

Appendix F. Dead Wood Removal and Monarch Butterfly Habitat Effects

Appendix G. Ellwood Monarch Butterfly Habitat Characterization Report

APPENDIX A. HEMISPHERICAL PHOTOGRAPHY METHODS

Hemispherical photographs were collected at Ellwood Main/ Goleta Butterfly Grove in the 1990, 1998, and 2021 by Dr. Stu Weiss.

Hemispherical photography has been a standard method for assessing forest canopy structure at monarch overwintering sites (Weiss et al. 1991, Weiss and Murphy 1992, Weiss 1998, Weiss 2011, Weiss 2016). Photographs are taken using a Nikkor 8mm lens on a Nixon D610 camera body, mounted on self-leveling gimbals so that the photograph is pointed straight up at the zenith. A compass is used to orient to north. The hemispherical photo point locations cover the habitat contributing to protection of monarch clustering locations. Photos taken at these points were used to produce a hemiphoto that shows the interpolated exposure from 8 different directions and the maximum exposure from all directions.

Photographs are analyzed with Hemiview 2.0 software (Delta-T Devices). The photographs are aligned, and a gray-scale threshold is interactively selected to differentiate sky from obstructions. Photographs are best taken under uniform overcast conditions, or at sunrise or sunset, when there is no direct illumination of the canopy (which can be brighter than the sky).

Hemiview overlays a "sky grid" (gray) that divides the upward hemisphere into 5° zenith angle increments (18 total = 90°) and 45° azimuth wedges centered on the eight cardinal directions. The fraction of open sky in each segment is calculated and weighted by the geometry of the segment depending on the analysis. Hemiview also overlays a "sun grid" (yellow) based on site latitude, with monthly increments through the year, and half-hourly increments over the day. The December 21 sunpath (winter solstice) is the lowest path, the middle path is March 21, and the highest path is June 21. The fraction of open sky in each of the segments is calculated, and the specified solar model is used to calculate insolation. Here, the units are MJ m-1 month-1, which is directly proportional to the LiDAR derived watt-hours m-2 d-1.

An example photograph, taken in the cluster site, shows both grids. The following "site factors" are extracted:

(1) ISFU – Indirect Site Factor Uncorrected, the fraction of visible sky in all directions.

(2) DSFU – Direct Site Factor Uncorrected, the fraction of potential radiation across all months.

(3) October, Nov/Feb and Dec/Jan potential direct insolation – calculated from fraction of unobstructed monthly sunpaths assuming clear skies.

(4) Wind Site Factors (WSF) – the fraction of sky visible in eight compass directions, a measure of relative wind exposure.

Reading a Hemispherical Photograph

The important thing to look at in the photographs is the amount of open sky in various sectors – in the 8 cardinal 45° compass directions (azimuth) and in the various elevation angle bands. Note how much larger the area of each sector is near the horizon. For wind at ground level, the most important sectors are the first 10° above the horizon. However, as one ascends in height, the higher elevation angle sectors become more important. WSF uses visible sky in the entire 45° sector as an approximation, one that provides a good measure of relative wind exposure. The basic relationship is monotonic – more open sky equals more wind exposure.

The sun paths are divided into monthly bands going east to west (left to right) across the photo, divided into half-hour time slices. Fully shaded is when a sector is totally blocked, dappled light of varying intensities is where many small holes in the canopy are visible, and full sun when the sky is open. Apparent sunpaths are quite sensitive to the height of observation – sites that are completely shaded at ground level may be in bright sun 20 ft up in the canopy, depending on the exact configuration of branches and canopy gaps.

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Weiss, Stuart B., Paul M. Rich, Dennis D. Murphy, William H. Calvert, and Paul R. Ehrlich. 1991. Forest Canopy Structure at Overwintering Monarch Butterfly Sites: Measurements with Hemispherical Photography. Conservation biology. Volume 5, No. 2. June 1991.

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APPENDIX B. WIND MODELLING METHODS

To assess changes in sheltering dynamics around monarch aggregation sites, we modeled existing and proposed wind conditions using microclimate airflow simulations.

A three-dimensional model of Ellwood Main was created in Rhinoceros 3D 7 (McNeel et. al. 2010) using LiDAR data collected by NV5 on September 27, 2021. Three categories of tree stems were classified and used in the model: living stems, standing dead stems, and dead downed stems (See Appendix G for additional details). All additional points were classified as vegetation. Point clouds were converted to a voxel volume by using the plugin, Volvox (Zwierzycki 2016). All stem categories were 0.25 m sized voxels, while vegetation was 1 m. Vegetation voxels were modeled as a momentum sink, using the default "dense" settings. Stems were also modeled as momentum sinks, but used high values (LAI = 50) to approximate a solid object. Terrain within the model was derived from classified ground points and converted to a 3D solid object.

Proposed restoration tree plantings were added using the landscape architecture plugin, Lands Design (Asuni 2022). The location of trees was directed from our proposed double row planting scheme and input from monarch restoration experts. Three scenarios were simulated: early establishment, minimum viable tree height, and maturity. Early establishment represents the first five years of planting where trees reach a height of 3.05 m (10 ft). Minimum viable tree height represents the first ten to fifteen years after planting where trees reach a height of 12.2 m (40 ft). This threshold was determined iteratively though multiple simulation runs at various heights. Maturity represents after thirty years or more of growth where trees reach a height of 24.4 - 30 m (80 - 100 ft). Tree object geometry was simplified for simulation runs and treated as momentum sinks, using the default "dense" setting. Only living stem and vegetation voxels were included in proposed simulations, as dead wood is proposed to be removed.

An additional simulation was conducted to test the effect of our double-wind row design in isolation. Using the same set of tree species and modeling specifications as used at Ellwood Main, a 274 m (900 ft) idealized double wind row was simulated in perfectly flat terrain. Model geometry was simplified identically as performed in Ellwood Main simulations.

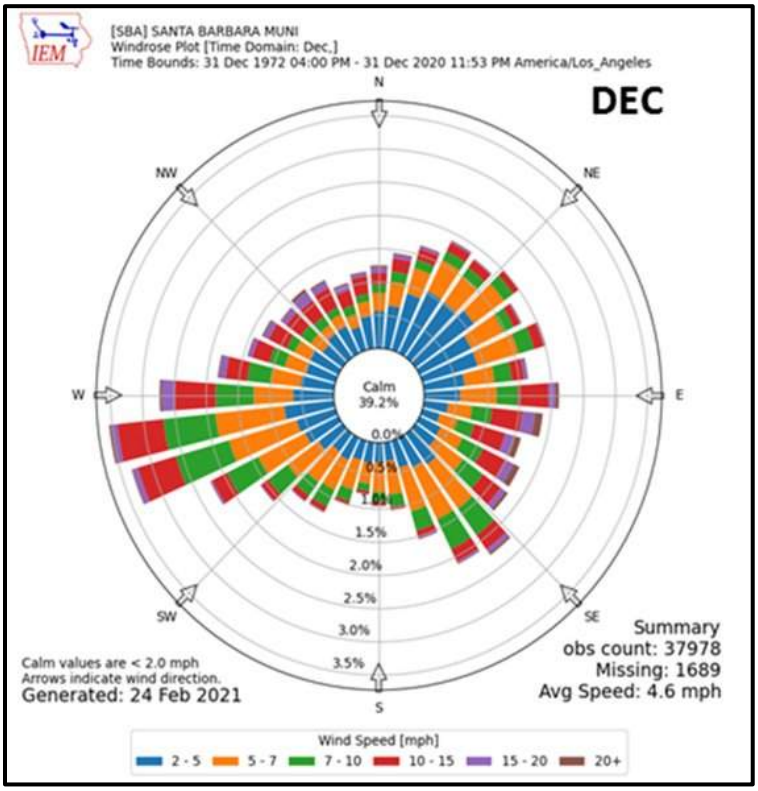
All simulated conditions were modeled using Eddy3D, a plugin for Rhino 7 that uses OpenFOAM, a computational fluid dynamic simulator, to model microclimate conditions (Weller et. al. 1998). An atmospheric flow boundary condition, informed by weather data collected at Santa Barbara Municipal Airport, was used for all models. Turbulence parameters used the kOmegaSST model. Relaxation factors and solution and control algorithms were both set to robust. The model treated trees as momentum sinks, using the default "dense tree" Darcy-Forcheimer coefficients. Models were allowed to run for 3,000 iterations. All residuals (Ux, Uy, Uz, omega, k) did not exceed 10^{-4}, except for p, which approached this value.

All scenarios used storm conditions of 12 m/s (27 mph) as the model input, which have been observed in all directions (Exhibit 1). We chose a southwest wind at Ellwood Main because those are the most frequent storms and also subject to some of the most severe dieback in existing canopy.

Modeling dynamic systems is challenging, even in tightly controlled environments. A large natural system, such as a grove of eucalyptus trees found within Ellwood Mesa, is subject to

some inaccuracy. However, modeling all conditions using identical parameters allows us to explore how proposed restoration efforts will vary from existing conditions.

Exhibit 1. Santa Barbara Airport Wind Rose December 1972-2020 shows strong winds from all directions.



Reference:

Asuni CAD. 2022. Lands Design, Version 5.6.2.7780. Barcelona, Spain.

APPENDIX C. ELLWOOD MESA MONARCH COUNTS 2015-2023

Ellwood Mesa Biweekly Monarch Population Data by Season

Data sources: Althouse and Meade Inc. and Rincon Consultants Inc.

2015-2016	10/23/15	11/11/15	12/3/15	12/16/15	12/31/15	1/8/16	1/22/16	2/3/16	2/19/16
Ellwood Main	72	2,852	6,610	7,505	7,617	5,680	4,654	3,335	0
Ellwood East	8	1,763	3,065	1,991	2,134	1,900	2,246	910	8
Ellwood West	37	840	1,525	322	75	7	0	0	0
Ellwood North	4	41	379	225	148	45	0	4	3
Sandpiper	795	2,626	7,823	4,932	1,770	306	2	2	4
Total	916	8,122	19,402	14,975	11,744	7,938	6,902	4,251	15

2016-2017	10/5/16	11/14/16	12/2/16	1/7/17	2/1/17	3/1/17
Ellwood Main	13	1,365	2,120	123	0	11
Ellwood East	5	1,175	1,200	2,670	20	8
Ellwood West	4	1,920	1,730	1,145	527	5
Ellwood North	10	25	1,580	1,490	453	15
Sandpiper	90	3,051	4,495	2,860	858	2
Total	122	7,536	11,125	8,288	1,858	41

2017-2018	10/24/17	11/9/17	11/30/17	1/8/18	1/13/18	1/23/18	2/8/18
Ellwood Main	120	829	1,390	2,185	1,510	1,680	192
Ellwood East	39	479	610	0	3	7	3
Ellwood West	117	825	2,537	120	2	3	0
Ellwood North	4	0	100	1	21	1,534	376
Sandpiper	156	771	2,407	0	0	0	0
Total	436	2,904	7,044	2,306	1,536	3,224	571

2018-2019	10/13/18	10/25/18	11/8/18	11/25/18	12/13/18	1/4/19	1/17/19
Ellwood Main	0	11	11	205	230	170	0
Ellwood East	0	0	1	0	0	0	0
Ellwood West	0	5	7	1	0	0	0
Ellwood North	0	3	0	0	1	0	2
Sandpiper	2	3	8	1	0	0	0
Total	2	22	27	207	231	170	2

2019-2020	10/10/19	10/24/19	11/7/19	11/19/19	12/5/19	12/19/19	1/2/20	1/16/20	1/30/20	2/14/20	2/28/20	3/12/20
Ellwood Main	0	8	66	52	2	1	1	0	2	0	1	0
Ellwood East	1	2	4	55	52	13	7	0	0	0	0	0
Ellwood West	0	5	2	44	15	2	1	0	0	0	4	0
Ellwood North	3	2	2	8	1	0	3	0	2	0	0	0
Sandpiper	9	22	18	89	40	0	2	0	3	2	5	0
Ellwood Ironbark	0	0	0	4	0	0	0	0	1	0	3	0
Ellwood Main Annex	0	0	0	19	1	0	0	0	0	0	5	0
Ocean Meadows	0	0	0	0	0	0	0	0	0	0	0	0
Total	13	39	92	271	111	16	14	0	8	2	18	0

2020-2021	10/15/20	10/29/20	11/12/20	11/25/20	12/15/20	12/27/20	1/13/21	1/26/21	2/15/21	2/25/21	3/17/21	3/31/21
Ellwood Main	0	3	5	0	0	0	0	0	0	0	0	0
Ellwood East	0	2	3	0	0	0	0	0	0	0	0	0
Ellwood West	0	0	0	0	0	0	0	0	0	0	0	0
Ellwood North	0	1	2	0	0	0	0	0	0	0	0	0
Sandpiper	0	0	0	0	0	0	0	0	0	0	0	0
Ellwood Ironbark	0	0	0	0	0	0	0	0	0	0	0	0
Ellwood Main Annex	0	0	0	0	0	0	0	0	0	0	0	0
Ocean Meadows	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	6	10	0	0	0	0	0	0	0	0	0

2021-2022	10/15/21	10/18/21	11/1/21	11/2/21	11/15/21	12/1/21	12/15/21	1/4/22	1/17/22	2/1/22
Ellwood Main	0	0	6	295	3,874	2,719	4,719	3,378	250	0
Ellwood East	0	0	18	0	4,292	3,645	8,900	10,714	11,840	9,555
Ellwood West	1	0	0	36	1,551	2,564	1,435	50	3	0
Ellwood North	6	0	0	14	6	3	0	0	0	0
Sandpiper	18	0	0	129	346	5	0	0	0	0
Ellwood Ironbark	3	0	0	0	0	0	0	0	0	0
Ellwood Main Annex	0	0	0	0	0	0	0	0	0	0
Ocean Meadows	0	1	0	0	1	0	1	0	0	0
Total	28	1	24	474	10,070	8,936	15,055	14,142	12,093	9,555

2022-2023	10/17/22	10/31/22	11/15/22	11/30/22	12/15/22	12/30/22	1/13/23
Ellwood Main	11	73	4,188	9,311	5,394	1,833	6
Ellwood East	3	202	1,756	2,946	1,443	78	12
Ellwood West	0	924	120	130	7	0	0
Ellwood North	0	3	0	0	0	0	0
Sandpiper	9	228	0	0	0	0	0
Ellwood Ironbark	0	1	0	0	0	0	0
Ellwood Main Annex	0	0	0	0	0	0	0
Ocean Meadows	0	0	0	0	0	0	0
Total	23	1,431	6,064	12,387	6,844	1,911	18

Western Monarch Population Data

Data source: Xerces Society 2023

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total Western Monarchs (WMTC)	1,235,490	564,349	267,574	390,057	209,570	99,353	254,378	205,085	218,679
SB Co. Total	354,300	84,309	87,138	131,266	67,078	13,922	35,324	33,598	78,319
Ellwood Main, Goleta	25,000	20,000	25,000	58,000	35,000	4,500	18,400	16,680	54,700

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Western Monarchs (WMTC)	221,058	86,437	131,889	58,468	143,204	222,525	144,812	211,275	234,731
SB Co. Total	50,853	14,430	29,230	8,000	40,518	54,260	33,621	54,980	46,916
Ellwood Main, Goleta	19,000	11,000	12,000	6,500	27,600	21,800	17,150	2,355	3,543

Year	2015	2016	2017	2018	2019	2020	2021
Total Western Monarchs (WMTC)	292,888	298,464	192,624	27,721	29,436	1,899	247,246
SB Co. Total	57,782	74,060	45,868	6,287	7,665	208	97,025
Ellwood Main, Goleta	6,610	2,120	1,390	205	55	0	3,874

APPENDIX D. MONARCH BUTTERFLY HABITAT ON THE RAZOR'S EDGE

Native and Non-native Vegetation in California and Occam's Razor, 2023

Monarch Butterfly Habitat on the Razor's Edge: Native and Non-native Vegetation in California and Occam's Razor

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for
City of Goleta, Santa Barbara County, California



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TABLE OF CONTENTS

1 INTRODUCTION 3
1.1 Purpose 3

2 SANTA BARBARA COUNTY HABITATS 4
2.1 Background 4
2.2 Data Analysis 5
2.3 Tree and Habitat Choices 7
2.4 Tree Characteristics 9

3 CONCLUSION 11

4 REFERENCES 12

ATTACHMENT A. TREE COMPARISON FOR CHARACTERISTICS IMPORTANT TO MONARCH BUTTERFLY AGGREGATION SITES 14

Production Note: This is updated from the original version completed in April 2019 with Daniel E. Meade, Jessica Griffiths, and Charis van der Heide as the original authors. Charis van der Heide completed this revision following the passing of Dr. Daniel E. Meade on November 26, 2022.

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Cover Page: Clustering Monarchs taken by Charis van der Heide on November 19, 2022.

1 INTRODUCTION

Conservation biologists and land managers face a dilemma prescribing effective, proven, conservative recommendations to restore western monarch butterfly aggregation sites (Lane 1993). In sites where monarchs aggregate in trees native to their location, such as Monterey pines (*Pinus radiata*) in Monterey, this question is beginning to be answered in favor of native trees when both native trees and eucalyptus are present (Griffiths and Villablanca 2015). But, in areas where native trees are absent from most monarch butterfly aggregation sites, such as Santa Barbara County, the question of what to plant in aggregation sites in need of restoration is more complicated. This pertains specifically to eucalyptus trees that are the subject of a long and sometimes bitter controversy in California regarding whether to keep or replace eucalyptus trees with native vegetation (Bell et al. 1993, Santos 1997, Farmer 2013, Marris 2016, St. George 2016, Longcore et al. 2020).

There are only four tree species native to Santa Barbara County's coastal habitats with suitable size and structure to be considered for protecting monarch aggregations from inclement weather: western sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii*), arroyo willow (*Salix lasiolepsis*), and coast live oak (*Quercus agrifolia*). Black cottonwood (*Populus balsamifera* subsp. *trichocarpa*) occur in some south coast riparian corridors. White alder trees (*Alnus rhombifolia*) are confined to higher elevations on the south coast in or near streams with abundant water. All except one of these trees, coast live oak, are deciduous and provide reduced protection from wind and storms once their leaves fall. Coast live oak does not have a columnar growth form that creates usable aggregation spaces. No aggregation sites are known in oak woodlands. A few native shrubs such as toyon (*Heteromeles arbutifolia*), California bay (*Umbellularia californica*), and holly-leafed cherry (*Prunus illicifolia*), expand the possible plant palette for roosting monarchs, but do not provide the tall canopy cover necessary at sites where monarchs aggregate. Therefore, choices for native trees are limited and are not sufficient for forming the typical structure of a monarch butterfly aggregation site with a flight area encircled by substantial, tall trees that filter light, buffer wind and ameliorate temperatures and humidity (Wenner 1987, Leong 1990, Weiss et al. 1991, Calvert 1991, Meade 1999, Leong 2016).

1.1 Purpose

Scientific problem-solving employs the principle of Occam's razor, or parsimony. This fundamental heuristic, or way of discovering something, is summarized as, "simpler solutions are more likely to be correct than complex ones" (attributed to William of Occam). When attempting to determine what causes monarchs to aggregate at a site, the simplest approach would be to examine the aggregation sites as a whole. The most easily observable feature of overwintering sites is the tree species they are comprised of. The structure of an overwintering site (i.e. the trees) directly influences the myriad other factors that cause monarchs to select a site, e.g. temperature, wind speed, humidity, and light. Thus, we can look at overall habitat preference using the composition of tree species and not all the other factors that may generate that preference. Although many factors may be involved in how monarch butterflies choose an aggregation site, a simple test of monarch habitat preference is to observe where they aggregate and note the tree composition of those sites. The trees present at a chosen aggregation site inform what works at aggregation sites. Additionally, if native tree habitats are present in the vicinity of aggregation sites, we could assess whether those native tree habitats are used preferentially to non-native tree

habitats. Our immediate goal must be to recover and enhance protection for monarchs at overwintering sites to the best of our ability given what we have learned about the characteristics of overwintering sites during the peak of the western monarch population.

2 SANTA BARBARA COUNTY HABITATS

2.1 Background

In Santa Barbara County there are 114 locations named as monarch butterfly aggregation sites by the Xerces Society (Xerces Society 2023). Another source, the 2018 report *Monarch Butterfly Overwintering Sites, Santa Barbara County, California* (Meade, Griffiths, van der Heide, and Villablanca 2018) documented 117 monarch butterfly aggregation sites, and inspected a total of 130 potential or known aggregation sites in Santa Barbara County. This study relied on previous work (Meade 1999, Calvert 1991) and the Xerces Society Monarch Overwintering Sites database for site locations along with additional potential sites added by the study investigators. These 130 sites are grouped into 5 categories based on what tree species the monarchs roost on at each site, listed in Table 1 Of the 130 sites investigated, 96 are dominated by eucalyptus (2 of which are eucalyptus and non-natives), 10 are mixed eucalyptus and California native trees, 9 sites are eucalyptus with local California native trees, 9 sites are California native trees, and 6 sites are local California native trees (only trees native to Santa Barbara County). Eucalyptus trees are either the primary vegetation, or a significant contributor to the creation of monarch butterfly aggregation sites in Santa Barbara County in 88% percent of known or potential aggregation sites.

TABLE 1. NUMBER OF AGGREGATION SITES BASED ON TREE SPECIES-COMPOSITION CATEGORIES

Category Number	Tree Composition Label	Tree Species	Count
1	Eucalyptus and other non-native trees	Blue gum, red iron bark, silver wattle, evergreen ash	97
2	Eucalyptus and California native trees	Monterey cypress, Monterey pine, coast redwood	9
3	Eucalyptus and Santa Barbara native trees	Eucalyptus trees and coast live oak, western sycamore, arroyo willow, California bay laurel	9
4	California native trees	Monterey cypress, Monterey pine, coast redwood	9
5	Santa Barbara native trees	Coast live oak, western sycamore, arroyo willow, California bay laurel	6
Total number of aggregation sites			130

2.2 Data Analysis

Analysis of data from the Santa Barbara County study of monarch abundance across these 5 tree categories by month shows that 92-99% of the monarch population in Santa Barbara County aggregated at sites with eucalyptus compared to sites with only native vegetation (Figure **1**). About 8% of the monarch population roosted at sites with native trees (combining the California and local native categories) in the early overwintering season and this number decreased to less than 1% in the later months of the overwintering season. Sites with only Santa Barbara County local native trees were utilized by 1% of the monarch population at peak use (data from Meade et al. 2018). This result raises the question of whether monarchs have a choice between eucalyptus and native trees for overwintering aggregations. If eucalyptus and native trees are equally available, monarchs may be preferentially choosing to aggregate in eucalyptus. However, if eucalyptus is more abundant and therefore more available than suitable native tree habitat, the monarchs may be aggregating in eucalyptus because they do not have a choice.

This data on a logarithmic scale presented in **Error! Reference source not found.** shows more detail into the behavior of the monarchs through the season. Like the stacked bar graph in Figure **1**, the logarithm scaled data in **Error! Reference source not found.** shows the monarchs use sites in the eucalyptus only group (Category 1) more than the other groups. The logarithm scale graph shows the monarchs used the categories 3 and 4 almost identically and they were present at sites in category 2 slightly more than categories 3 and 4 in the winter months of December and January. Sites with only species native to Santa Barbara County were utilized by the fewest monarchs in the fall months with a steep decline of utilization in January when the monarchs abandoned those sites for the season.

FIGURE 1. MONARCH BUTTERFLY USE OF SITES IN 5 TREE COMPOSITION CATEGORIES IN SANTA BARBARA COUNTY BY MONTH IN BAR GRAPH

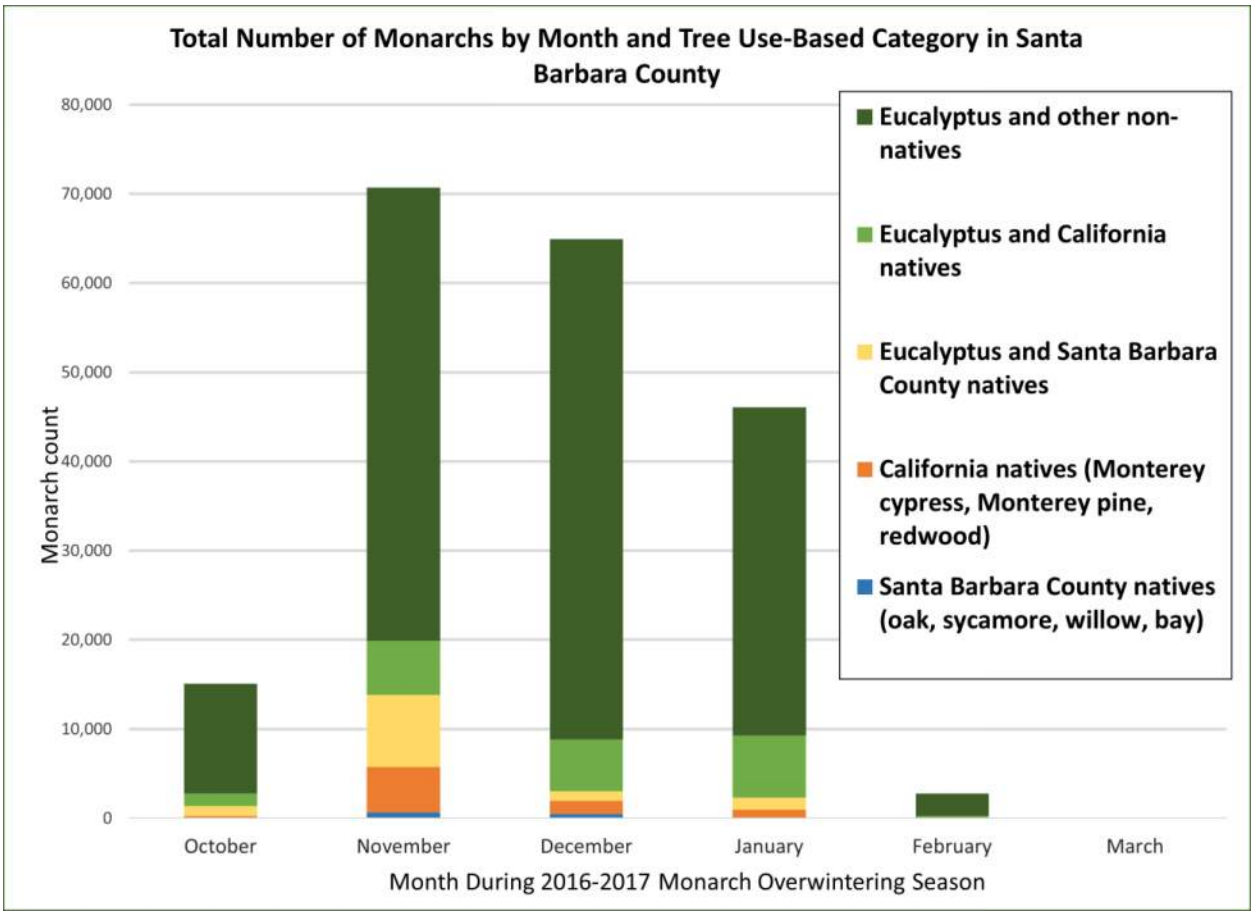
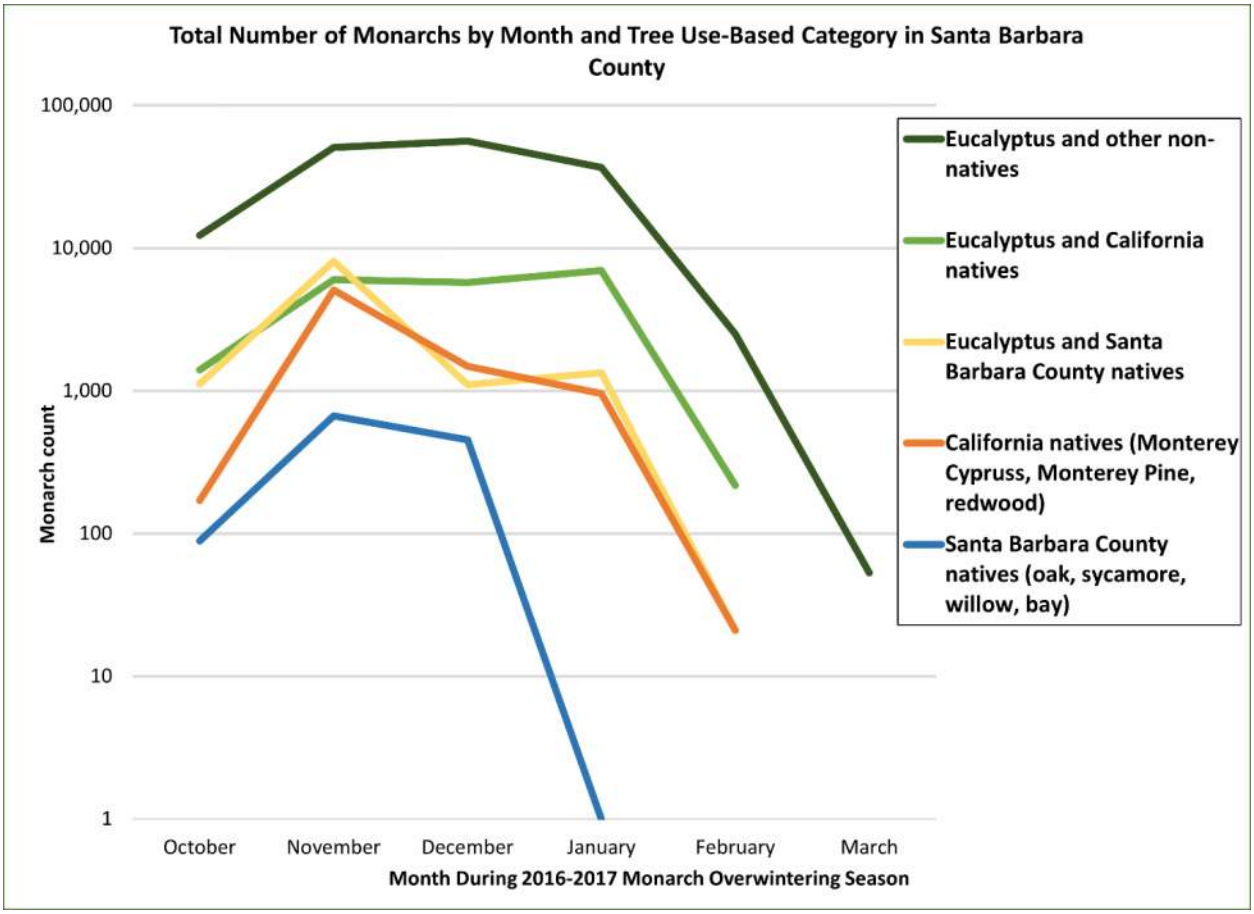


FIGURE 2. MONARCH BUTTERFLY USE OF SITES IN FIVE TREE COMPOSITION CATEGORIES IN SANTA BARBARA COUNTY BY MONTH IN LOGARITHMS



2.3 Tree and Habitat Choices

To explore this idea of tree choice by monarch butterflies, we examined locations with native trees along the south coast of Santa Barbara County. Criteria for consideration include well-established native trees, locations near the coast, and sites of similar elevation within one mile of known aggregations. At least 17 locations of these native riparian habitats are in proximity to known eucalyptus dominated monarch aggregation sites, yet no records of aggregating monarch butterflies occur for these native areas (Table 2). These native riparian habitats are within ½ mile or less of known monarch aggregation sites with a range of nearly adjacent (e.g. Rincon Creek) to a distance of less than ½ mile (e.g. Garrapata Creek). Choice is available for monarch butterflies between eucalyptus tree stands and native riparian vegetation habitats.

TABLE 2. SANTA BARBARA COUNTY SOUTH COAST LOCATIONS WITH ABUNDANT NATIVE VEGETATION, NO ROOSTING MONARCHS, AND NEAREST KNOWN MONARCH BUTTERFLY AGGREGATIONS

Location	Native vegetation	Nearest monarch aggregation (Name and Site Number)**	Distance to native tree habitat (ft)
Rincon Creek	willow, cottonwood, sycamore, oak	Rincon Canyon, Site 118	200
Rincon Creek	willow, cottonwood, sycamore, oak	6765 Rincon Road, Site 102	1,200
Carpinteria Creek	sycamore, willow, cottonwood	Carpinteria Creek*, Site 99	400
Arroyo Paredon	sycamore, willow, oak	Padaro Lane sites	900
Garapata Creek	sycamore, coast live oak riparian forest	Lambert Road, Site 95	2,100
Toro Canyon Creek	oak, sycamore	Lambert Road, Site 95	1,100
Romero Creek	sycamore, oak, willow	Ortega Hill, Site 92	650
San Ysidro Creek	sycamore, willow, oak	Crane School, Site 90	600
Arroyo Burro Creek	willow, sycamore	Arroyo Burro Canyon, Site 82	900
Atascadero Creek	sycamore, willow	Atascadero Creek, Site 78 (historic location)	250
San Jose Creek	willow, cottonwood, sycamore	Elks Grove*, Site 76	1,500
Bell Canyon	sycamore, willow, cottonwood, oak	Bell Canyon, Site 58	1,000
Tecolote Canyon	willow, oak	Tocolote Canyon, Site 57	1,400
Gato Canyon	sycamore, oak	Arroyo west of Gato Canyon, Site 53	1,600
El Capitan Canyon	sycamore, oak, pine, cottonwood	El Capitan State Park, Site 52	750
Honda Canyon	sycamore, willow, cottonwood	Arroyo Hondo, Site 110	100
Gaviota Creek	willow, cottonwood	Gaviota Beach Road, Site 109	250

oak = coast live oak (Quercus agrifolia)

willow = arroyo willow (Salix lasiolepsis)

cottonwood = Fremont cottonwood (Populus fremontii)

sycamore = western sycamore (Platanus racemosa)

**Some native trees occur at the aggregation site and support clusters, however the site is protected by large blue gum eucalyptus.*

***Site names and numbers correspond with Meade et al 2018.*

There are nine south coast sites where monarch butterfly aggregations were observed clustering on native trees. These sites include: Canada Refugio (Site 49), El Rancho Refugio (Site 101), Corral Canyon (Site 51), Elks Grove (Site 76), Los Carneros Creek (Site 71), Carpinteria Creek (Site 99), Maria Ygnacio Creek at La Ramada Road (Site 115), Padaro Lane (Site 119), and Stow Grove County Park (Site 75).

Five of these sites are closely associated with eucalyptus. Carpinteria Creek and Elks Grove have large blue gum eucalyptus trees that provide shade and weather protection for the site. At those two sites, monarch butterflies cluster on both eucalyptus and native trees that overhang the creek. At Rincon Creek, native sycamore, willow, and oak trees line the drainage adjacent to eucalyptus, and yet monarch butterflies chose to aggregate in the one stand of eucalyptus trees along the creek channel. At one time monarchs also aggregated at a eucalyptus row on Rincon Road (since removed). At Los Carneros Creek, monarchs have been observed clustering on oak branches over the creek and on eucalyptus trees that protect the site and line the creek bank.

The remaining four of these sites are not associated with eucalyptus trees: Canada Refugio, El Rancho Refugio, Corral Canyon, and Stow Grove County Park. Canada Refugio and El Rancho Refugio, which each held about 3,000 butterflies in 1998, had a high count of 7 and 75 respectively in October 2016. El Rancho Refugio site is adjacent to a lemon orchard where up to 12,000 butterflies were observed in native willow and cottonwood vegetation on January 6, 1990 (Calvert 1991). Calvert (1991) considered the location to be a nectaring bivouac for lemon blossoms. This site is in a relatively protected canyon, and native vegetation is still present. Corral Canyon held an autumnal aggregation of 637 monarchs in 2016 and 1,425 butterflies in November 2017. These sites were then abandoned during the winter. The Stow Grove site is one of only two locations in the County where monarchs aggregated on redwood trees, holding 100 butterflies in 1999. Drought severely damaged the redwoods, and only 3 butterflies were observed there in fall 2017.

These site-specific observations together with the monthly analysis shown in Figure **1** show us that butterflies can use south coast native stands of vegetation as aggregation sites; however, they support low numbers of monarchs in the fall and not through the overwintering period. The use of habitat dominated by eucalyptus is likely a matter of preference as well as availability.

2.4 Tree Characteristics

To evaluate candidates for restoration planting, we compiled a list of characteristics of trees native to California and species known at monarch aggregation sites. We used records in the Xerces Society's database and site descriptions (Lane 1993, Meade 1999, Meade et al. 2018, Xerces Society 2023). The list of species and the compilation of characteristics are shown in Attachment A. We used tree character information from the Urban Forest Ecosystems Tree Detail list (Urban Forest Ecosystems Institute 2023), Calscape (California Native Plant Society 2023), and Cal-IPC Inventory (Cal-IPC 2023) databases, along with our observations and information from an analysis of aggregation habitats (Meade et al. 2018). Ratings are assigned based on characteristics that are directly related to forming suitable aggregations sites for monarch butterflies along south coast sites in Santa Barbara County. A higher rating score indicates a species better suited for use in monarch butterfly site restoration. Characters are summed for each species providing a comparative rating among species, shown in Table 3. The highest rated species are three eucalyptus trees commonly found at aggregation sites: red iron bark gum, blue gum, and river red gum. The next six species are trees that create suitable aggregation habitat for the duration of the

overwintering season: lemon scented gum, red flowering gum, toyon, karri, Monterey cypress, and sugar gum. All the trees with lower ratings would provide additional habitat benefits by increasing diversity and wind shelter to an aggregation grove in associate with the nine higher ranked species: Bishop pine, silver wattle, Canary Island pine, holly-leaf cherry, Monterey pine, Torrey pine, coast redwood, evergreen ash, cork oak, blackwood, California bay laurel, western sycamore, Fremont cottonwood, coast live oak, grand fir, arroyo willow, Douglas fir, monkey-puzzle, dawn redwood, and black cottonwood.

TABLE 3. TREE SPECIES BY OVERALL MATRIX SCORE

Species	Common Name	Overall Score
Eucalyptus sideroxylon	Red iron bark gum	62.0
Eucalyptus globulus	Blue gum	61.0
Eucalyptus camaldulensis	River red gum	59.0
Corymbia citriodora	Lemon scented gum	56.0
Corymbia ficifolia	Red flowering gum	56.0
Heteromeles arbutifolia	Toyon	56.0
Eucalyptus diversicolor	karri	55.0
Hesperocyparis macrocarpa	Monterey cypress	54.0
Eucalyptus cladocalyx	Sugar gum	53.0
Pinus muricata	Bishop pine	51.0
Acacia dealbata	silver wattle	50.0
Pinus canariensis	Canary Island pine	50.0
Prunus illicifolia	Holly-leaf cherry	50.0
Pinus radiata	Monterey pine	49.0
Pinus torreyana	Torrey pine	49.0
Sequoia sempervirens	Coast redwood	48.0
Fraxinus uhdei	Evergreen ash	47.0
Quercus suber	Cork oak	47.0
Acacia melanoxylon	Blackwood	46.0
Umbellularia californica	California bay laurel	45.0
Platanus racemosa	Western sycamore	44.0
Populus fremontii	Fremont cottonwood	44.0
Quercus agrifolia	Coast live oak	44.0
Abies grandis	Grand fir	43.0
Salix lasiolepsis	Arroyo willow	43.0
Pseudotsuga menziesii	Douglas fir	42.0

Species	Common Name	Overall Score
Araucaria araucana	Monkey-puzzle	40.0
Metasequoia glyptostoboides	Dawn Redwood	34.0
Populus trichocarpa	Black cottonwood	34.0

3 CONCLUSION

Why are so few monarch butterfly aggregations in south Santa Barbara County in native vegetation, even though native vegetation is present near or adjacent to eucalyptus dominated aggregation sites? The simplest conclusion based on observation is that in this area of California, eucalyptus trees provide better shelter for monarch butterfly overwintering aggregations than do native plant habitats. The butterflies have shown us their preference when a choice is available and when we consider growth forms and attributes of tree choices available. Tree species with a structure most likely to provide protection added with a history of monarch's behavior explains what might continue to work. Eucalyptus grove structures often provide better protection from wind and rain than sycamore, oak, cottonwood, and willow habitats.

The recovery of the western monarch butterfly population will depend on action at every stage of their migration and life cycle. Restoration and enhancement of monarch overwintering sites is an important part of that recovery (Xerces Society 2019). When creating a protective aggregation habitat is the goal, eucalyptus trees remain a reliable choice for restoration. Monarchs have shown their preference for sites with eucalyptus trees in Santa Barbara County. Using the species most likely to provide the best protection for aggregating monarchs seems the most reasonable approach to the pressing conservation question of what species to plant in Santa Barbara County south coast monarch restoration sites.

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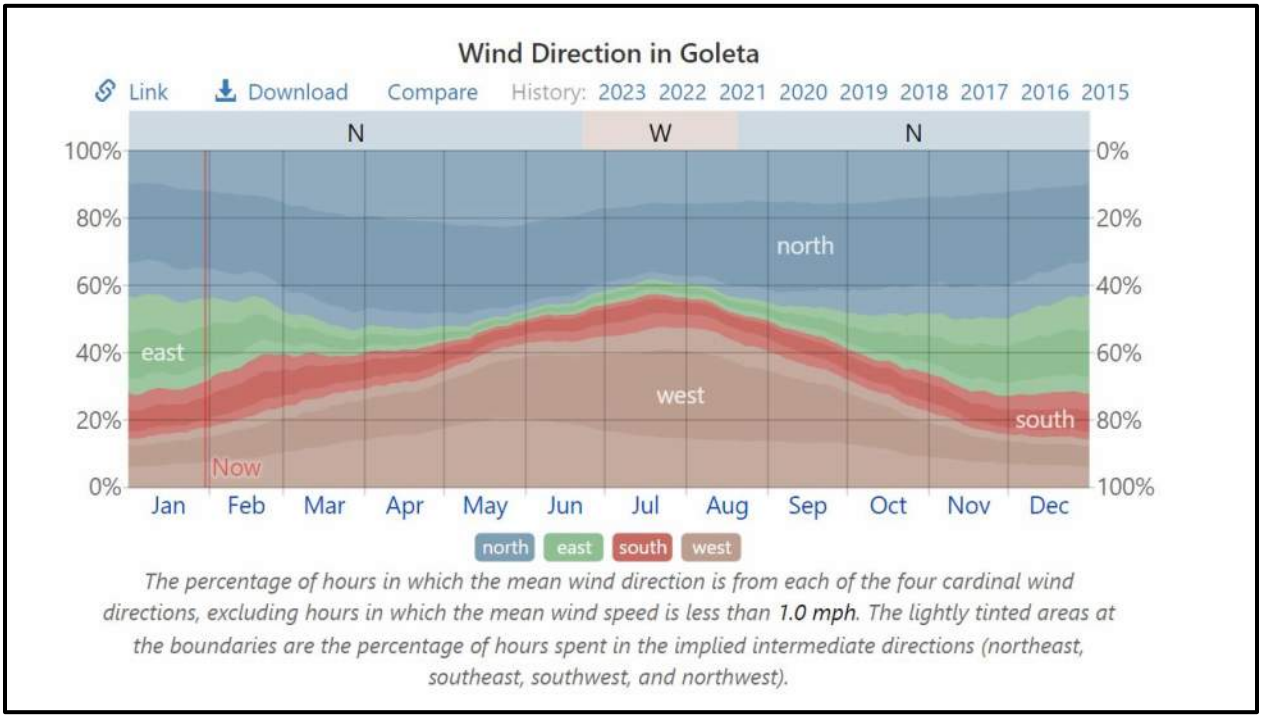
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ATTACHMENT A. TREE COMPARISON FOR CHARACTERISTICS IMPORTANT TO MONARCH BUTTERFLY AGGREGATION SITES

Species	Common Name	Nativeness	Percentage of Monarch Use in SB Co	Used by Roosting Monarchs in California	Nectar value	Growth Form	Height (m)	Canopy/wind protection factor	Ease of care	Water require-ment (Drought Tolerance)	Branch Strength	Life Span	Growth Rate	Climate change Resilience	Potential for success at Ellwood North site	Cal-IPC invasive level	Overall Score
Abies grandis	Grand fir	3	0	1	0	5	5	5	4	1	3	5	4	1	1	5	43.0
Acacia dealbata	silver wattle	0	1	4	3	5	4	5	5	4	1	3	5	4	4	2	50.0
Acacia melanoxylon	Blackwood	1	0	3	2	4	3	3	5	5	1	3	5	4	4	3	46.0
Araucaria araucana	Monkey-puzzle	1	0	1	0	5	5	2	4	1	3	5	3	2	3	5	40.0
Corymbia citriodora	Lemon scented gum	1	1	3	5	5	5	3	4	5	3	3	5	4	4	5	56.0
Corymbia ficifolia	Red flowering gum	1	2	4	5	5	3	2	5	5	3	3	3	5	5	5	56.0
Eucalyptus camaldulensis	River red gum	0	4	5	5	5	5	3	5	5	4	3	5	3	4	3	59.0
Eucalyptus cladocalyx	sugargum	0	1	4	3	4	4	3	5	4	3	5	5	4	4	4	53.0
Eucalyptus diversicolor	karri	0	0	1	4	5	5	5	5	4	3	5	5	4	4	5	55.0
Eucalyptus globulus	Blue gum	0	5	5	5	5	5	5	5	4	2	5	5	3	4	3	61.0
Eucalyptus sideroxylon	Red iron bark gum	0	3	5	5	5	4	4	5	5	3	3	5	5	5	5	62.0
Fraxinus uhdei	evergreen ash	1	1	5	1	5	4	5	5	1	2	3	5	3	1	5	47.0
Hesperocyparis macrocarpa	Monterey cypress	3	2	4	0	5	4	5	4	3	4	3	5	3	4	5	54.0
Heteromeles arbutifolia	Toyon	5	2	5	2	3	1	5	5	5	3	3	3	4	5	5	56.0
Metasequoia glyptostoboides	Dawn Redwood	2	0	1	0	1	4	2	3	1	3	5	5	1	1	5	34.0
Pinus canariensis	Canary Island pine	2	1	3	0	5	4	5	4	5	3	3	5	4	1	5	50.0
Pinus muricata	Bishop pine	4	1	4	0	5	4	5	4	4	3	3	5	1	3	5	51.0
Pinus radiata	Monterey pine	3	2	3	0	5	5	5	4	1	2	3	5	3	3	5	49.0
Pinus torreyana	Torrey pine	3	0	1	0	4	5	5	4	4	3	5	5	3	2	5	49.0
Platanus racemosa	Western sycamore	5	1	4	0	1	4	3	3	1	3	5	5	2	2	5	44.0
Populus fremontii	Fremont cottonwood	5	1	4	2	1	4	4	5	1	1	3	5	2	1	5	44.0
Populus trichocarpa	Black cottonwood	5	1	1	0	1	4	3	5	2	1	3	3	2	1	5	37.0
Prunus illicifolia	Hollyleaf cherry	5	0	1	5	5	1	2	5	4	3	3	4	3	4	5	50.0
Pseudotsuga menziesii	Douglas fir	3	0	1	0	4	5	5	5	1	3	5	3	1	1	5	42.0
Quercus agrifolia	Coast live oak	5	1	2	0	4	2	2	5	3	2	5	2	3	3	5	44.0
Quercus suber	Cork oak	0	0	1	0	4	4	5	4	5	4	5	3	4	3	5	47.0
Salix lasiolepsis	Arroyo willow	5	1	4	3	1	2	5	5	1	1	1	5	2	2	5	43.0
Sequoia sempervirens	Coast redwood	3	1	5	0	4	5	3	4	1	5	5	5	1	1	5	48.0
Umbellularia californica	California bay laurel	5	1	2	2	2	1	2	5	4	5	5	2	2	2	5	45.0

Ratings Broken Down for each column	Rating Scale	Nativeness	Percentage of Monarch Use in SB Co	Used by Roosting Monarchs in California	Nectar value	Growth Form	Height (m)	Canopy/wind protection factor	Ease of care	Water require-ment (Drought Tolerance)	Branch Strength	Life Span	Growth Rate	Climate change Resilience	Potential for success at Ellwood North site	Cal-IPC invasive level
	5	Goleta	75-100%	Goleta	Nectar available over winter	Evergreen, spreading	35 m and up	Full canopy	Easy	Extremely Low	Strong	Greater than 150 years	Fast/ 36 in. per year	High	High	Not rated
	4	Santa Barbara County	50-74%	Santa Barbara Co	Some nectar available overwinter	Evergreen columnar	15-35 m	Top only	Moderately Easy	Very Low	Strong-medium	n/a		Good	Good	watch/alert
	3	South and Central California	25-49%	Monterey Co south	Limited nectar available	Evergreen, shrub	10-15 m	Top only sparce	Moderate	Moderate	Medium	50 to 150 years.	Moderate, 24 in. per year	Medium	Medium	limited
	2	West Coast	5-24%	California	Nectar out of season	Sub-tree	5-10 m	Sparce canopy	Moderately High	High	Medium-weak	n/a		Question-able	Question-able	moderate
	1	North America	1-5%	Limited records	Poor nectar	Winter deciduous	0-5 m	No canopy	High	Very High	weak	Less than 50 years	less than 12 inches per year	n/a	Low	high
	0	Another continent	0%	No Records	No Nectar	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

APPENDIX E. ELLWOOD WIND DATA



Source: https://weatherspark.com/y/1430/Average-Weather-in-Goleta-California-United-States-Year-Round

November 2021 – January 2022 – Daily Wind

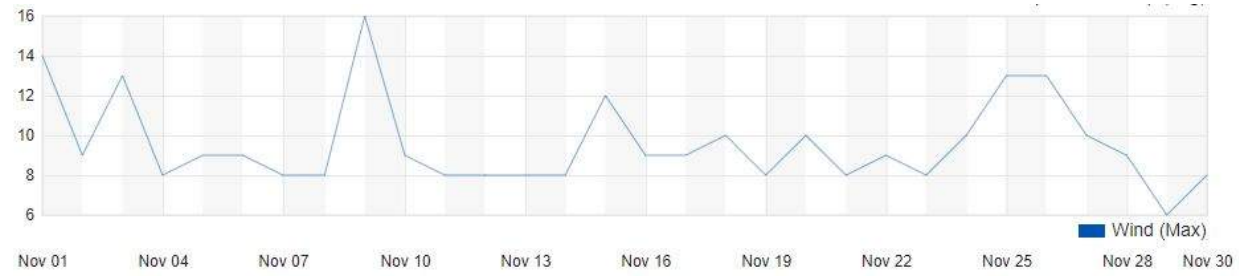


FIGURE 1. NOVEMBER 2021

Nov 9th – W 12-16 mph (3:30PM-5PM)

Nov 25th – W/SW 12-13 mph (12PM-3PM) / Gust of 25 mph (4am), variable direction

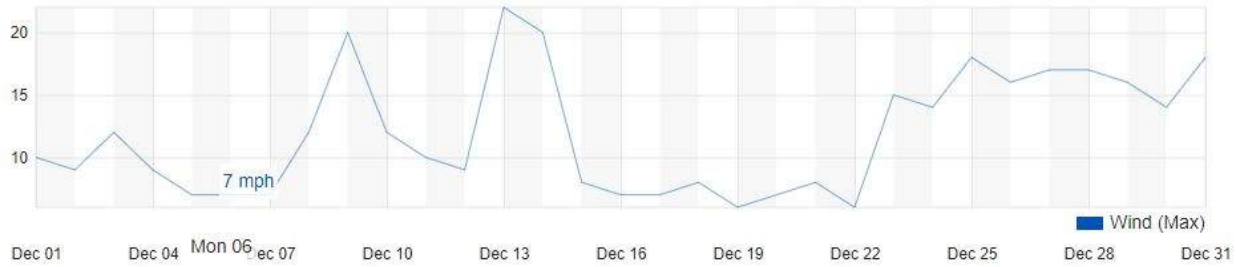


FIGURE 2. DECEMBER 2021

Dec 9th – W/NW - 12-20 mph (12pm-4pm) / Gusts 18-25 mph (12pm-4pm)

Dec 13th – E/SE - 13-22 mph (9am-11pm) / Gusts – 18-23 mph early in the day, 23-29 mph (9pm-11pm)

Dec 14th – E/SE - 13-20 mph (12am-3am) / Gusts 18-28 mph (12am-3am)

– W/NW – 12-17 mph (8am-9pm) / Gusts 20-24 mph (8am-9pm)

Dec 23-31 – Average wind – 6 mph variable direction / Gusts 22-26 mph (Large gusts mostly W/NW/SW)

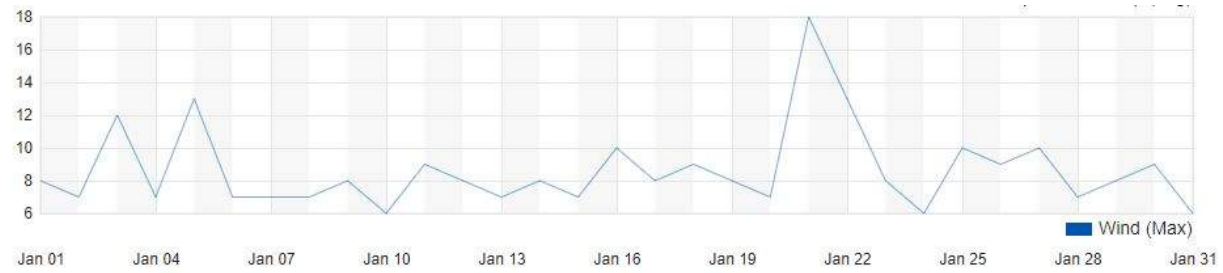


FIGURE 3. JANUARY 2022

Jan 21st – NE – 18 mph (11pm)

TABLE 1. JANUARY 21ST – JAN 22ND 2022- NE WIND AT MIDNIGHT

5:53 PM	54 °F	51 °F	90 %	CALM	0 mph	0 mph	29.94 in	0.0 in	Fair
6:53 PM	53 °F	49 °F	86 %	N	3 mph	0 mph	29.96 in	0.0 in	Fair
7:53 PM	51 °F	45 °F	80 %	SSE	7 mph	0 mph	29.96 in	0.0 in	Fair
8:53 PM	51 °F	44 °F	77 %	N	5 mph	0 mph	29.97 in	0.0 in	Fair
9:53 PM	48 °F	41 °F	77 %	NNE	3 mph	0 mph	29.99 in	0.0 in	Fair
10:53 PM	46 °F	39 °F	76 %	CALM	0 mph	0 mph	30.01 in	0.0 in	Fair
11:53 PM	61 °F	31 °F	32 %	NNE	18 mph	0 mph	29.99 in	0.0 in	Fair
12:53 AM	57 °F	37 °F	47 %	SE	5 mph	0 mph	29.98 in	0.0 in	Fair
1:53 AM	47 °F	35 °F	63 %	N	6 mph	0 mph	30.00 in	0.0 in	Fair
2:53 AM	46 °F	34 °F	63 %	CALM	0 mph	0 mph	29.99 in	0.0 in	Fair
3:53 AM	45 °F	34 °F	65 %	NNE	6 mph	0 mph	29.98 in	0.0 in	Fair
4:53 AM	45 °F	33 °F	63 %	CALM	0 mph	0 mph	29.98 in	0.0 in	Fair
5:53 AM	38 °F	31 °F	76 %	CALM	0 mph	0 mph	29.99 in	0.0 in	Fair
6:53 AM	39 °F	32 °F	76 %	CALM	0 mph	0 mph	30.01 in	0.0 in	Fair
7:53 AM	41 °F	33 °F	73 %	CALM	0 mph	0 mph	30.04 in	0.0 in	Fair
8:53 AM	53 °F	36 °F	52 %	NE	3 mph	0 mph	30.06 in	0.0 in	Fair
9:53 AM	63 °F	38 °F	40 %	CALM	0 mph	0 mph	30.07 in	0.0 in	Fair
10:53 AM	65 °F	38 °F	37 %	SSW	7 mph	0 mph	30.07 in	0.0 in	Fair

November 2022 – January 2023 – Daily Wind

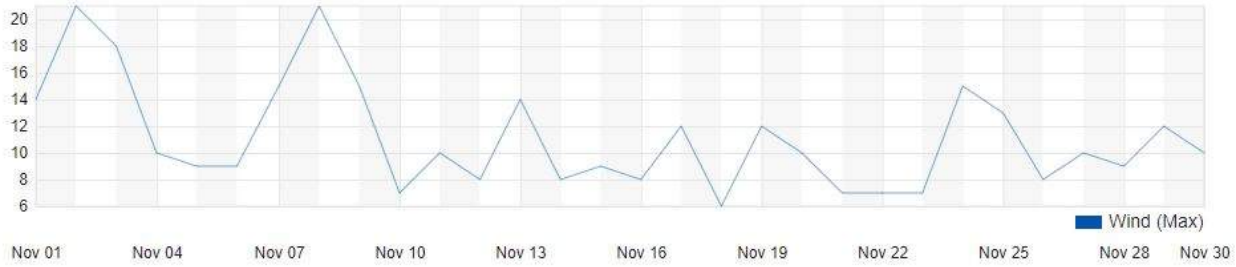


FIGURE 4. NOVEMBER 2022

Nov 2nd – W/NW - 13-21 mph (6am-10pm) / Gusts 21-31 mph (*especially strong @ 10am-4pm)
Nov 3rd – W/NW/NE - 10-18 mph (2am-7pm) / Gusts 22-28 mph (8am-2pm)
Nov 7th – E/SE - 10-15 mph (9am-2pm)
Nov 8th – E/SE - 12-21 mph (7am-1pm) / Gusts 22-29 mph (10am-12pm)
Nov 9th - W/SW 13-15 mph (1pm-4pm) / Gust 23 mph (1pm)



FIGURE 5. DECEMBER 2022

Dec 10th – E/SE - 10-18 mph (1pm-11pm) / Gusts 22-26 ((9pm-11pm)

Dec 11th – S/SW/W/NW – 10-18 mph (12am-4pm) / Gusts - S/SW 20-28 mph(12am-2am) – N/NW 21-25 mph (12pm-4pm)

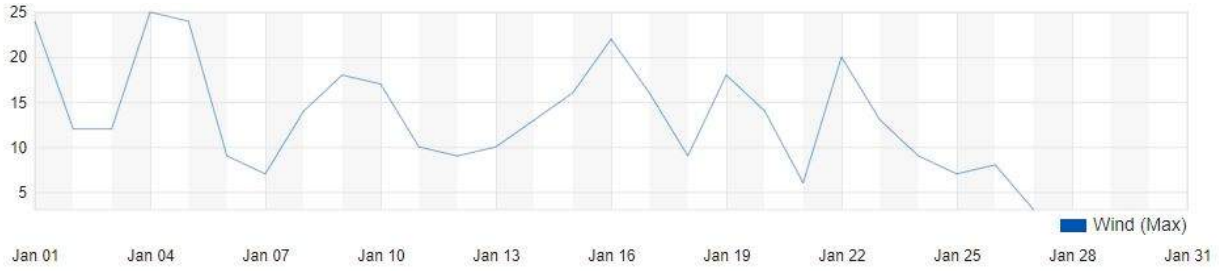


FIGURE 6. JANUARY 2023

Jan 1st - W/NW 13-24 mph (12am-7pm) / Gusts 17-33 (12am-7pm, *especially strong from 8am – 7pm)

Jan 4th - E/SE 12-25mph (12am-11pm) / Gusts 22-38 mph (5am-11pm, *especially strong from 6pm-11pm)

Jan 5th - E/SE 12-24 mph (12am-3pm) / Gusts 22-33 mph (12am-3pm, *especially strong from 12am-5am)

Jan 16 - NE/E/SE/SW/W/NW 12-22mph (12am-8pm) / Gusts 16-28 (Sporadic throughout the day)

Jan 22 -W/SW/NW/W/NE 12-20 (4pm-11pm) / Gust 20 (3pm) & 29 mph (7pm)

TABLE 2. JAN 15TH – 16TH – E/NE WINDS THROUGHOUT THE NIGHT

1:53 PM	57 °F	50 °F	77 %	CALM	0 mph	0 mph	29.79 in	0.0 in	Cloudy
2:53 PM	57 °F	50 °F	77 %	CALM	0 mph	0 mph	29.78 in	0.0 in	Light Rain
3:33 PM	56 °F	52 °F	87 %	CALM	0 mph	0 mph	29.76 in	0.0 in	Light Rain
3:53 PM	56 °F	51 °F	84 %	ESE	5 mph	0 mph	29.77 in	0.1 in	Rain
4:53 PM	52 °F	48 °F	86 %	ENE	5 mph	0 mph	29.76 in	0.2 in	Light Rain
5:53 PM	53 °F	49 °F	86 %	E	3 mph	0 mph	29.77 in	0.0 in	Light Rain
6:53 PM	52 °F	48 °F	86 %	E	7 mph	0 mph	29.76 in	0.0 in	Light Rain
7:53 PM	52 °F	49 °F	89 %	E	13 mph	0 mph	29.74 in	0.0 in	Light Rain
8:53 PM	52 °F	48 °F	86 %	E	15 mph	0 mph	29.73 in	0.0 in	Light Rain
9:53 PM	52 °F	48 °F	86 %	E	16 mph	0 mph	29.70 in	0.0 in	Light Rain
10:53 PM	52 °F	48 °F	86 %	E	14 mph	0 mph	29.66 in	0.0 in	Light Rain
11:53 PM	53 °F	49 °F	86 %	E	14 mph	20 mph	29.65 in	0.1 in	Light Rain
Time	**Temperature**	**Dew Point**	**Humidity**	**Wind**	**Wind Speed**	**Wind Gust**	**Pressure**	**Precip.**	**Condition**
12:51 AM	54 °F	50 °F	88 %	E	20 mph	25 mph	29.62 in	0.0 in	Light Rain
12:53 AM	54 °F	50 °F	86 %	E	21 mph	25 mph	29.63 in	0.0 in	Light Rain
1:53 AM	55 °F	50 °F	83 %	ENE	8 mph	0 mph	29.61 in	0.0 in	Cloudy
2:04 AM	55 °F	50 °F	83 %	E	13 mph	0 mph	29.61 in	0.0 in	Cloudy
2:53 AM	56 °F	50 °F	80 %	E	12 mph	18 mph	29.60 in	0.0 in	Light Rain
3:36 AM	55 °F	51 °F	86 %	CALM	0 mph	0 mph	29.60 in	0.1 in	Rain
3:43 AM	55 °F	51 °F	86 %	E	6 mph	0 mph	29.60 in	0.1 in	Light Rain
3:53 AM	55 °F	51 °F	86 %	E	9 mph	0 mph	29.60 in	0.1 in	Light Rain
4:15 AM	55 °F	52 °F	89 %	NNW	7 mph	0 mph	29.61 in	0.0 in	Light Rain
4:19 AM	55 °F	52 °F	89 %	CALM	0 mph	0 mph	29.61 in	0.0 in	Rain

TABLE 3. JANUARY 22ND – 23RD – N/NE WINDS THROUGHOUT THE NIGHT

12:53 PM	66 °F	38 °F	36 %	WSW	12 mph	0 mph	29.90 in	0.0 in	Fair
1:53 PM	69 °F	33 °F	26 %	W	10 mph	0 mph	29.86 in	0.0 in	Fair
2:53 PM	69 °F	31 °F	24 %	NNE	8 mph	20 mph	29.86 in	0.0 in	Fair
3:53 PM	66 °F	27 °F	23 %	N	12 mph	0 mph	29.86 in	0.0 in	Fair
4:53 PM	63 °F	27 °F	26 %	NNW	12 mph	0 mph	29.87 in	0.0 in	Fair
5:53 PM	59 °F	26 °F	28 %	NE	14 mph	0 mph	29.89 in	0.0 in	Fair
6:53 PM	57 °F	25 °F	29 %	NNE	20 mph	29 mph	29.91 in	0.0 in	Fair
7:53 PM	54 °F	27 °F	35 %	NNE	16 mph	0 mph	29.92 in	0.0 in	Fair
8:53 PM	53 °F	28 °F	38 %	NE	12 mph	0 mph	29.94 in	0.0 in	Fair
9:44 PM	55 °F	29 °F	37 %	NNE	10 mph	0 mph	29.96 in	0.0 in	Fair
9:53 PM	54 °F	30 °F	40 %	N	10 mph	0 mph	29.96 in	0.0 in	Fair
10:53 PM	55 °F	29 °F	37 %	NNE	15 mph	0 mph	29.95 in	0.0 in	Fair
11:53 PM	52 °F	30 °F	43 %	ENE	7 mph	0 mph	29.97 in	0.0 in	Fair

Example Santa Ana wind events – October 2007, December 2017

TABLE 4. OCTOBER 21ST 2007

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
10:53 PM	67 °F	29 °F	24 %	ENE	15 mph	24 mph	29.87 in	0.0 in	Cloudy
11:53 PM	68 °F	29 °F	23 %	NE	21 mph	26 mph	29.86 in	0.0 in	Cloudy / Windy
12:53 AM	68 °F	29 °F	23 %	NNE	13 mph	0 mph	29.87 in	0.0 in	Cloudy
1:09 AM	66 °F	28 °F	24 %	CALM	0 mph	0 mph	29.88 in	0.0 in	Cloudy
1:53 AM	63 °F	31 °F	30 %	WNW	8 mph	18 mph	29.88 in	0.0 in	Cloudy
2:53 AM	61 °F	0 °F	34 %	NNW	7 mph	0 mph	29.88 in	0.0 in	Mostly Cloudy
3:13 AM	57 °F	0 °F	38 %	S	3 mph	0 mph	29.88 in	0.0 in	Partly Cloudy
3:30 AM	57 °F	34 °F	41 %	SE	3 mph	0 mph	29.89 in	0.0 in	Mostly Cloudy
3:53 AM	57 °F	35 °F	44 %	CALM	0 mph	0 mph	29.89 in	0.0 in	Mostly Cloudy
4:01 AM	57 °F	36 °F	44 %	CALM	0 mph	0 mph	29.89 in	0.0 in	Partly Cloudy
4:53 AM	50 °F	35 °F	57 %	CALM	0 mph	0 mph	29.91 in	0.0 in	Fair
5:53 AM	52 °F	35 °F	53 %	CALM	0 mph	0 mph	29.93 in	0.0 in	Fair
6:53 AM	50 °F	35 °F	57 %	CALM	0 mph	0 mph	29.97 in	0.0 in	Fair
7:53 AM	62 °F	35 °F	37 %	CALM	0 mph	0 mph	30.00 in	0.0 in	Fair
8:53 AM	69 °F	35 °F	29 %	CALM	0 mph	0 mph	30.01 in	0.0 in	Fair
9:53 AM	69 °F	36 °F	30 %	WSW	9 mph	0 mph	30.02 in	0.0 in	Fair
10:53 AM	72 °F	36 °F	27 %	VAR	6 mph	0 mph	30.03 in	0.0 in	Fair
11:53 AM	74 °F	30 °F	20 %	W	10 mph	0 mph	30.03 in	0.0 in	Fair
12:53 PM	74 °F	28 °F	18 %	W	12 mph	0 mph	30.01 in	0.0 in	Fair
1:53 PM	76 °F	25 °F	15 %	WNW	8 mph	0 mph	30.01 in	0.0 in	Fair
2:53 PM	76 °F	25 °F	15 %	WNW	10 mph	0 mph	30.01 in	0.0 in	Fair
3:53 PM	75 °F	28 °F	18 %	WSW	8 mph	0 mph	30.02 in	0.0 in	Fair
4:53 PM	70 °F	24 °F	18 %	WNW	8 mph	0 mph	30.03 in	0.0 in	Fair

TABLE 5. DEC 16TH 2017 – SANTA ANA WIND DRIVEN FIRE EVENT

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
12:53 AM	54 °F	51 °F	90 %	E	7 mph	0 mph	29.84 in	0.0 in	Smoke
1:53 AM	59 °F	44 °F	58 %	E	6 mph	0 mph	29.79 in	0.0 in	Smoke
2:53 AM	54 °F	48 °F	80 %	CALM	0 mph	0 mph	29.80 in	0.0 in	Smoke
3:53 AM	51 °F	43 °F	74 %	WNW	13 mph	0 mph	29.77 in	0.0 in	Smoke
4:53 AM	51 °F	46 °F	83 %	E	3 mph	0 mph	29.72 in	0.0 in	Smoke
5:53 AM	45 °F	41 °F	86 %	CALM	0 mph	0 mph	29.71 in	0.0 in	Smoke
6:53 AM	55 °F	40 °F	57 %	NNE	18 mph	24 mph	29.69 in	0.0 in	Smoke
7:53 AM	57 °F	38 °F	49 %	NNE	10 mph	0 mph	29.69 in	0.0 in	Smoke
8:53 AM	59 °F	39 °F	48 %	CALM	0 mph	0 mph	29.70 in	0.0 in	Smoke
9:53 AM	66 °F	34 °F	30 %	CALM	0 mph	0 mph	29.70 in	0.0 in	Smoke
10:53 AM	67 °F	38 °F	34 %	S	8 mph	0 mph	29.70 in	0.0 in	Smoke
11:53 AM	68 °F	35 °F	30 %	VAR	3 mph	0 mph	29.67 in	0.0 in	Smoke
12:53 PM	68 °F	40 °F	36 %	S	6 mph	0 mph	29.66 in	0.0 in	Smoke
1:53 PM	65 °F	47 °F	52 %	SSE	5 mph	0 mph	29.66 in	0.0 in	Smoke
2:53 PM	64 °F	46 °F	52 %	ESE	6 mph	0 mph	29.66 in	0.0 in	Smoke
3:53 PM	62 °F	44 °F	52 %	CALM	0 mph	0 mph	29.66 in	0.0 in	Smoke
4:53 PM	63 °F	29 °F	28 %	NNE	7 mph	0 mph	29.68 in	0.0 in	Smoke
5:53 PM	64 °F	26 °F	24 %	N	10 mph	0 mph	29.70 in	0.0 in	Smoke
6:53 PM	60 °F	26 °F	27 %	NE	3 mph	0 mph	29.73 in	0.0 in	Smoke
7:53 PM	57 °F	33 °F	40 %	VAR	5 mph	0 mph	29.74 in	0.0 in	Smoke
8:53 PM	58 °F	26 °F	30 %	CALM	0 mph	0 mph	29.76 in	0.0 in	Smoke
9:53 PM	57 °F	27 °F	32 %	NE	3 mph	0 mph	29.77 in	0.0 in	Smoke
10:53 PM	47 °F	27 °F	46 %	WNW	7 mph	0 mph	29.79 in	0.0 in	Smoke
11:53 PM	47 °F	28 °F	48 %	CALM	0 mph	0 mph	29.80 in	0.0 in	Smoke

TABLE 6. DEC 20TH 2017 – POSSIBLE SANTA ANA WIND EVENT

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
12:53 AM	44 °F	43 °F	96 %	N	5 mph	0 mph	30.14 in	0.0 in	Partly Cloudy
1:53 AM	44 °F	43 °F	96 %	CALM	0 mph	0 mph	30.13 in	0.0 in	Fair
2:53 AM	42 °F	42 °F	100 %	NNW	3 mph	0 mph	30.14 in	0.0 in	Partly Cloudy
3:53 AM	40 °F	40 °F	100 %	CALM	0 mph	0 mph	30.13 in	0.0 in	Mostly Cloudy
4:34 AM	43 °F	41 °F	93 %	CALM	0 mph	0 mph	30.12 in	0.0 in	Cloudy
4:53 AM	42 °F	40 °F	92 %	W	3 mph	0 mph	30.12 in	0.0 in	Cloudy
5:29 AM	44 °F	41 °F	89 %	CALM	0 mph	0 mph	30.11 in	0.0 in	Partly Cloudy
5:53 AM	43 °F	41 °F	93 %	CALM	0 mph	0 mph	30.12 in	0.0 in	Partly Cloudy
6:53 AM	42 °F	40 °F	92 %	CALM	0 mph	0 mph	30.12 in	0.0 in	Partly Cloudy
7:53 AM	46 °F	44 °F	93 %	CALM	0 mph	0 mph	30.12 in	0.0 in	Mostly Cloudy
8:53 AM	50 °F	45 °F	83 %	CALM	0 mph	0 mph	30.14 in	0.0 in	Cloudy
9:53 AM	57 °F	47 °F	69 %	VAR	3 mph	0 mph	30.14 in	0.0 in	Partly Cloudy
10:53 AM	59 °F	48 °F	67 %	S	6 mph	0 mph	30.12 in	0.0 in	Mostly Cloudy
11:53 AM	61 °F	47 °F	60 %	VAR	3 mph	0 mph	30.08 in	0.0 in	Fair
12:53 PM	64 °F	48 °F	56 %	WSW	20 mph	30 mph	30.04 in	0.0 in	Partly Cloudy
1:53 PM	63 °F	47 °F	56 %	W	16 mph	24 mph	30.01 in	0.0 in	Mostly Cloudy
2:53 PM	63 °F	46 °F	54 %	WNW	20 mph	26 mph	29.99 in	0.0 in	Fair
3:53 PM	58 °F	43 °F	58 %	W	16 mph	26 mph	29.96 in	0.0 in	Fair
4:53 PM	58 °F	36 °F	44 %	NW	10 mph	0 mph	29.97 in	0.0 in	Partly Cloudy
5:52 PM	57 °F	30 °F	36 %	N	12 mph	25 mph	29.99 in	0.0 in	Fair
6:53 PM	55 °F	24 °F	30 %	N	9 mph	0 mph	30.01 in	0.0 in	Partly Cloudy
7:53 PM	53 °F	22 °F	30 %	NNE	13 mph	0 mph	30.04 in	0.0 in	Fair
8:53 PM	55 °F	20 °F	25 %	N	12 mph	29 mph	30.04 in	0.0 in	Fair
9:53 PM	52 °F	18 °F	26 %	N	8 mph	0 mph	30.06 in	0.0 in	Fair
10:53 PM	52 °F	19 °F	27 %	VAR	3 mph	0 mph	30.07 in	0.0 in	Fair
11:53 PM	42 °F	23 °F	47 %	N	5 mph	0 mph	30.07 in	0.0 in	Fair

APPENDIX F. DEAD WOOD REMOVAL AND MONARCH BUTTERFLY HABITAT EFFECTS

ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES

CREEKSIDE SCIENCE

Dead wood removal and monarch butterfly habitat effects

March 9, 2022

TO: George Thomson
Parks & Open Space Manager
City of Goleta - Public Works Department

FROM: Dr. Daniel Meade, Principal Scientist, Althouse and Meade, Inc.
Dr. Stu Weiss, Chief Scientist, Creekside Science

Removal of dead downed wood and dead standing trees benefits monarch butterfly habitat and forest health. Forest habitat is best for monarch butterflies when it provides a balance between cover and room for flight. Wind shelter by a dense outer screen of trees is critical. Inside that screen, dappled light is key to monarch aggregation locations. Very dense canopies from overcrowded trees or open canopies from death of trees are not suitable as monarch aggregation habitat.

The Xerces Society guidelines for managing monarch groves (The Xerces Society 2017) suggests that even very important trees (VITs), "…that are also hazard trees should be replaced." (pg. 14). "Completely dead trees and branches generally do not contribute to monarch habitat and are a potential liability. Felled debris from diseased and infected trees should be removed from the habitat to eliminate host material." (pg. 19). "Standing dead trees generally do not contribute to monarch habitat and are a hazard to people and other trees." (pg.25).

The 1993 Monarch conservation and management guidelines (Bell et al. 1993) state, "Theauthors recognize the importance of removing hazardous trees from forests." (Recommendation 18). And "Understory levels should be managed to prevent a localizedbuildup of dead plant materials." (Recommendation 30).

Monarch Habitat

In our experience of visiting scores of monarch butterfly aggregation sites during more than 30 years of observation, monarch butterflies prefer to aggregate in locations with a wind protection buffer surrounding a more open center that allows access and patrolling space for flying butterflies. Monarchs leave roosts subject to disruptive wind (Leong 2016) for protected locations that provide dappled light and ameliorate temperature and humidity extremes.

Monarch aggregation habitats often have low to moderate densities of ground vegetation with an open mid story within the wind protected area. Several famous monarch butterfly aggregation sites, such as Pismo Beach and Pacific Grove have highly managed understories free of downed wood. The relatively clear floors in those groves include wide walking paths thatare not detrimental to monarch aggregations that form in the surrounding trees.

In Ellwood, monarchs have sought out wind-sheltered gaps in the forest to form their aggregations. Ellwood Main prior to the recent drought die-off was the exemplar of an aggregation site with a "Cathedral" structure consisting of an open understory, minimal ground cover, and a high vertical open space encompassed by protective trees. Surrounding slopes contributed to wind shelter and tall canopy trees formerly provided ideal dappled light and room to fly. The northern entrance to the aggregation site remained open and thicker vegetation around the edges of the site provided excellent wind buffering. The drought die-off of trees changed the site and where protective trees stood west and east of the grove, tangles of dead fallen wood and standing dead stems occupy the space and allow wind to penetrate far deeper into the grove than previously. Within the aggregation site, standing dead trees place other treesat risk, and downed trees and debris interfere with recruitment of replacement trees. Ellwood Main no longer provides the excellent aggregation habitat as in past years.

Monarchs are often observed flying through stands of trees investigating habitat. This behaviorcan lead them to aggregations. Groves where trees are too dense, or where debris and tanglesof dead wood block patrolling areas, reduce access and increase effort to locate suitable roosting locations.

Historically, Ellwood forests were managed to remove dead wood and maintain healthy standsof trees through normal forestry practices (Santos 1997, Meade personal observation). Failure to manage a grove results in over recruitment of trees during periods of higher rainfall and then death of trees during times of water stress (droughts). Appropriately managing tree density based on water demand creates a more stable grove and is a fundamental tenet of forestry management, even for groves managed for wildlife (Grebner et al. 2021, Taylor 2018).

Eucalyptus does not break down as quickly as native vegetation and wood and bark debris that accumulates on the ground retains nutrients and can inhibit new growth. Fallen blue gum eucalyptus trees decompose very slowly (DiTomaso et al. 2013), especially in dry climates. Thehigh level of phenolics in eucalyptus inhibits fungi from breaking down the wood and allows accumulation of fire fuel (Reid et al.2005). Chipping will aid the release of nutrients from woodydebris by converting coarse wood to fine pieces (Russell et al. 2015). Mulching around new forest plantings can increase planting survival and growth rate (Cahill et al. 2005, Chalker-Scott2007).

Wildfire Risk

Accumulation of bark and dead wood on the ground and leaning into the tree canopy creates a major fire hazard to monarch habitats (Xerces 2017). Ignition from camp fires and other human sources can feed on ground debris and quickly escalate into a catastrophic fire event. This risk can be managed by reducing fuel load through removal of dead branches, trunks and highly flammable vegetation that can create fire ladders into the forest crown. The Ellwood groves, once managed for wood production, now present a tangle of downed wood, dead leaning trunks and over abundant understory shrubs. The City of Goleta Community Wildfire Protection Plan (2012) provides management recommendations to reduce, "potential fire intensity, rate of spread, and severity of effects." (pg 58). Management prescriptions in the CWPP when implemented will help to protect life, property, and natural resources including monarch butterflyhabitat.

The presence of large quantity of dead wood at Ellwood results in:

- Increased wind penetration and speed at aggregation locations due to downed trees.
- Higher risk to remaining live trees
- Reduction in shade at aggregation sites
- Loss of cover for butterflies from predators
- Poor recruitment and growth of replacement trees
- Increased wildfire risk - intensification of fires and a fire ladder to canopy
- Public safety hazard from dead standing and leaning trees and ground debris

Removal of dead wood from the Ellwood forests and monarch groves will have positive effects for monarch butterflies.

- Removal and replacement of dead trees will increase humidity and shade and boost protection of monarchs.
- Removal of downed trees and branches eliminates debris tangles that interfere with recruitment of saplings and growth of trees with good form.
- Space for planting trees will be opened by removing dead wood.
- Removal of leaning dead trees and branch and debris tangles will improve patrolling and clustering habitat for monarch butterflies.
- Reduction of hazards for visitors to the grove
- Preserve habitat by reducing intensity and rate of spread of fires.

Photo 1 shows the dead stand along the trail that runs west of the gully at Ellwood Main. Large tangles of fallen trees lie among the standing dead, and the canopy is very open.



The hemispherical photographs (hemiphotos) below show some of the impacts of tree mortalityon the effectiveness of windbreaks. Photo 2 was taken near the same site as Photo 1 above. The hemiphoto is taken straight up - the horizon is at the circular edge, and the zenith is the center of the circle. North is at the top of the photograph, and east and west are reversed froma map view because the photograph is looking upward. The opening in the orange circle in the SW direction is where many trees died (the site in Photo1), allowing wind to penetrate well intothe aggregation site. The dead standing trees block only a tiny fraction of the sky compared with the live trees in other directions. Photo 3 was taken 10 meters south of Photo 2, showing the same wind shelter gap, which affects a large area downwind. In this case, the loss of shelter against prevailing SW winds has degraded the quality of Ellwood Main.

Photo 2

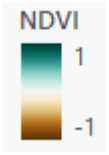
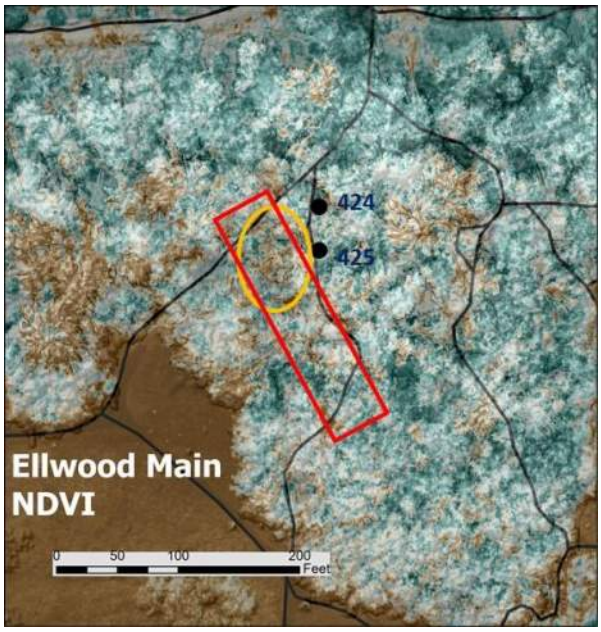


Photo 3

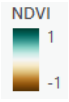
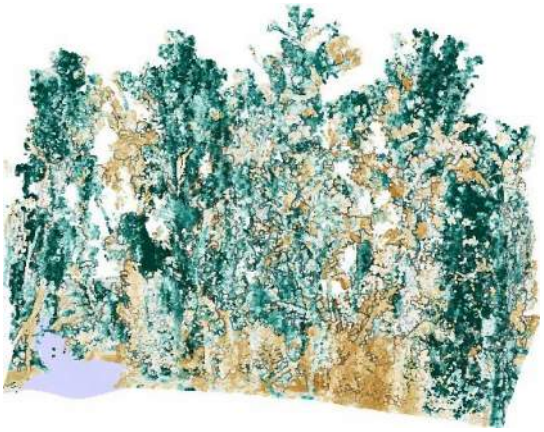


The map below shows a measure of canopy greenness (Normalized Difference Vegetation Index, NDVI) where the blue-green shows healthy foliage and the brown shows dead canopy (and brown grass outside of the forest). Note how much of the canopy around Ellwood Main has died, leaving dead standing trees, and large piles of downed wood.

The orange circle is the gap in Photos 1-3., which leaves the aggregation area to the east of the photograph sites (424 and 425) vulnerable to prevailing SW winds. Note also the numerous dead tree crowns throughout Ellwood Main, and the particularly large dead area at the western edge of the map, which is shown from the ground in Photo 4.

Normalized DIfference Vegetation Index (NDVI) map of Ellwood Main. Blue-green is live foliage (high NDVI) and brown is dead trunks, branches, and grass.	
Map 1 	Photo 4 

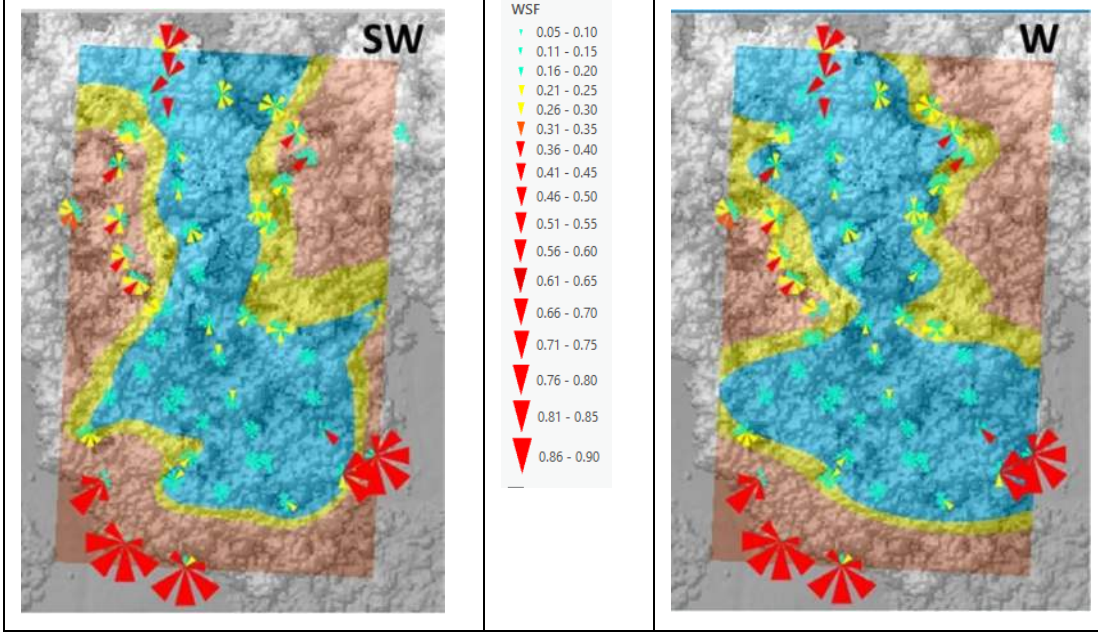
Below is a profile of forest, with the same NDVI color scale as Map 1, taken along the west edge of Ellwood Main (red rectangle). The small dip at the left is the road from the mesa going down to Deveraux Creek. The large masses of brown dead trees stand out, with a particularly dense mass of dead trees at the center-right. The oblique view gives some sense of the depth of the dead zone. All of the dead standing material will eventually fall to the ground, further opening up the canopy to wind.

Profile view west side Ellwood Main 	Oblique view west side Ellwood Main
	

Maps of wind exposure

The map below shows “wind roses” of the exposure from eight cardinal directions, with size of the arrow being proportional to the fraction of open sky in that direction. The arrows are color coded where blue is well-sheltered (<0.20), yellow is marginal (0.20-0.30) and red is high exposure (>0.30). The same colors are used for the interpolated surfaces of SW wind (left) and W wind (right).

The increased wind penetration into the western edge, caused by the tree deaths, is apparent in the red and yellow intrusions. Sealing up this edge will greatly increase habitat suitability within Ellwood Main.



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APPENDIX G. ELLWOOD MONARCH BUTTERFLY HABITAT CHARACTERIZATION REPORT

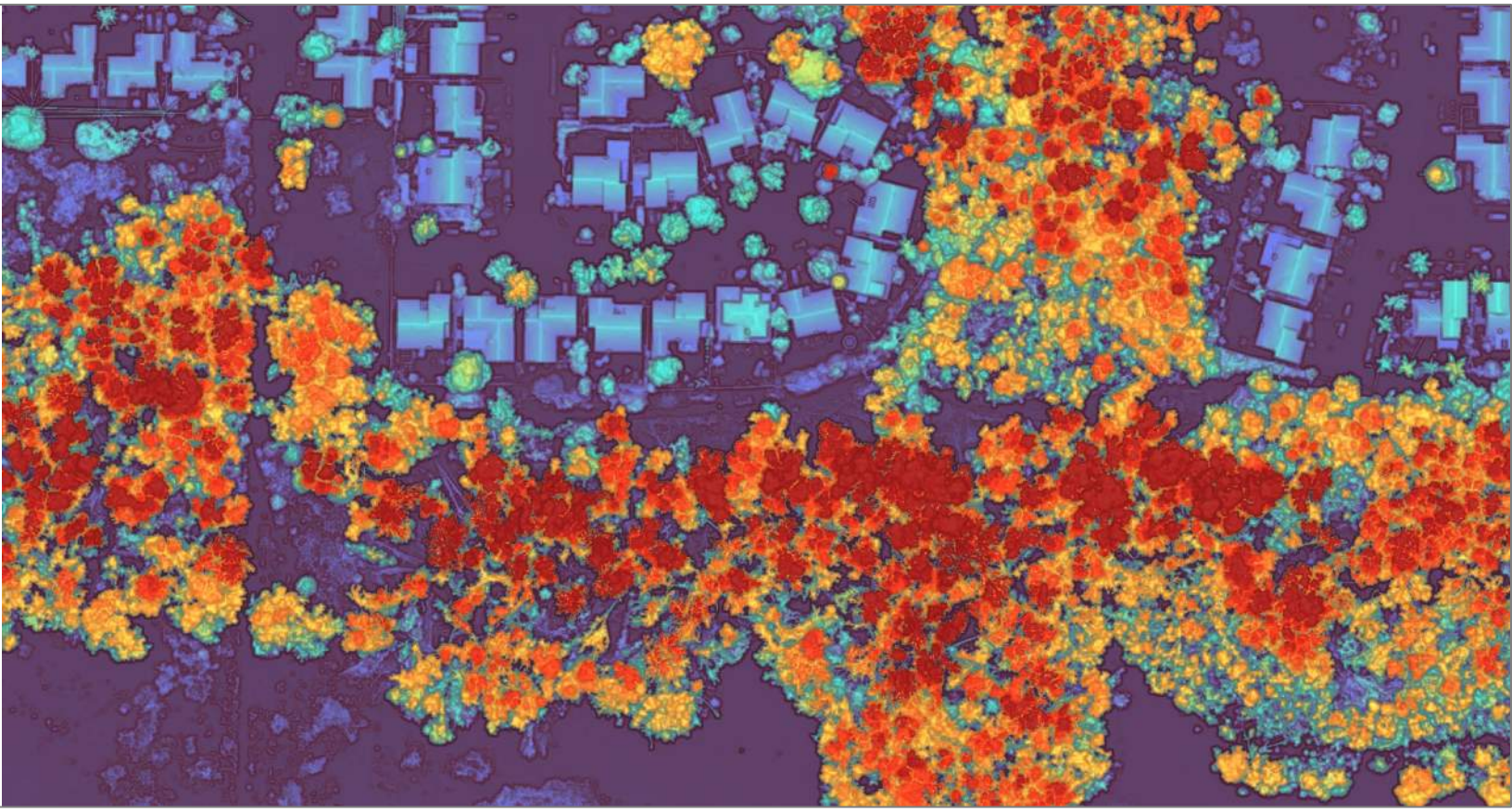
Prepared by NV5 dated October 24, 2022

ELLWOOD MESA MONARCH BUTTERFLY HABITAT CHARACTERIZATION

October 24, 2022

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TABLE OF CONTENTS

1.0 Introduction 1
2.0 Acquisition 3
2.1 Planning 3
2.2 Airborne Survey 3
2.2.1 Lidar 3
2.2.2 Digital Imagery 5
2.3 Ground Survey 6
2.3.1 Base Stations 6
2.3.2 Ground Survey Points (GSPs) 7
2.3.3 Air Targets 7
3.0 Lidar and Imagery Processing 8
3.1 Lidar Data 8
3.2 Digital Imagery 8
4.0 Acquisition Results and Accuracy Assessment 9
4.1 Lidar Density 9
4.2 Lidar Accuracy Assessments 10
4.2.1 Lidar Non-Vegetated Vertical Accuracy 10
4.2.2 Lidar Relative Vertical Accuracy 11
4.2.3 Lidar Horizontal Accuracy 12
4.3 Orthophoto Accuracy 13
4.3.1 Ground Control 13
4.3.2 Anomalies and Misfits 14
4.4 Acquisition Accuracy Controls 14
5.0 Analytical Methodology 16
5.1 Lidar Point Density Profiles 16
5.1.1 Products 16
5.2 Standing Dead and Downed Woody Debris Classification 20
5.2.1 Woody Material Identification 20
5.2.2 Standing Dead 20
5.2.3 Downed Woody Debris 22
5.2.4 Dead Material Volume Estimates 22
5.2.5 Products 23
5.3 Fisheye Photo Simulation from the Lidar Point Cloud 26
5.3.1 Plot Adjustments 27
5.3.2 Photo Simulation 28
5.3.3 Products 30
6.0 Discussion 31

7.0 Fisheye PLot Photo Comparison 33
8.0 Glossary 43

LIST OF TABLES

Table 1: Acquisition dates, acreage, and data types collected on the Ellwood site 1
Table 2: Deliverable product projection information. 1
Table 3: Lidar and imagery products delivered for the Ellwood site. 2
Table 4: Analytical products delivered for the Ellwood site. 2
Table 5: Lidar specifications and survey settings 4
Table 6: Camera manufacturer's specifications. 5
Table 7: Project-specific orthophoto specifications. 6
Table 8: Base station position for the Ellwood acquisition. Coordinates are on the NAD83 datum. 6
Table 9: NV5 Geospatial ground survey equipment identification. 7
Table 10: ASPRS LAS classification standards applied to the Ellwood dataset. 8
Table 11: Average lidar point densities. 9
Table 12: Absolute accuracy results. 10
Table 13: Relative accuracy results 12
Table 14: Lidar horizontal accuracy. 12
Table 15: Orthophotography accuracy statistics for Ellwood Mesa. 13
Table 16: Location of air target check points withheld from aerial triangulation adjustment. 14
Table 17: Lidar accuracy error sources and solutions. 15
Table 18: Las classification scheme. 26
Table 19: Plot adjustment change log. Bearings are recorded in degrees from North and distances are recorded in feet to match the project projection units. 27
Table 20: Field photo and simulated fisheye photo comparison. Simulated fisheyes are generated from the lidar point cloud at 1.75-meter height above ground. The asterisk (*) on a plot number indicates that a confident plot geolocation adjustment could not be made and that there is not confidence in the simulated fisheye results. 33

LIST OF FIGURES

Figure 1: Location map of the Ellwood 2021 site in California. 3
Figure 2: NV5 Geospatial's DJI M600 with Riegl VUX-1LR LiDAR Scanner..... 4
Figure 3: Ground survey location map. 7
Figure 4: Cross section of the lidar point cloud in Ellwood. 8
Figure 5: Frequency distribution of first return point density values per 1 x 1 meter cell. 9
Figure 6: Frequency histogram for lidar classified LAS deviation from ground check point values (NVA). 11
Figure 7: Frequency histogram for the lidar bare earth DEM surface deviation from ground check point values (NVA) 11
Figure 8: Frequency plot for relative vertical accuracy between flight lines..... 12
Figure 9: Map of orthophoto accuracy assessments. 13
Figure 10: [Left] Demonstration of lidar point density percentage from 1-5 meters above ground. Houses, shrubs, leaning eucalyptus stems, and the lower levels of the tree canopy are visible in this map. [Right] Ladder fuels AOI within the Ellwood project area. 17
Figure 11: Summarized ladder fuels AOI showing average lidar point density for the 1-2 meter profile. 17
Figure 12: Map displaying lidar point density profiles for an example region of Ellwood. Top to bottom: Canopy Height Model shows a surface model of the highest returns captured in the height normalized point cloud. The density profiles from 0-1 meters above ground, 1-2 meters above ground, and 2-3 meters above ground, respectively. 18
Figure 14: Example of dead trees identified in the orthoimagery..... 21
Figure 15: Mapped results of the identified standing dead trees within the Ellwood area of interest. 21
Figure 17: Voxel representations of classified downed woody debris for a lidar tile. A six-inch voxel size is shown on the left and a 12-inch voxel size is shown on the right. Voxel visualizations are colored by elevation above ground. Cool colors represent features closer to ground level, while warmer colors represent features farther from the ground. 23
Figure 21: Downed woody debris volume raster for an example region of Ellwood. The raster visualization is colored by the number of voxels representing standing dead material within a given pixel footprint. 25
Figure 22: Example image of the classified lidar point cloud showing the identified standing dead material and downed woody debris for a particular unhealthy region of the Ellwood project area. 26
Figure 23: An example of a point cloud projected to a sphere. The yellow sphere located in the center of the unmodified point cloud (left) represents the center of the sphere and the point of view for the simulated photo. 29

Figure 24: (A) Projected Point Cloud: An example of a point cloud projected to a sphere. The small yellow sphere located in the center of the projected point cloud represents the center of the projection sphere and the point of view for the simulated photo. (B) Cropped Projected Point Cloud: The projected point cloud cropped at the height of the point of view. (C) Point of View Enforced Simulated Photo: The cropped point cloud is viewed from below and the orientation of the photo is enforced to ensure that North is on top. 29

Figure 25: Image matrix showing various sphere radius and voxel size pairs. The selected parameters with the best look and feel compared to field photographs was a 400 foot radius and 2 foot voxel size (shown in the bottom right). 30

Figure 26: Image matrix showing how the input data tile size changes the resulting simulated image. A tile size of 400 feet was selected to balance the inclusion of features represented in the image and memory limitations. 30

Figure 27: Examples of simulated fisheye photos centered on a historic monarch cluster site and moving upwards through the canopy. Left to right images show the camera point of view situated 20 feet, 30 feet, 40 feet, and 50ft above the ground. 31

1.0 INTRODUCTION

In June 2020, NV5 Geospatial (NV5G) was contracted by Althouse and Meade, Inc. to collect high density Light Detection and Ranging (lidar) and multispectral orthoimagery data for the fall of 2021 across the Ellwood Mesa site in Goleta, California. Site characterization products were then developed to support planning, management, and future analysis of the Ellwood Mesa site using the lidar, imagery, and field data provided by Stu Weiss of Creekside Science.

The Ellwood Mesa Monarch Butterfly Habitat Characterization Project was undertaken using an experimental approach that would allow for the design of custom deliverables to meet the needs of various stakeholders involved in the project. By working with Stu Weiss of Creekside Science and Althouse and Meade, Inc. a suite of analytical datasets was outlined to support the characterization of monarch butterfly habitat and management of the Ellwood Mesa project area. An important outcome for this project was to create analytical products that would support the rehabilitation of the eucalyptus grove and site management to mitigate wildfire risk for nearby structures. To support these efforts, deliverable datasets were designed to leverage the three-dimensional nature of a lidar point cloud to identify the presence of vegetation and dead material in different height strata throughout the project area. The three primary deliverables designed for this project are lidar point density profiles for ladder fuels assessment, standing dead and downed woody debris classification, and simulated fisheye photos from the lidar point cloud. These datasets were identified as being more valuable to the characterization of monarch butterfly habitat and site management than the tree and canopy metric deliverables originally outlined in the project proposal.

This report accompanies the delivered lidar data, imagery, and analytical products. It documents contract specifications, data acquisition procedures, processing methods, and analysis of the final dataset including lidar accuracy and density. Acquisition dates and acreage are shown in Table 1, the projection information for the project is shown in Table 2, a complete list of contracted deliverables provided to Althouse and Meade, Inc. and Creekside Science is shown in Table 3 and Table 4, and the project area of interest (AOI) is shown in Figure 1.

Table 1: Acquisition dates, acreage, and data types collected on the Ellwood site

Project Site	Contracted Acres	Buffered Acres	Acquisition Dates	Data Type
Ellwood	230	270	09/27/2021	Lidar
Ellwood	230	270	10/29/2021	5 band (Red, Green, Blue, Near Infrared, Red Edge) Digital Imagery

Table 2: Deliverable product projection information.

Projections	EPSG	Horizontal Datum	Vertical Datum	Units
California zone 5	6424	NAD83(2011)	NAVD88 (GEOID18)	US Survey Feet

Table 3: Lidar and imagery products delivered for the Ellwood site.

Product Type	File Type	Product Details
Points	LAS v 1.4 (*.las, *.laz)	All Classified Returns
Vectors	Shapefiles (*.shp)	• Project Area of Interest • Lidar Tile Index • Ground Survey Data
Rasters	GeoTiffs (*.tif)	• Bare Earth Digital Elevation Model (DEM) – 1.5 ft resolution • Highest Hit Digital Surface Model (DSM) – 1.5 ft resolution • Normalized Digital Surface Model (nDSM) – 1.5 ft resolution • Intensity Raster – 0.25 ft resolution
Digital Imagery	GeoTiffs (*.tif)	9.75 cm Orthophotography • 5 spectral bands (RGB, NIR, Red Edge)

Table 4: Analytical products delivered for the Ellwood site.

Product Type	File Type	Product Details
Points	LAS v 1.4 (*.las)	Height Normalized Point Cloud with Custom Classification • Standing dead wood (64), downed woody debris (65), tree stems (67), ground (2), and unclassified (1).
Vectors	Shapefiles (*.shp)	• Point Density Profiles Summarized to 100 ft x 100 ft Ladder Fuel Grid • Adjusted Plot Locations
Rasters	GeoTiffs (*.tif)	• Point Density Profiles – 1 meter resolution • Dead Material Volume Rasters ○ Standing Dead Wood – 6-inch and 12-inch voxel ○ Downed Woody Debris – 6-inch and 12-inch voxel
Tables	Comma Separated Values (*.csv)	Point Density Profiles Summarized to 100 ft x 100 ft Ladder Fuel Grid
Images	JPEG (*.jpeg)	Simulated Fisheye Photos from Lidar Point Cloud • Adjusted plot locations with points of view (POV) located 1.75, 5, and 10 meters above ground • Historic Monarch cluster locations with POV located at 5-foot intervals for the range of heights measured for each Monarch cluster.

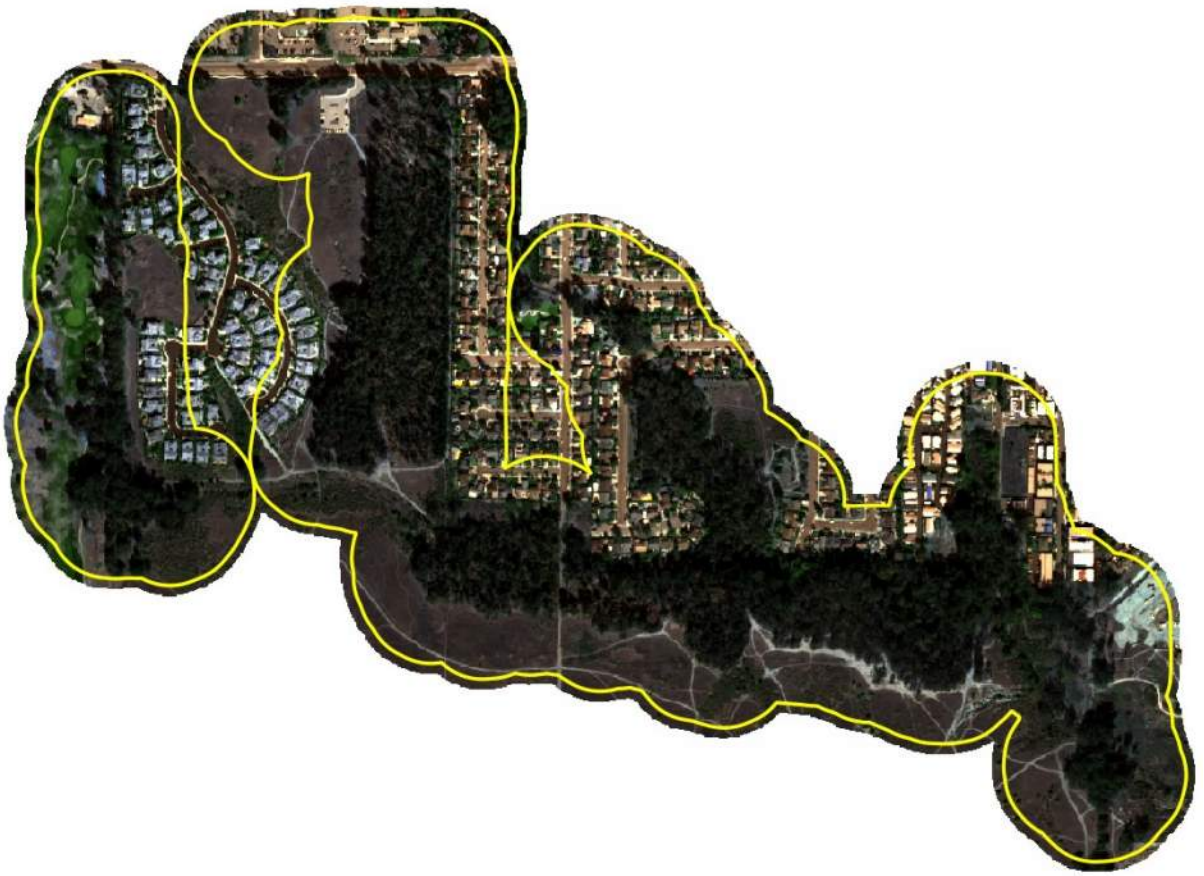


Figure 1: Location map of the Ellwood 2021 site in California.

2.0 ACQUISITION

2.1 PLANNING

In preparation for data collection, NV5 Geospatial reviewed the project area and developed a specialized flight plan to ensure complete coverage of the Ellwood Mesa lidar study area at the target point density of ≥50.0 points/m^2. Acquisition parameters including orientation relative to terrain, flight altitude, pulse rate, scan angle, and ground speed were adapted to optimize flight paths and flight times while meeting all contract specifications.

Factors such as satellite constellation availability and weather windows must be considered during the planning stage. Any weather hazards or conditions affecting the flight were continuously monitored due to their potential impact on the daily success of airborne and ground operations. In addition, logistical considerations including private property access and potential air space restrictions were reviewed.

2.2 AIRBORNE SURVEY

2.2.1 Lidar

The lidar survey was accomplished using a Riegl VUX-1UAV system mounted on an DJI Matrice 600 Unmanned Aerial Vehicle (UAV) (Figure 2). Table 5 summarizes the settings used to yield an average pulse density of ≥50 pulses/m^2 over the Ellwood Mesa project area. The Riegl VUX-1UAV laser system can record 8 range measurements (returns) per pulse at 122 meters nominal terrain height. It is not uncommon for some types of surfaces (e.g., dense vegetation or water) to return fewer

pulses to the lidar sensor than the laser originally emitted. The discrepancy between first return and overall delivered density will vary depending on terrain, land cover, and the prevalence of water bodies. All discernible laser returns were processed for the output dataset.



Figure 2: NV5 Geospatial's DJI M600 with Riegl VUX-1LR LiDAR Scanner.

Table 5: Lidar specifications and survey settings

Lidar Survey Settings & Specifications	Details
Acquisition Dates	September 27, 2021
Aircraft Used	DJI Matrice 600
Sensor	Riegl
Laser	VUX-1UAV
Maximum Returns	8
Resolution/Density	Average 50 pulses/m^2
Survey Altitude (AGL)	122 m
Survey speed	15 knots
Field of View	90º
Mirror Scan Rate	78.5 Lines Per Second
Target Pulse Rate	820 kHz
Pulse Length	3 ns
Laser Pulse Footprint Diameter	6.1 cm
Central Wavelength	1064 nm
Pulse Mode	Multiple Times Around (MTA)
Beam Divergence	0.5 mrad
Swath Width	244 m
Swath Overlap	50%
Intensity	16-bit
Accuracy	RMSEZ ≤ 10 cm

All areas were surveyed with an opposing flight line side-lap of ≥50% (≥100% overlap) in order to reduce laser shadowing and increase surface laser painting. To accurately solve for laser point position (geographic coordinates x, y and z), the positional coordinates of the airborne sensor and the attitude of the aircraft were recorded continuously throughout the lidar data collection mission. Position of the aircraft was measured twice per second (2 Hz) by an onboard differential GPS unit, and aircraft attitude was measured 200 times per second (200 Hz) as pitch, roll and yaw (heading) from an onboard inertial measurement unit (IMU). To allow for post-processing correction and calibration, aircraft and sensor position and attitude data are indexed by GPS time.

2.2.2 Digital Imagery

Imagery was collected using a Micasense Red Edge-MX digital mapping camera (Table 6). The Red Edge –MX is a global shutter multispectral camera manufactured by Micasense. The system is mounted fixed to the UAS platform and collects multispectral imagery and Downwelling Light Sensor (DLS) data.

Table 6: Camera manufacturer's specifications.

Camera Specification	Details
Equipment	Micasense Red Edge-MX
Focal Length	5.4 mm
Data Format	Blue, Green, Red, NIR, Red Edge
Pixel Size	8 cm @ 120 m
Image Size	1,280 x 960 pixels
Frame Rate	1 Hz
HFOV	47.2°

For the Ellwood Mesa site, images were collected in five spectral bands (red, green, blue, NIR, and Red Edge) with 90% along track overlap and 75% sidelap between frames. The acquisition flight parameters were designed to yield a native pixel resolution of ≤ 10 cm. Orthophoto specifications particular to the Ellwood Mesa project are in Table 7.

Table 7: Project-specific orthophoto specifications.

Orthophoto Specification	Details
Equipment	Micasense Red Edge - MX
Spectral Bands	Blue, Green, Red, NIR, Red Edge
Ground Sampling Distance (GSD)	9.4 cm pixel size
Along Track Overlap	≥90%
Cross Track Overlap	≥75%
Above Ground Level (AGL)	122 meters
GPS PDOP	≤3.0
GPS Satellite Constellation	≥6
Image	8-bit GeoTiff

2.3 GROUND SURVEY

Ground control surveys, including monumentation, aerial targets and ground survey points (GSPs) were conducted to support the airborne acquisition. Ground control data were used to geospatially correct the aircraft positional coordinate data and to perform quality assurance checks on final lidar data and orthoimagery products.

2.3.1 Base Stations

Base stations were utilized for collection of ground survey points using real time kinematic (RTK) and static survey techniques. Base station locations (Table 8) were selected with consideration for satellite visibility, field crew safety, and optimal location for GSP coverage.

Table 8: Base station position for the Ellwood acquisition. Coordinates are on the NAD83 datum.

Monument ID	Latitude	Longitude	Ellipsoid (meters)
1000	34° 25' 16.71413"	-119° 53' 48.47240"	-9.868

NV5 Geospatial utilized static Global Navigation Satellite System (GNSS) data collected at 1 Hz recording frequency for each base station. During post-processing, the static GNSS data were triangulated with nearby Continuously Operating Reference Stations (CORS) using the Online Positioning User Service (OPUS[1]) for precise positioning. Multiple sessions over the same monument were processed to confirm antenna height measurements and to refine position accuracy.
Ground control was collected using real time kinematic (RTK) survey techniques. For RTK surveys, a roving receiver receives corrections from a nearby base station via radio, enabling rapid collection of points with relative errors less than 1.5 cm horizontal and 2.0 cm vertical. RTK surveys record data while stationary for at least thirty, one-second epochs for aerial targets and five, one-second epochs for GSPs. All aerial targets were calculated by taking the average of two independent thirty, one-second epochs. All GSP measurements were made during periods with a Position Dilution of

[1] OPUS is a free service provided by the National Geodetic Survey to process corrected monument positions. http://www.ngs.noaa.gov/OPUS.

Precision (PDOP) of ≤ 3.0 with at least six satellites in view of the stationary and roving receivers. See Table 9 for Trimble unit specifications.

2.3.2 Ground Survey Points (GSPs)

GSPs were collected in areas where good satellite visibility was achieved on paved roads and other hard surfaces such as gravel or packed dirt roads. GSP measurements were not taken on highly reflective surfaces such as center line stripes or lane markings on roads due to the increased noise seen in the laser returns over these surfaces. GSPs were collected within as many flightlines as possible; however, the distribution of GSPs depended on ground access constraints and monument locations and may not be equitably distributed throughout the study area (Figure 3).

2.3.3 Air Targets

Ground survey data were collected by NV5 Geospatial to adjust aircraft positional and attitude data and to perform an accuracy assessment of final orthophoto products. NV5 Geospatial collected hard surface air targets typically on high visibility road markings or temporary white vinyl chevrons. Air target points were surveyed throughout the Ellwood Mesa study area, prior to imagery acquisition, using RTK techniques (Figure 3). Hard surface points consisted of high contrast, road markings such as stop bars, turn arrows, or cement corners. Typically, each corner of the road marking or temporary air target panel was surveyed, in this way only one point was used for aerial triangulation while the remaining points were used for quality assurance purposes.

Table 9: NV5 Geospatial ground survey equipment identification.

Receiver Model	Antenna	OPUS Antenna ID	Use
Trimble R10	Integrated Antenna	TRMR10 NONE	Rover

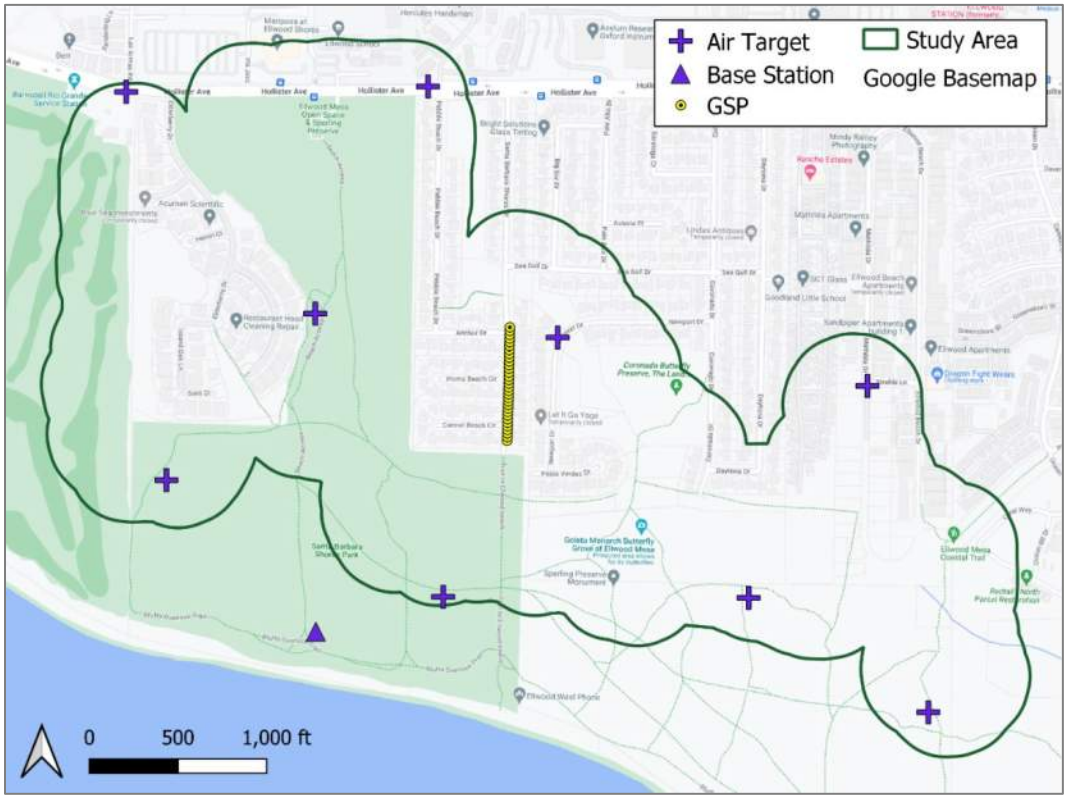


Figure 3: Ground survey location map.

3.0 LIDAR AND IMAGERY PROCESSING

3.1 LIDAR DATA

Upon completion of data acquisition, NV5 Geospatial processing staff initiated a suite of automated and manual techniques to process the data into the requested deliverables. Processing tasks included GPS control computations, smoothed best estimate trajectory (SBET) calculations, kinematic corrections, calculation of laser point position, sensor, and data calibration for optimal relative and absolute accuracy, and lidar point classification (Table 10). Processing methodologies were tailored for the landscape. Figure 4 shows a cross section of the lidar acquired in the Ellwood Mesa project area.

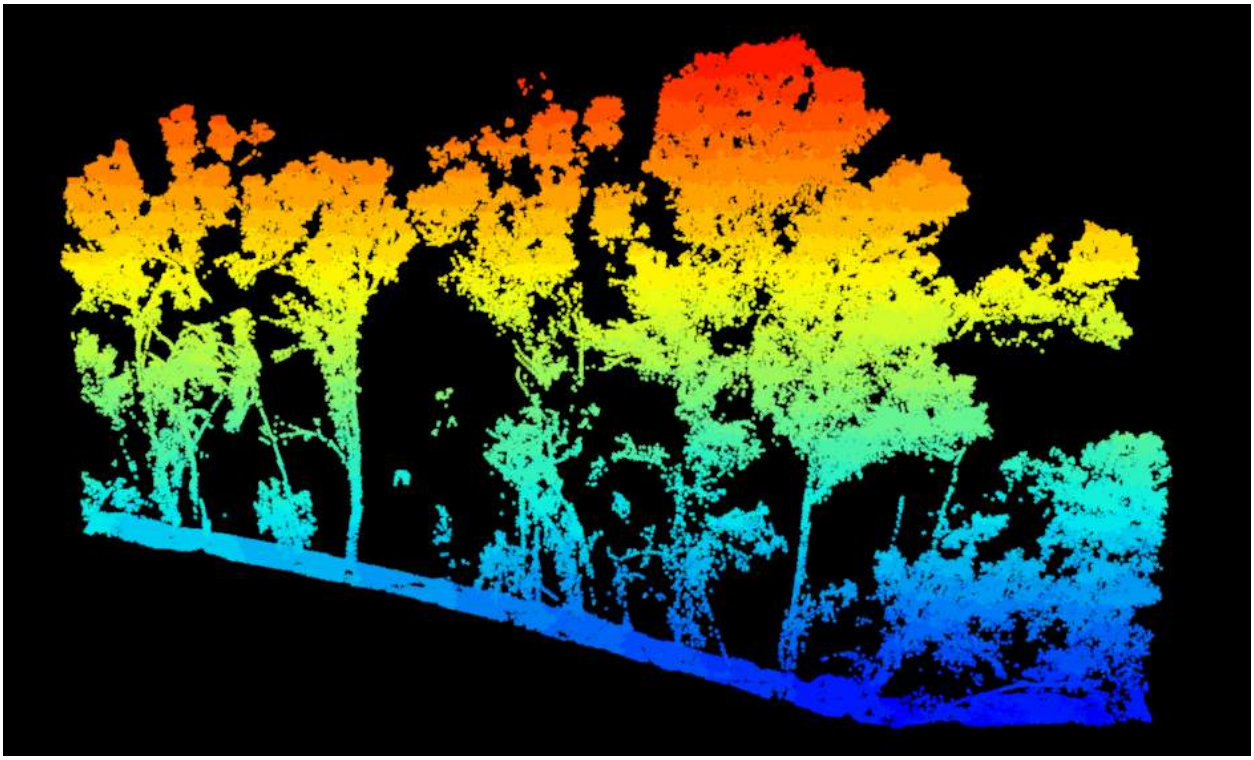


Figure 4: Cross section of the lidar point cloud in Ellwood.

Table 10: ASPRS LAS classification standards applied to the Ellwood dataset.

Classification Number	Classification Name	Classification Description
1	Default/Unclassified	Laser returns that are not included in the ground class, composed of vegetation and anthropogenic features
2	Ground	Laser returns that are determined to be ground using automated and manual cleaning algorithms

3.2 DIGITAL IMAGERY

To produce a normalized multispectral orthomosaic in post-processing it was necessary to take radiance images of a calibration panel with known spectral reflectance in each of the collected spectral bands. These images are then used for spectral reflectance calibration, which normalizes the radiance values across all acquired imagery and calculates resulting reflectance values for each image.

Images of each spectral band were matched to their respective camera station and composited into stacked 5 band images. In Agisoft Metashape, these images were then adjusted and orthorectified using the Lidar-derived ground model to remove displacement effects from topographic relief inherent in the imagery. The resulting orthos were mosaicked and exported. The final mosaic was inspected and edited for seam cutlines across above ground features such as buildings and other man-made features.

4.0 ACQUISITION RESULTS AND ACCURACY ASSESSMENT

4.1 LIDAR DENSITY

The acquisition parameters were designed to acquire an average first-return density of 50 points/m^2. First return density describes the density of pulses emitted from the laser that return at least one echo to the system. Multiple returns from a single pulse were not considered in first return density analysis. Some types of surfaces (e.g., breaks in terrain, water, and steep slopes) may have returned fewer pulses than originally emitted by the laser. First returns typically reflect off the highest feature on the landscape within the footprint of the pulse. In forested or urban areas, the highest feature could be a tree, building or power line, while in areas of unobstructed ground, the first return will be the only echo and represents the bare earth surface.

The density of ground-classified lidar returns was also analyzed for this project. Terrain character, land cover, and ground surface reflectivity all influenced the density of ground surface returns. In vegetated areas, fewer pulses may penetrate the canopy, resulting in lower ground density.

The average first-return density of lidar data for the Ellwood Mesa project was 277.81 points/m^2 (Table 11). The statistical distribution of first return densities per 1 meter x 1 meter cell are portrayed in Figure 5.

Table 11: Average lidar point densities.

Classification	Point Density
First-Return	277.81 points/m^2

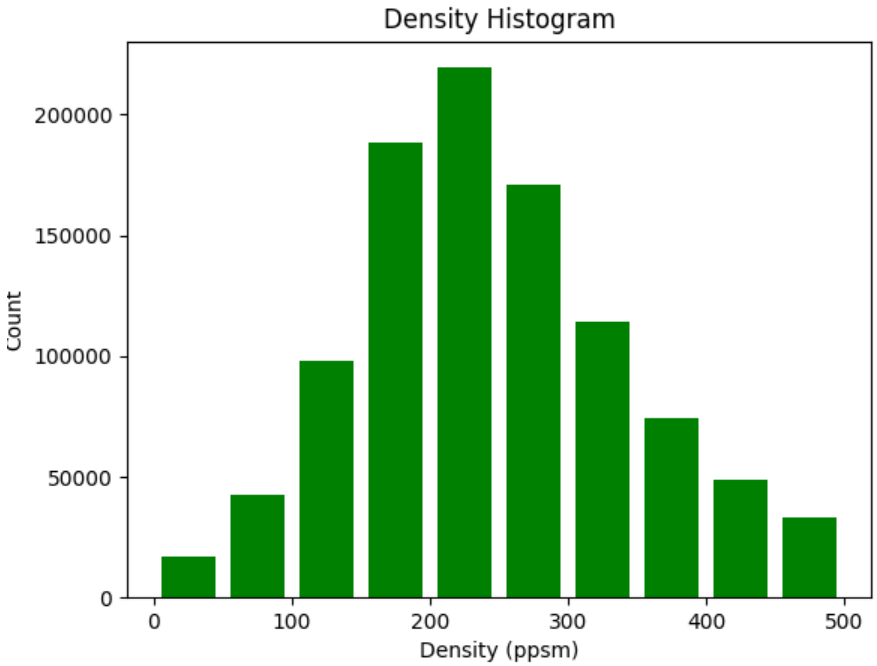


Figure 5: Frequency distribution of first return point density values per 1 x 1 meter cell.

4.2 LIDAR ACCURACY ASSESSMENTS

The accuracy of the lidar data collection can be described in terms of absolute accuracy (the consistency of the data with external data sources) and relative accuracy (the consistency of the dataset with itself). See Acquisition Accuracy Controls for further information on sources of error and operational measures used to improve relative accuracy.

4.2.1 Lidar Non-Vegetated Vertical Accuracy

Absolute accuracy was assessed using Non-Vegetated Vertical Accuracy (NVA) reporting designed to meet guidelines presented in the FGDC National Standard for Spatial Data Accuracy[2]. NVA compares known ground check point data that were withheld from the calibration and post-processing of the lidar point cloud to the triangulated surface generated by the classified lidar point cloud as well as the derived gridded bare earth DEM. NVA is a measure of the accuracy of lidar point data in open areas where the lidar system has a high probability of measuring the ground surface and is evaluated at the 95% confidence interval (1.96 * RMSE), as shown in Table 12.

The mean and standard deviation (sigma σ) of divergence of the ground surface model from quality assurance point coordinates are also considered during accuracy assessment. These statistics assume the error for x, y and z is normally distributed, and therefore the skew and kurtosis of distributions are also considered when evaluating error statistics. For the Ellwood Mesa survey, 41 ground check points were withheld from the calibration and post processing of the lidar point cloud, with resulting non-vegetated vertical accuracy of 0.078 feet compared to classified LAS, and 0.066 feet as compared to the bare earth DEM, with 95% confidence (Figure 6, Figure 7).

Table 12: Absolute accuracy results.

	NVA, as compared to classified LAS	NVA, as compared to bare earth DEM
Sample	41 points	41 points
95% Confidence (1.96*RMSE)	0.078 ft	0.066 ft
Average	-0.015 ft	-0.013 ft
Median	-0.017 ft	-0.012 ft
RMSE	0.040 ft	0.033 ft

[2] Federal Geographic Data Committee, ASPRS POSITIONAL ACCURACY STANDARDS FOR DIGITAL GEOSPATIAL DATA EDITION 1, Version 1.0, NOVEMBER 2014. https://www.asprs.org/a/society/committees/standards/Positional_Accuracy_Standards.pdf.

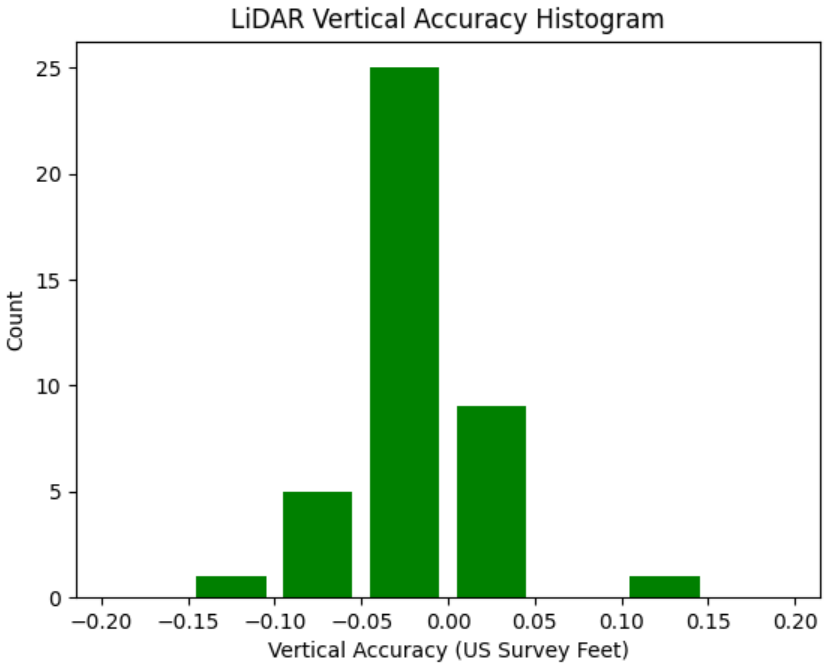


Figure 6: Frequency histogram for lidar classified LAS deviation from ground check point values (NVA).

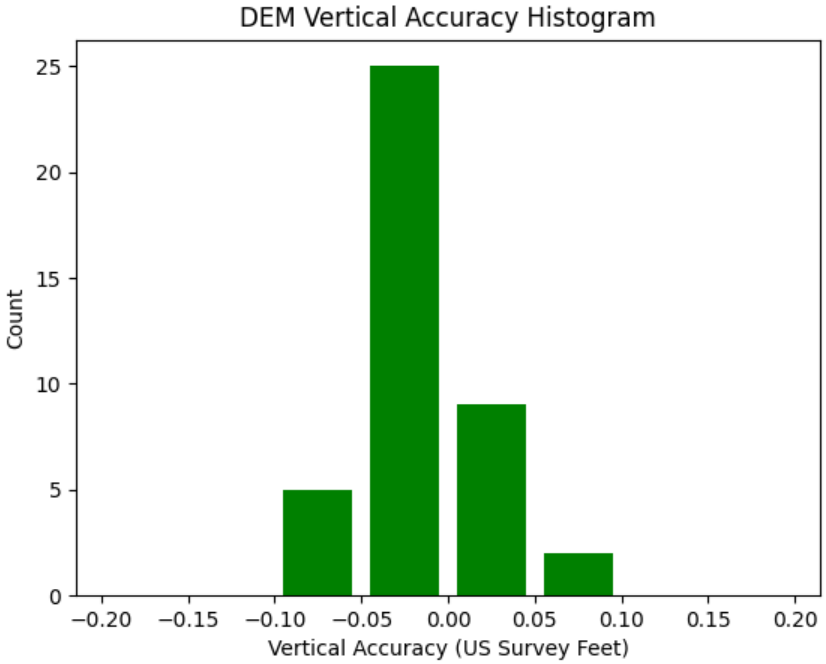


Figure 7: Frequency histogram for the lidar bare earth DEM surface deviation from ground check point values (NVA)

4.2.2 Lidar Relative Vertical Accuracy

Relative vertical accuracy refers to the internal consistency of the data set as a whole: the ability to place an object in the same location given multiple flight lines, GPS conditions, and aircraft attitudes. When the lidar system is well calibrated, the swath-to-swath vertical divergence is low (<0.10 meters). The relative vertical accuracy was computed by comparing the ground surface model of each individual flight line with its neighbors in overlapping regions. The average (mean) line to line relative vertical accuracy for the Ellwood Mesa Lidar project was 0.079 feet (0.024 meters) (Table 13, Figure 8).

Table 13: Relative accuracy results

Relative Accuracy	
Sample	17 surfaces
Average	0.001 ft
Median	0.001 ft
RMSE	0.083 ft
Total Compared Points	6,465,865

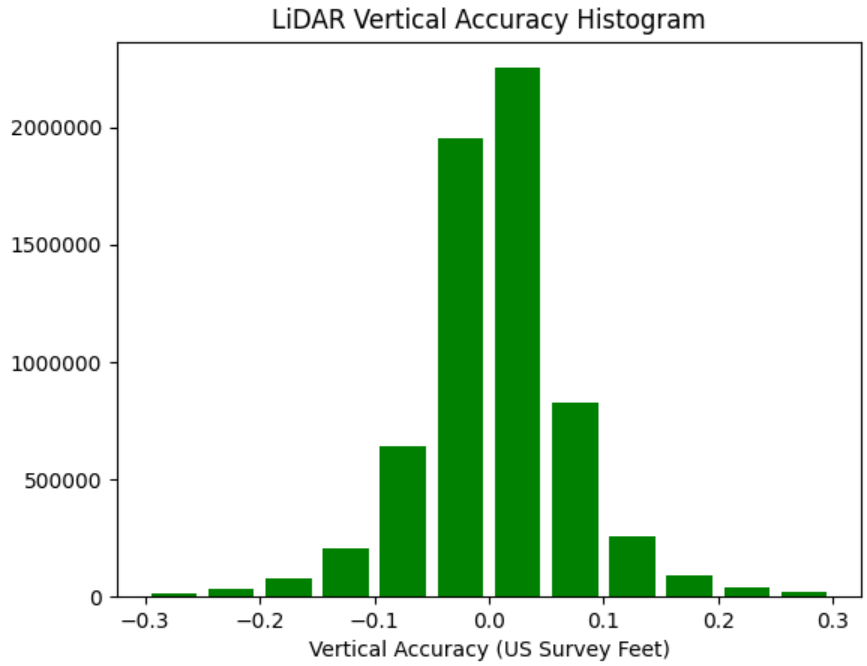


Figure 8: Frequency plot for relative vertical accuracy between flight lines

4.2.3 Lidar Horizontal Accuracy

Lidar horizontal accuracy is a function of Global Navigation Satellite System (GNSS) derived positional error, flying altitude, and INS derived attitude error. The obtained $RMSE_r$ value is multiplied by a conversion factor of 1.7308 to yield the horizontal component of the National Standards for Spatial Data Accuracy (NSSDA) reporting standard where a theoretical point will fall within the obtained radius 95 percent of the time. Based on a flying altitude of 122 meters, an IMU error of 0.016 decimal degrees, and a GNSS positional error of 0.019 meters, this project was compiled to meet 0.36 feet (0.11 m) horizontal accuracy at the 95% confidence level (Table 14).

Table 14: Lidar horizontal accuracy.

Unit	RMSEr	ACCr
Feet	0.21 ft	0.36 ft
Meter	0.06 m	0.11 m

4.3 ORTHOPHOTO ACCURACY

Image accuracy was assessed using the air target points from the aerial triangulation procedure. Image accuracy results are shown in Figure 9 and Table 15.

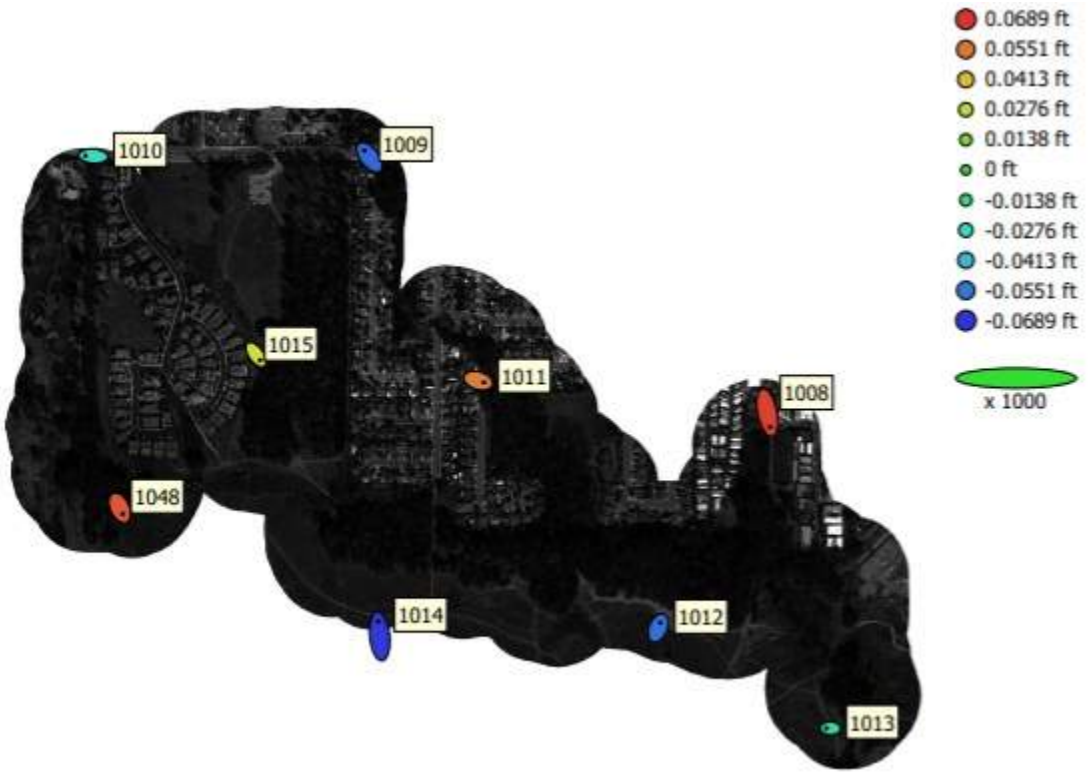


Figure 9: Map of orthophoto accuracy assessments.

Table 15: Orthophotography accuracy statistics for Ellwood Mesa.

Count	X Error (ft)	Y Error (ft)	Z Error (ft)	XY Error (ft)	Total (ft)
9	0.0541056	0.0969402	0.0521177	0.111017	0.122642

4.3.1 Ground Control

Air target points from the aerial triangulation adjustment are listed with their location and residuals in Table 16.

Table 16: Location of air target check points withheld from aerial triangulation adjustment.

Label	X Error (ft)	Y Error (ft)	Z Error (ft)	Total (ft)	Image (pix)
1008	0.035652	-0.176307	0.0661093	0.191639	6.390 (17)
1009	-0.0633332	0.0813204	-0.0578349	0.11819	10.845 (8)
1010	-0.0950713	0.00616302	-0.028731	0.0995088	6.922 (8)
1011	0.070953	-0.0208685	0.0536556	0.0913714	5.937 (11)
1012	0.0282189	0.0662476	-0.0564813	0.0915161	26.104 (9)
1013	-0.046341	0.00135106	-0.0213413	0.0510369	29.024 (8)
1014	-0.0175511	0.178497	-0.0674167	0.19161	23.088 (8)
1015	0.0499553	-0.0690696	0.0321876	0.0911163	7.289 (8)
1048	0.0352748	-0.0733733	0.0616433	0.102117	16.989 (8)
Total	0.0541056	0.0969402	0.0521177	0.122642	16.189

4.3.2 Anomalies and Misfits

No anomalies or misfits detected.

4.4 ACQUISITION ACCURACY CONTROLS

Relative Accuracy Calibration Methodology:

Manual System Calibration: Calibration procedures for each mission require solving geometric relationships that relate measured swath-to-swath deviations to misalignments of system attitude parameters. Corrected scale, pitch, roll and heading offsets were calculated and applied to resolve misalignments. The raw divergence between lines was computed after the manual calibration was completed and reported for each survey area.

Automated Attitude Calibration: All data were tested and calibrated using TerraMatch automated sampling routines. Ground points were classified for each individual flight line and used for line-to-line testing. System misalignment offsets (pitch, roll and heading) and scale were solved for each individual mission and applied to respective mission datasets. The data from each mission were then blended when imported together to form the entire area of interest.

Automated Z Calibration: Ground points per line were used to calculate the vertical divergence between lines caused by vertical GPS drift. Automated Z calibration was the final step employed for relative accuracy calibration.

Table 17: Lidar accuracy error sources and solutions.

Type of Error	Source	Post Processing Solution
GPS (Static/Kinematic)	Long Base Lines	None
GPS (Static/Kinematic)	Poor Satellite Constellation	None
GPS (Static/Kinematic)	Poor Antenna Visibility	Reduce Visibility Mask
Relative Accuracy	Poor System Calibration	Recalibrate IMU and sensor offsets/settings
Relative Accuracy	Inaccurate System	None
Laser Noise	Poor Laser Timing	None
Laser Noise	Poor Laser Reception	None
Laser Noise	Poor Laser Power	None
Laser Noise	Irregular Laser Shape	None

Operational measures taken to improve relative accuracy:

Low Flight Altitude: Terrain following was employed to maintain a constant above ground level (AGL). Laser horizontal errors are a function of flight altitude above ground (about 1/3000th AGL flight altitude).

Focus Laser Power at narrow beam footprint: A laser return must be received by the system above a power threshold to accurately record a measurement. The strength of the laser return (i.e., intensity) is a function of laser emission power, laser footprint, flight altitude and the reflectivity of the target. While surface reflectivity cannot be controlled, laser power can be increased and low flight altitudes can be maintained.

Reduced Scan Angle: Edge-of-scan data can become inaccurate. The scan angle was reduced to a maximum of ±45° from nadir, creating a narrow swath width and greatly reducing laser shadows from trees and buildings.

Quality GPS: Flights took place during optimal GPS conditions (e.g., 6 or more satellites and PDOP [Position Dilution of Precision] less than 3.0). Before each flight, the PDOP was determined for the survey day. During all flight times, a dual frequency DGPS base station recording at 1 second epochs was utilized and a maximum baseline length between the aircraft and the control points was less than 13 nm at all times.

Ground Survey: Ground survey point accuracy (<1.5 cm RMSE) occurs during optimal PDOP ranges and targets a minimal baseline distance of 4 miles between GPS rover and base. Robust statistics are, in part, a function of sample size (n) and distribution. Ground survey points are distributed to the extent possible throughout multiple flight lines and across the survey area.

50% Side-Lap (100% Overlap): Overlapping areas are optimized for relative accuracy testing. Laser shadowing is minimized to help increase target acquisition from multiple scan angles. Ideally, with a 50% side-lap, the nadir portion of one flight line coincides with the swath edge portion of overlapping flight lines. A minimum of 50% side-lap with terrain-followed acquisition prevents data gaps.

Opposing Flight Lines: All overlapping flight lines have opposing directions. Pitch, roll and heading errors are amplified by a factor of two relative to the adjacent flight line(s), making misalignments easier to detect and resolve.

5.0 ANALYTICAL METHODOLOGY

The goal of the analytical portion of this project is to create lidar derived products that support the management of the Ellwood Mesa eucalyptus stand and the characterization of monarch butterfly habitat within the project area. Three products were identified and designed to meet these needs: lidar point density profiles for ladder fuel management, standing dead and downed woody debris identification to guide dead material removal and plan replanting, and simulated fisheye photos from the lidar point cloud to support monarch habitat characterization throughout the eucalyptus stand.

5.1 LIDAR POINT DENSITY PROFILES

To assess the prevalence and location of ladder fuels along the boundary of the eucalyptus grove and the nearby structures in the Ellwood Mesa site, point density profiles were generated from the lidar point cloud. Point density profiles highlight the location of dominant, subdominant, and understory vegetation by dividing the above ground space within the AOI into height profiles or slices and measuring the number of lidar returns within each profile. The density profiles generated for this project can be used to map ladder fuels near buildings as well as clumps and gaps of canopy cover within the eucalyptus grove.

Prior to generating the point density profiles, the point cloud was height normalized. Height normalization creates a point cloud where all ground returns have an elevation of 0 and the elevation of all features captured in the point cloud have heights relative to ground level. The height normalized point cloud was then filtered to remove ground classified points and sliced into 1-meter tall height slices (or profiles). The percentage of points within the profile range compared to the total number of points within the pixel footprint were summarized by pixel. Functionally this is a representation of the relative point density within each 1-meter voxel that covers the area of interest. This dataset shows where returns are located within the specified height ranges so that ladder fuels can be identified or gaps in forest cover can be targeted for planting.

5.1.1 Products

A 37-layer raster product (at 1-meter resolution) was needed to fully characterize the height variability in the point cloud. Each layer, one through thirty-seven, was populated with a percentage of the total points captured in that 1-meter cube (or voxel) relative to all returns present in its respective vertical point cloud column. A refined area of interest was used in the ladder fuels assessment to target areas that are close to structures and require management to reduce wildfire risk. The ladder fuels AOI is shown in Figure 10. Each point density profile raster was summarized to the gridded polygons of the ladder fuels AOI to represent the mean point density of each polygon for all 37 density profiles (Figure 11). The summarized ladder fuels AOI can be used to identify regions of the AOI that may need management for fire risk.

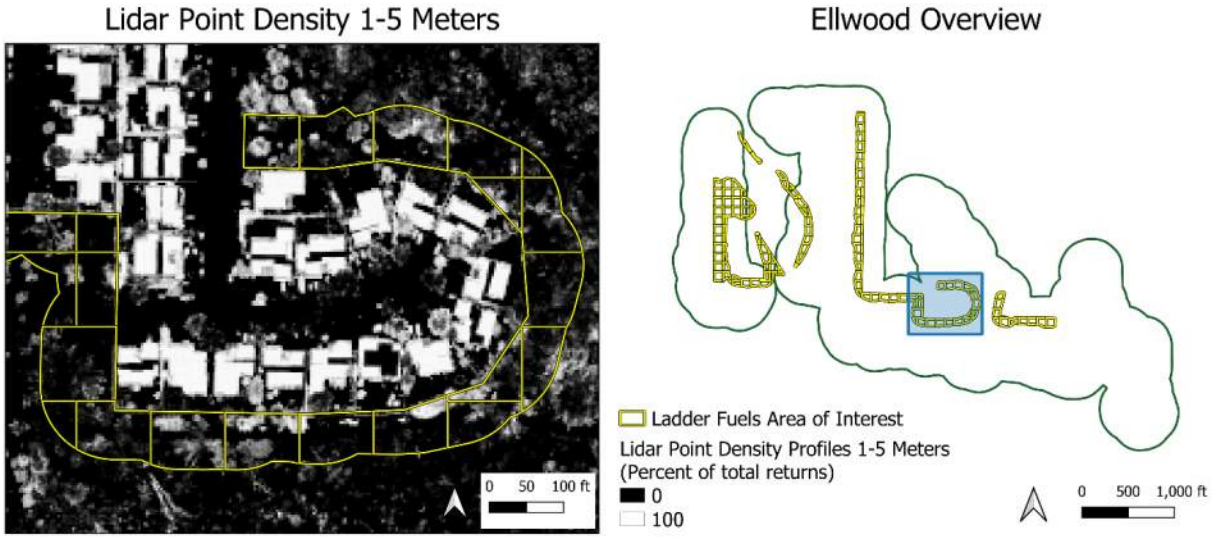


Figure 10: [Left] Demonstration of lidar point density percentage from 1-5 meters above ground. Houses, shrubs, leaning eucalyptus stems, and the lower levels of the tree canopy are visible in this map. [Right] Ladder fuels AOI within the Ellwood project area.

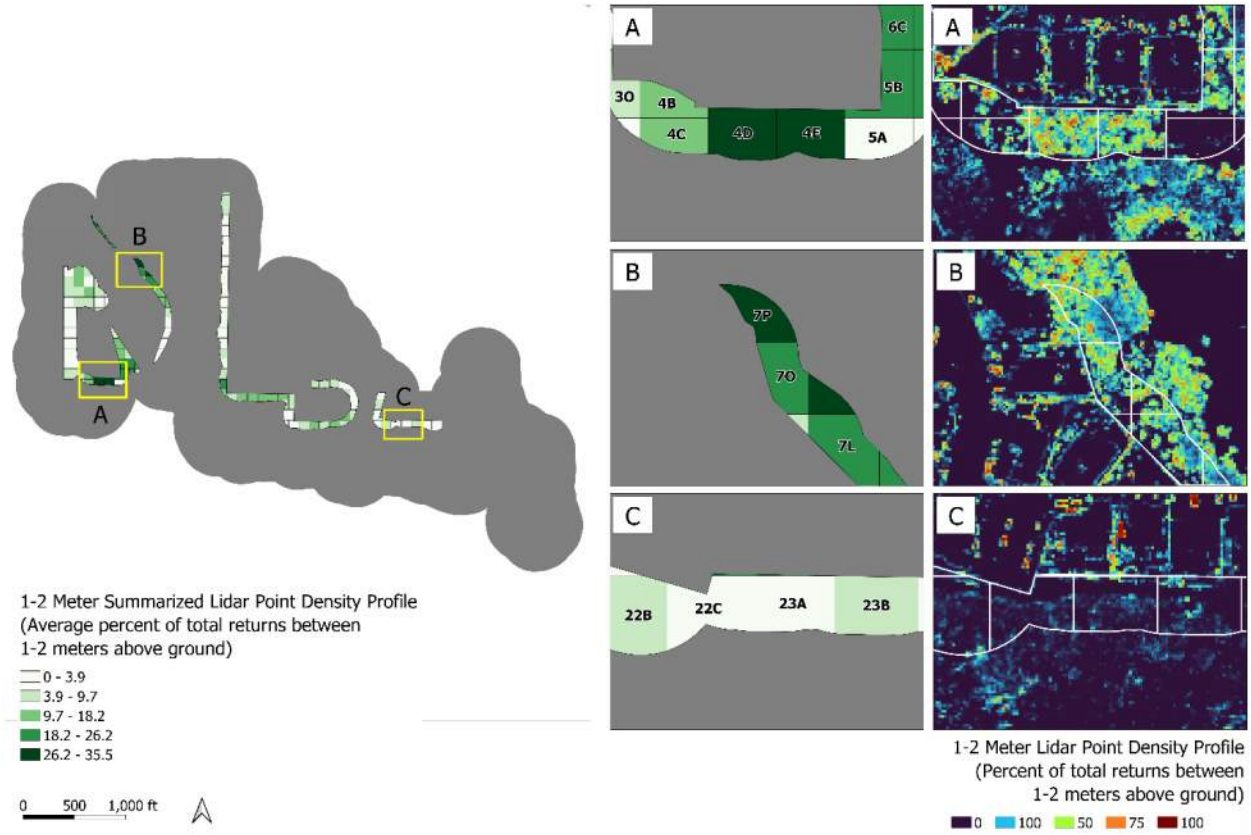


Figure 11: Summarized ladder fuels AOI showing average lidar point density for the 1-2 meter profile.

The lidar point density deliverable dataset allows a user to peel back layers of the point cloud to identify where ladder fuels may be present within the forest. Figure 12 provides a comparison between the canopy height model and the individual density profiles to demonstrate the concept of looking through the canopy to the inner layers of the point cloud. In the map shown at the top of Figure 12 the canopy height model showcases the upper canopy layers, rooftops, and exposed ground locations. A canopy height model shows a surface model of the highest returns captured in the height normalized point cloud. The first density profile layer (second from the top in Figure 12) represents the proportion of lidar returns present from 0-1 meter above ground and excludes lidar

returns that are classified as ground. This layer shows where low lying vegetation is present and shows values near 100 in regions where no lidar points are obscured by taller features like houses or canopy. The next two density profile layers shown in Figure 12 demonstrate where lidar point returns are located for the 1-2 meter profile and the 2-3 meter profile, respectively. In the 1-2 meter profile, returns from fences, shrubs, and leaning debris are visible. In the 2-3 meter profile, returns begin to capture roof edges and taller shrub features. Figure 13 shows an overview of the point density profile rasters for the lowest six point density profile layers (0-1 meters, 1-2 meters, 2-3 meters, 4-5 meters, and 5-6 meters).

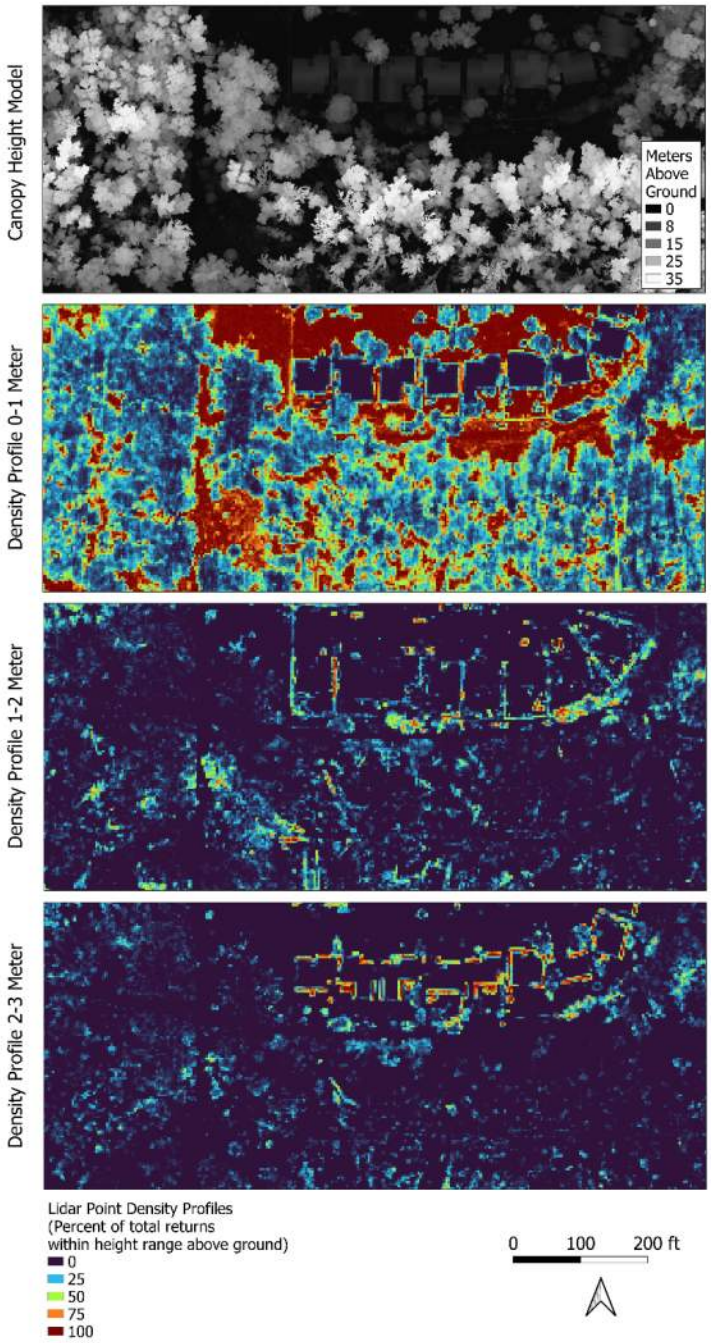


Figure 12: Map displaying lidar point density profiles for an example region of Ellwood. Top to bottom: Canopy Height Model shows a surface model of the highest returns captured in the height normalized point cloud. The density profiles from 0-1 meters above ground, 1-2 meters above ground, and 2-3 meters above ground, respectively.

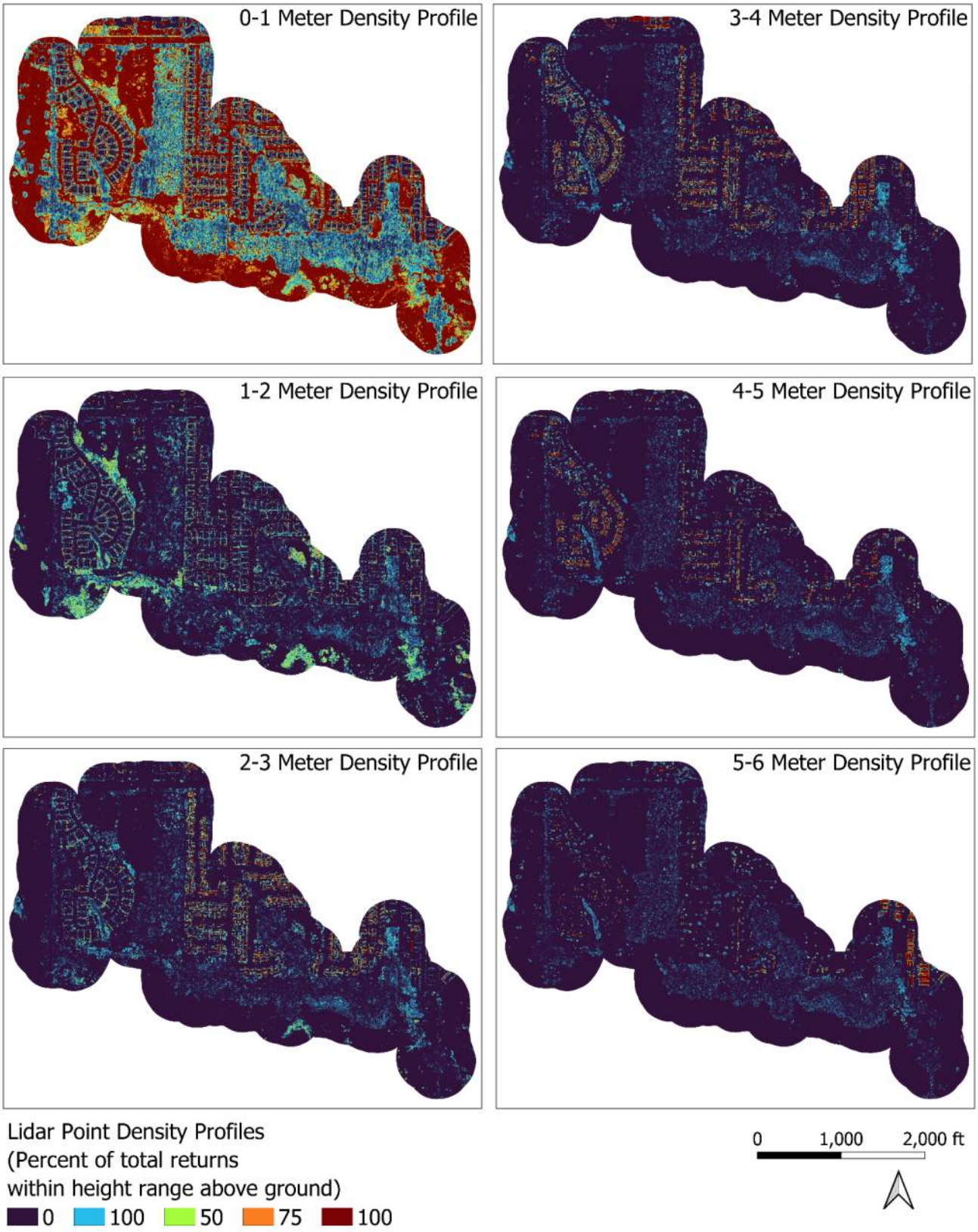


Figure 13: Overview of lidar point density profile rasters for the Ellwood Mesa AOI. Top to bottom and left to right: 0-1 meter density profile, 1-2 meter density profile, 2-3 meter density profile, 3-4 meter density profile, 4-5 meter density profile, and 5-6 meter density profile.

5.2 STANDING DEAD AND DOWNED WOODY DEBRIS CLASSIFICATION

Standing dead trees and downed woody debris were identified in this project to support forest rehabilitation, fire risk mitigation, maintenance, and safety within the Ellwood project area. Deliverable products related to the identification of dead material within the AOI were designed to provide mapped locations and volume estimates of dead material to aid in the planning and execution of hazard removal.

The standing dead and downed woody debris classification was implemented using imagery and lidar derived inputs in three main phases: an intermediate classification of woody material lidar returns, spectral classification of standing dead trees, and a threshold-based classification of downed woody debris with manual review. Downed woody debris is considered to be dead tree material within 0.5-3.5 feet (approximately 0.15-1 meters) above ground level. Any dead material identified higher than 3.5 feet above ground level was considered to be standing dead material.

5.2.1 Woody Material Identification

A preliminary step involved in the classification of the lidar point cloud for standing and downed dead material was a filtering process used to isolate woody material lidar returns, such as tree stems and branches. The lidar point cloud was filtered using non-ground lidar returns, lidar return intensity, and eigen values relating each point to its five nearest neighbors. Lidar returns identified as woody material in this process were classified as class 67. Standing dead material and downed woody debris were classified from this subset of woody material classified points. The woody material filtering procedure was very influential in the classification of standing dead and downed trees because it reduced the false positive classification of leafy material near dead trees.

The woody material class (67) is considered an intermediate classification because it was not manually edited or evaluated after assignment. The classification procedure was tuned to the specific attributes of the Ellwood lidar dataset and is expected to contain false positive and false negative classifications. The woody material classification was retained in the final deliverable dataset to support future analysis by the client, and it should be evaluated for appropriateness of use prior to inclusion in any additional work.

5.2.2 Standing Dead

The standing dead classification was focused on identifying and quantifying the volume of standing dead trees. To perform the standing dead classification, a model was trained to identify dead trees represented in the orthoimagery. Dead trees were identified as lacking green and leafy material. They are characterized by exposed branches and light and brown colored returns from the stem and branch structures. The full spectrum of potential tree health statuses were not considered in this process, a binary live or dead classification scheme was used.

Spectral training points were selected by a photo interpreter and used to build a random forest model. The five imagery bands (R, G, B, NIR, Red edge) and additional spectral indices were incorporated as predictor variables. Once the model was applied across the area of interest, the results were vectorized, manually reviewed, and edited where necessary. Upon finalization of the two-dimensional standing dead vector layer, the classification was applied to the lidar point cloud, converting any points greater than 3.5 feet above ground and classified as 67 into class 65: standing dead material. Figure 14 shows a map of standing dead features identified in the orthoimagery and Figure 15 shows a map of the identified standing dead trees within the Ellwood Mesa project area.

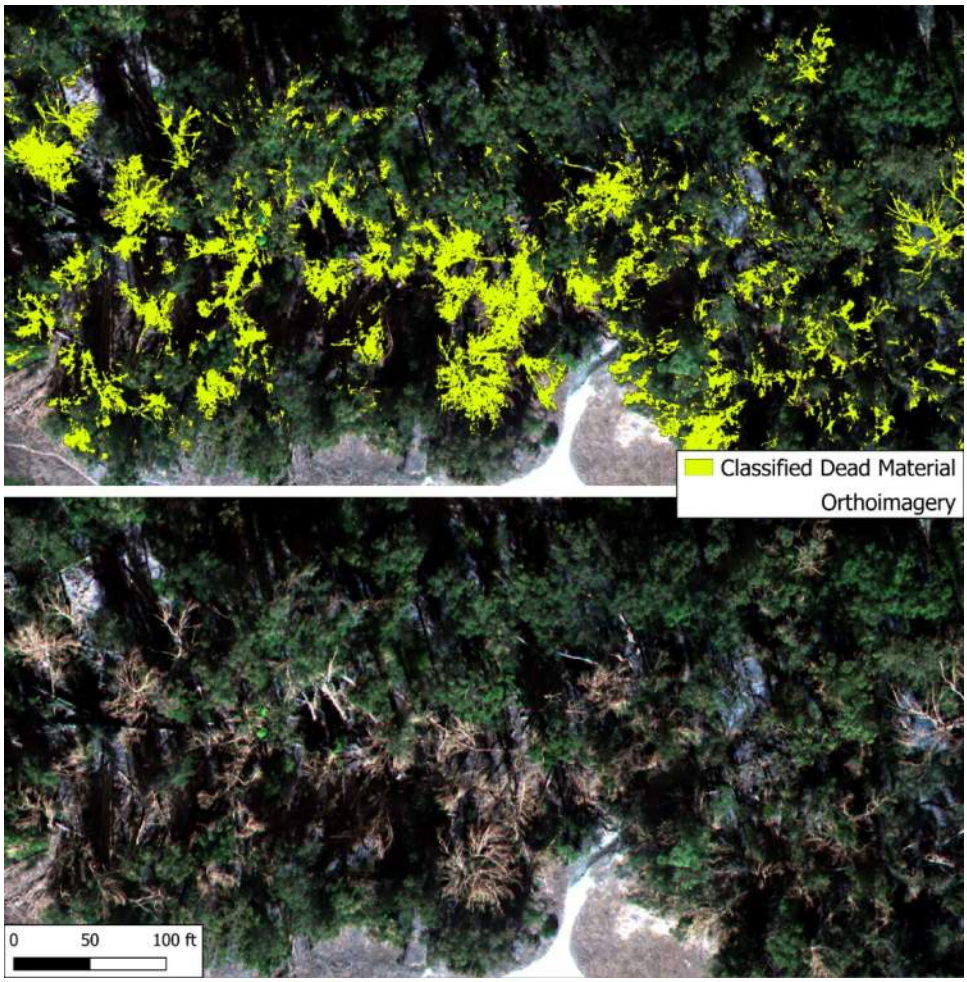


Figure 14: Example of dead trees identified in the orthoimagery.



Figure 15: Mapped results of the identified standing dead trees within the Ellwood area of interest.

5.2.3 Downed Woody Debris

The process for classifying downed woody debris was built upon the woody material classification described in Section 5.2.1. After the lidar point cloud was processed to identify woody material, all woody material returns (class 67) between 0.5 feet and 3.5 feet above the ground were reclassified as downed woody debris (class 64). The regions of classified downed woody debris were then extracted and manually edited. Manual review of the downed woody debris classification focused on reducing the false positive classification of shrubs and bushes and filling in gaps of downed stems and branches. Fine resolution vegetation density profiles were used to aid in the digitization of downed woody debris to visualize the forest floor through the canopy. The edited downed woody debris identification layer was then applied to lidar returns between 0.5 and 3.5 feet tall to create the final downed woody debris classification (class 64). Figure 16 shows a map of the identified downed woody debris within the Ellwood Mesa project area.

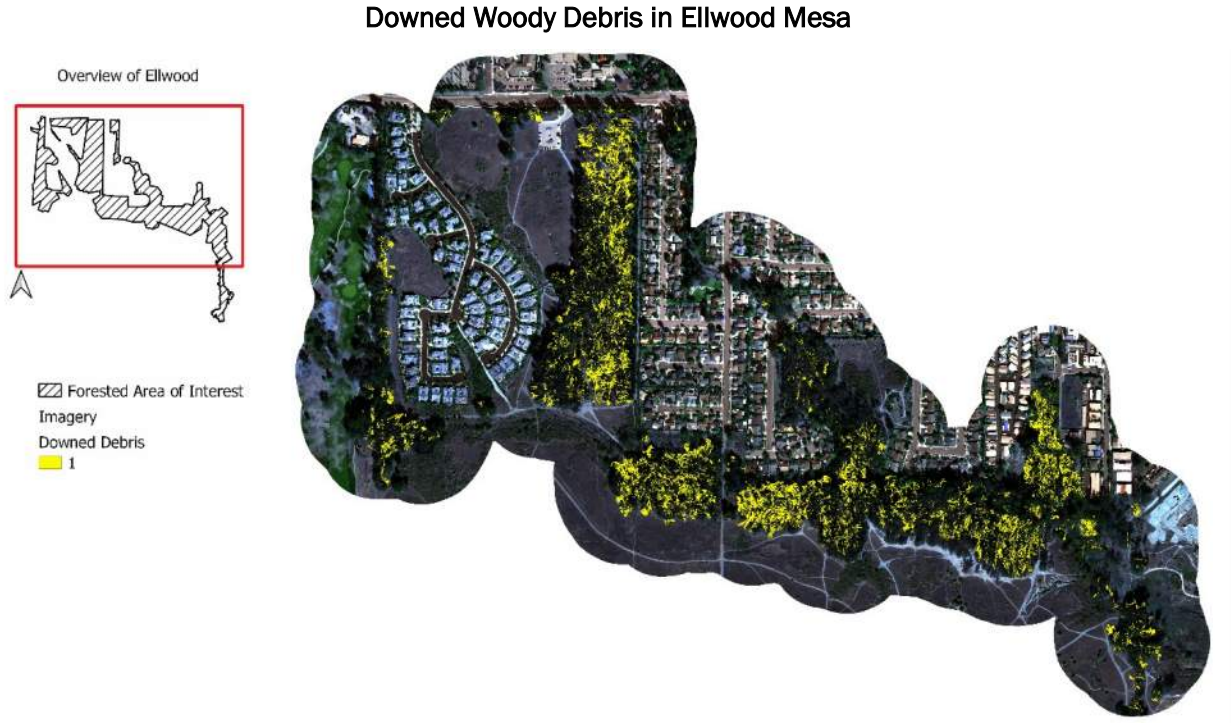


Figure 16: Mapped results of the identified downed woody debris within the Ellwood area of interest.

5.2.4 Dead Material Volume Estimates

Dead material volume estimates were generated from the classified lidar point cloud using voxels to estimate the area occupied by standing dead trees or downed woody debris. Voxelization of the lidar point cloud converts the point returns into 3-dimensional cubes of a user defined size. Multiple lidar returns can occupy one voxel, and all points are represented by a voxel. A six-inch voxel size was used for volume estimation for the Ellwood project because it created realistic visualizations of the point cloud that did not overinflate the areas represented by the stems in this forest. Figure 17 shows examples of the voxelized downed woody debris for a lidar tile to highlight the impact of voxel size on the overall volume estimate. A 12-inch voxel size creates a wood volume model treats every stem as at least 12 inches in diameter. This is not realistic for the eucalyptus trees within the Ellwood project area.

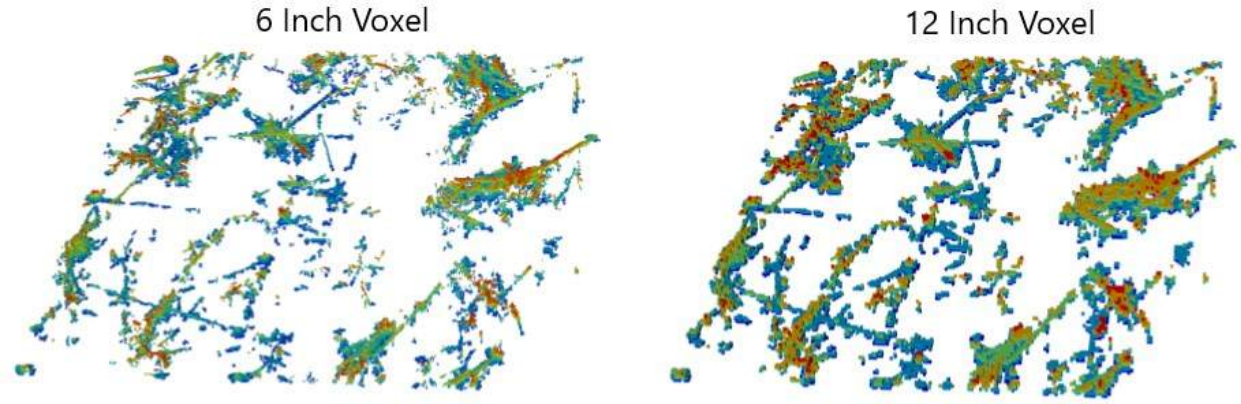


Figure 17: Voxel representations of classified downed woody debris for a lidar tile. A six-inch voxel size is shown on the left and a 12-inch voxel size is shown on the right. Voxel visualizations are colored by elevation above ground. Cool colors represent features closer to ground level, while warmer colors represent features farther from the ground.

5.2.5 Products

The primary deliverable products for this dead wood classification analysis are geospatial rasters representing the mapped location and voxel count of the downed woody debris and standing dead tree classifications. A raster format was chosen to offer flexible visualization of the project results and the potential for custom summarization of specific areas of interest within the larger project area. To calculate the volume of standing dead or downed woody debris for a specific region of Ellwood, the sum of the pixel values within that geographic region (the total number of classified voxels) should be calculated and multiplied by 0.125 to measure the cubic footage of dead material (either standing dead or downed woody debris depending on which raster is being summarized). The total volume of standing dead trees within the Ellwood project area is estimated to be 222,953 cubic feet and the total volume of downed woody debris within the Ellwood project area is estimated to be 207,252 cubic feet. Figure 18, Figure 19, Figure 20, and Figure 21 show examples of the raster-based dead wood volume deliverables created for the Ellwood project area.



Figure 18: Standing dead volume raster for an example region of Ellwood. The raster visualization is colored by the number of voxels representing standing dead material within a given pixel footprint.



Figure 19: Downed woody debris volume raster for an example region of Ellwood. The raster visualization is colored by the number of voxels representing standing dead material within a given pixel footprint.



Figure 20: Standing dead volume raster for an example region of Ellwood. The raster visualization is colored by the number of voxels representing standing dead material within a given pixel footprint.



Figure 21: Downed woody debris volume raster for an example region of Ellwood. The raster visualization is colored by the number of voxels representing standing dead material within a given pixel footprint.

The downed woody debris and standing dead tree raster products were generated from the classified and voxelized point cloud results. To support further modeling and analysis in the Ellwood Mesa project area the classified lidar point cloud was also delivered to the client. The classification scheme for the delivered point cloud is outlined in Table 18. Class 67 was used as an intermediate classification for identifying woody material (as outlined in Section 5.2.1). However, it was not specifically tuned for accuracy beyond its needs for the dead material classification and should be evaluated for appropriateness of use prior to inclusion in any additional analyses. Figure 22 shows an example tile of the classified point cloud displaying only the standing dead and downed woody debris for a particularly unhealthy region of the project area.

Table 18: Las classification scheme.

Classification	Definition
1	Unclassified Points
2	Ground
64	Standing Dead (Z > 3.5 ft)
65	Downed Dead (Z <= 3.5 ft)
67	Woody Returns

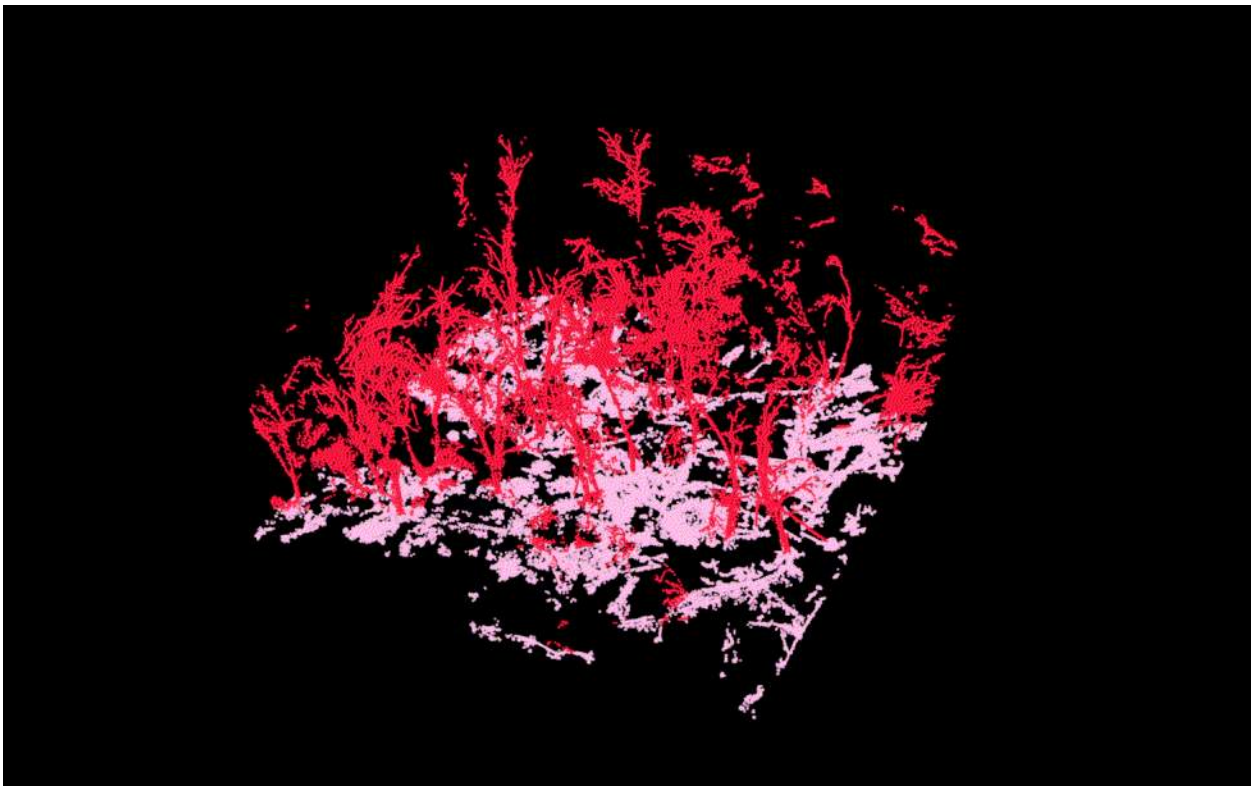


Figure 22: Example image of the classified lidar point cloud showing the identified standing dead material and downed woody debris for a particular unhealthy region of the Ellwood project area.

5.3 FISHEYE PHOTO SIMULATION FROM THE LIDAR POINT CLOUD

Simulated fisheye photos were targeted as deliverables for this project in order to supplement field collected photos and support seamless quantification of solar exposure and potential wind penetration within the Ellwood eucalyptus stand. Historically, monarch habitat suitability has been assessed at this site and others using fisheye photos processed with Hemiview software to characterize the canopy gap fraction and quantity and quality of light penetration into the canopy. Appropriate wind shelter and solar exposure are important elements of quality monarch habitat. Exhaustive fisheye photography field campaigns are limited by resource availability and by the physical limitations of camera placement positions. Simulated photos allow the photo point of view to be placed anywhere in x, y, and z space within the project area. This creates the potential for photos to be simulated in the middle of the canopy at monarch cluster locations or throughout the canopy to measure how canopy closure changes at different heights above ground. NV5G's current investigation into simulated fisheye photos from a lidar point cloud is being complemented by an investigation into drone spherical photography by Althouse and Meade, Inc.

Fisheye photographs were collected and provided to NV5G by the client in designated field plots across the Ellwood project area. Photos were taken on a tripod approximately 5 feet tall and image locations were recorded using GPS. For each of the field photos, a lidar derived simulated photo was

created to facilitate comparison and evaluation of performance for the simulated photos. A prerequisite to simulating the fisheye photo in each plot, was to adjust for GPS error and ensure that photo locations were geolocated accurately and that features in the lidar matched with features captured in the field photographs.

5.3.1 Plot Adjustments

Thirty field plots were collected throughout the Ellwood project area by Stu Weiss, Creekside Science, and his team. For each plot, the plot center was flagged 2 meters south of a central reference tree and its GPS location was recorded. Then dominant trees within a 1/10th acre plot were selected and their distance and azimuth from plot center were measured. Additional information about these trees was also recorded, such as diameter at breast height, species, total height, crown condition, and health. A fisheye photo was also collected at each plot center location.

Manual adjustment of the plot geolocation was necessary to align the field collected data to the features captured in the lidar point cloud. Plot adjustment corrects for GPS error that occurs during field collection and allows for precise alignment of lidar derived products with features on the ground. To perform plot adjustments, the 3-5 dominant reference trees collected for each plot were projected around the plot center using the measured distances and azimuths to create tree constellations. The tree constellations were then used to perform plot location adjustments by matching the arrangement and heights of reference trees to features seen in the lidar point cloud. Plot adjustments were tested by simulating fisheye photos at the adjusted locations and visually comparing the simulated photos with photos captured in the field. The same forest features (presence or absence of trees and patterns of view to sky) are expected to be seen in both the field and simulated photographs. Table 19 contains the plot adjustment changelog with the calculated bearings and distances of each plot adjustment. The most extreme adjustment in terms of distance moved was approximately 50 feet (Plot Number 5), however average adjustments were roughly 17 feet. Five of the thirty reference plots could not be confidently matched with the lidar features. Plots typically could not be aligned with the point cloud features due to high forest density in the region the plot was taken, or due to a small number of reference trees collected. In these cases, the reference tree patterns and heights were not unique enough to identify within the point cloud data.

Table 19: Plot adjustment change log. Bearings are recorded in degrees from North and distances are recorded in feet to match the project projection units.

Plot Number	Bearing (degrees)	Distance (feet)	Comment
1	58	17.7	-
2	345	0.89	-
3	64	4.83	-
4	184	9.69	-
5	199	57.46	-
6	180	3.77	-
7	328	20.02	-
8	244	30.05	-
9	114	13.63	-
10	149	4.66	-
11	198	27.25	-
12	213	12.04	-

Plot Number	Bearing (degrees)	Distance (feet)	Comment
13	199	7.02	-
14	220	7.73	-
15	43	33.45	-
16	120	33.35	-
17	16	20.62	-
18	190	12.47	-
19	181	26.75	-
20	22	10.46	Unable to confidently match plot with point cloud features
21	309	24.84	Unable to confidently match plot with point cloud features
22	153	4.31	-
23	44	11.75	-
24	205	2.08	Unable to confidently match plot with point cloud features
25	200	3.79	Unable to confidently match plot with point cloud features
26	168	18.78	-
27	198	29.48	-
28	180	7.09	-
29	350	29.16	-
30	97	15	Unable to confidently match plot with point cloud features

5.3.2 Photo Simulation

Simulated fisheye photos were created from the lidar point cloud by spherically projecting the point cloud, converting the points to voxels, flattening the image, and enforcing its orientation. Simulated photos were designed to contain equiangular distortion and a 180-degree viewing angle that matches the lens information provided by Stu Weiss, Creekside Science. The fisheye photo simulation procedure is built around the location of the target point of view. The point of view represents the simulated camera location and can be placed anywhere within the point cloud along the x, y, and z axes. For a given point of view, a subset of the full point cloud is extracted with the point of view at its center. Equiangular distortion of the simulated image is achieved by projecting the target point cloud to a sphere (Figure 23 and Figure 24A). The 180-degree viewing angle is achieved by cropping the projected point cloud at a height equal to the sphere's center location (the location of the point of view) (Figure 24B). The upper hemisphere of the point cloud is then rotated and aligned so that the point of view is rendered looking up to the sky with North at the top of the simulated image. The point cloud is then voxelized in order to determine which pixels of the simulated photo are blocked by forest features and which have a clear view to sky (Figure 24C).

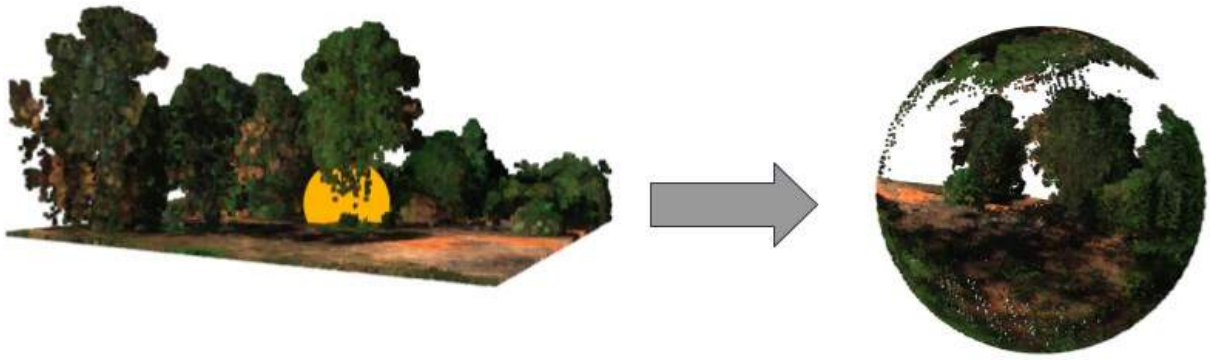


Figure 23: An example of a point cloud projected to a sphere. The yellow sphere located in the center of the unmodified point cloud (left) represents the center of the sphere and the point of view for the simulated photo.

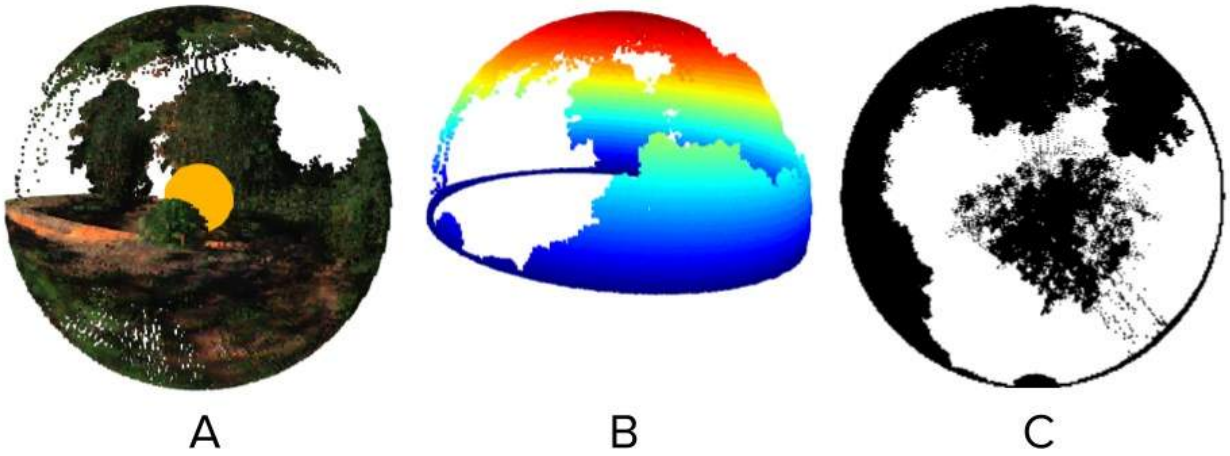


Figure 24: (A) Projected Point Cloud: An example of a point cloud projected to a sphere. The small yellow sphere located in the center of the projected point cloud represents the center of the projection sphere and the point of view for the simulated photo. (B) Cropped Projected Point Cloud: The projected point cloud cropped at the height of the point of view. (C) Point of View Enforced Simulated Photo: The cropped point cloud is viewed from below and the orientation of the photo is enforced to ensure that North is on top.

Point cloud projection and voxelization parameters were tested by simulating fisheye photos with varying tile sizes, radii for spherical projection, and voxel sizing. A sphere radius of 400 feet with a voxel size of 2 feet was selected to most closely approximate the look and feel of field photographs based on visual interpretation (Figure 25). In order to balance memory limitations and feature inclusion, a lidar tile size of 400 feet was selected as the input data extent for each simulated photograph. Figure 26 demonstrates examples of three different tile sizes that were tested for this project. As the tile size increases, more distant features are included in the simulated photo and the number of lidar points used to build the image increases. As a result, more pixels of the fisheye photo along the image perimeter are obscured. This effect is demonstrated by the increase in dark pixels along the bottom left of each simulated photo shown in Figure 26 where tile size increases by 200 feet in each simulation from left to right.

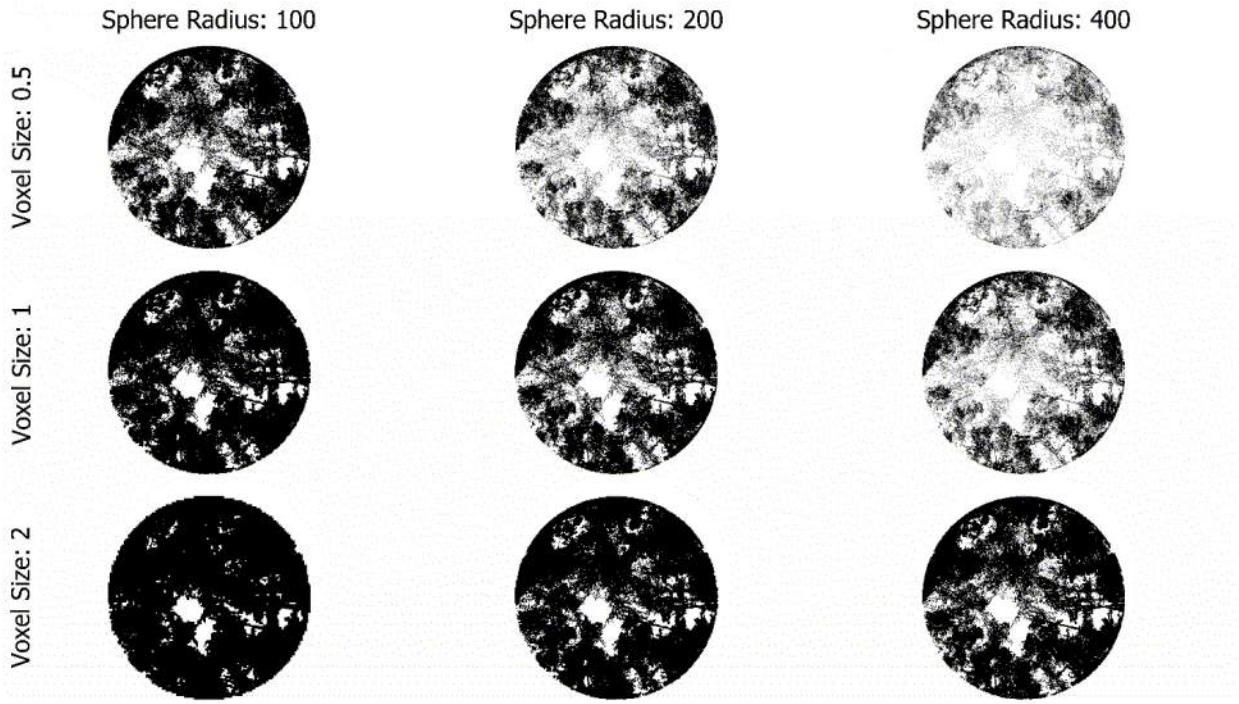


Figure 25: Image matrix showing various sphere radius and voxel size pairs. The selected parameters with the best look and feel compared to field photographs was a 400 foot radius and 2 foot voxel size (shown in the bottom right).

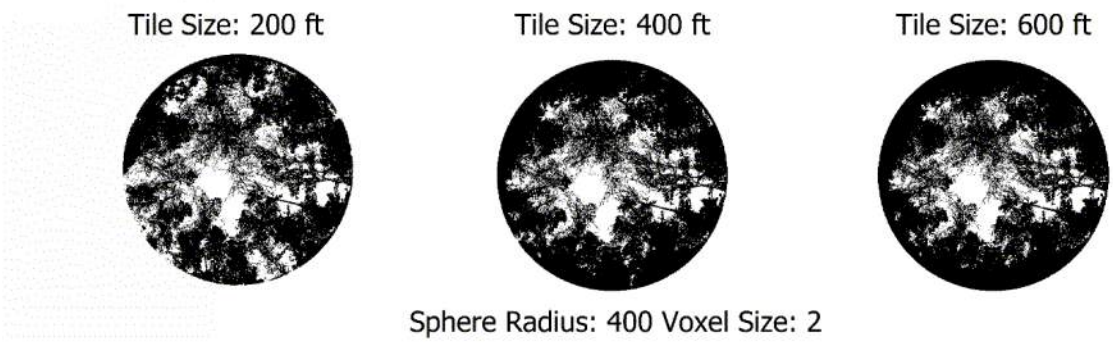


Figure 26: Image matrix showing how the input data tile size changes the resulting simulated image. A tile size of 400 feet was selected to balance the inclusion of features represented in the image and memory limitations.

5.3.3 Products

Products created during the fisheye photo simulation procedure include jpeg images representing simulated hemispherical photography with a 180-degree viewing angle and equiangular distortion. Fisheye photos were simulated from the lidar point cloud at multiple locations throughout the Ellwood project area. Photos were simulated in a location that matched each field plot center with a point of view at 1.75 meters above ground, 5 meters above ground, and 10 meters above ground. Photos were also simulated at all historical monarch cluster locations the client had documented. Monarch cluster photos were simulated with points of view between 20 and 60 feet above ground depending on the recorded height of the monarch cluster.

5.3.3.1 Fisheyes for Field Plots

Fisheye photos were simulated at each field plot center at multiple points of view (POV).

- POV 1.75 meters above ground – 30 photos

- POV 5 meters above ground – 30 photos
- POV 10 meters above ground – 30 photos

Deliverable images are named by plot number, tile size, sphere radius, and voxel size (EX: 'P01_400ft_400_v2.jpeg'= Plot #1, 400 ft tile size, 400 ft sphere radius, 2ft voxel). The folders indicate their height above ground (EX: 'Fisheyes_01_75_meters' indicates 1.75 meters above ground). Table 20 contains a comparison of the fisheye photographs collected in the field and those simulated using the lidar point cloud.

Some features are represented differently between the field and simulated images. For example, powerlines and sparsely leaved branches at the top of the canopy block more view to sky in the simulated photos than the field photos. Additionally, due to a lack of lidar point density in the lower regions of the forest, primarily on stems, the eucalyptus trunks that block light very definitively in the field photos are less present or missing in the simulated fisheye photos.

5.3.3.2 Fisheyes for Monarch Cluster Locations

Fisheye photos simulated from the lidar point cloud at points of view (POV) determined by the attributed height of monarch cluster points.

- When the attributed height of the cluster point was represented by a range, a fisheye photo was generated at each 5-foot interval between the minimum and maximum height listed.

Files are named by their cluster GlobalID and height above ground (EX: '0a8017df-eebe-456d-8d75-030427c9a047__25ft.jepg' represents a cluster captured with a point of view 25 feet above ground).

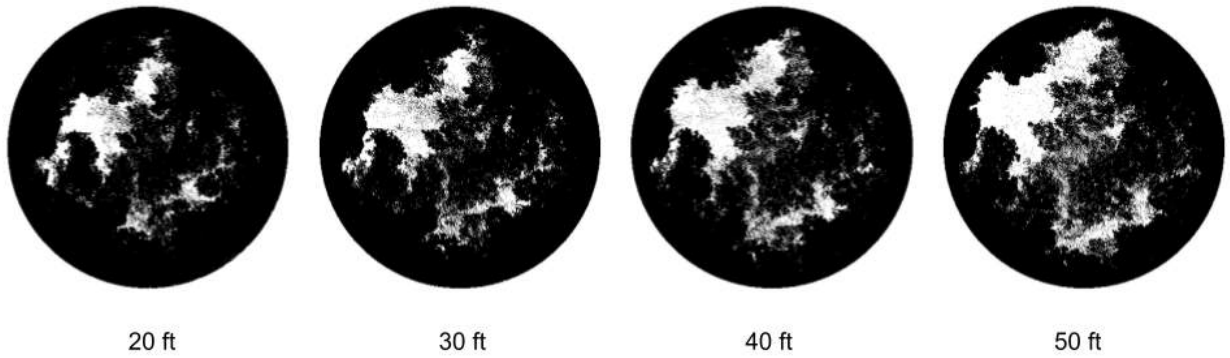


Figure 27: Examples of simulated fisheye photos centered on a historic monarch cluster site and moving upwards through the canopy. Left to right images show the camera point of view situated 20 feet, 30 feet, 40 feet, and 50ft above the ground.

6.0 DISCUSSION

The data created as a part of the Ellwood Mesa Monarch Butterfly Habitat Characterization project will facilitate a fine-scale analysis of the eucalyptus grove used as a monarch over-wintering site. The point density rasters, dead debris classification, and fisheye photo simulations will support the assessment, planning, and management of forest rehabilitation. These data will also support future analytical work and provide a baseline for assessing change over time with the collection of future lidar datasets.

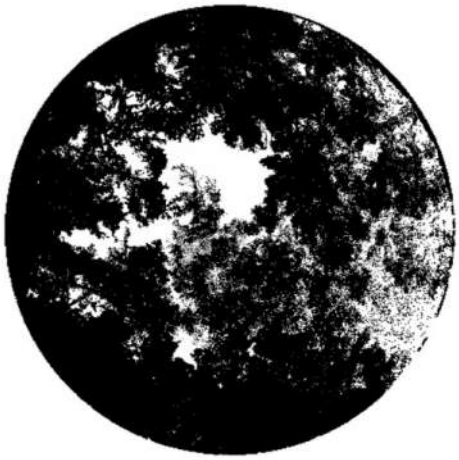
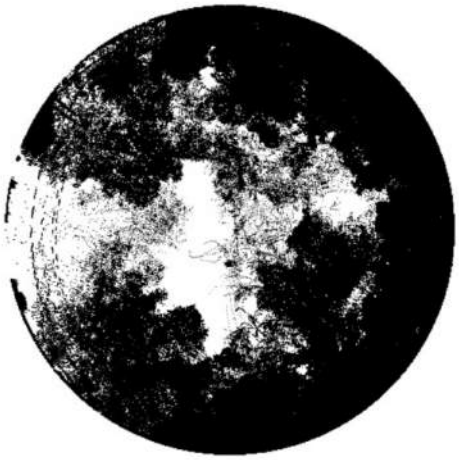
The work done for this project has explored a variety of methods for transforming and analyzing lidar and imagery collected across the Ellwood Mesa project area. The deliverable dataset demonstrates the high level of flexibility and analytical opportunity that comes with a high-density three-

dimensional dataset. A key achievement of this project was the development of a method for simulating fisheye photographs from lidar point clouds. However, the simulated fisheye photos should be evaluated for classification accuracy once the fisheye photos captured in the field have been processed into classified images. The relationship between simulated fisheye photos and field-collected photos needs to be established so that analysts can appropriately interpret and understand the gap fraction and solar exposure values calculated from a simulated photo. Additionally, the relationship between wind and solar exposure measured from fisheye photos and other lidar-derived indices should be explored to support smooth interpolation of monarch habitat characteristics across the project area. Future work could expand upon the methods developed in this project to create datasets that are planning-ready and would require fewer client-side analytical resources. One opportunity to stream-line data analysis is to investigate the capacity for open source software to programmatically analyze simulated fisheye photos. This would allow for the provision of simulated fisheye photos set at any desired point of view and processed information regarding canopy gap fraction and solar exposure potential at each location.

A future area of investigation is to understand whether similar products and results can be generated with lower density lidar. The UAS collected lidar had excellent canopy penetration and high first return densities (average 277.81 points/m^2) creating an ideal foundation for analytical work. Future efforts should study the capabilities of downed woody debris detection and fisheye photo simulation using lower density lidar datasets.

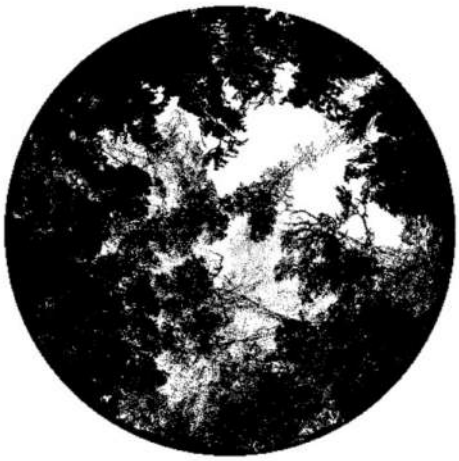
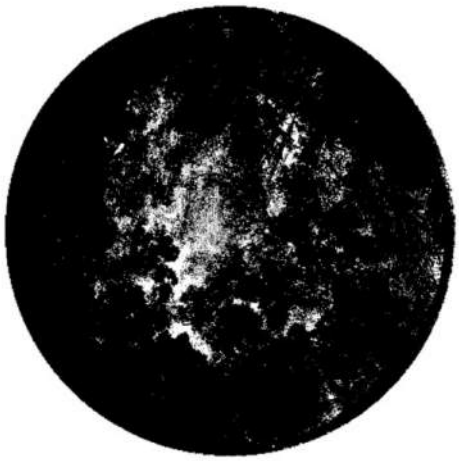
7.0 FISHEYE PLOT PHOTO COMPARISON

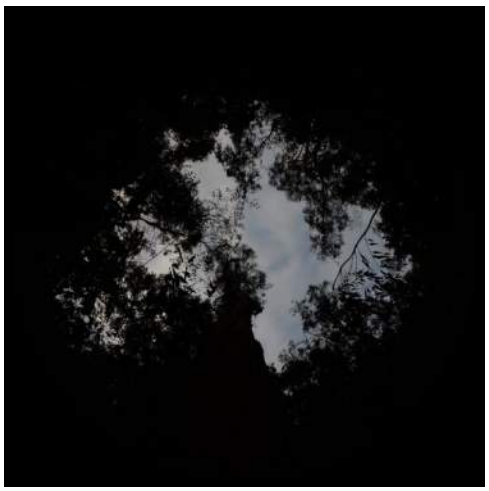
Table 20: Field photo and simulated fisheye photo comparison. Simulated fisheyes are generated from the lidar point cloud at 1.75-meter height above ground. The asterisk (*) on a plot number indicates that a confident plot geolocation adjustment could not be made and that there is not confidence in the simulated fisheye results.

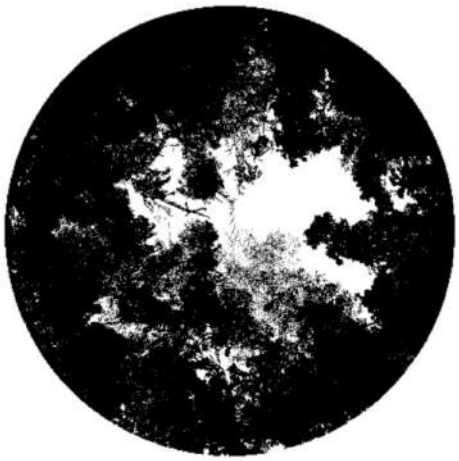
Plot Number	Field Photo	Simulated Fisheye Photo
1		
2		
3		

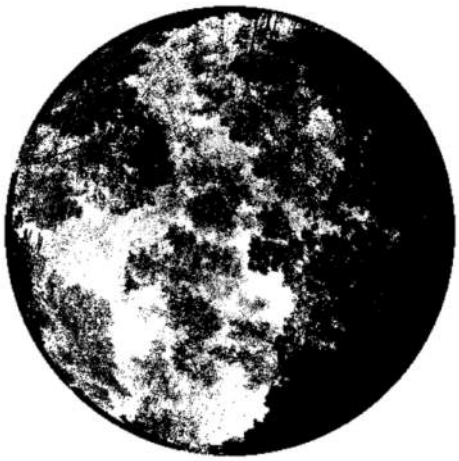
Plot Number	Field Photo	Simulated Fisheye Photo
4		
5		
6		

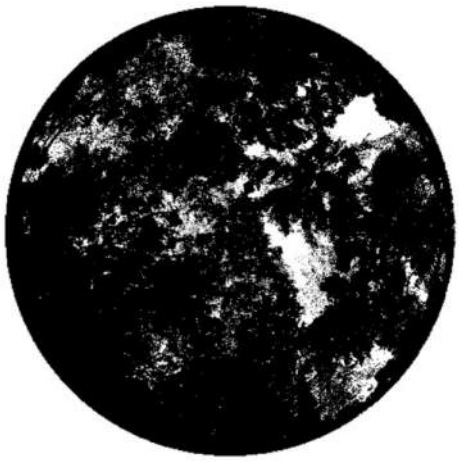
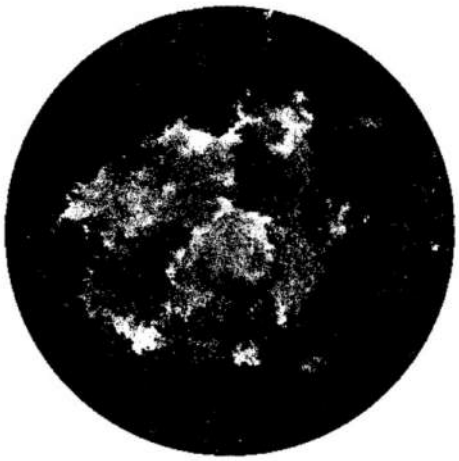
Plot Number	Field Photo	Simulated Fisheye Photo
7		
8		
9		

Plot Number	Field Photo	Simulated Fisheye Photo
10		
11		
12		

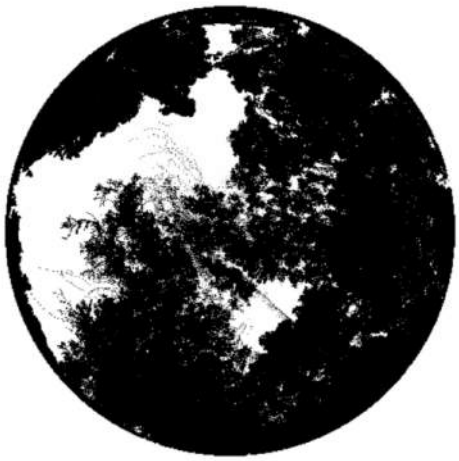
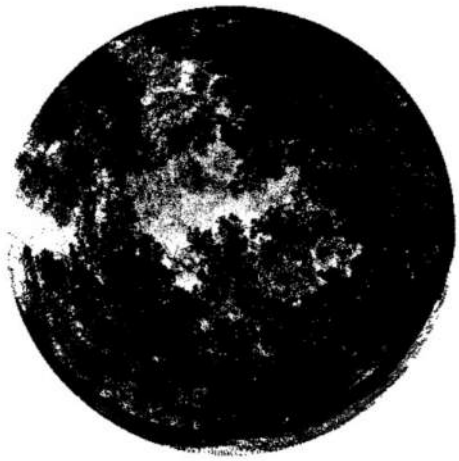
Plot Number	Field Photo	Simulated Fisheye Photo
13		
14		
15		

Plot Number	Field Photo	Simulated Fisheye Photo
16		
17		
18		

Plot Number	Field Photo	Simulated Fisheye Photo
19		
20*		
21*		

Plot Number	Field Photo	Simulated Fisheye Photo
22		
23		
24*		

Plot Number	Field Photo	Simulated Fisheye Photo
25*		
26		
27		

Plot Number	Field Photo	Simulated Fisheye Photo
28		
29		
30*		

8.0 GLOSSARY

1-sigma (σ) Absolute Deviation: Value for which the data are within one standard deviation (approximately 68th percentile) of a normally distributed data set.

1.96 * RMSE Absolute Deviation: Value for which the data are within two standard deviations (approximately 95th percentile) of a normally distributed data set, based on the FGDC standards for Non-vegetated Vertical Accuracy (NVA) reporting.

Accuracy: The statistical comparison between known (surveyed) points and laser points. Typically measured as the standard deviation (sigma σ) and root mean square error (RMSE).

> **Absolute Accuracy:** The vertical accuracy of lidar data is described as the mean and standard deviation (sigma σ) of divergence of lidar point coordinates from ground survey point coordinates. To provide a sense of the model predictive power of the dataset, the root mean square error (RMSE) for vertical accuracy is also provided. These statistics assume the error distributions for x, y and z are normally distributed, and thus we also consider the skew and kurtosis of distributions when evaluating error statistics.
>
> **Relative Accuracy:** Relative accuracy refers to the internal consistency of the data set; i.e., the ability to place a laser point in the same location over multiple flight lines, GPS conditions and aircraft attitudes. Affected by system attitude offsets, scale and GPS/IMU drift, internal consistency is measured as the divergence between points from different flight lines within an overlapping area. Divergence is most apparent when flight lines are opposing. When the lidar system is well calibrated, the line-to-line divergence is low (<10 cm).
>
> **Root Mean Square Error (RMSE):** A statistic used to approximate the difference between real-world points and the lidar points. It is calculated by squaring all the values, then taking the average of the squares and taking the square root of the average.

Data Density: A common measure of lidar resolution, measured as points per square meter.

Digital Elevation Model (DEM): File or database made from surveyed points, containing elevation points over a contiguous area. Digital terrain models (DTM) and digital surface models (DSM) are types of DEMs. DTMs consist solely of the bare earth surface (ground points), while DSMs include information about all surfaces, including vegetation and man-made structures.

Intensity Values: The peak power ratio of the laser return to the emitted laser, calculated as a function of surface reflectivity.

Nadir: A single point or locus of points on the surface of the earth directly below a sensor as it progresses along its flight line.

Overlap: The area shared between flight lines, typically measured in percent. 100% overlap is essential to ensure complete coverage and reduce laser shadows.

Pulse Rate (PR): The rate at which laser pulses are emitted from the sensor; typically measured in thousands of pulses per second (kHz).

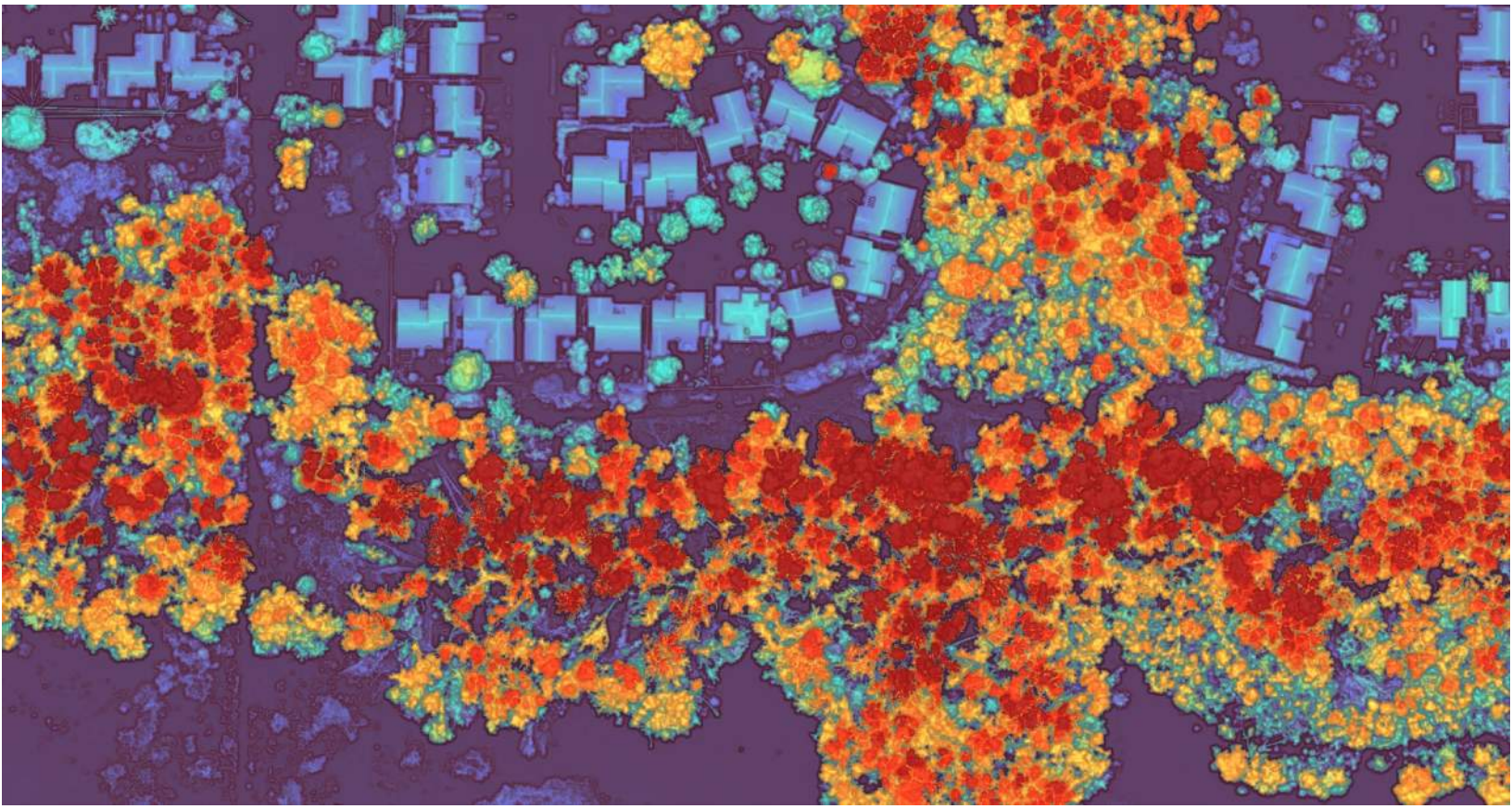
Pulse Returns: For every laser pulse emitted, the number of wave forms (i.e., echoes) reflected back to the sensor. Portions of the wave form that return first are the highest element in multi-tiered surfaces such as vegetation. Portions of the wave form that return last are the lowest element in multi-tiered surfaces.

Real-Time Kinematic (RTK) Survey: A type of surveying conducted with a GPS base station deployed over a known monument with a radio connection to a GPS rover. Both the base station and rover receive differential GPS data and the baseline correction is solved between the two. This type of ground survey is accurate to 1.5 cm or less.

Post-Processed Kinematic (PPK) Survey: GPS surveying is conducted with a GPS rover collecting concurrently with a GPS base station set up over a known monument. Differential corrections and precisions for the GNSS baselines are computed and applied after the fact during processing. This type of ground survey is accurate to 1.5 cm or less.

Scan Angle: The angle from nadir to the edge of the scan, measured in degrees. Laser point accuracy typically decreases as scan angles increase.

Native Lidar Density: The number of pulses emitted by the lidar system, commonly expressed as pulses per square meter.



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