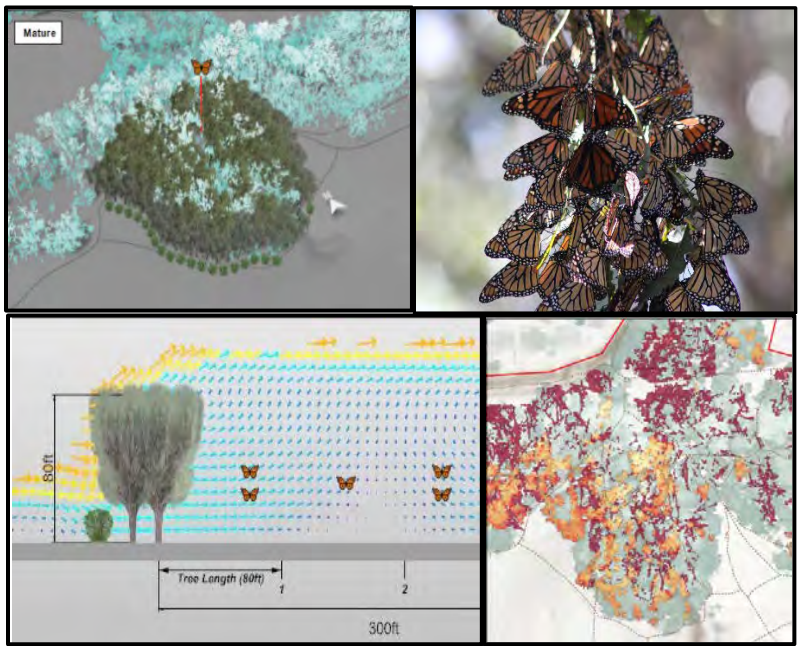
Appendix D

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.

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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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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).

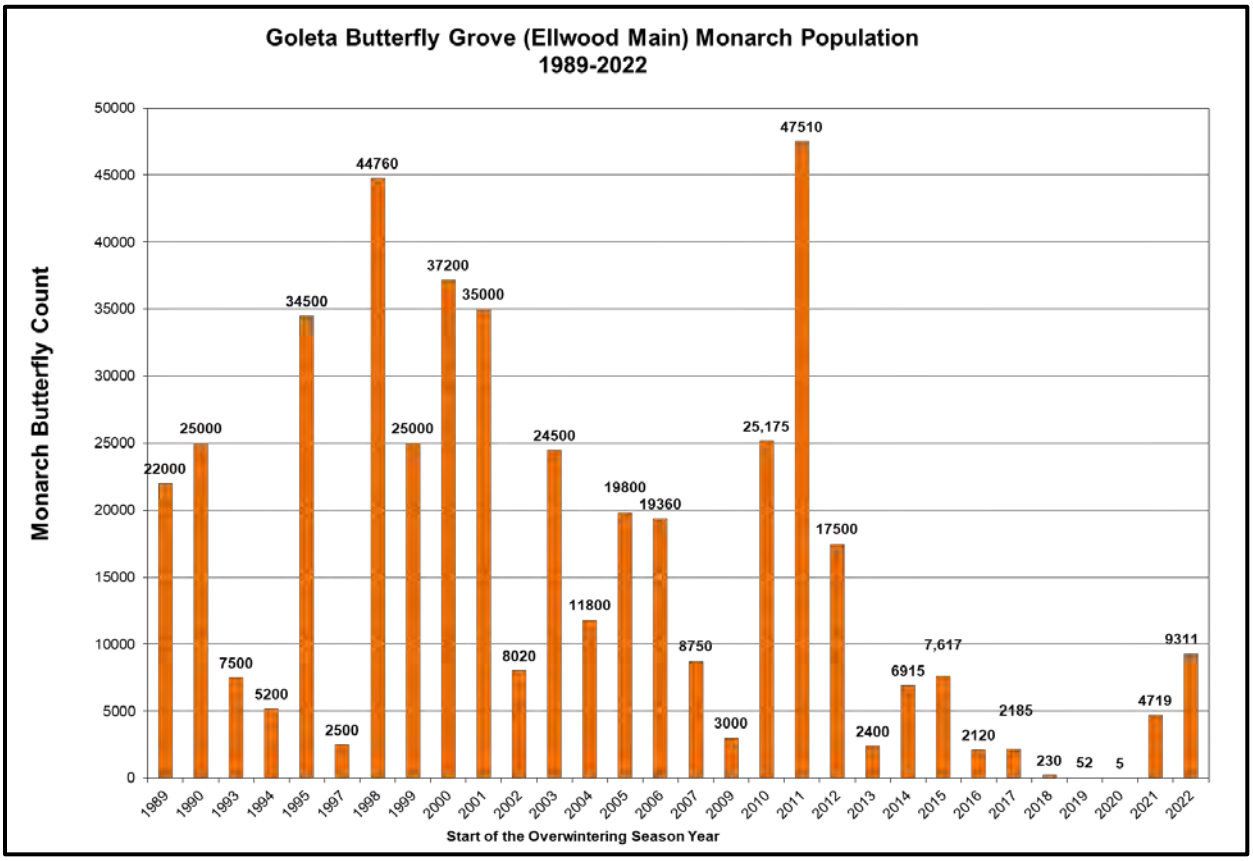
We assume that monarch butterflies vote on suitable overwintering habitat with their presence. Monarch butterflies select preferable and suitable habitat and show us these locations with their numbers. There is a direct relationship between suitable habitat and monarch counts. In a year with a decent 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.

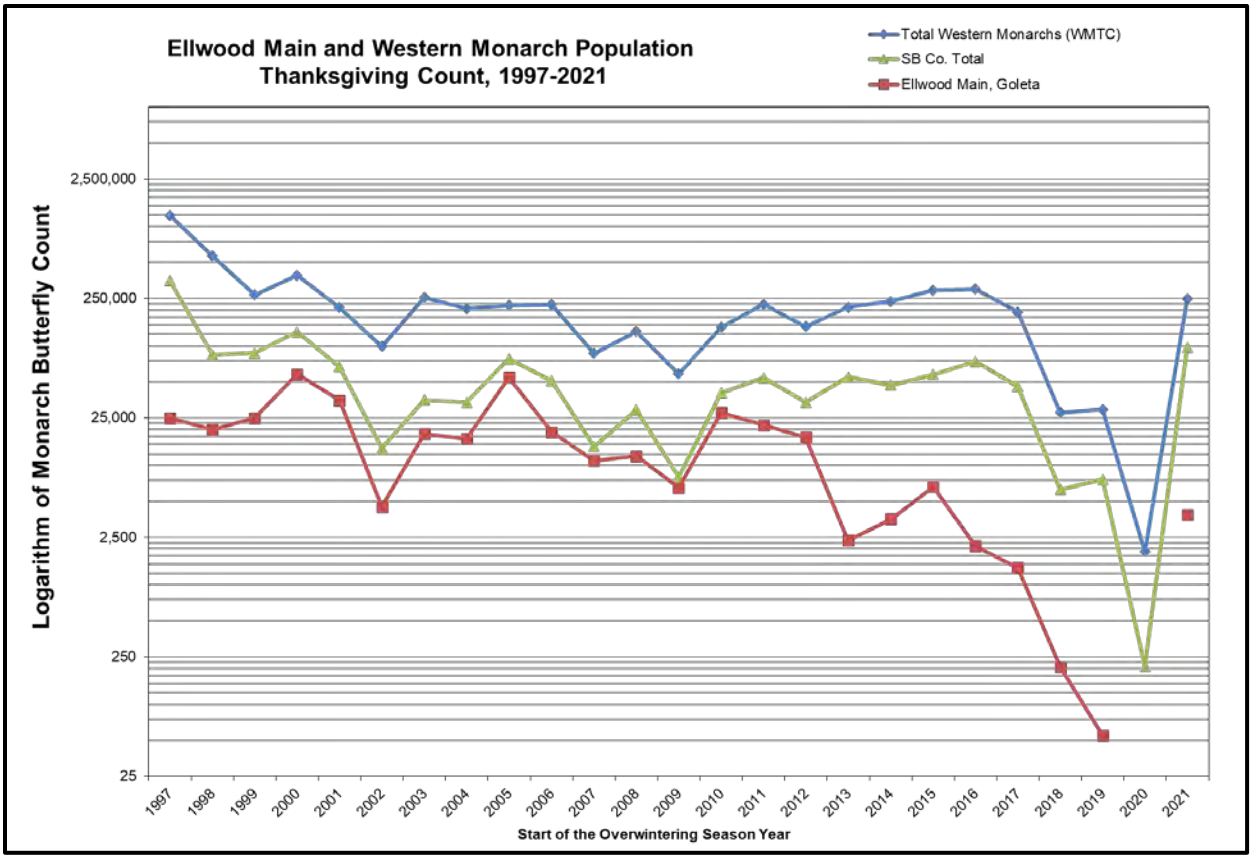
In addition to the Western Monarch Thanksgiving Counts, the City of Goleta conducts monarch counts at the six known aggregation sites every two weeks during the overwintering period, October 1st through March 15th. In 2019, the city included habitat-wide surveys for monarchs potentially roosting outside 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.



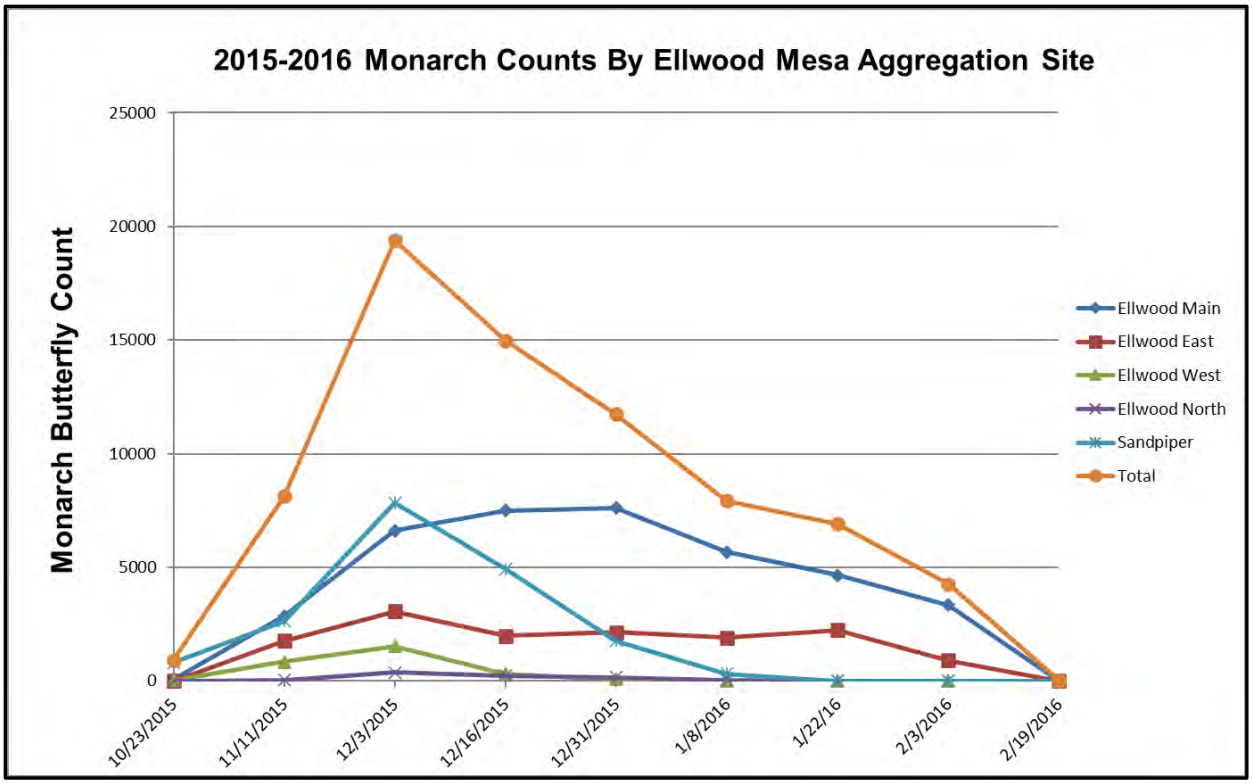
GRAPH 1. PEAK MONARCH POPULATION AT ELLWOOD MAIN FROM 1989 TO 2022

Data from Althouse and Meade Inc and Rincon Consultants Inc.



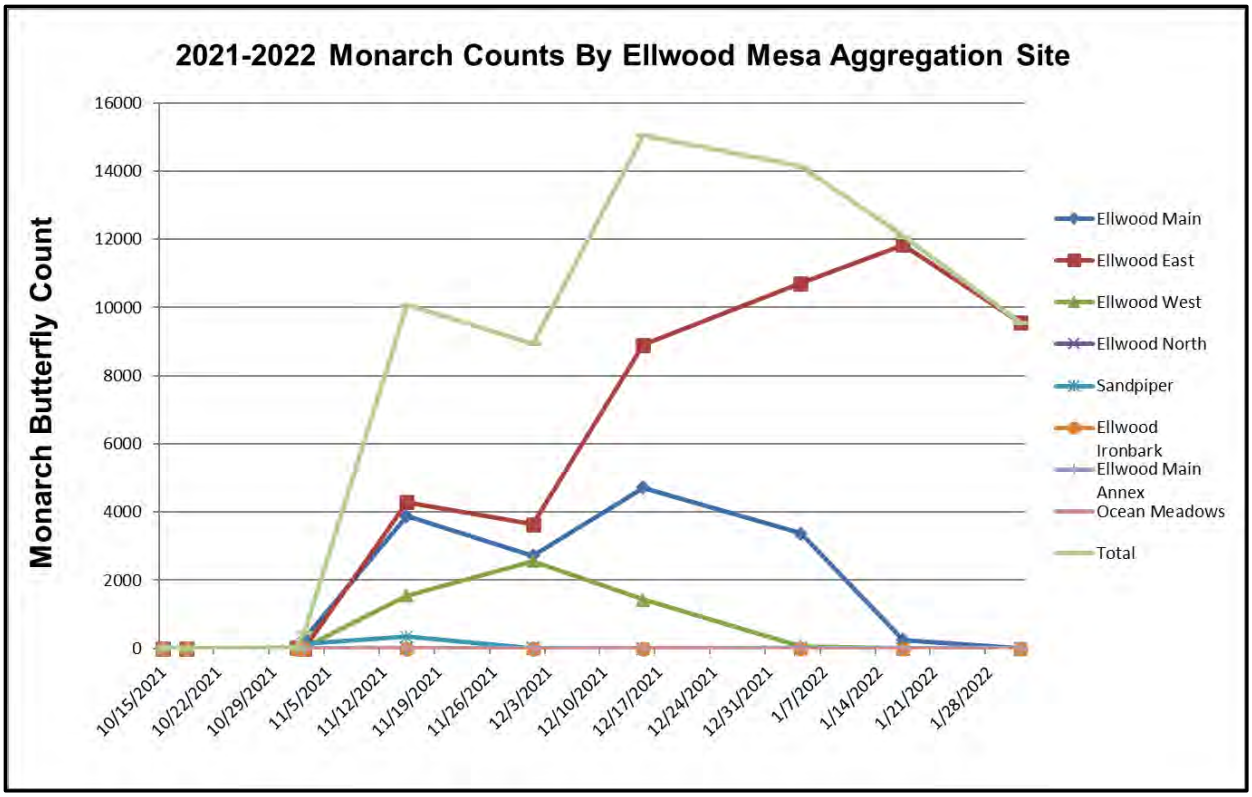
GRAPH 2. TOTALS OF WESTERN MONARCH POPULATION, SANTA BARBARA COUNTY MONARCH POPULATION, AND MONARCHS AT ELLWOOD MAIN IN LOGARITHMIC SCALE

Data source: Xerces Society for Invertebrate Conservation 2023.



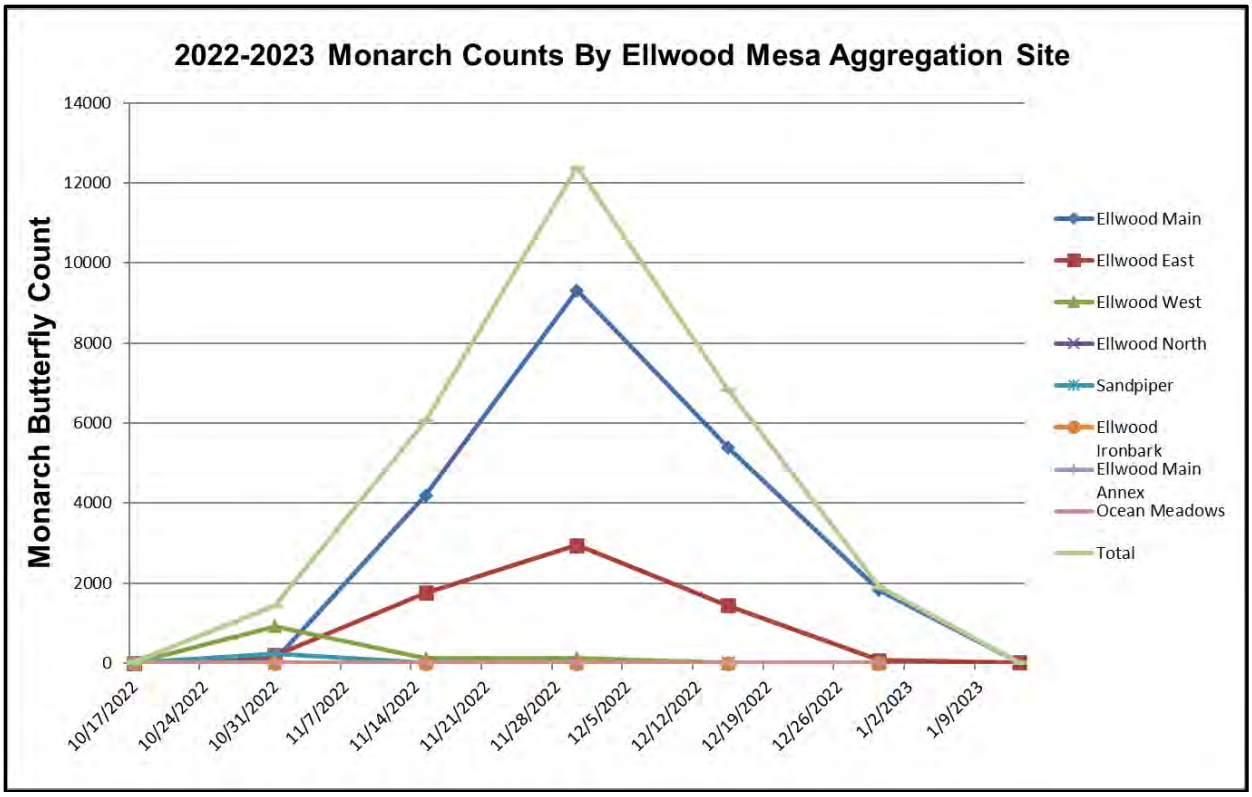
GRAPH 3. MONARCH COUNTS AT ELLWOOD MESA, 2015-2016 SEASON

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.



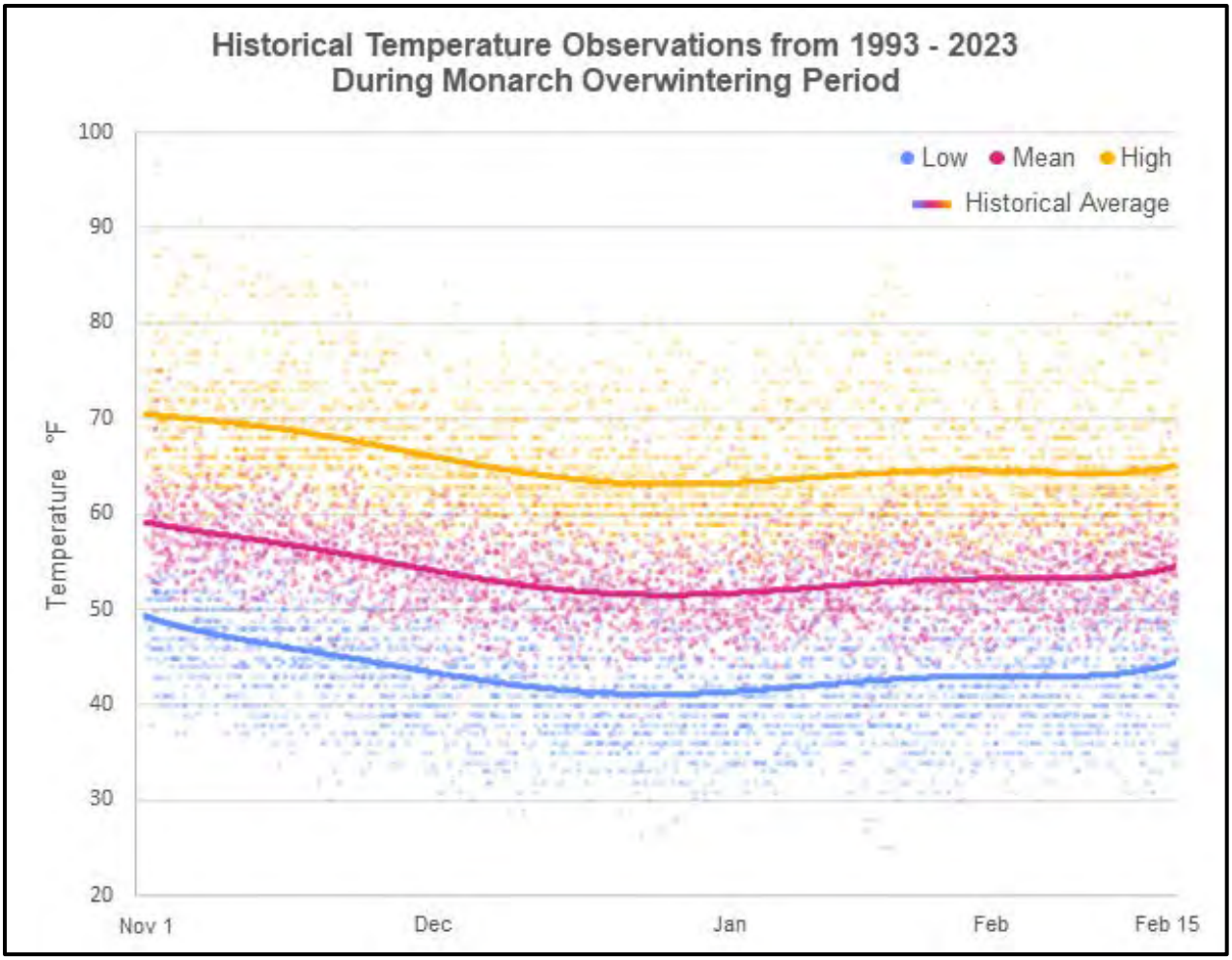
GRAPH 5. MONARCH COUNTS AT ELLWOOD MESA, 2022-2023 SEASON
Data from Rincon Consultants Inc.

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).

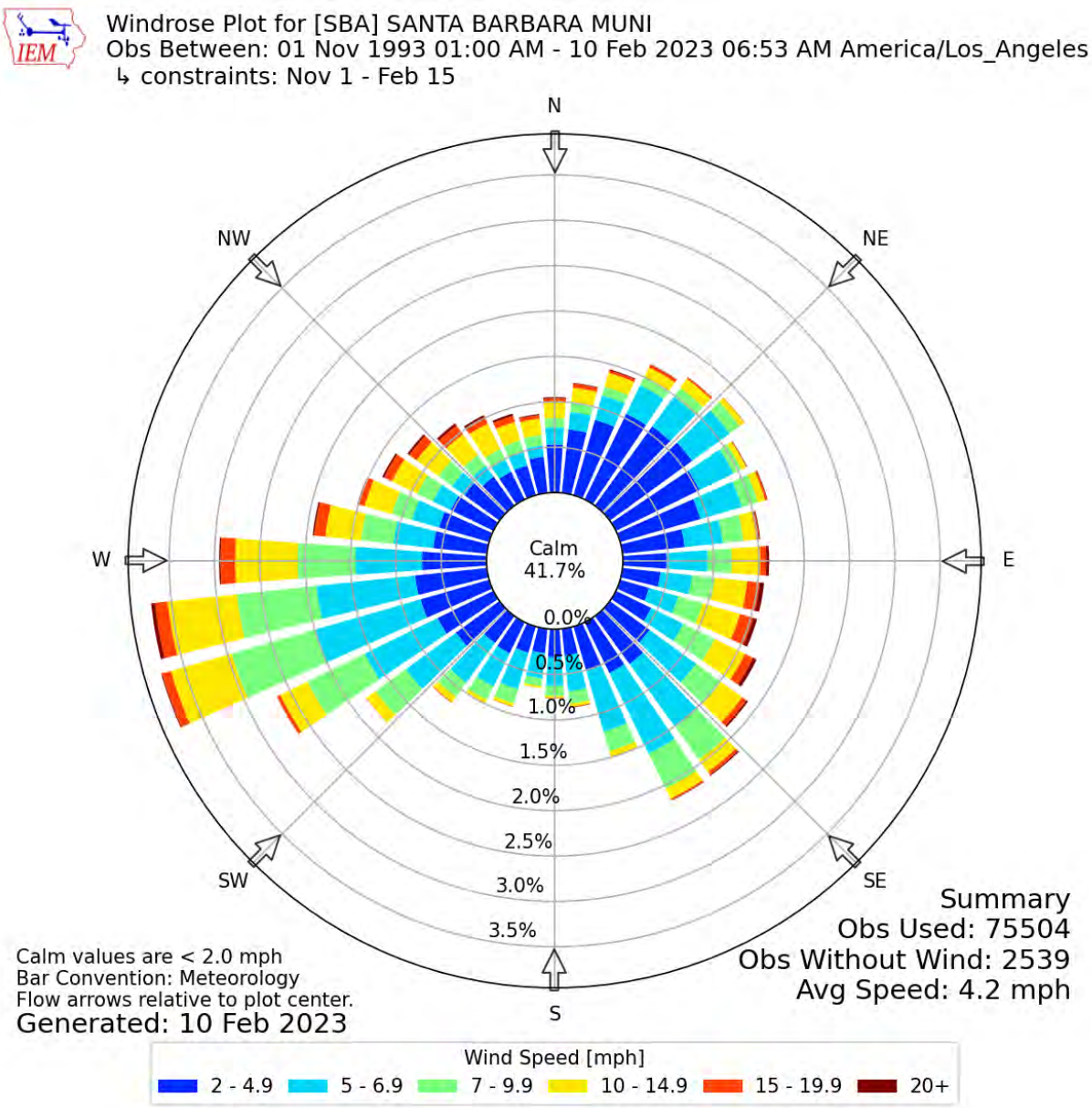
Wind conditions at Ellwood Mesa are generally suitable for monarch butterflies, with the majority of wind observations under 10 mph (blue, teal, and green areas in Graph 7). However, winter storms periodically bring strong winds throughout the overwintering period. These storms most frequently come from 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

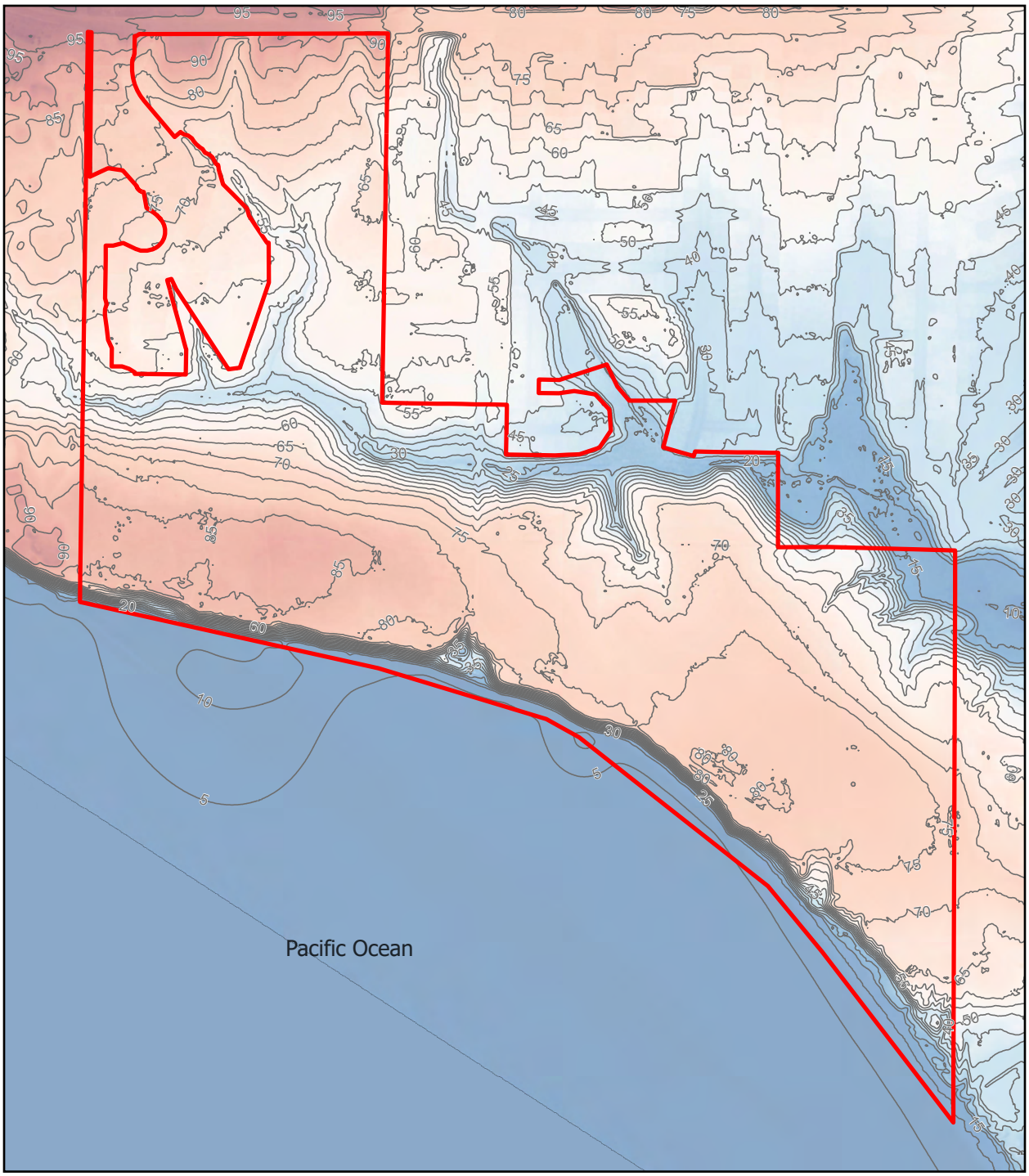
Data is during the monarch overwintering period. Temperature extremes and mean are plotted by date for each year. Averages for each temperature category are plotted across the time range.



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

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Map Updated:
February 28, 2023 05:00 PM by CDM

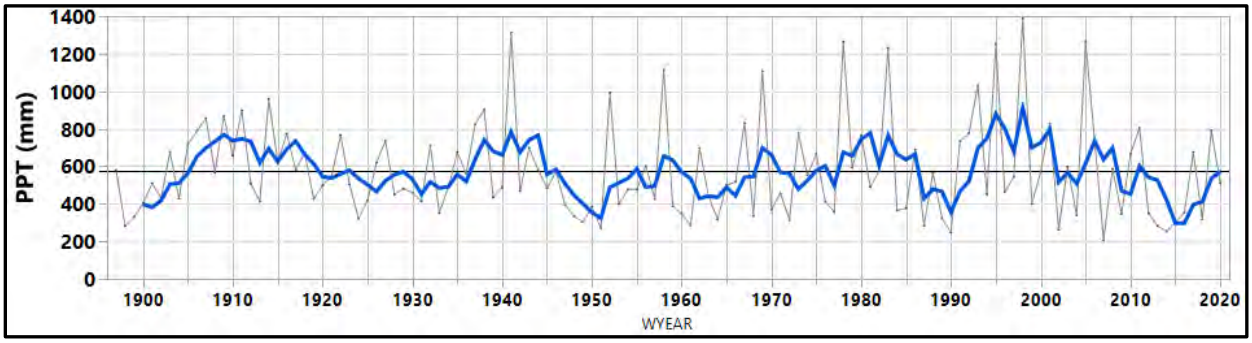
4.4 The 2012 – 2016 Drought: Unprecedented Event

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.



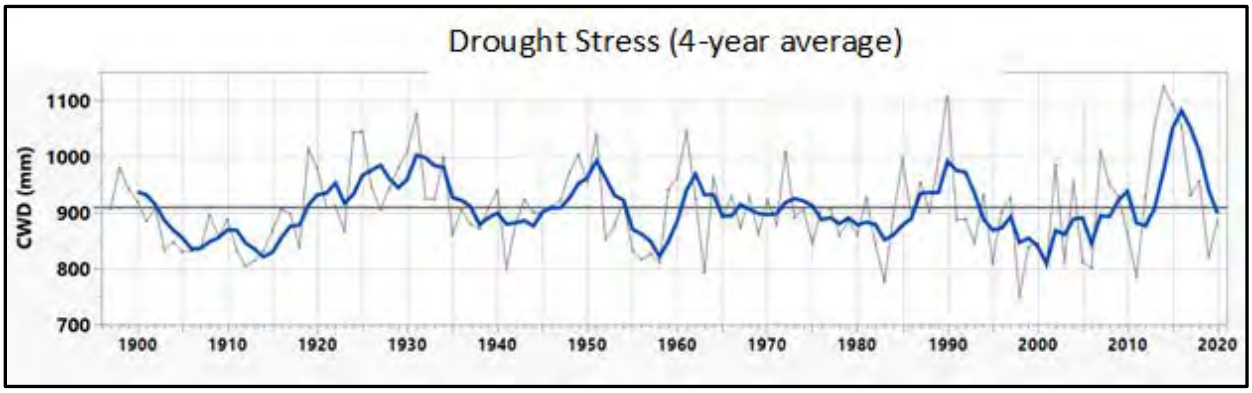
GRAPH 8. ANNUAL PRECIPITATION AT ELLWOOD MESA (OCT. 1 – SEPT. 30)
Long-Term Average=576 mm (22.7", Horizontal Line)

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.



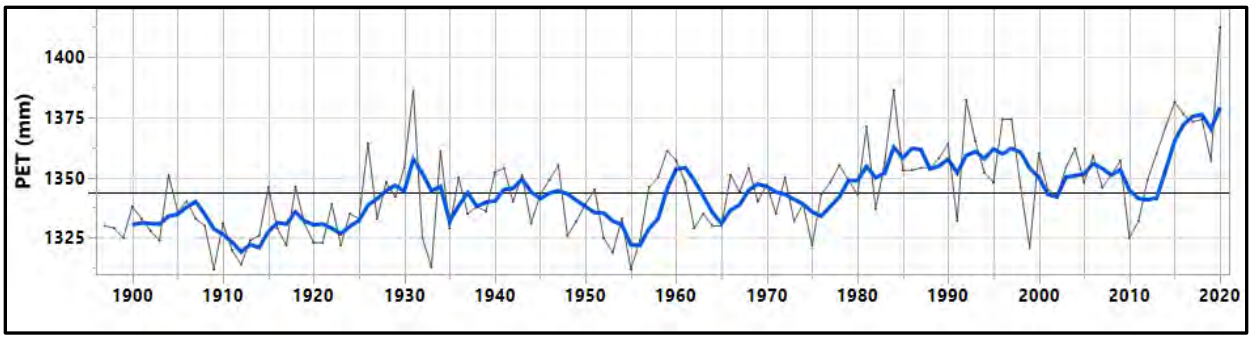
GRAPH 9. ANNUAL CLIMATIC WATER DEFICIT AND 4-YEAR RUNNING AVERAGE

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).

Figure 4. Dead Wood Volume Zones



Legend

Dead Wood Volume Zones

Monarch Roosting Site

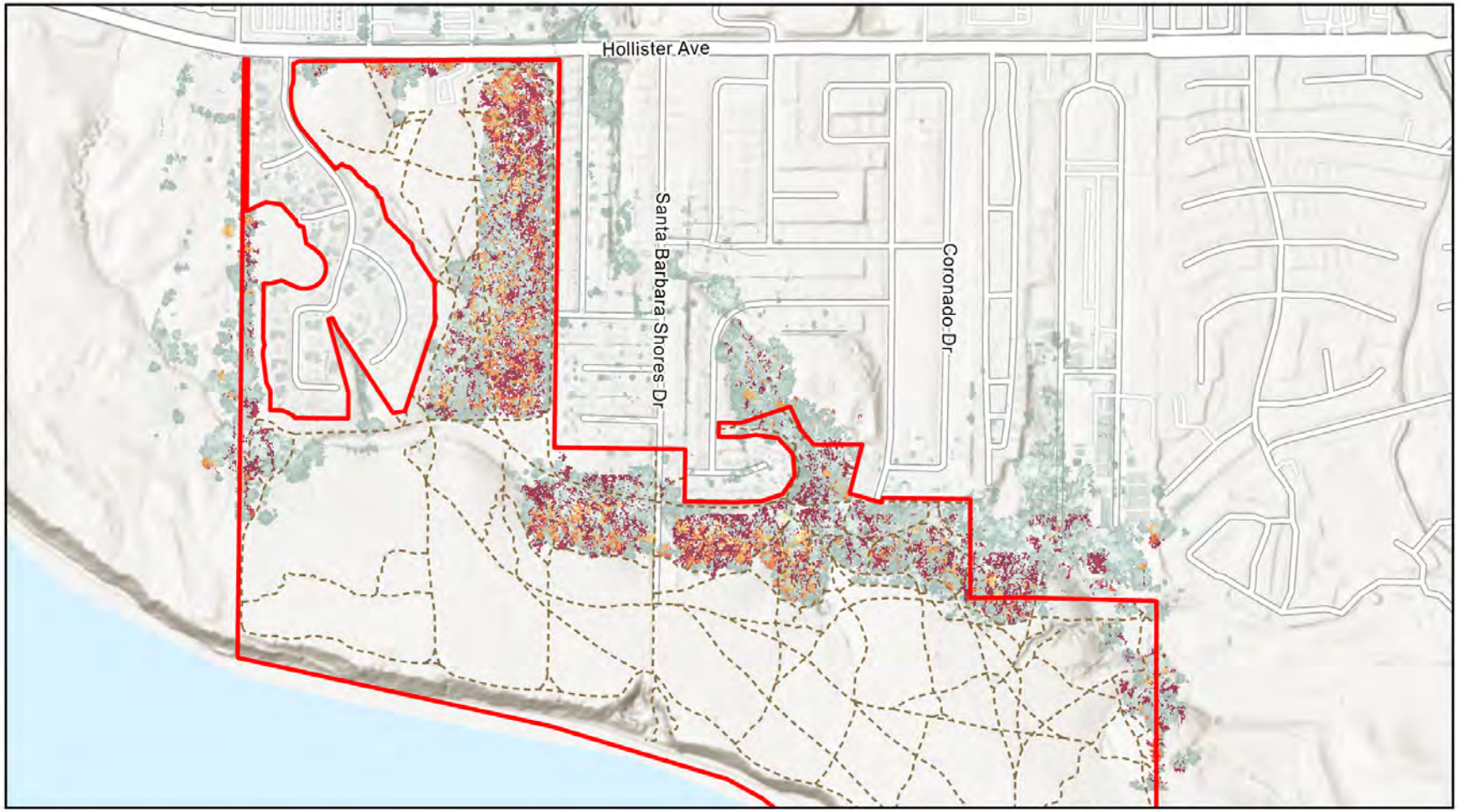
N

0 500 1,000 Feet

Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42491°N 119.89278°W
Goleta, Santa Barbara

Imagery Source: USDA NAIP, 06/20/2022

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

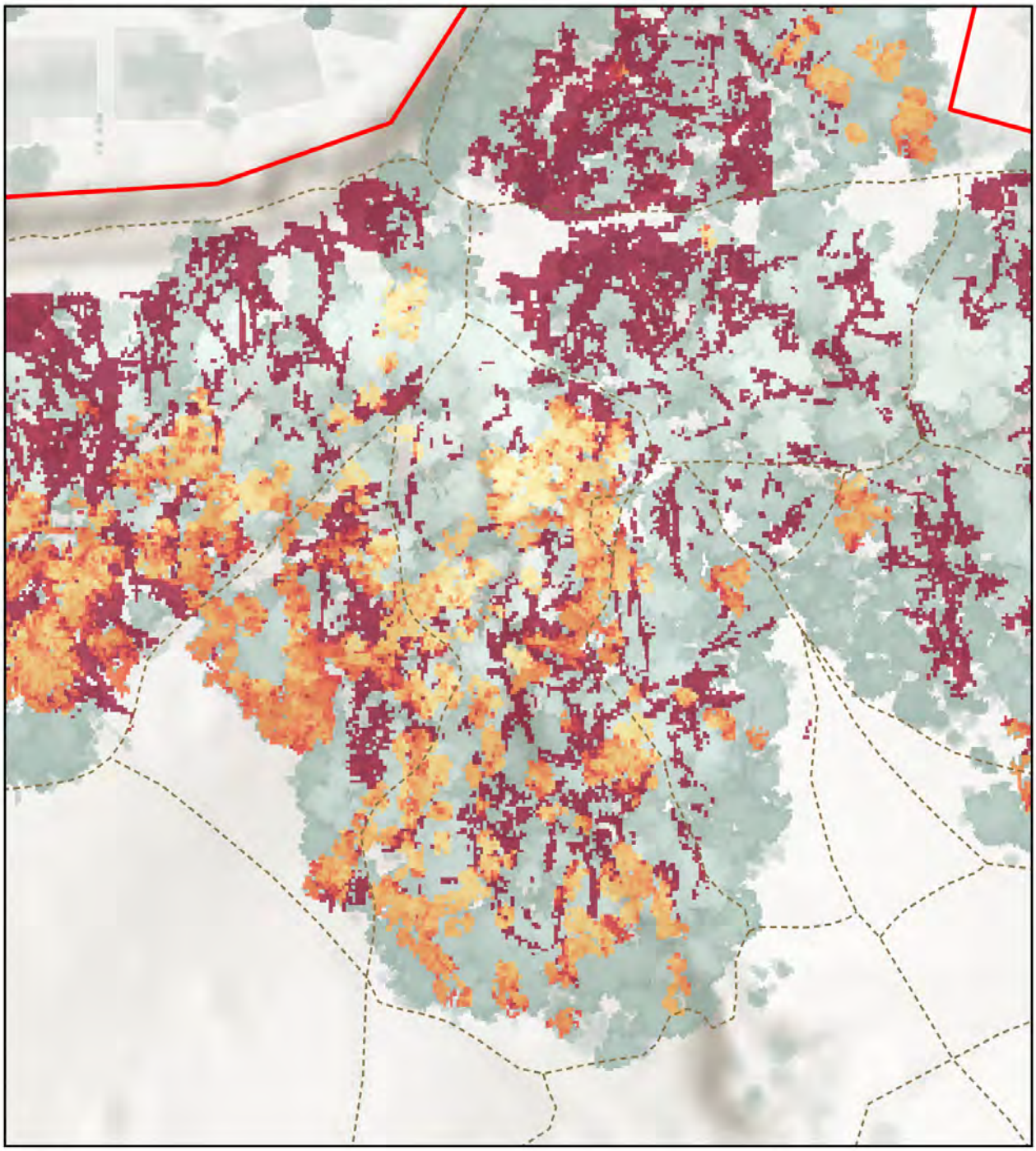
Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42479°N 119.89213°W
Goleta, Santa Barbara County

LiDAR Source: NV5, 09/27/2021

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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

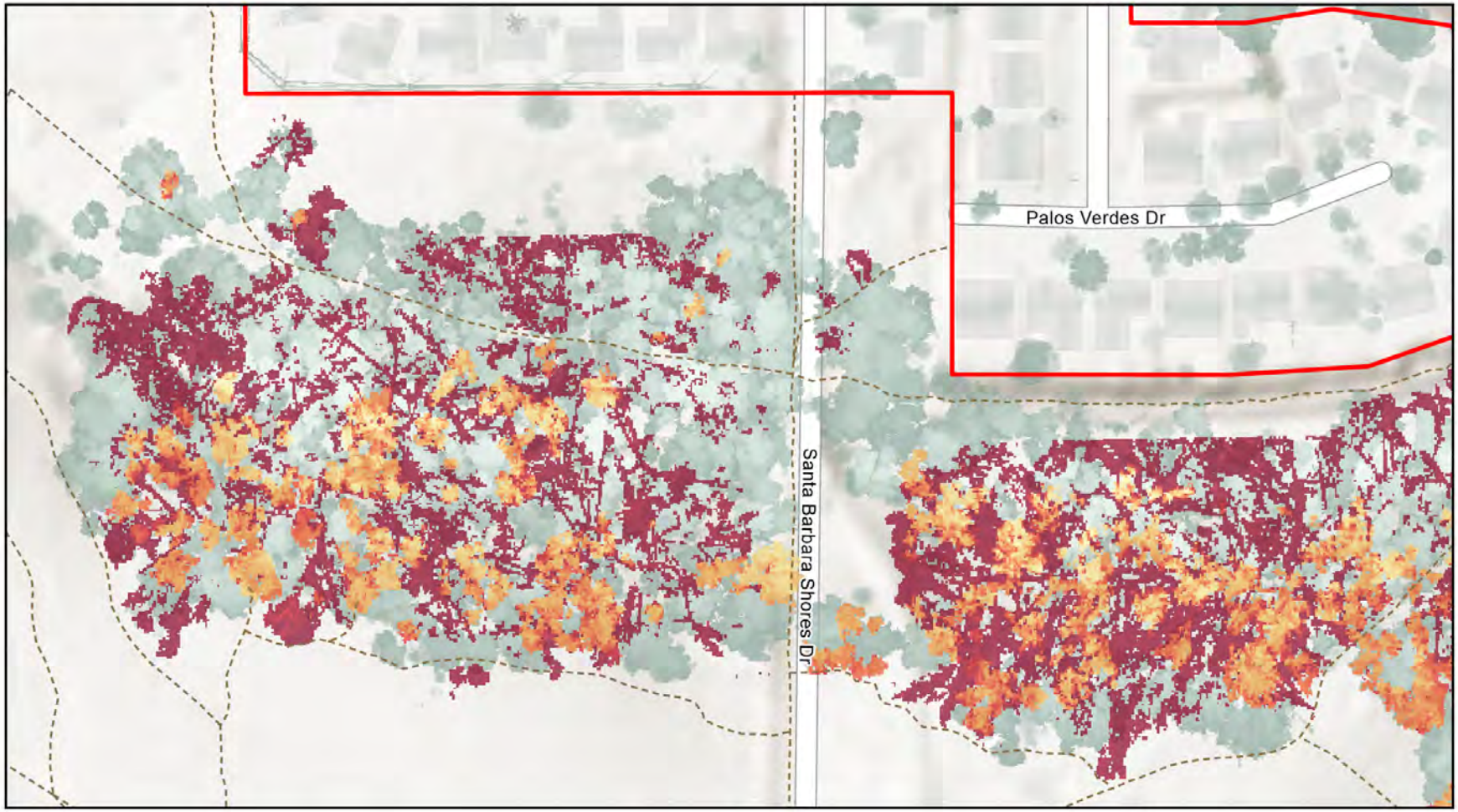
Goleta, Santa Barbara County

LiDAR Source: NV5, 09/27/2021

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Map Updated:
February 21, 2023 01:35 PM by KRN

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

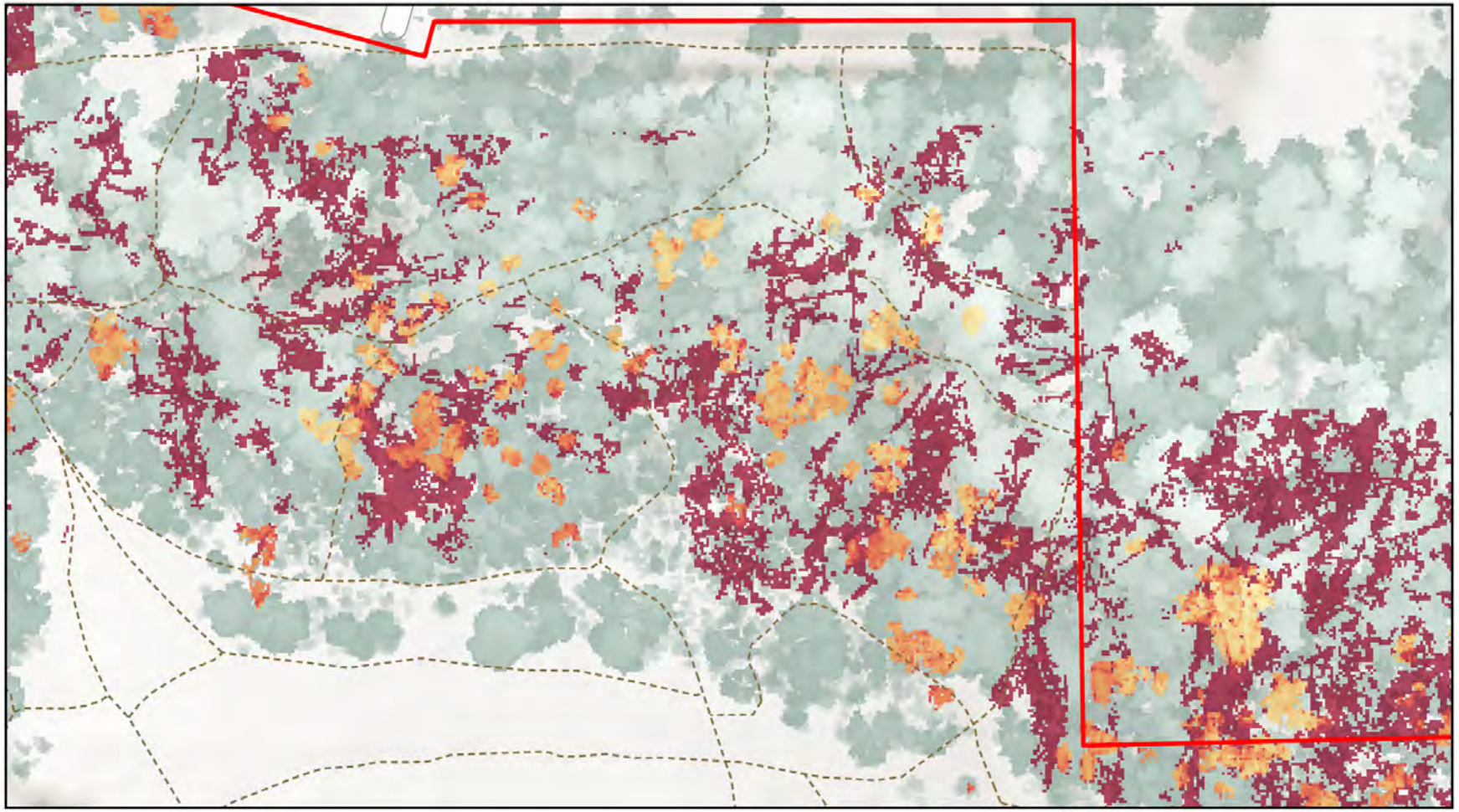
Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42338°N 119.89355°W
Goleta, Santa Barbara County

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

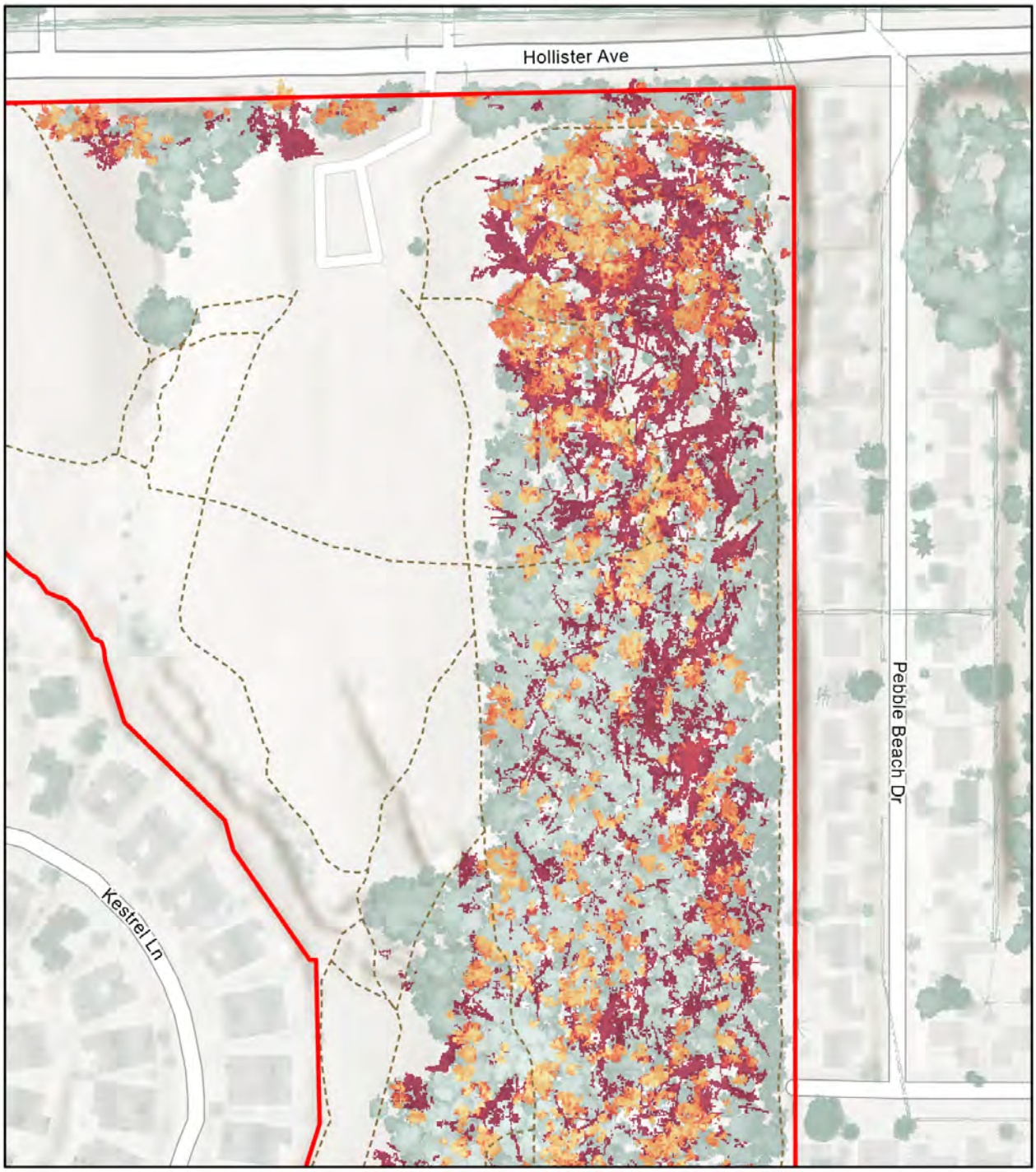
Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42283°N 119.88886°W
Goleta, Santa Barbara County

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

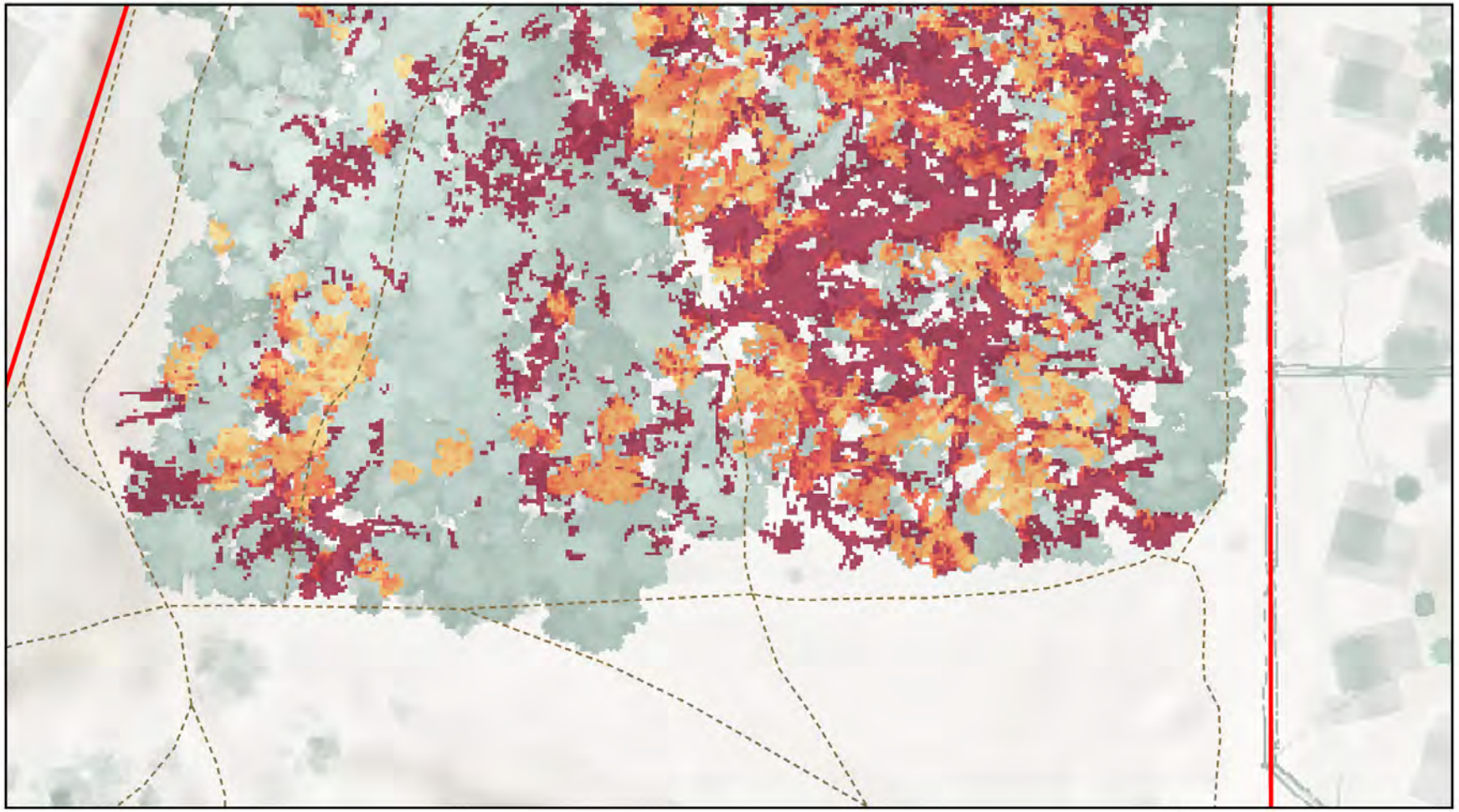
Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.4278°N 119.89625°W
Goleta, Santa Barbara County

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

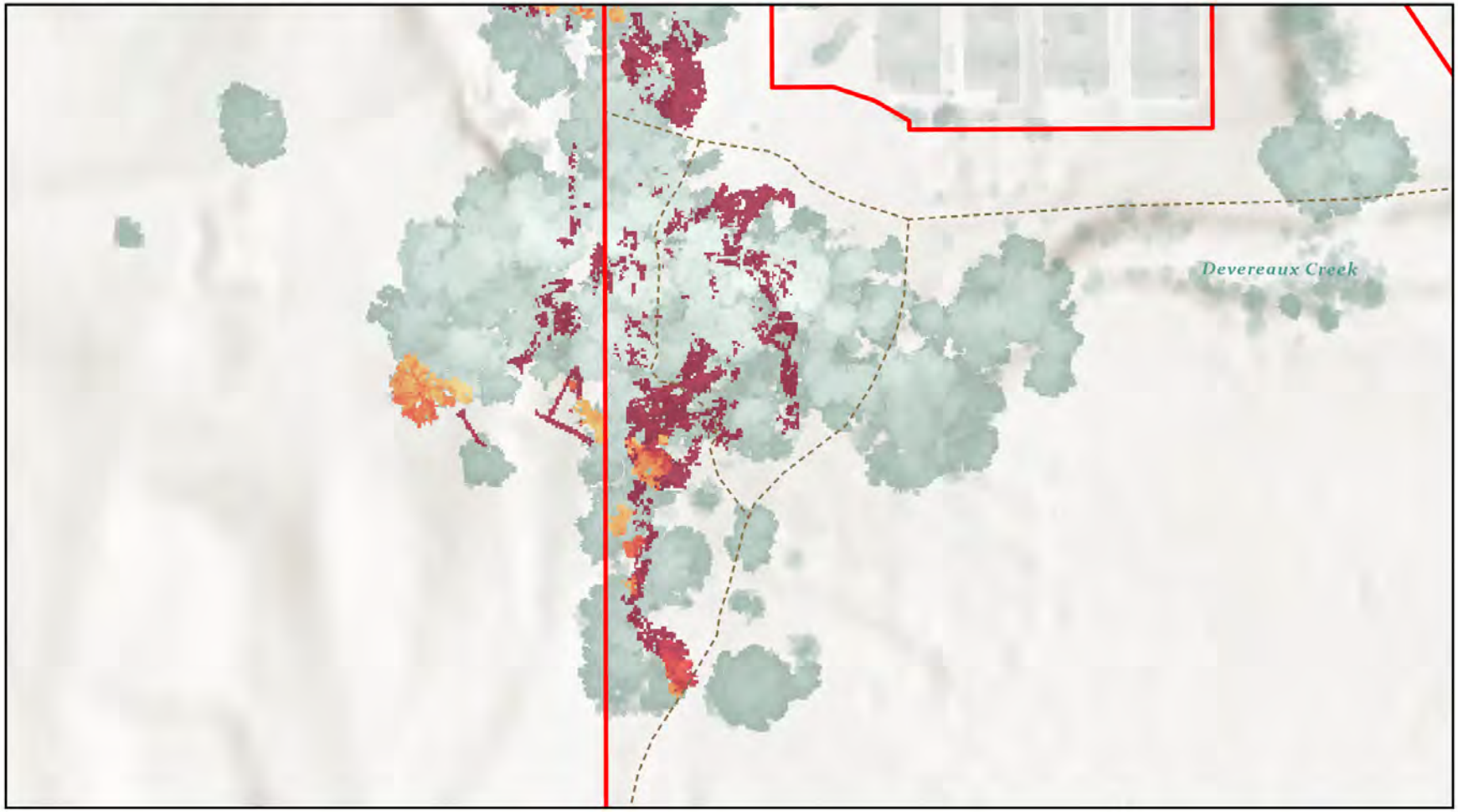
Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42486°N 119.89609°W
Goleta, Santa Barbara County

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

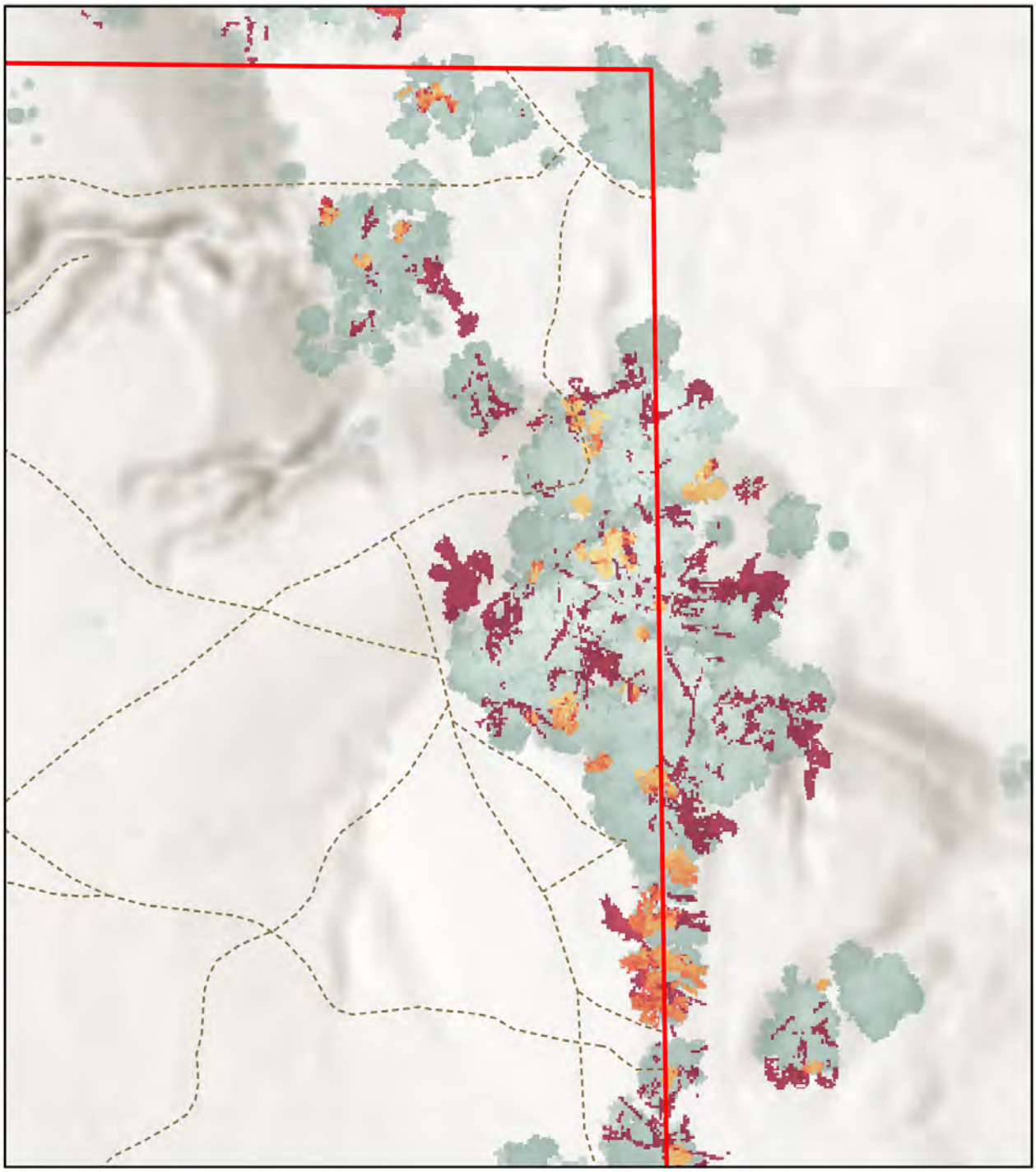
Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42385°N 119.89995°W
Goleta, Santa Barbara County

LiDAR Source: NV5, 09/27/2021

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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

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February 21, 2023 01:38 PM by KRN



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

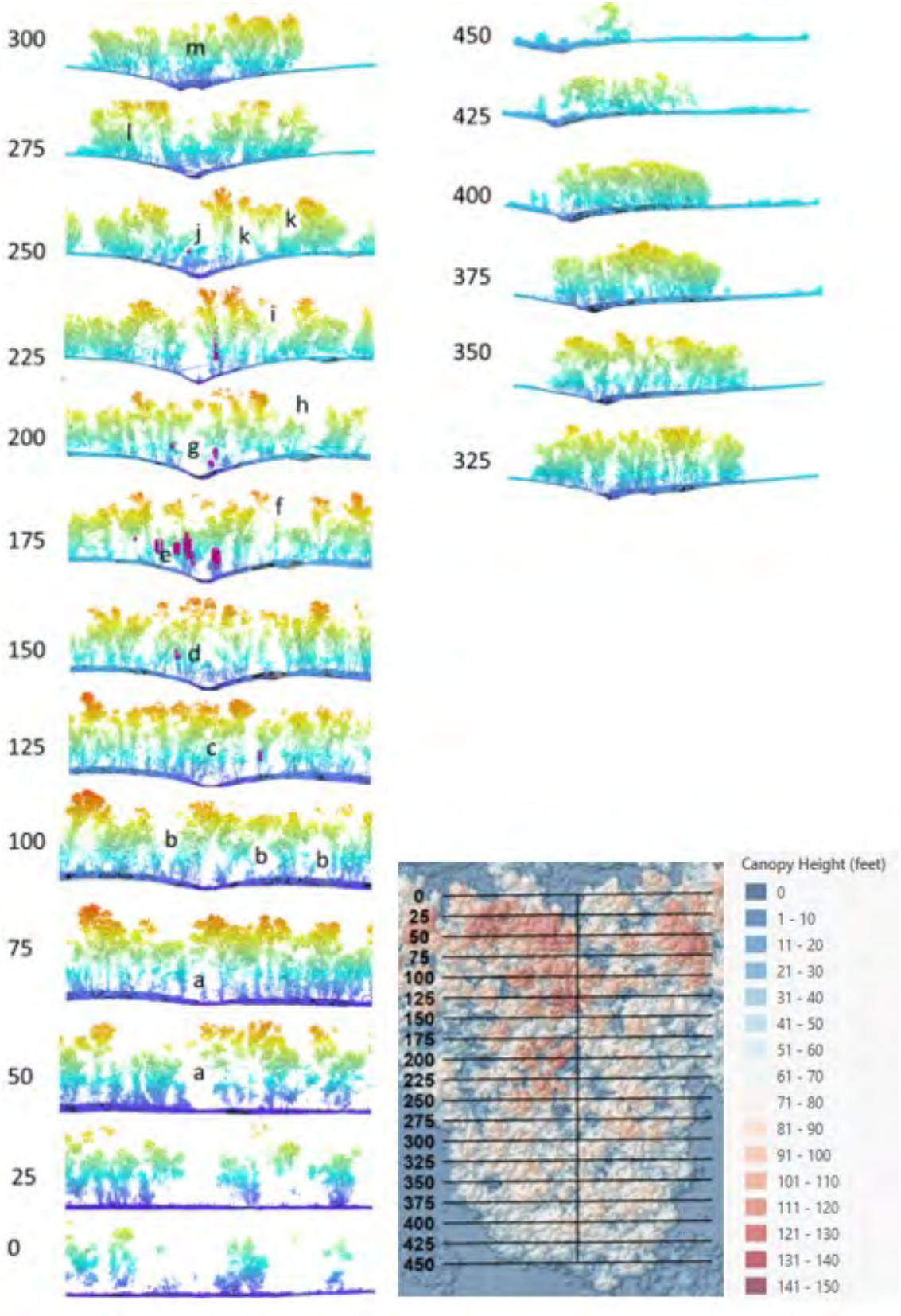


TABLE 4. DESCRIPTION OF ELLWOOD MESA CANOPY SLICES

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

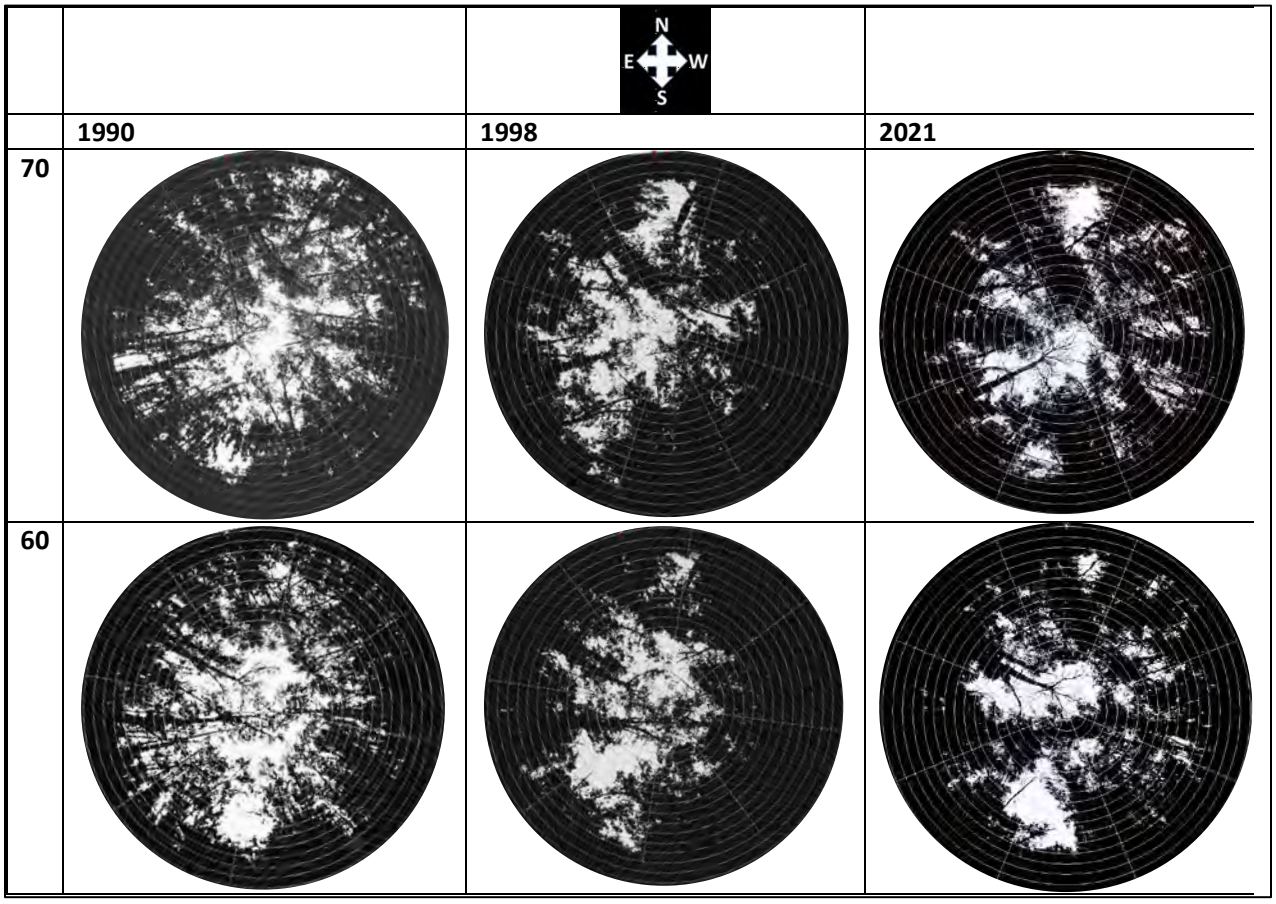


FIGURE 16. GRAPHIC ASSESSMENT OF CANOPY GAPS OBSERVED IN THE HEMIPHOTOS EACH OF THREE YEARS

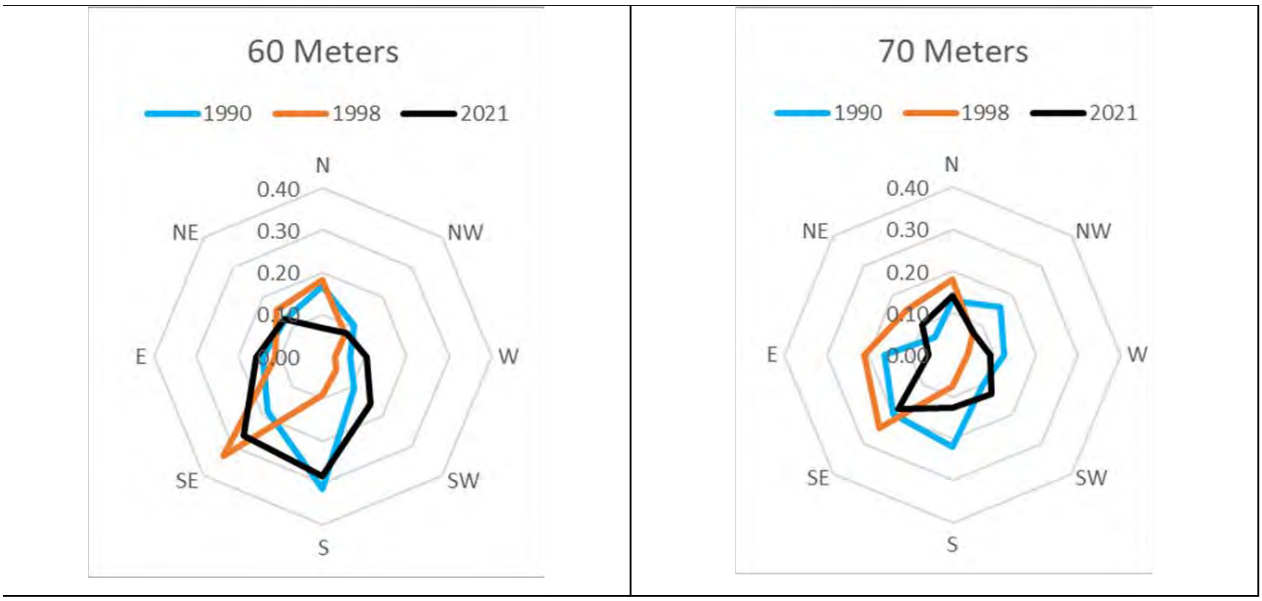
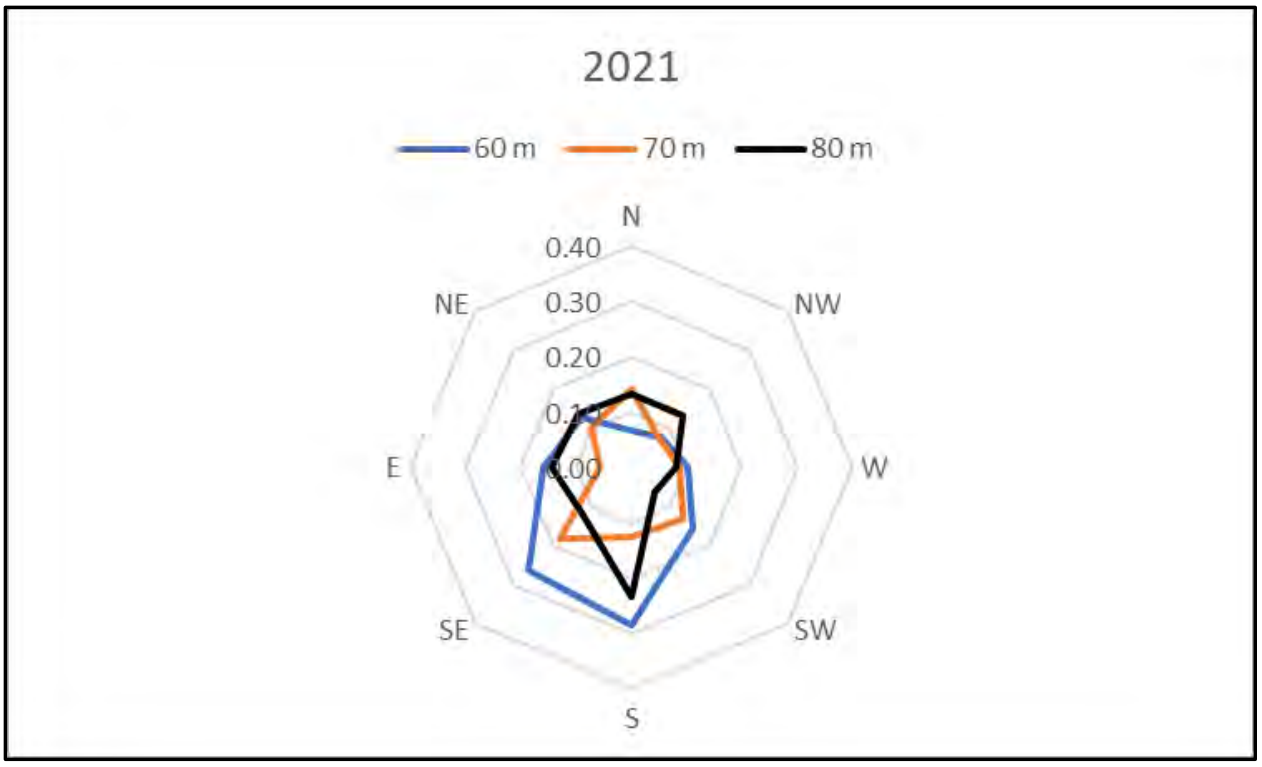


FIGURE 17. GRAPHIC ASSESSMENT OF 2021 DIRECTIONAL EXPOSURE AT THREE LOCATIONS 10 METERS APART IN THE CLUSTER ZONE



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.

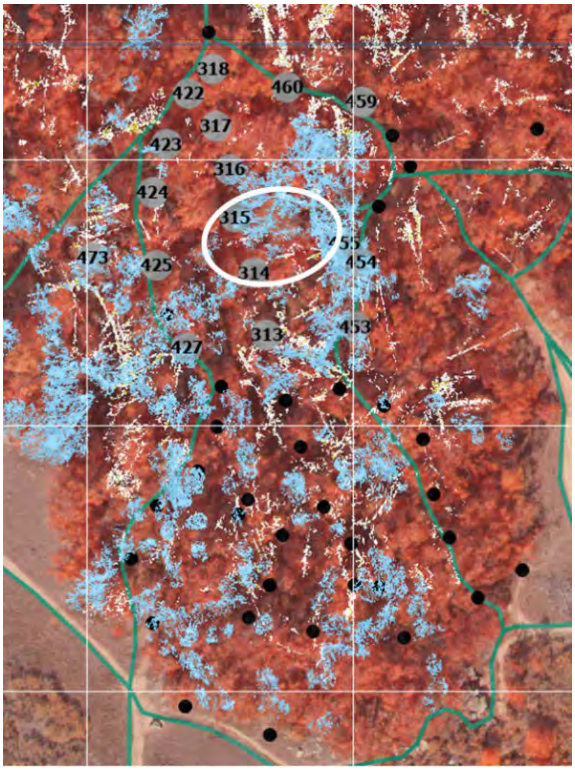
The restoration recommendations (Figure 26) show the primary cluster zone, the main dieback zones, and the vulnerabilities described above.

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



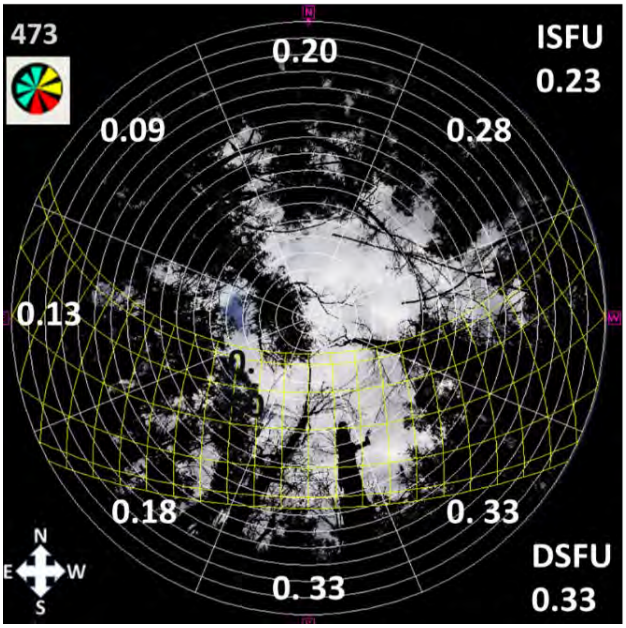


Photo locations on left, on top of a CIR image and dead standing (blue) and dead downed (white) wood. Example photograph (473) in high mortality zone with directional exposure in each octant, as a reference. Maximun expoure to S, SW, and W, lowest NE. Monthly sunpaths are in yellow, from December (most 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).

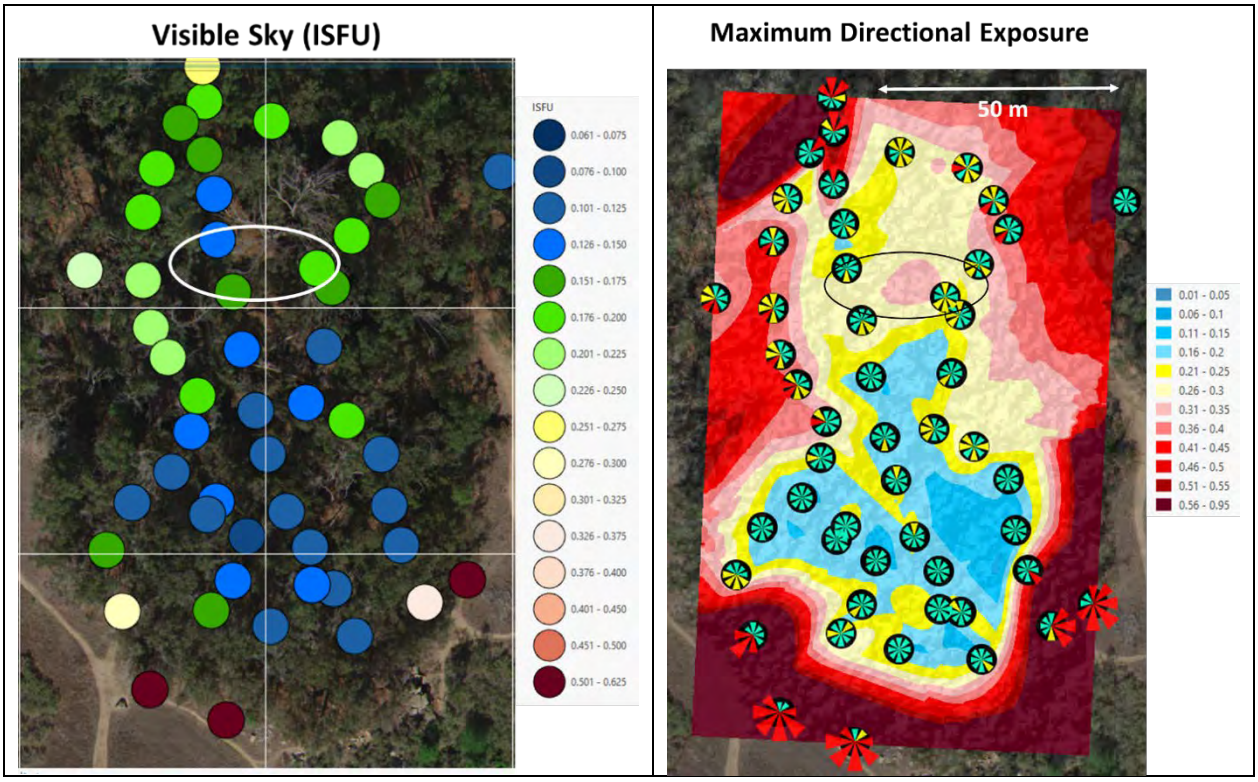


FIGURE 20. DIRECTIONAL EXPOSURE FROM 8 DIRECTIONS

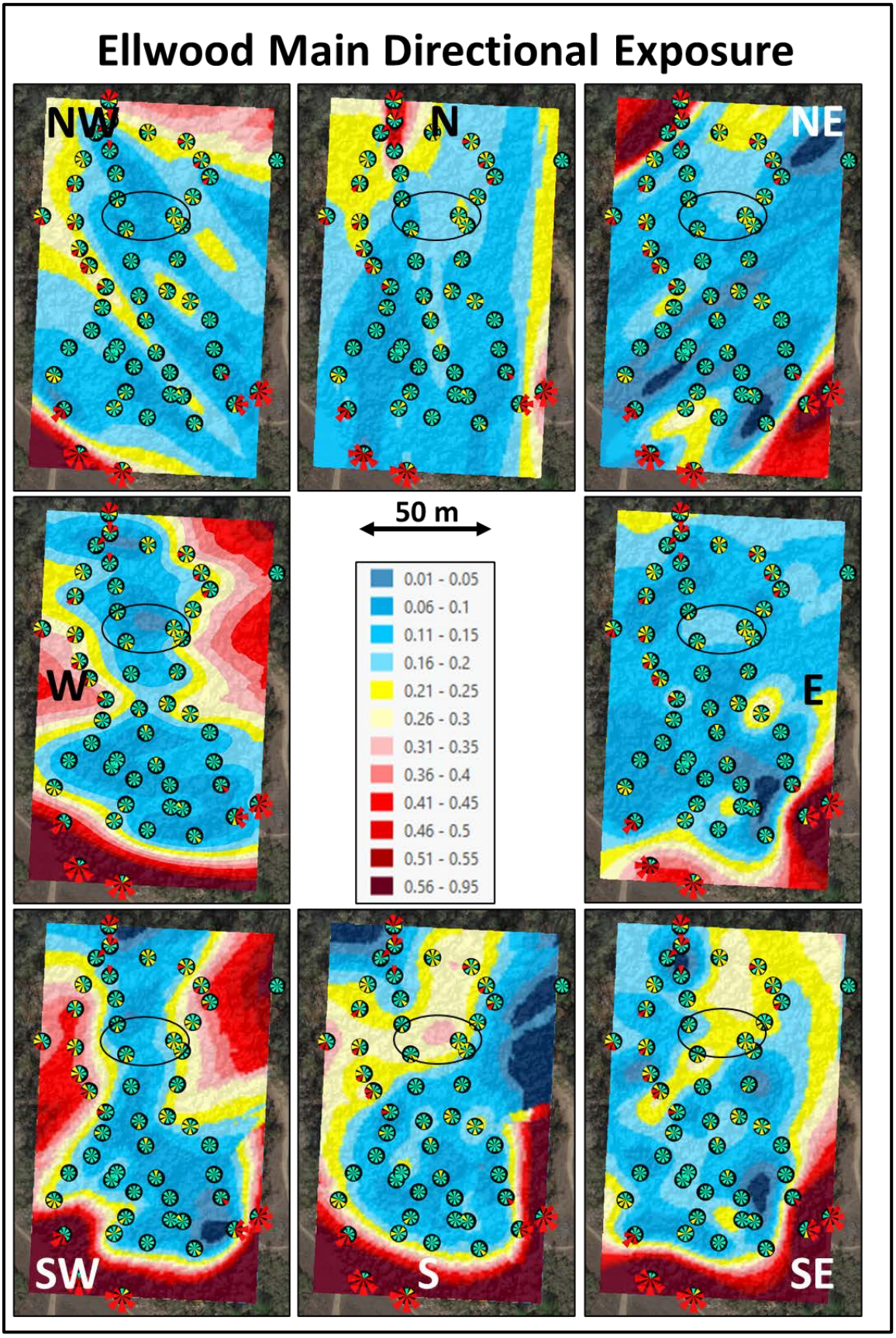


TABLE 6. DETAILS OF 4 HEMIPHOTOS WITHIN PRIMARY CLUSTER ZONE

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.

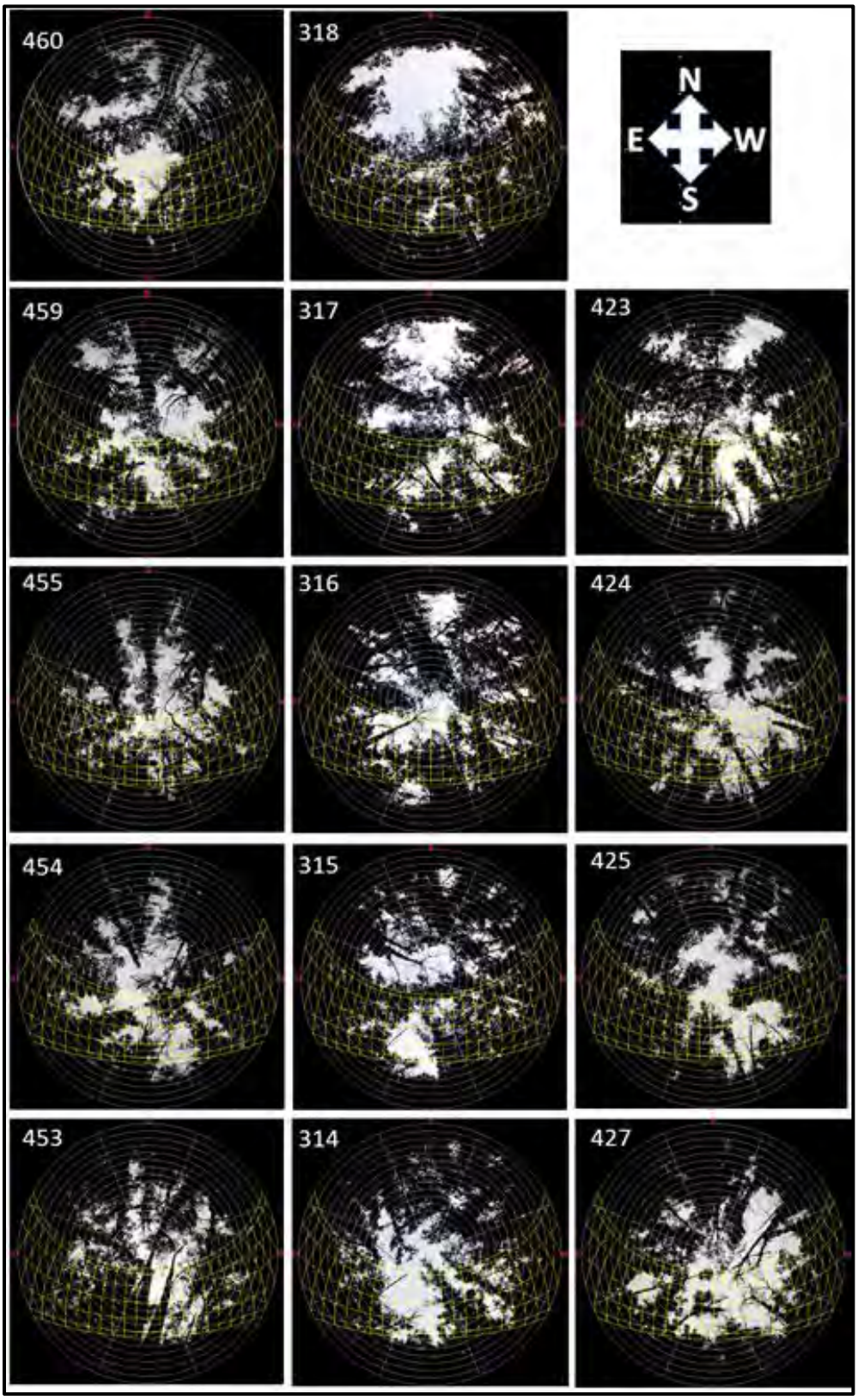


FIGURE 22. INSOLATION AT HEMIPHOTO SITES

Upper legend only applies to DSFU

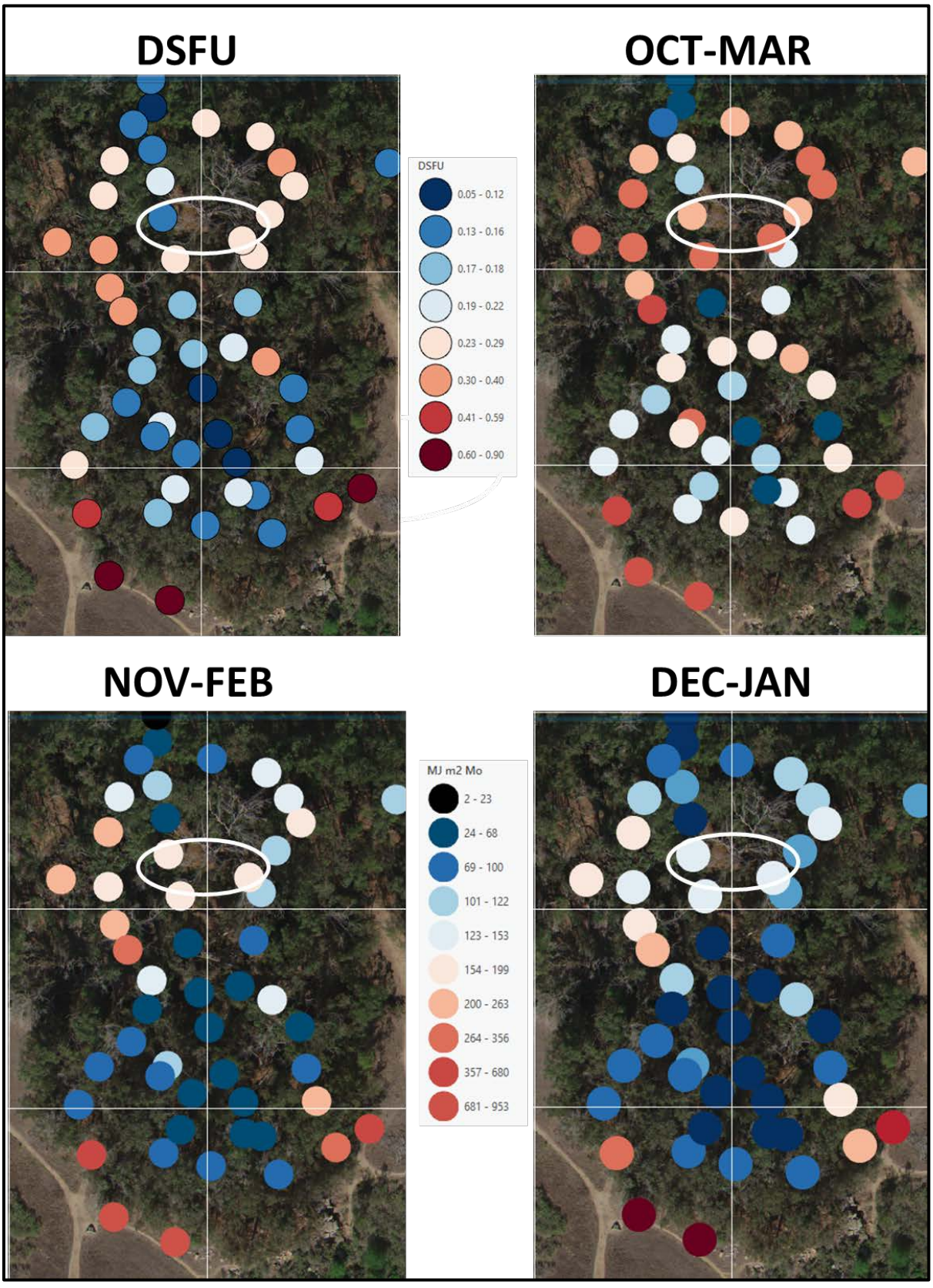


FIGURE 23. OBLIQUE LIDAR VIEW FROM SOUTH WITH EXAMPLE HEMIPHOTO

Dead standing trees in northeast sector and protruding into south gap.

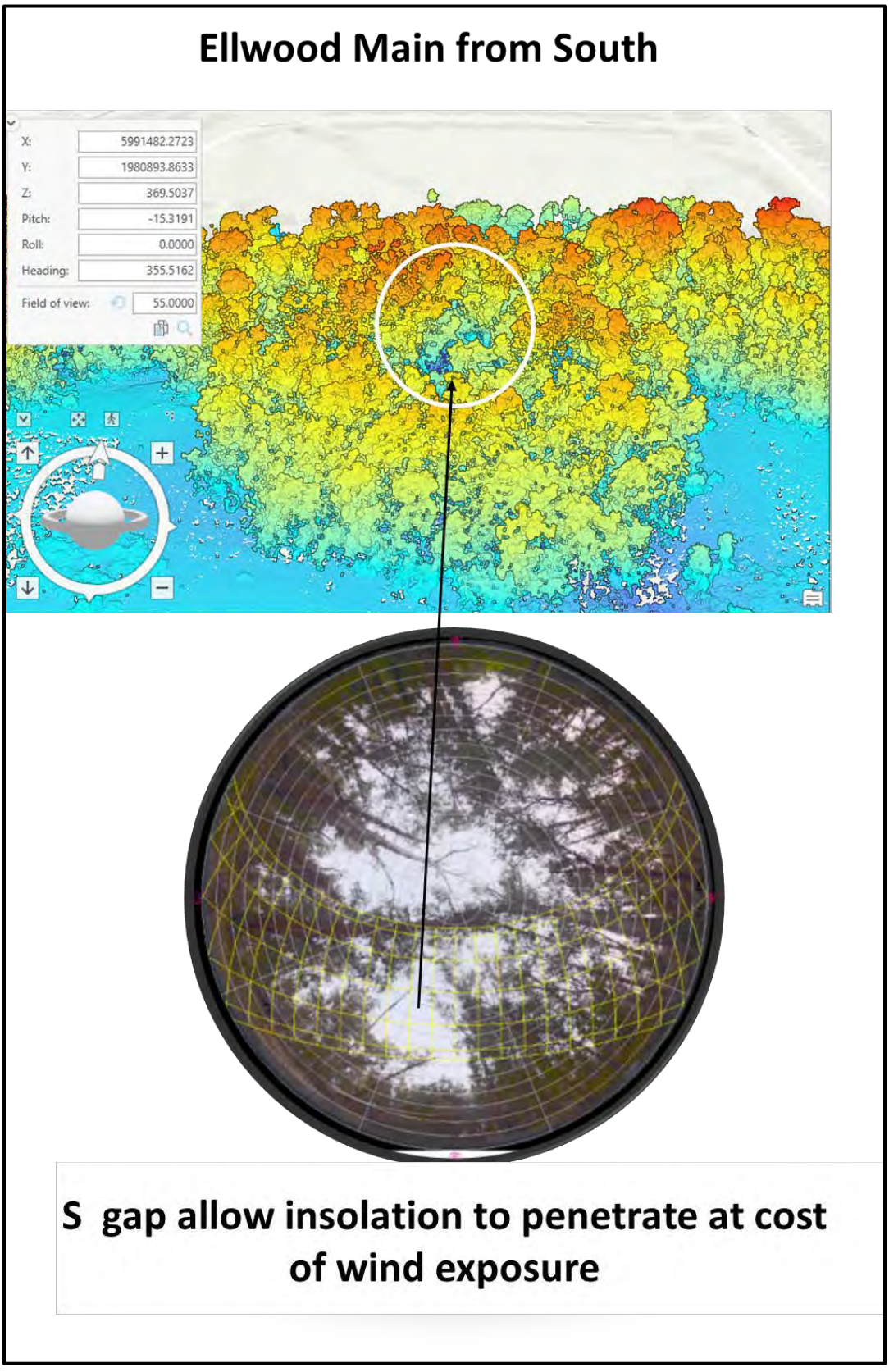


FIGURE 24. OBLIQUE LIDAR VIEW FROM SOUTHWEST WITH EXAMPLE HEMIPHOTO

Thin green line is at top of photo between the photo and the cluster zone.

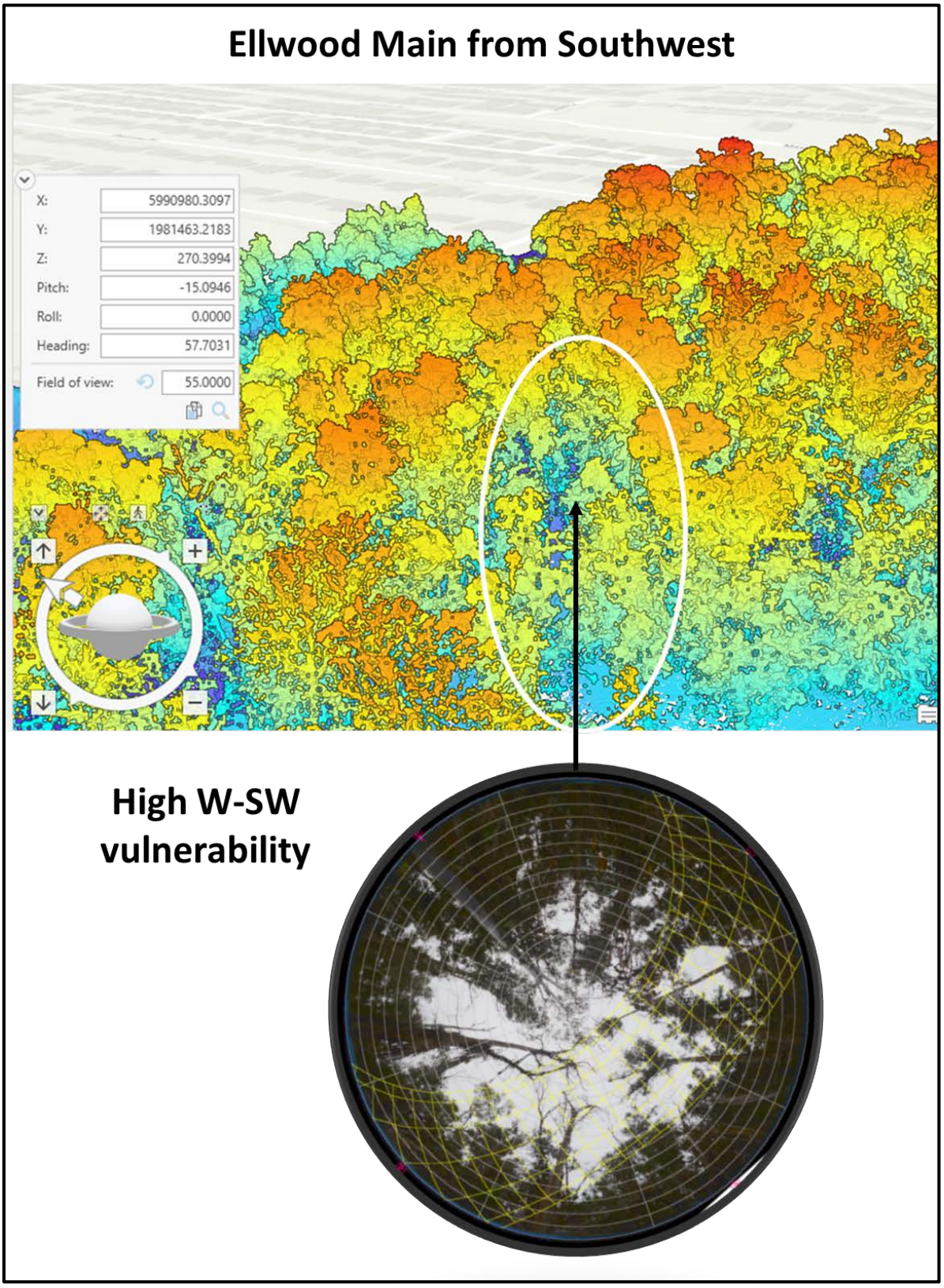


FIGURE 25. OBLIQUE LIDAR VIEW FROM N, WITH TWO HEMIPHOTOS ALONG GULLY
90m and 70m with thin green line of remaining wind shelter in between the photos.

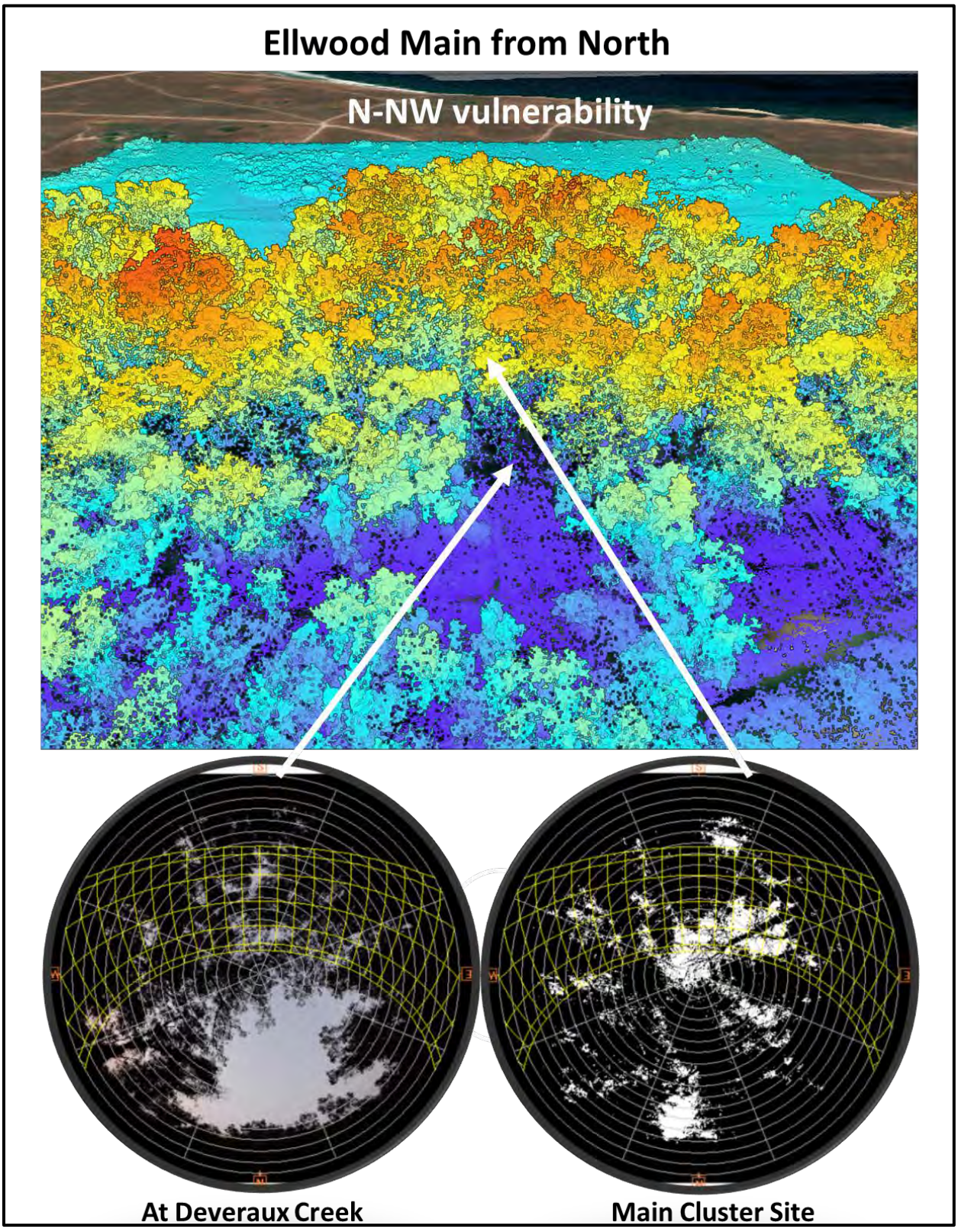


FIGURE 26. ELLWOOD MAIN VULNERABILITIES AND RECOMMENDATIONS FOR RESTORATION

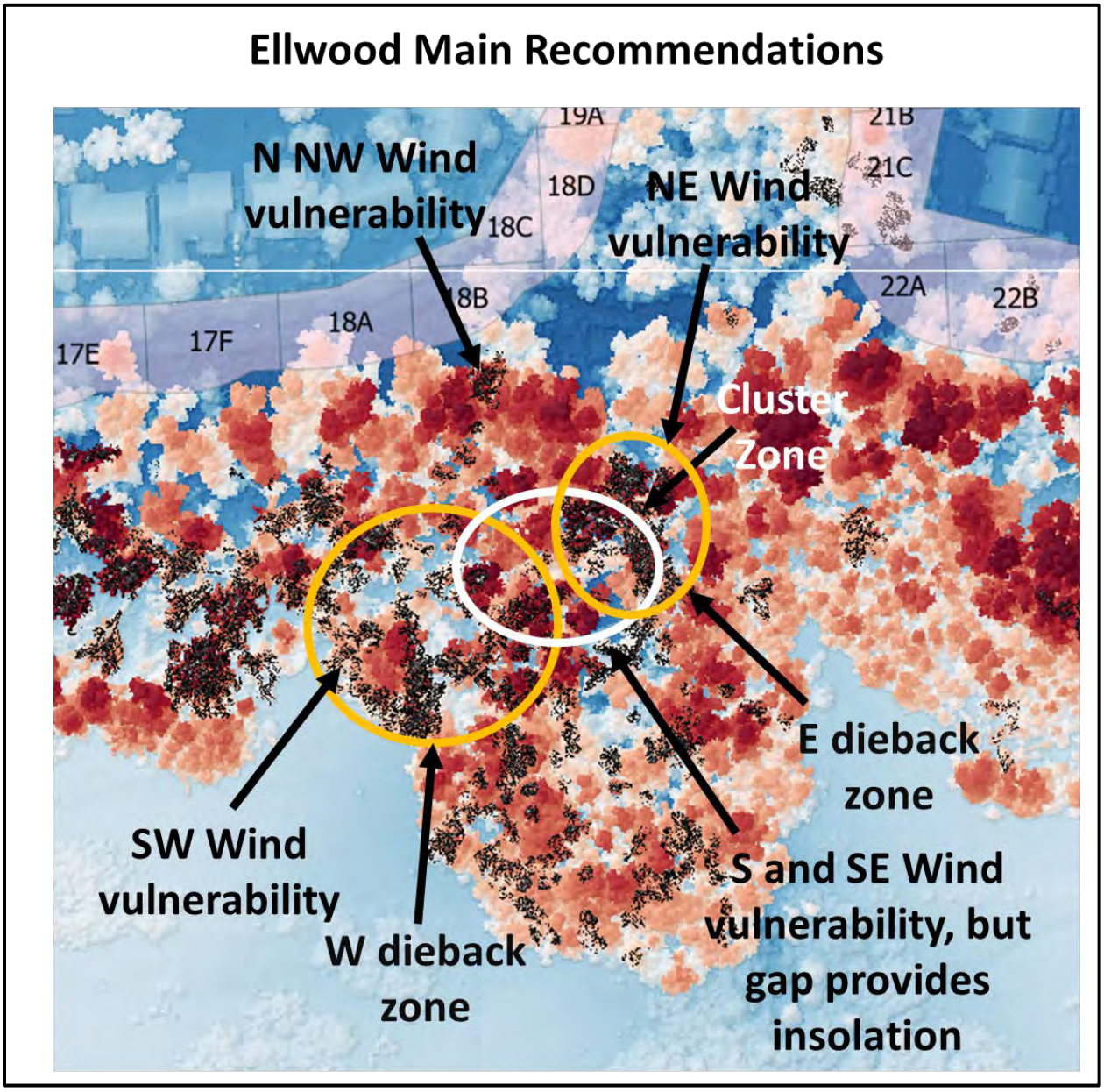
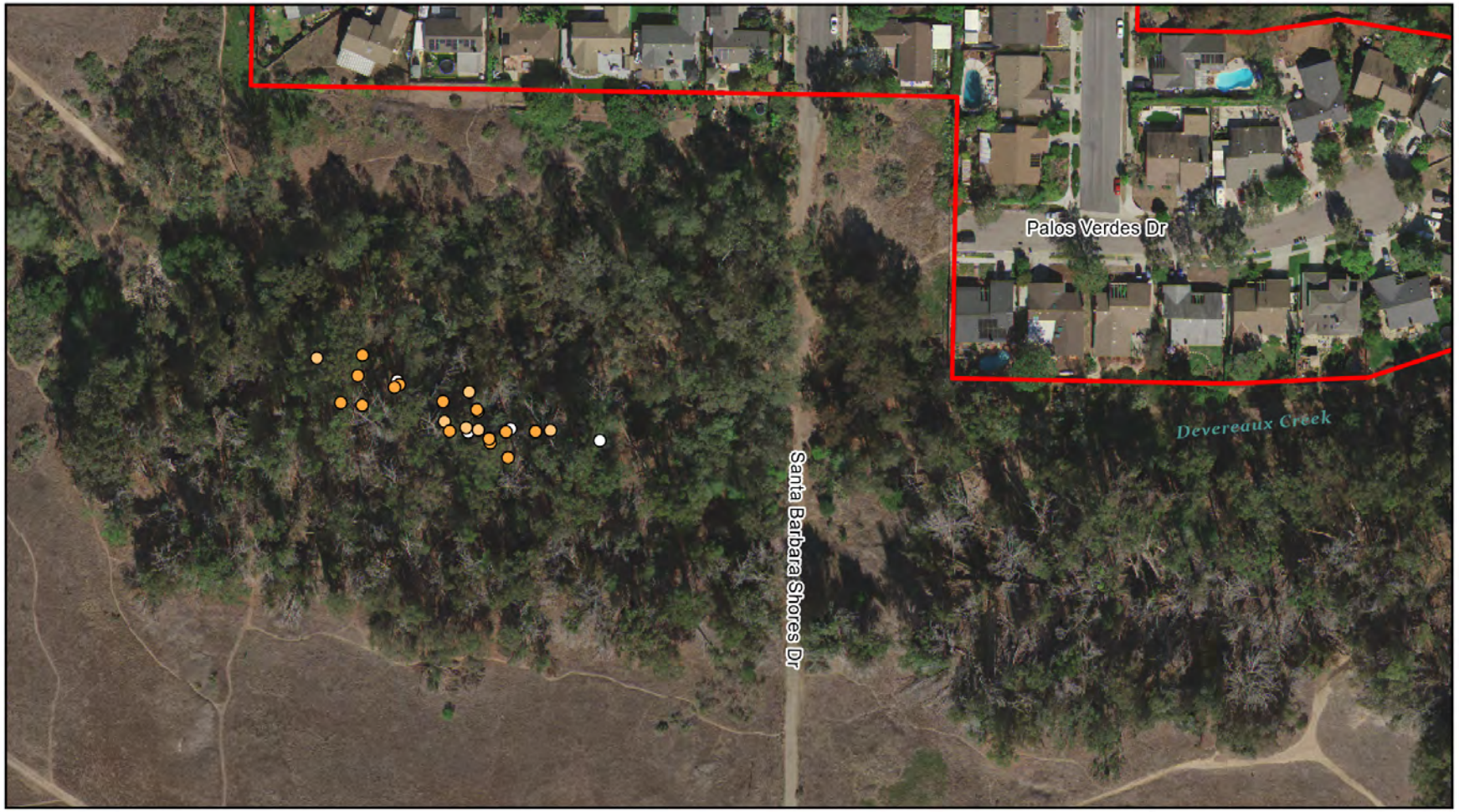


Figure 27. Monarch Observations - Ellwood West



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

ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES

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.

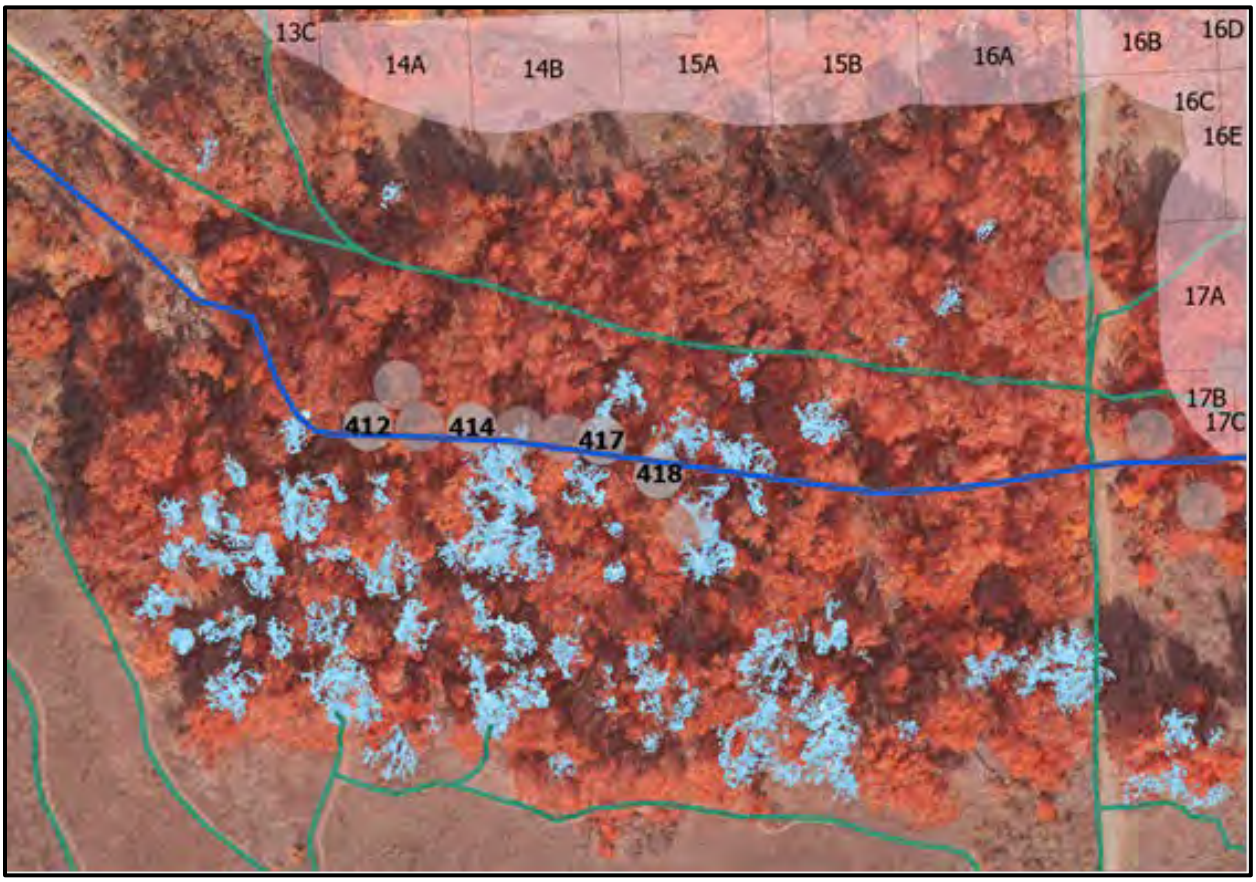
5.3.2 Recommendations for Ellwood West Restoration Actions

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).



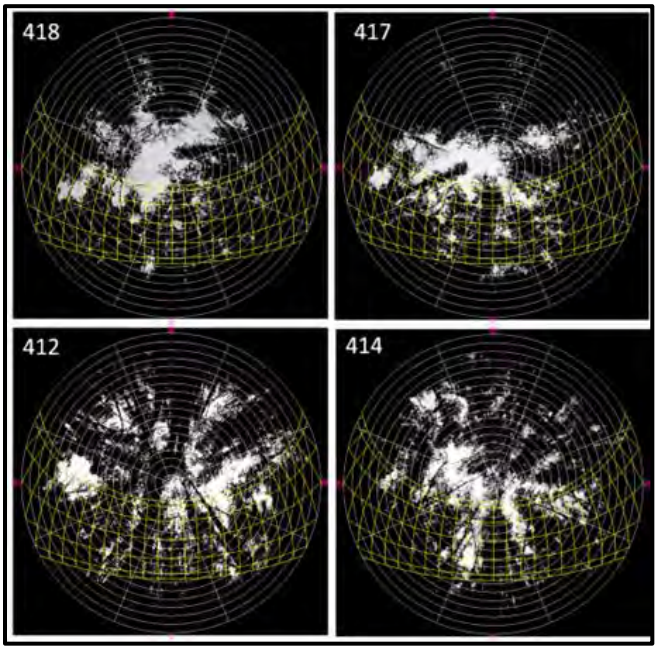


FIGURE 28B. EXAMPLE HEMIPHOTOS AT ELLWOOD WEST

Photos 418 and 417 are the cluster site.

FIGURE 29. POINT MAPS OF HEMIPHOTO RESULTS AT ELLWOOD WEST

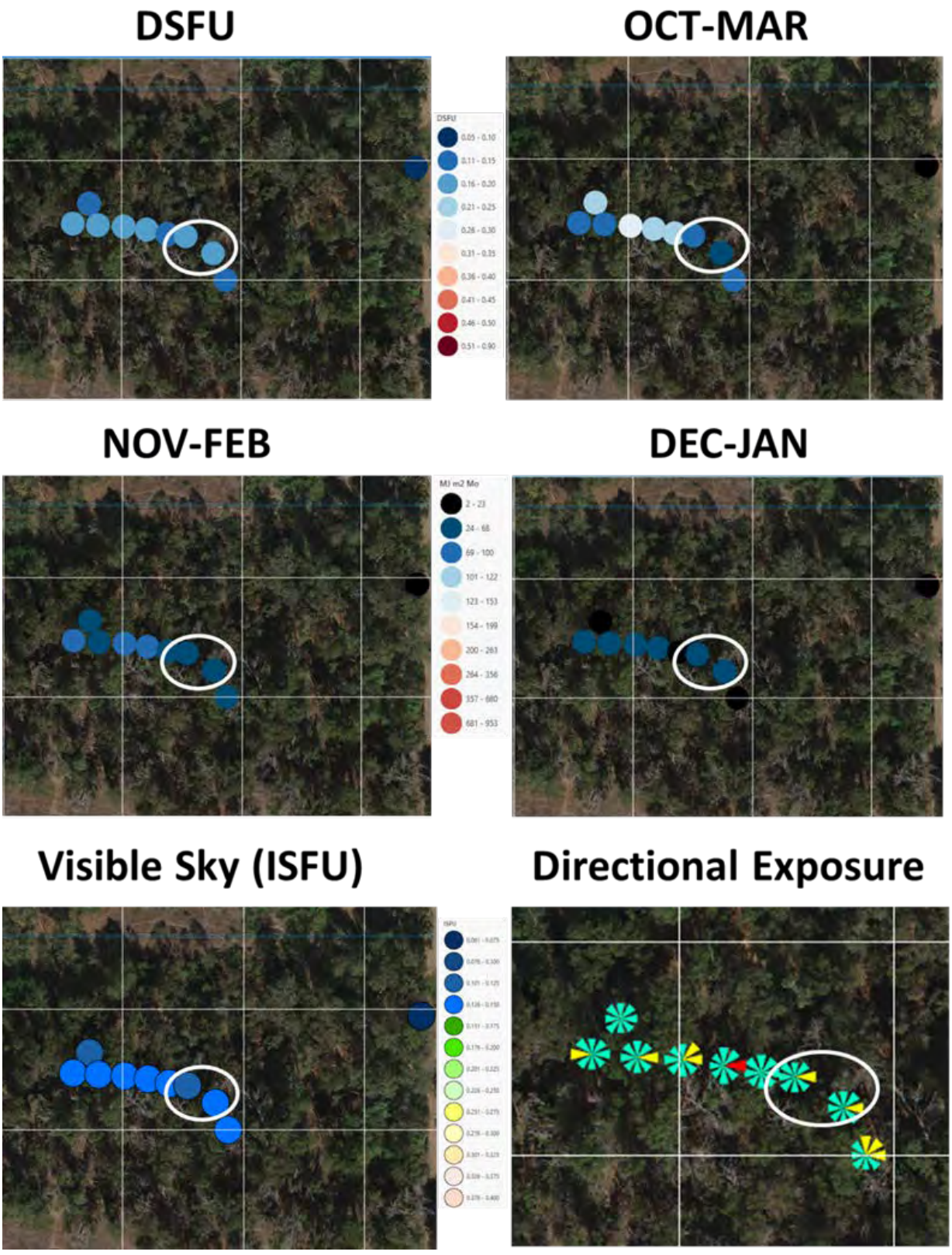
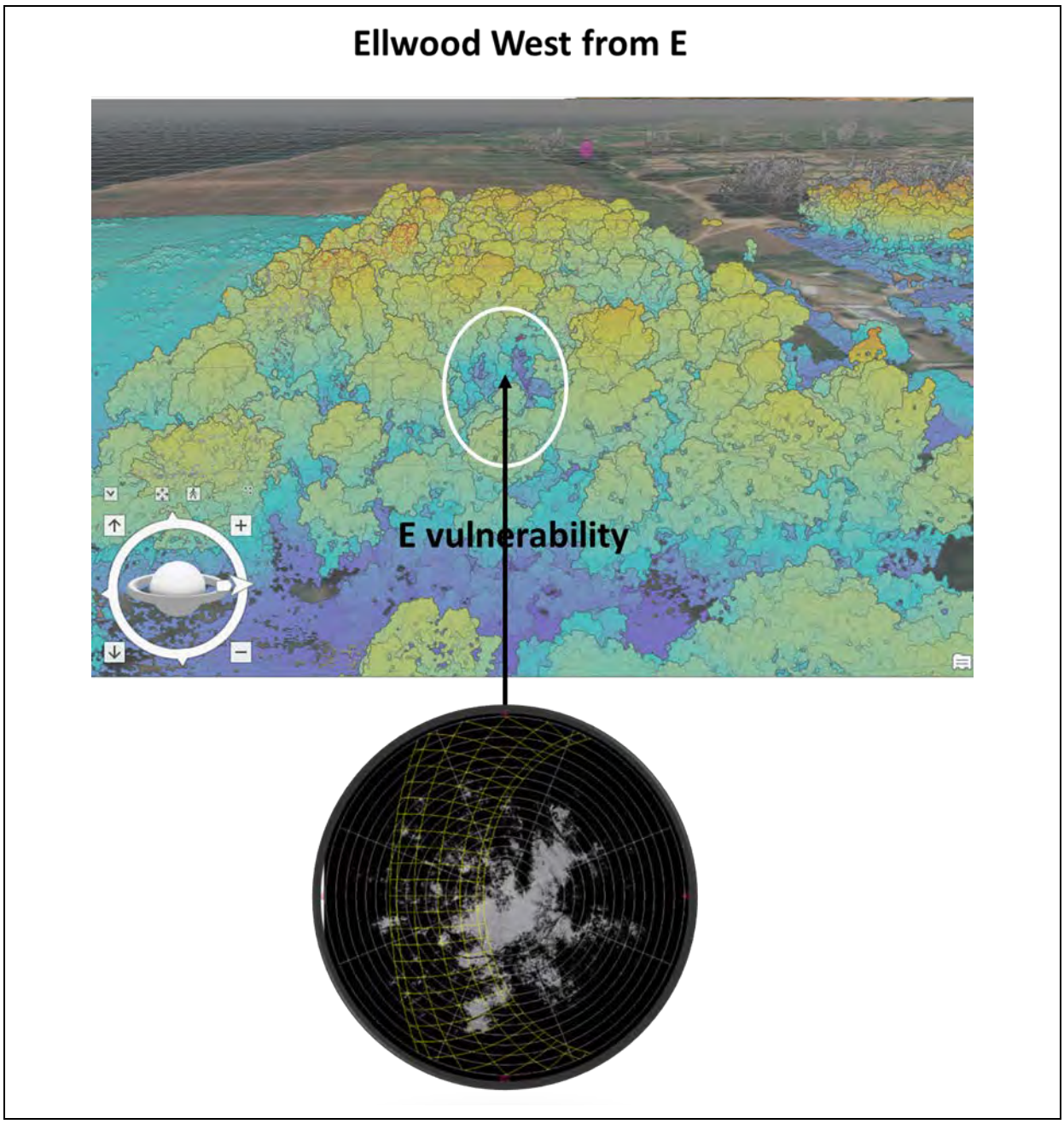


FIGURE 30. OBLIQUE VIEW ELLWOOD WEST VULNERABILITIES



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

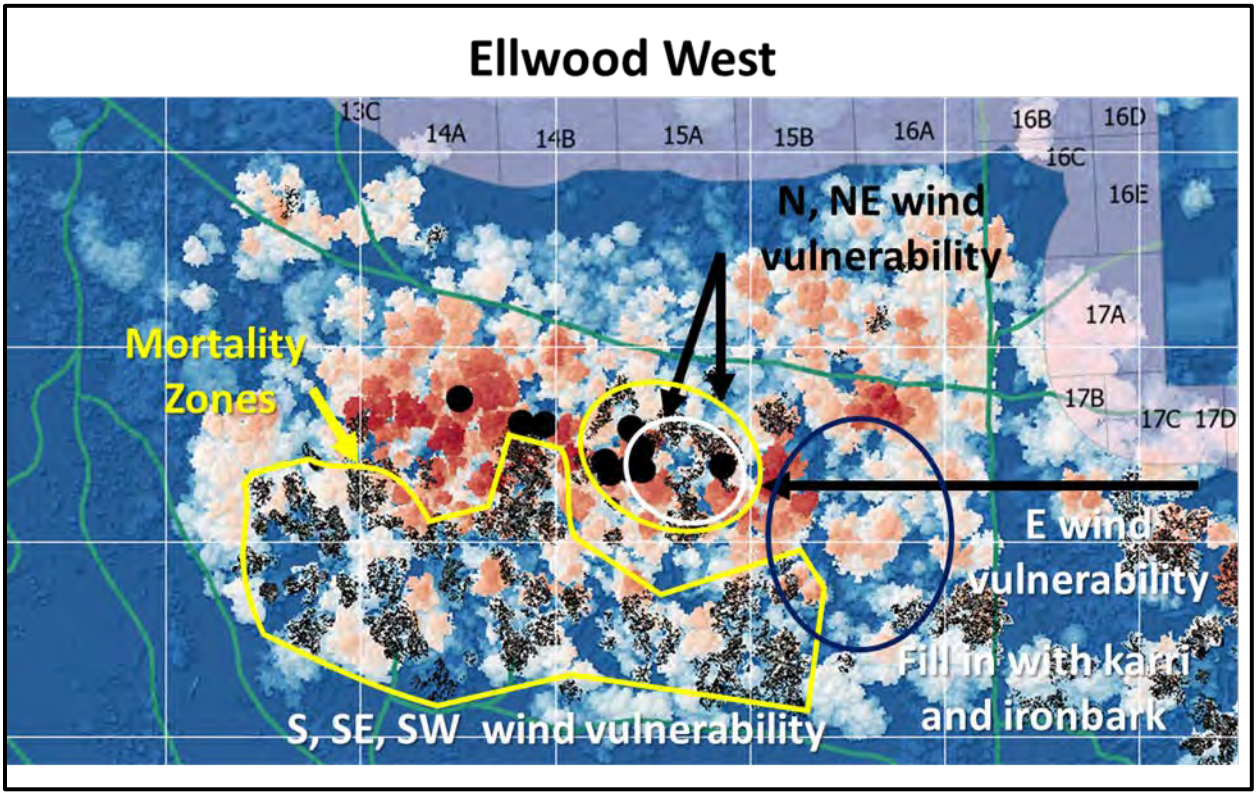


Figure 32. Monarch Observations - Ellwood East



Legend

Ellwood Mesa Open Space Boundary

Monarch Cluster Observations by year

- 2022
- 2021
- 2020
- 2019

N

0 100 200 Feet

Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42283°N 119.88886°W
Goleta, Santa Barbara County

Imagery Source: NV5, 10/29/2021

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Map Updated:
February 28, 2023 05:04 PM by CDM

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.

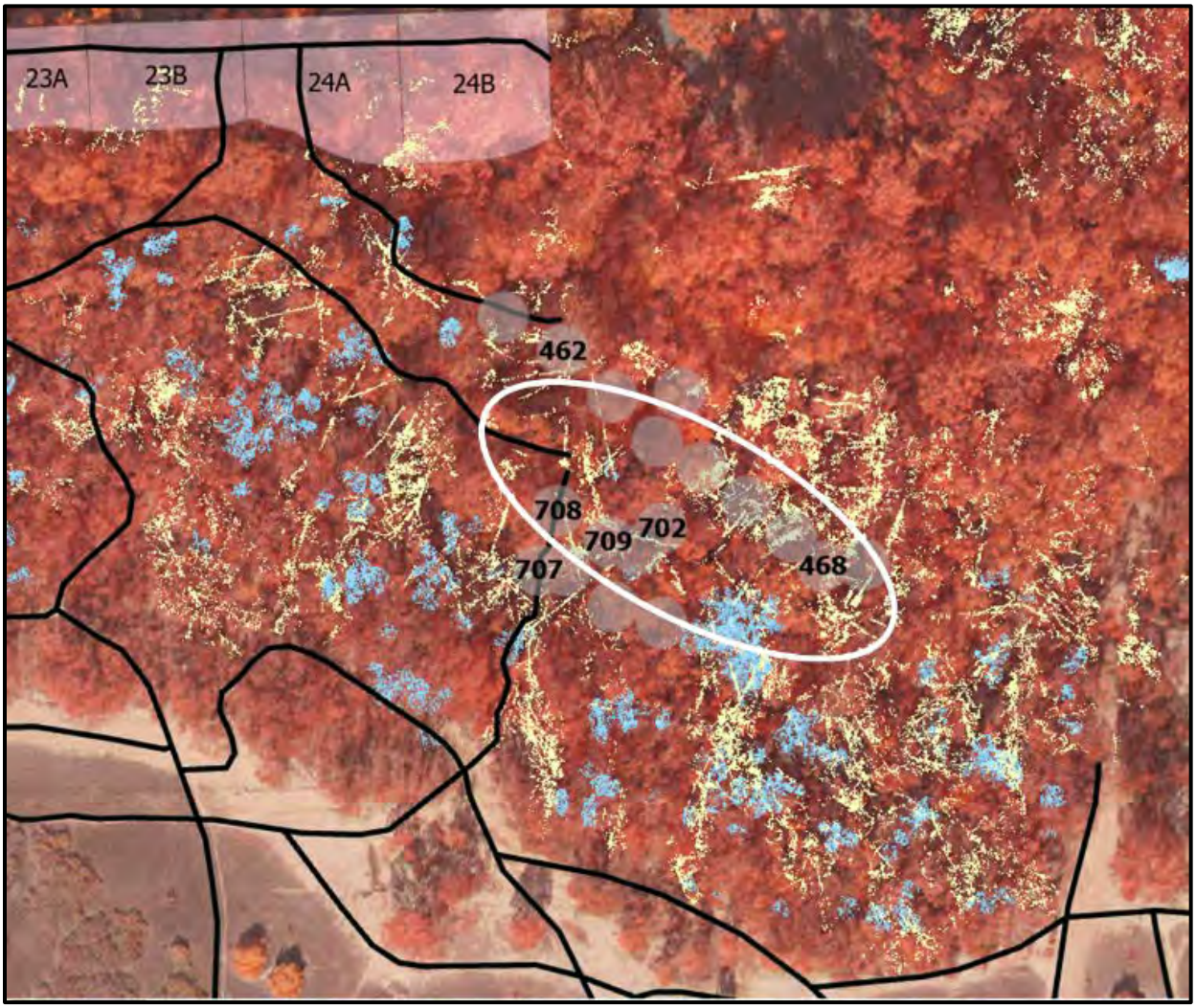


FIGURE 33B. EXAMPLE HEMIPHOTOS FOR ELLWOOD EAST

Hemiphotos 702,708,709, and 468 are in the cluster zone.

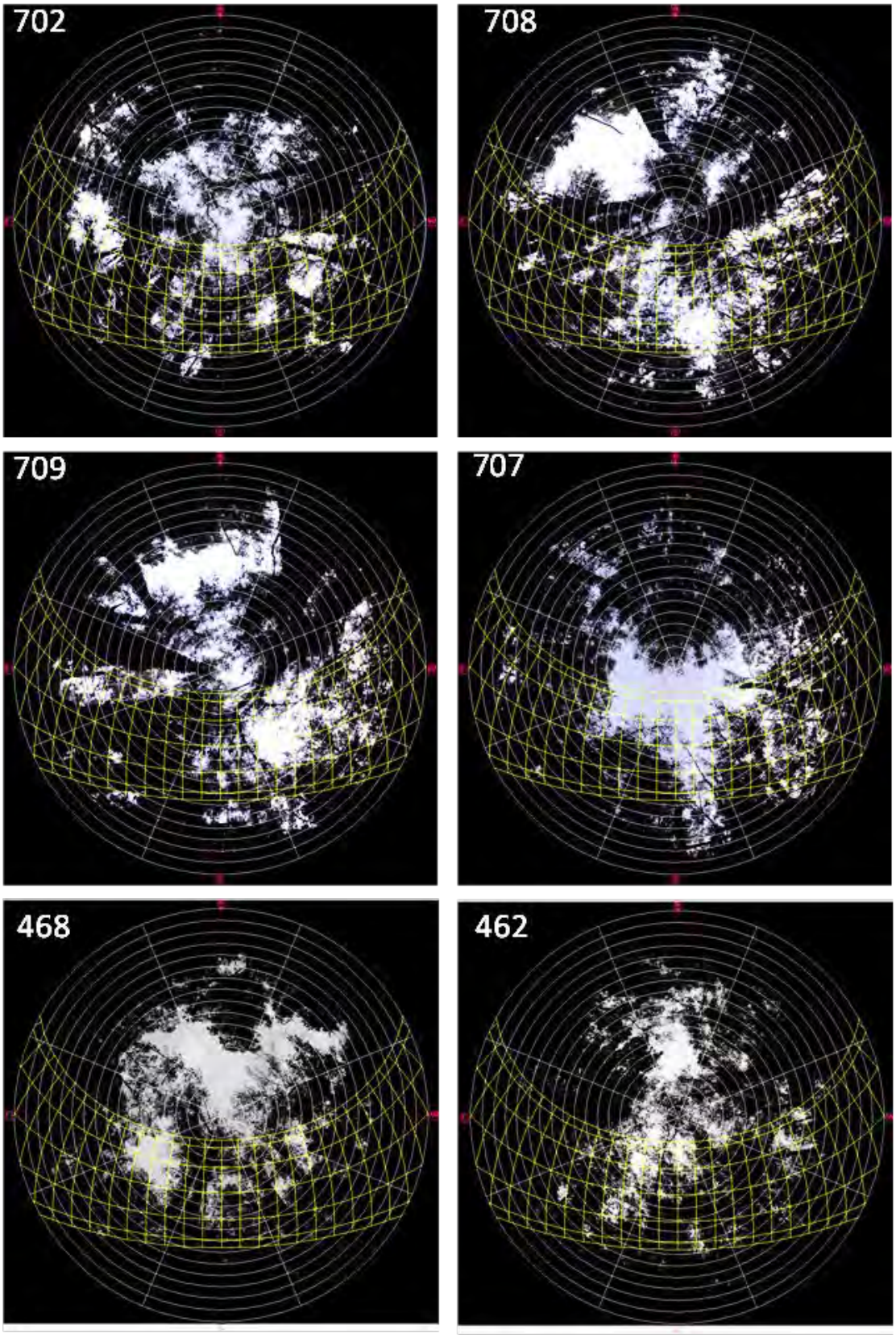


FIGURE 34. POINT MAPS OF HEMIPHOTO RESULTS AT ELLWOOD EAST

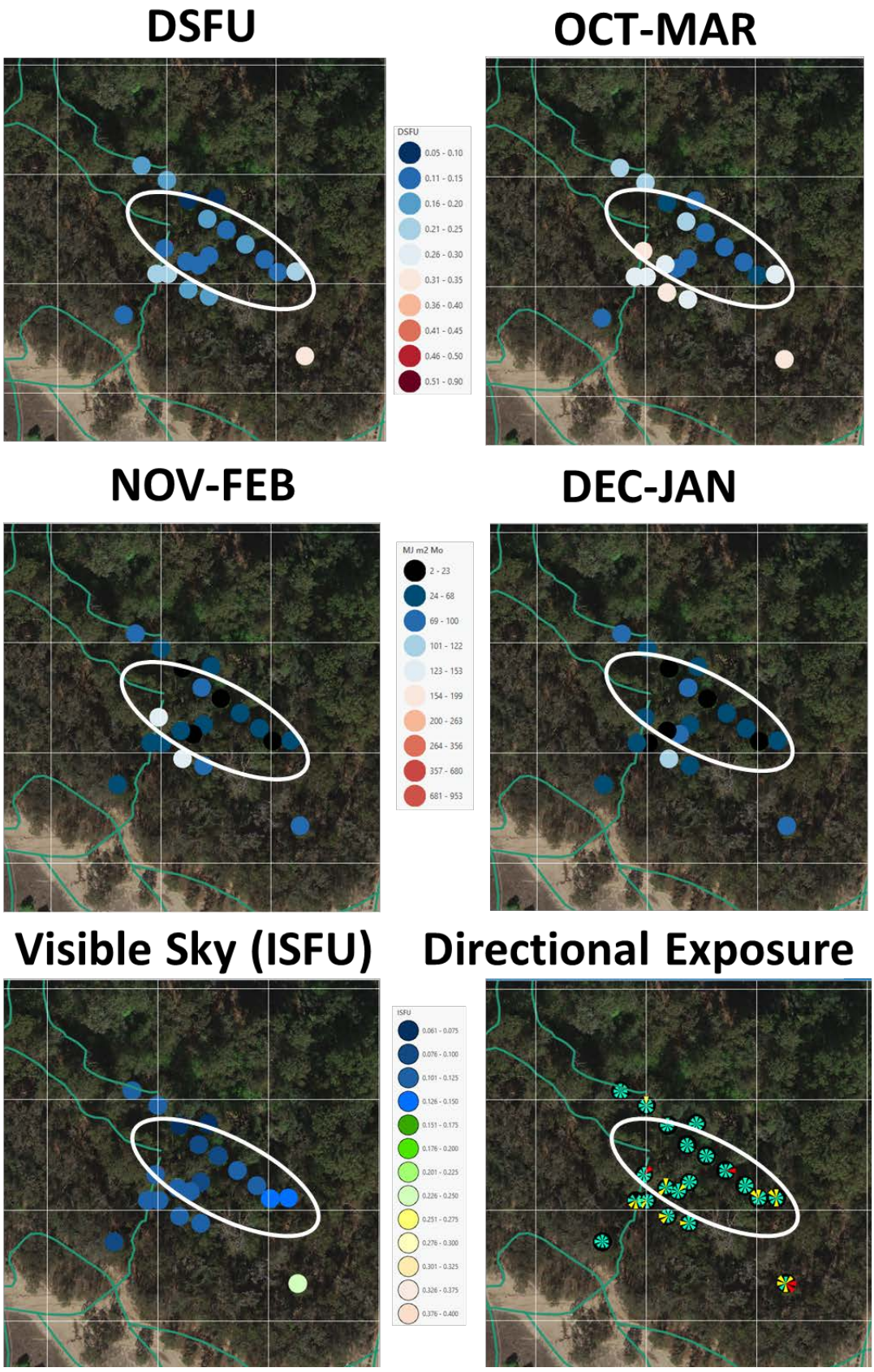


FIGURE 35. ELLWOOD EAST VULNERABILITIES AND RECOMMENDATIONS FOR RESTORATION
Cluster sites are small white circles within the larger ellipse.

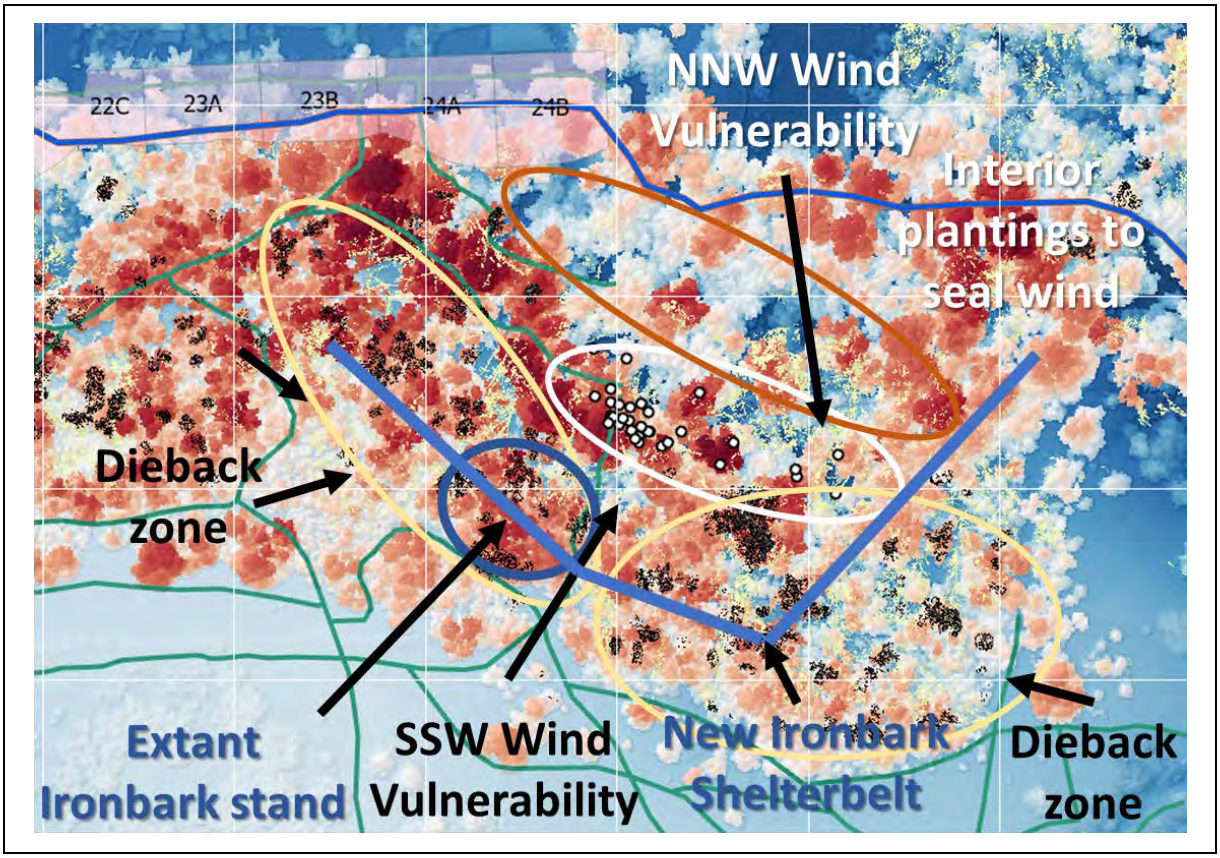


Figure 36. Monarch Observations - Ellwood North



Legend

Ellwood Mesa Open Space Boundary

Monarch Cluster Observations by year

2019

Aggregation Sites

Primary

Historic

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, 10/29/2021

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Map Updated:
April 21, 2023 12:53 PM by CDM

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.

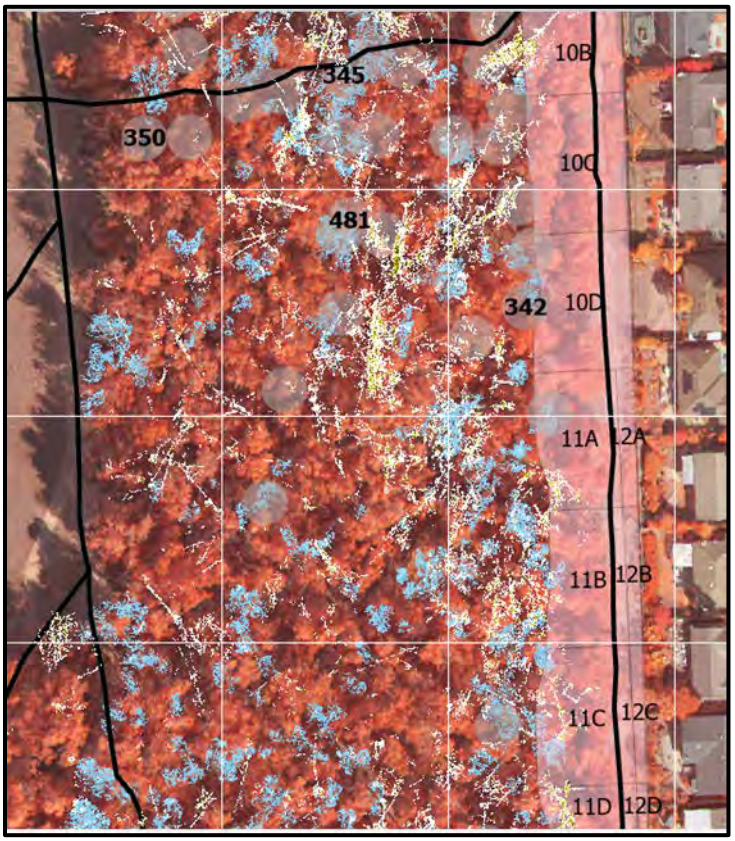


FIGURE 37A. HEMIPHOTO TRANSECT LOCATIONS AT ELLWOOD NORTH CENTRAL

Map with 50 m Grid. Dead standing (blue) and Downed (yellow) shown over a color infrared photo. Lighter shaded grids are fuel management areas.

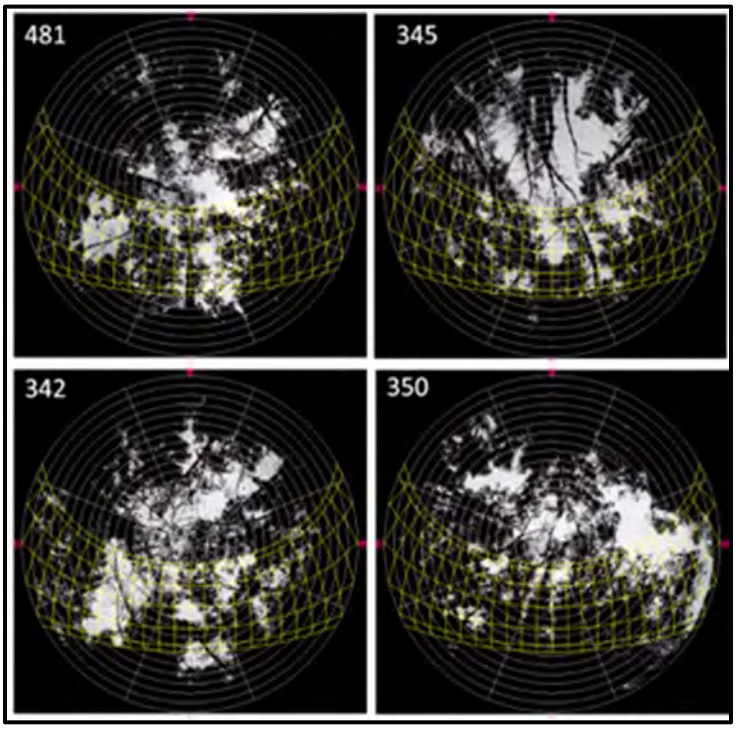


FIGURE 37B. EXAMPLE HEMIPHOTOS AT ELLWOOD NORTH CENTRAL

FIGURE 38. POINT MAPS OF HEMIPHOTO RESULTS AT ELLWOOD NORTH-CENTRAL

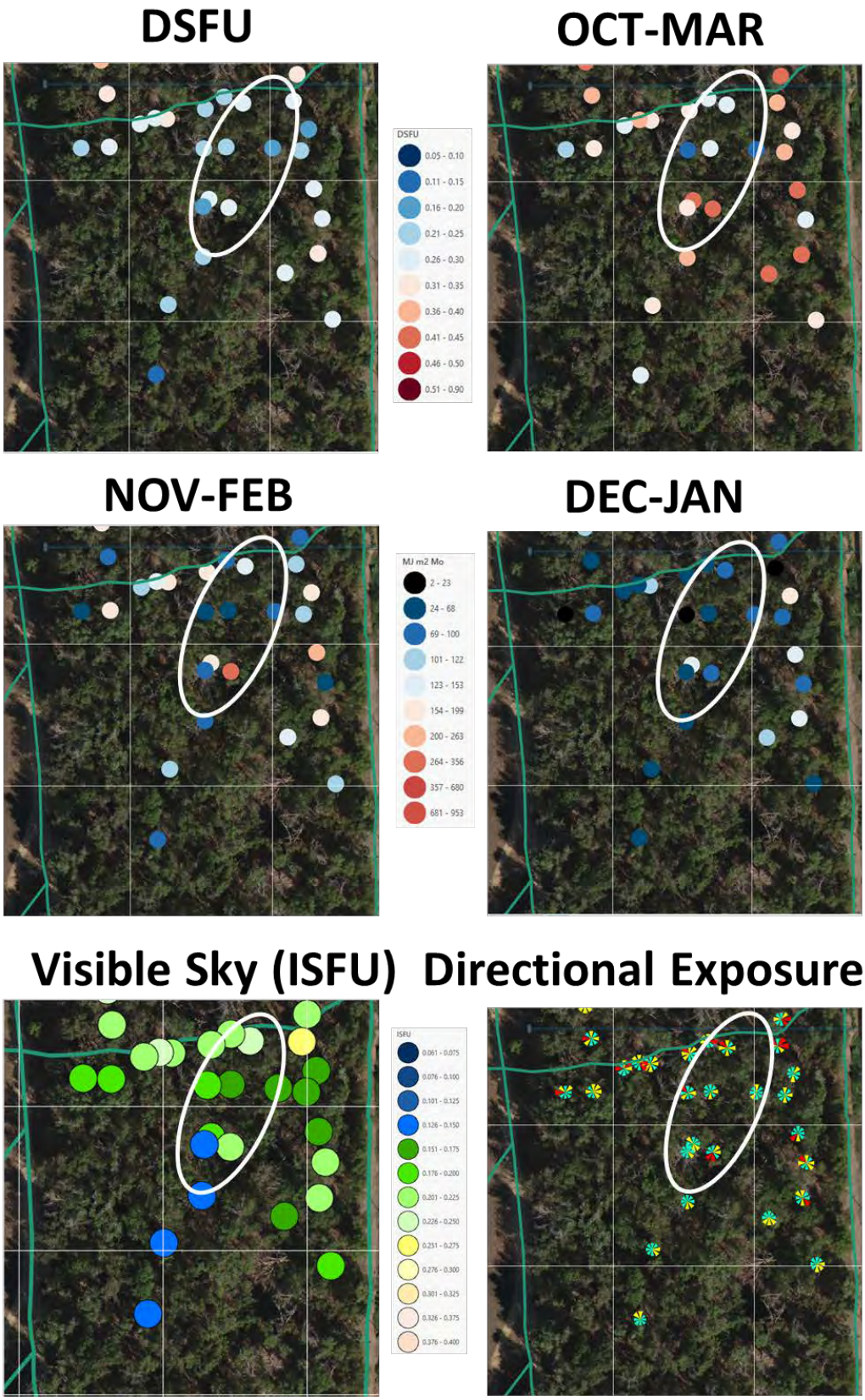
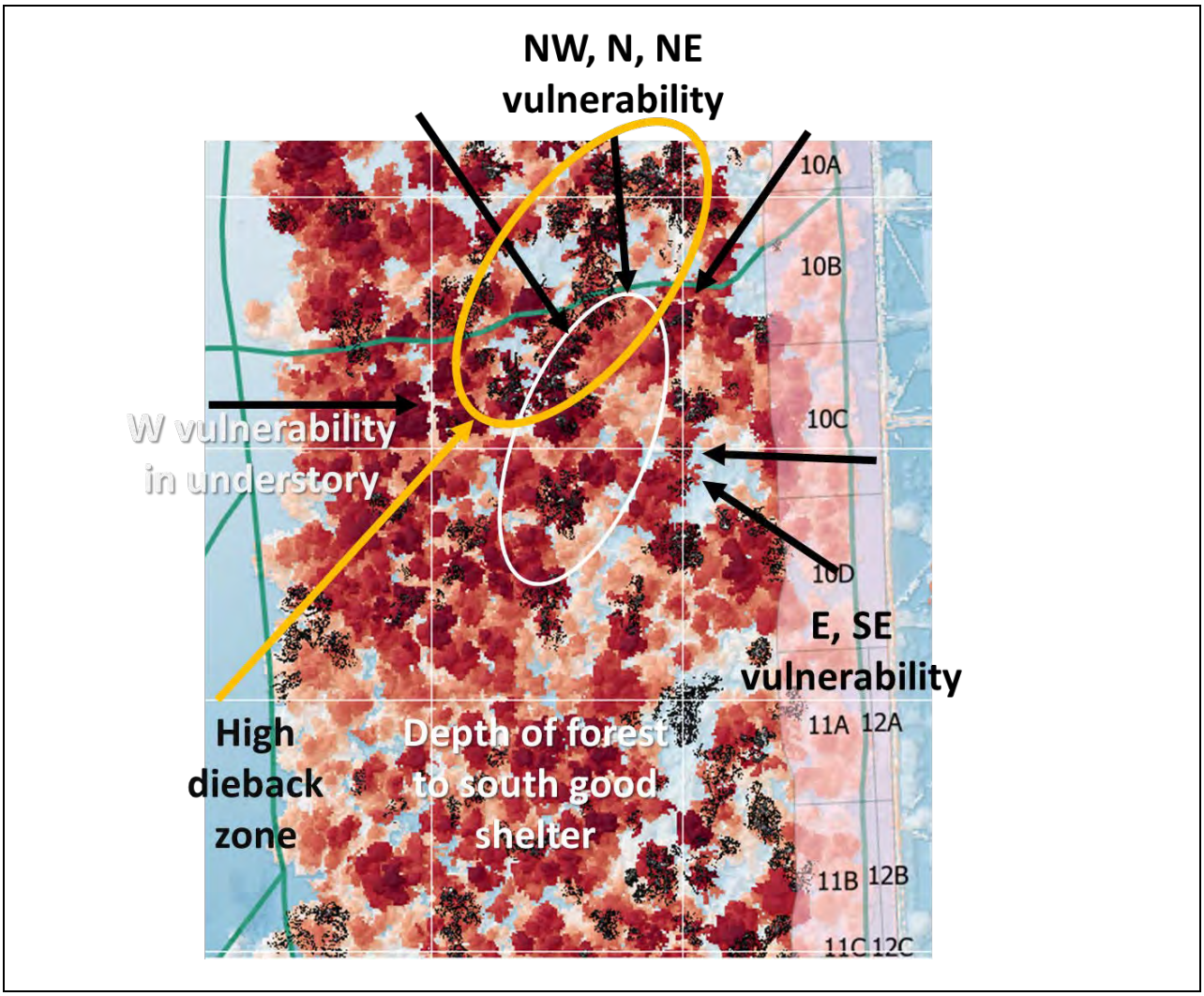


FIGURE 39. ELLWOOD NORTH-CENTRAL VULNERABILITIES AND RECOMMENDATIONS FOR RESTORATION



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.

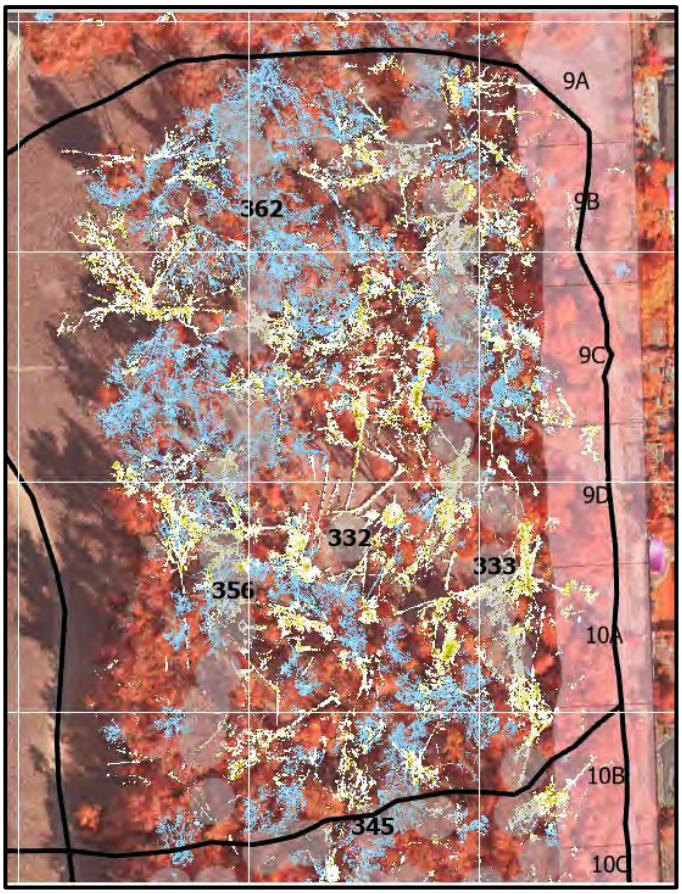


FIGURE 40A. HEMIPHOTO TRANSECT LOCATIONS AT ELLWOOD NORTH-NORTH

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.

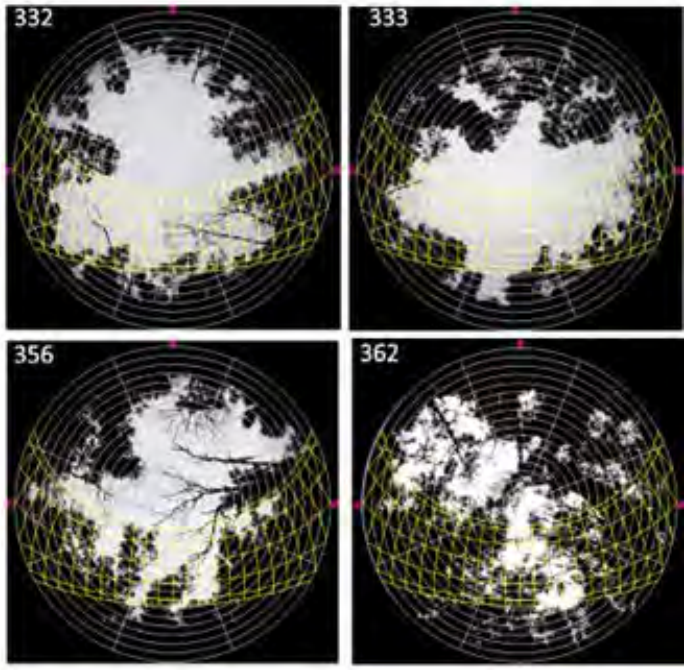


FIGURE 40B. EXAMPLE HEMIPHOTOS AT ELLWOOD NORTH-NORTH

FIGURE 41. POINT MAPS OF HEMIPHOTO RESULTS AT ELLWOOD NORTH-NORTH

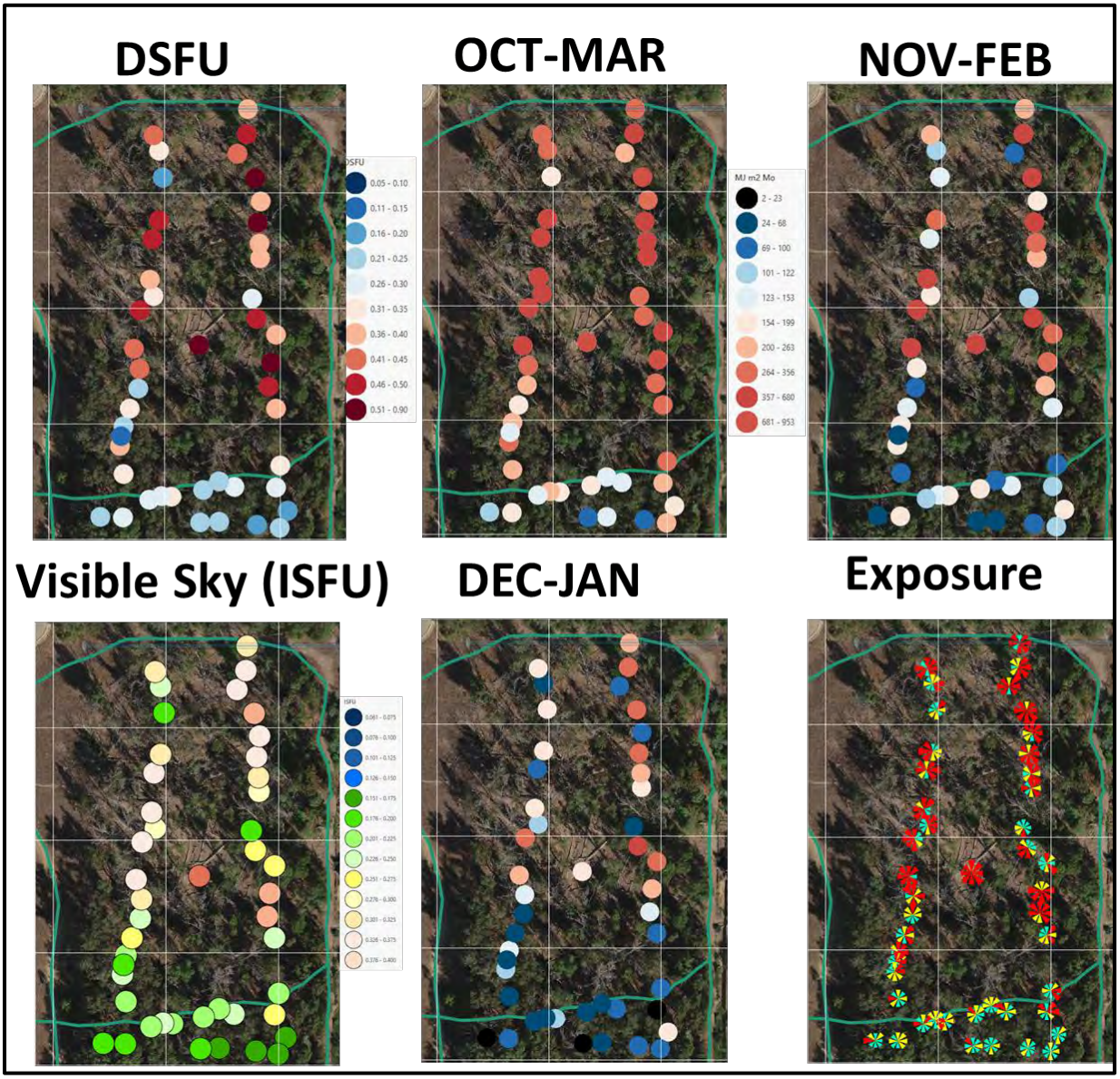


Figure 42. Monarch Observations - Ellwood Ironbark



Legend

Ellwood Mesa Open Space Boundary

Monarch Cluster Observations by year

2019

N

0 50 100 Feet

Goleta Monarch Butterfly Grove at Ellwood Mesa
Map Center: 34.42486°N 119.89609°W
Goleta, Santa Barbara County

Imagery Source: NV5, 10/29/2021

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.

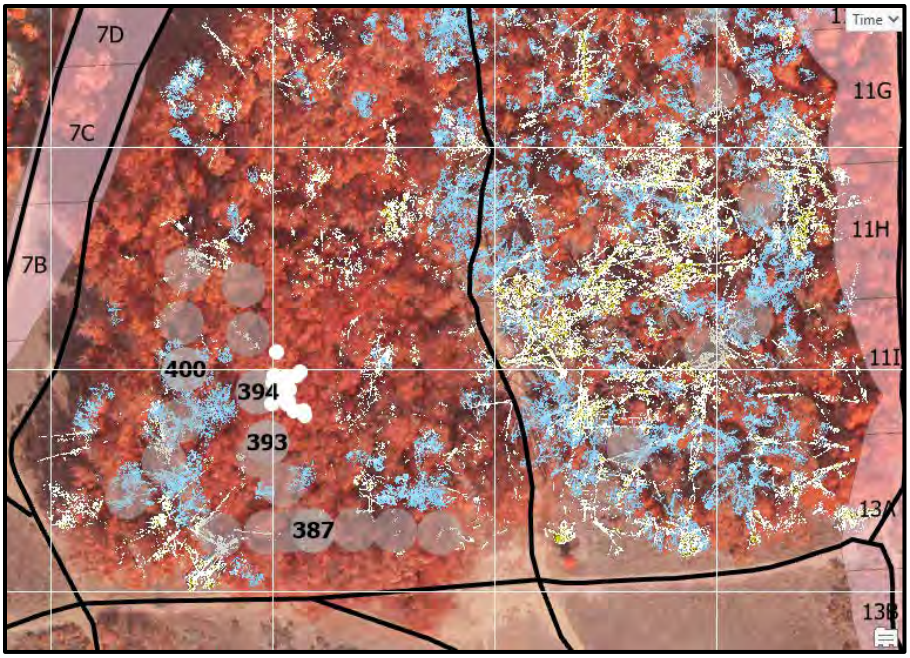


FIGURE 43A. HEMIPHOTO TRANSECT LOCATIONS AT ELLWOOD IRONBARK

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.

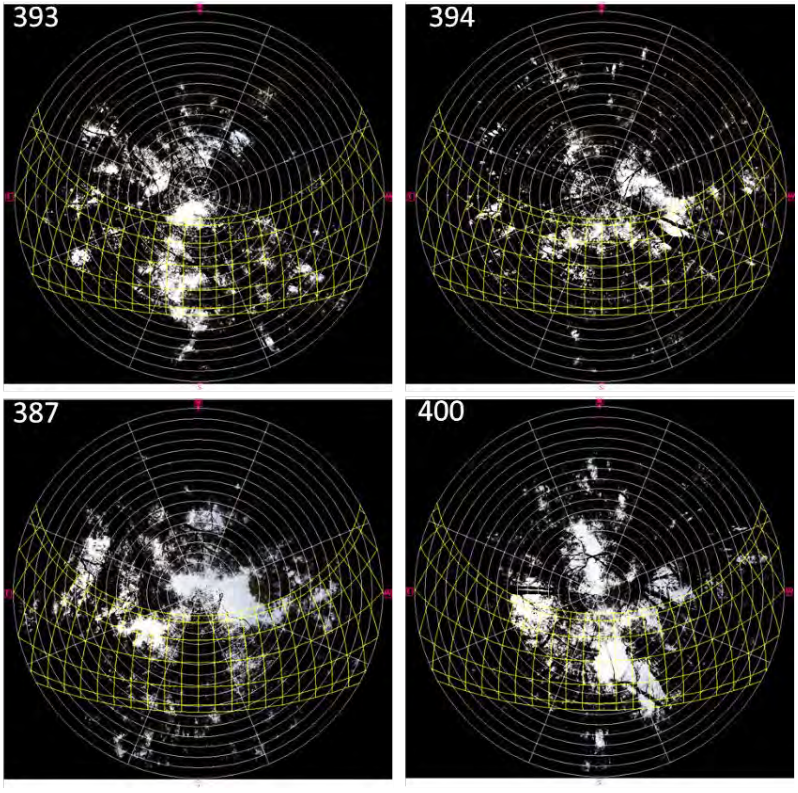


FIGURE 43B. EXAMPLE HEMIPHOTOS AT ELLWOOD IRONBARK

FIGURE 44. POINT MAPS OF HEMIPHOTO RESULTS AT ELLWOOD IRONBARK

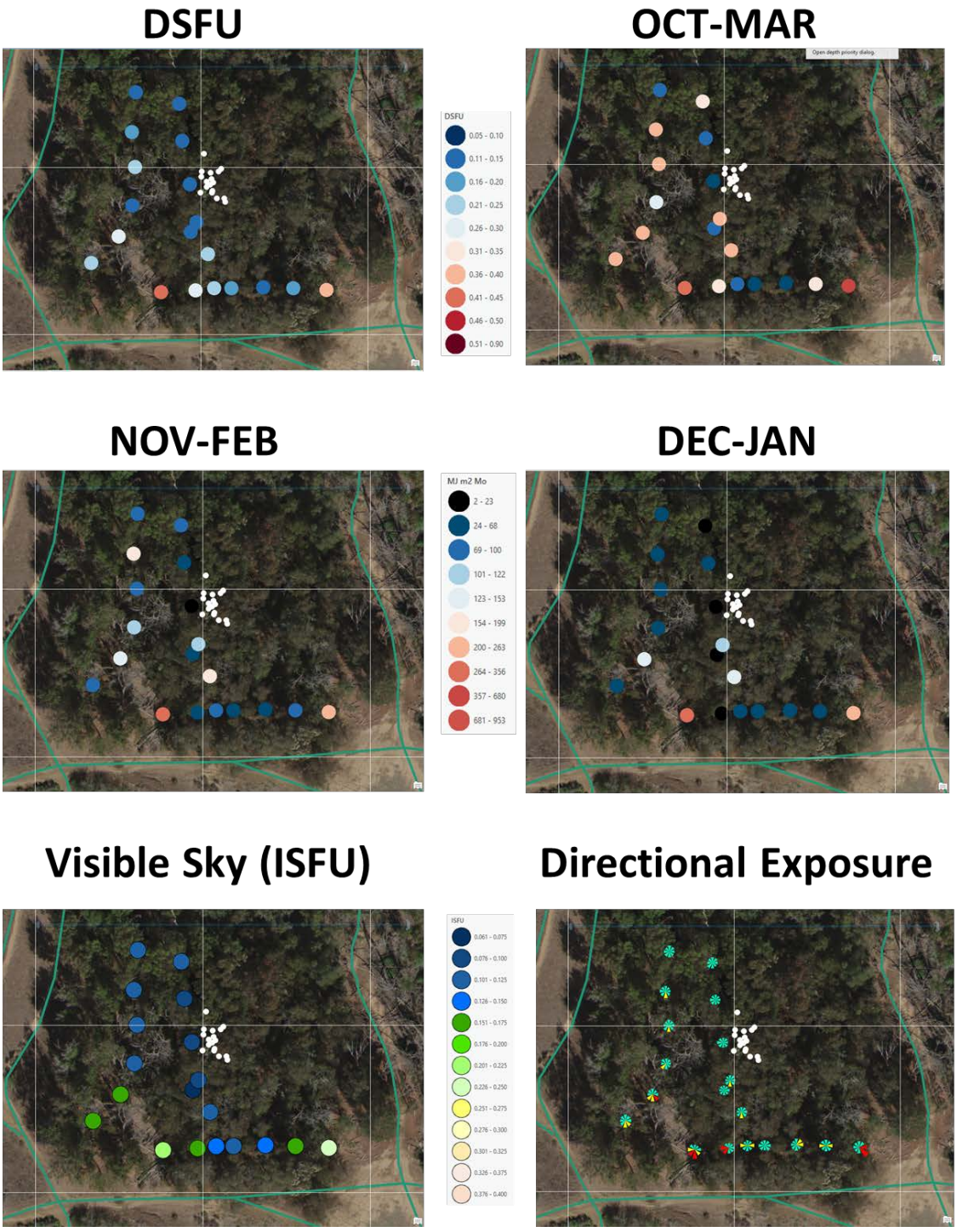
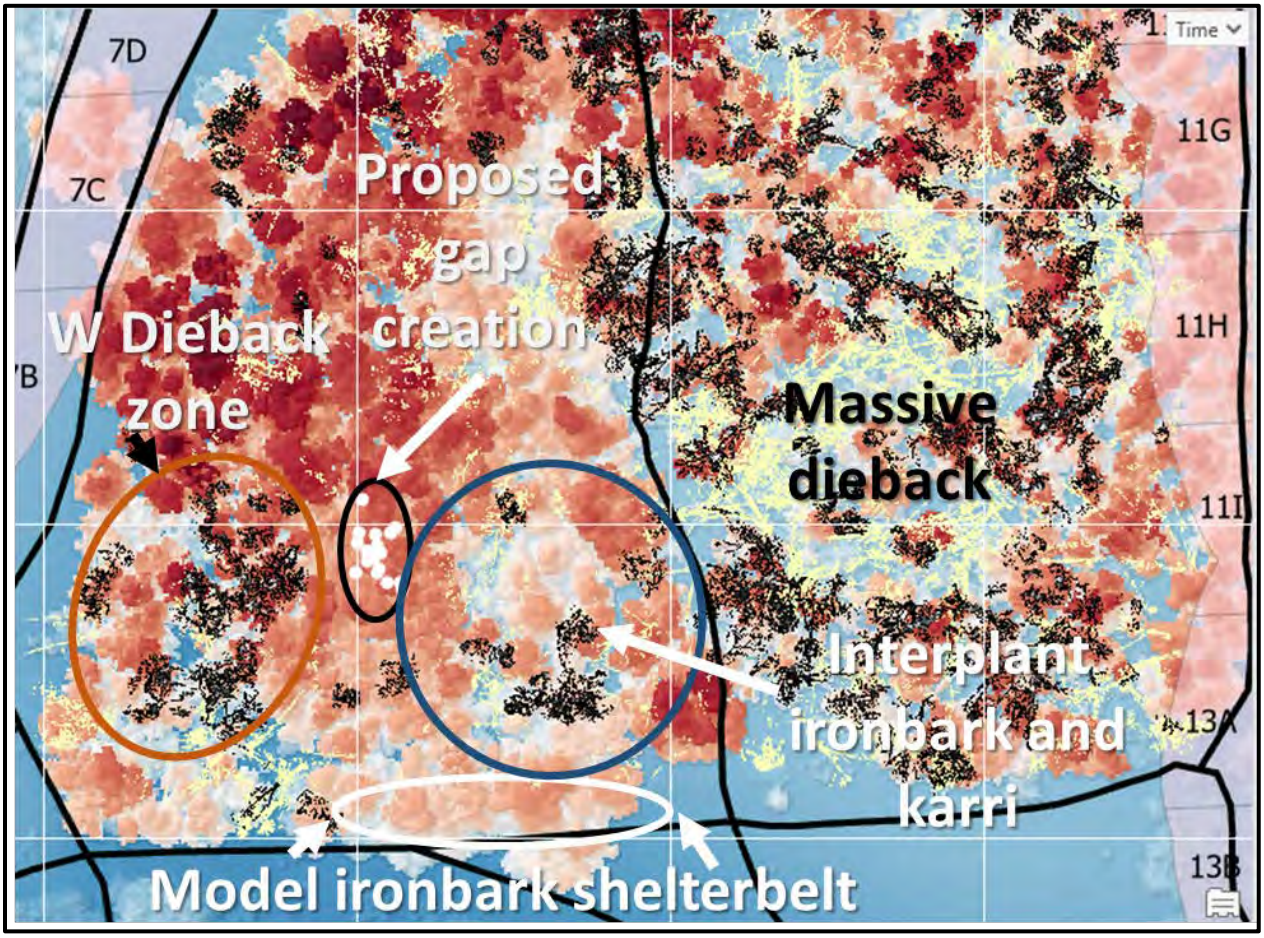


FIGURE 45. ELLWOOD IRONBARK RECOMMENDATIONS



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

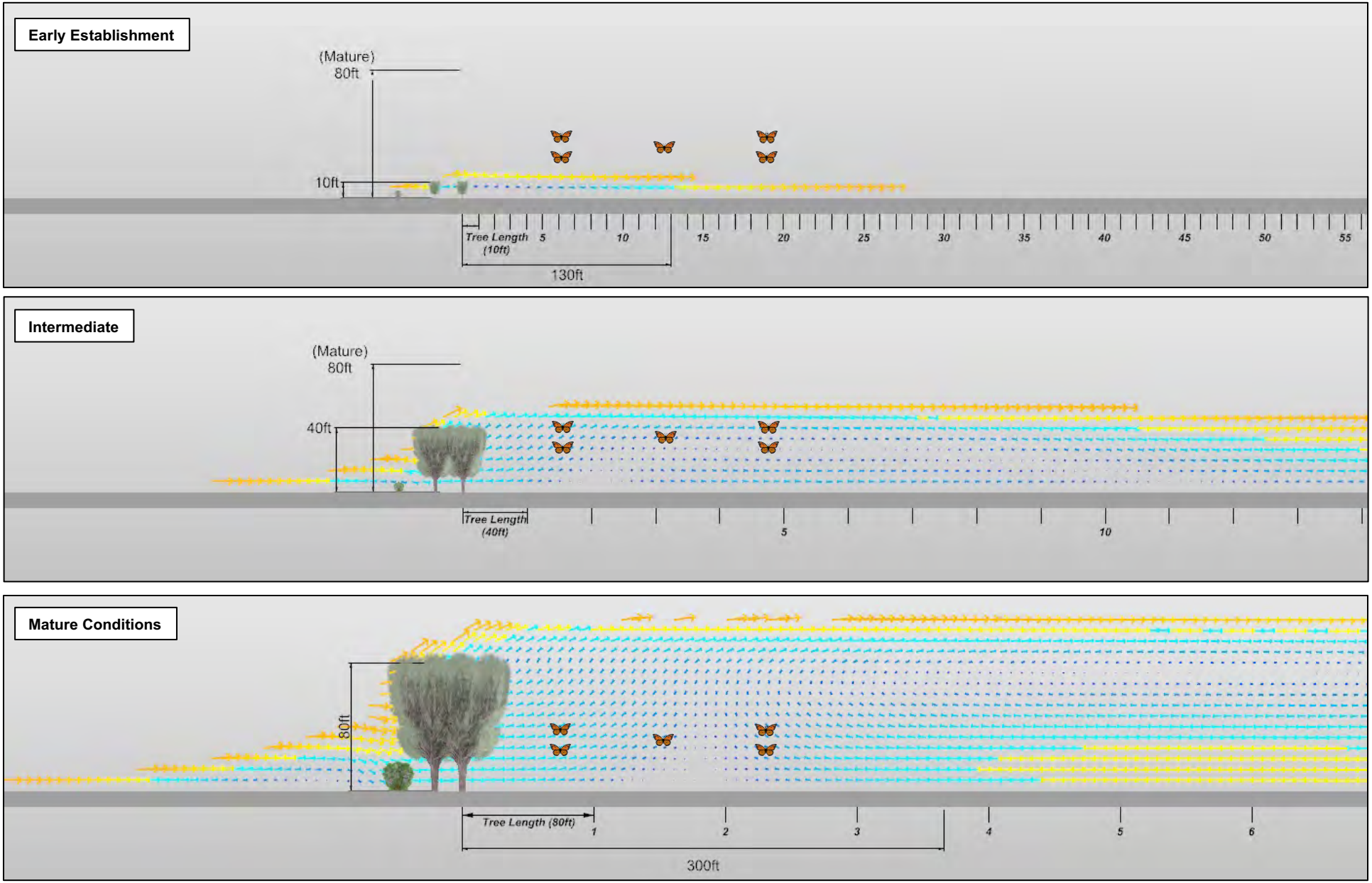


Figure 47. Double Row Layout

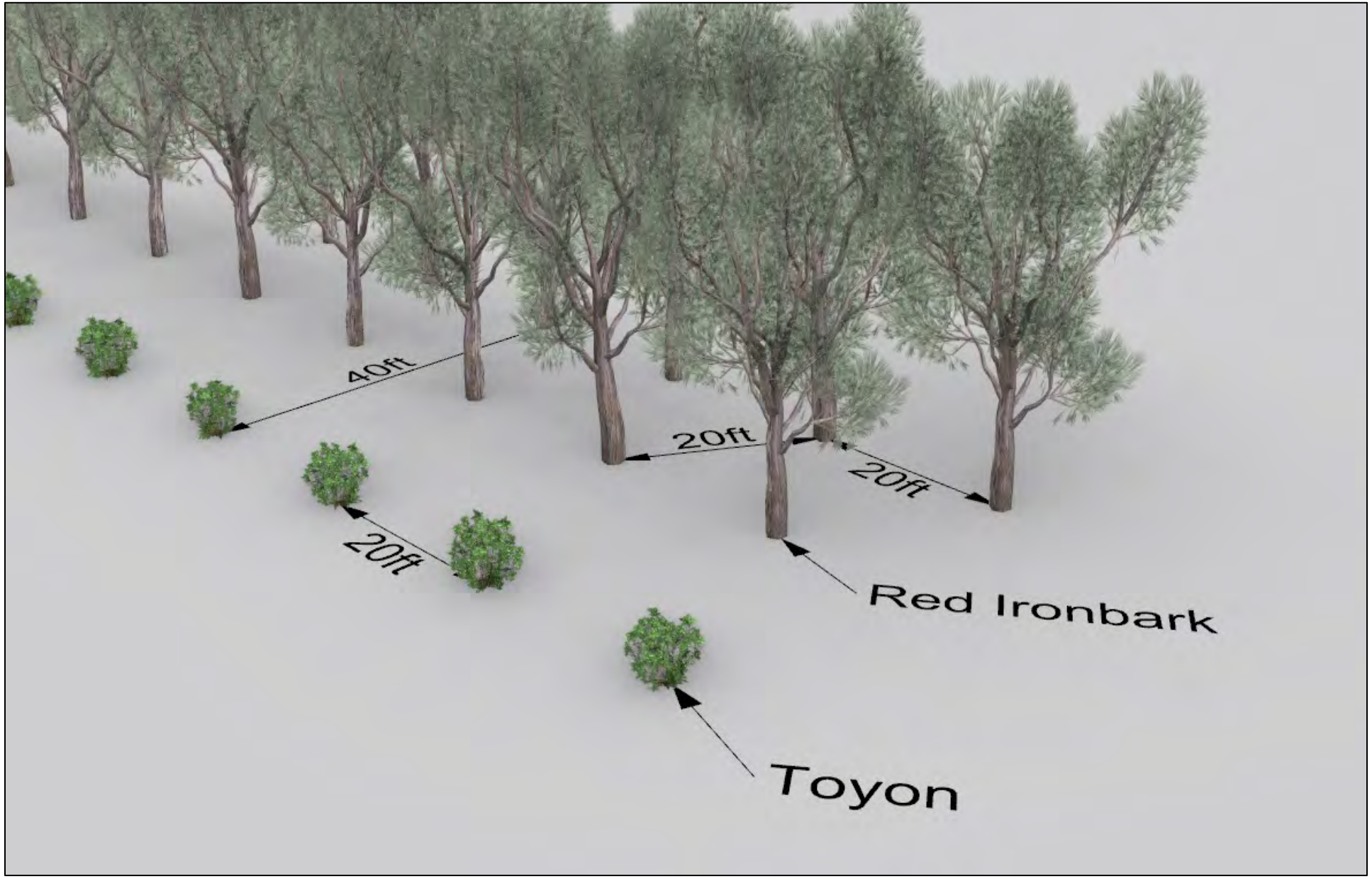
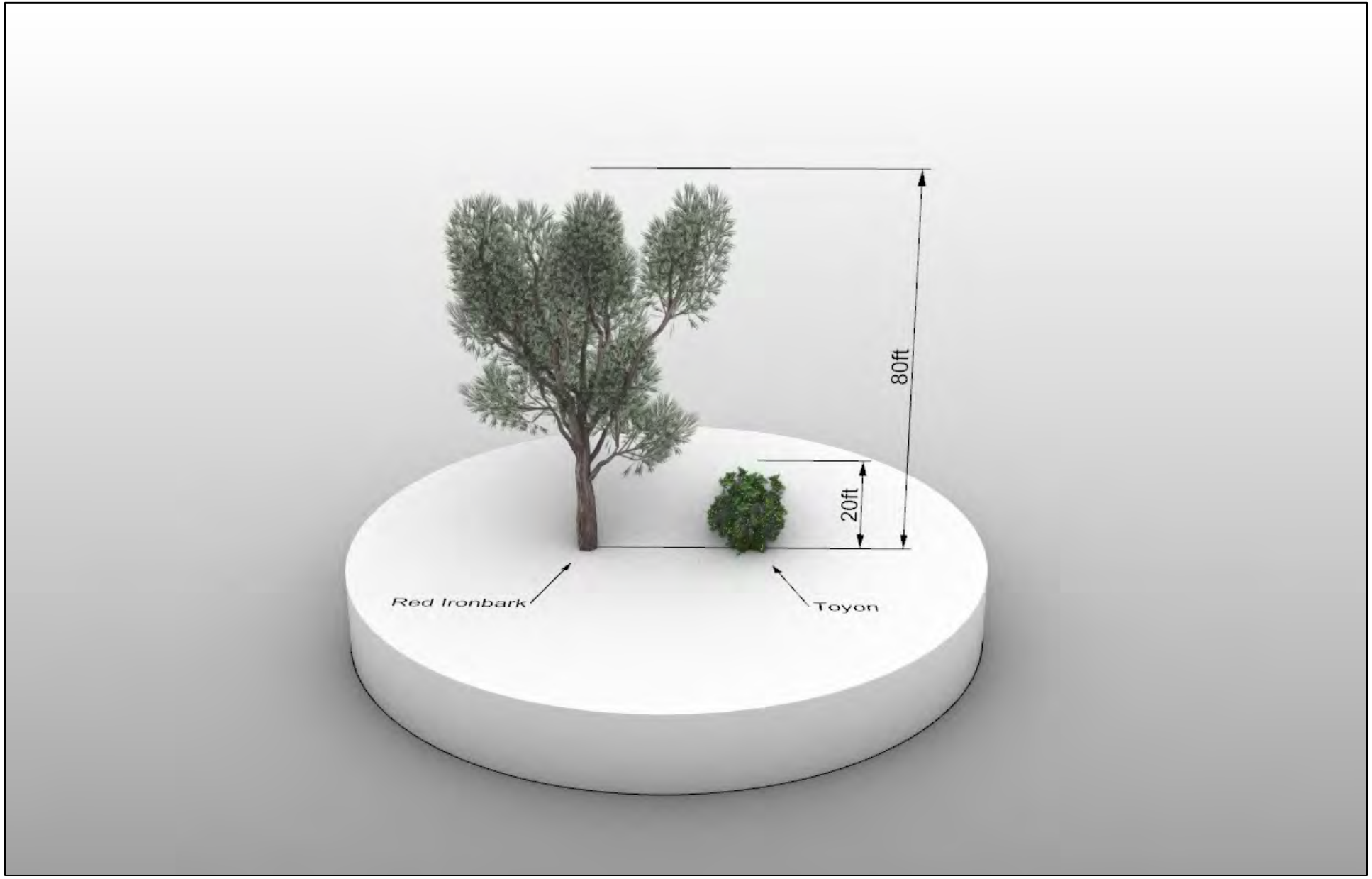


Figure 48. Double Row Species Models



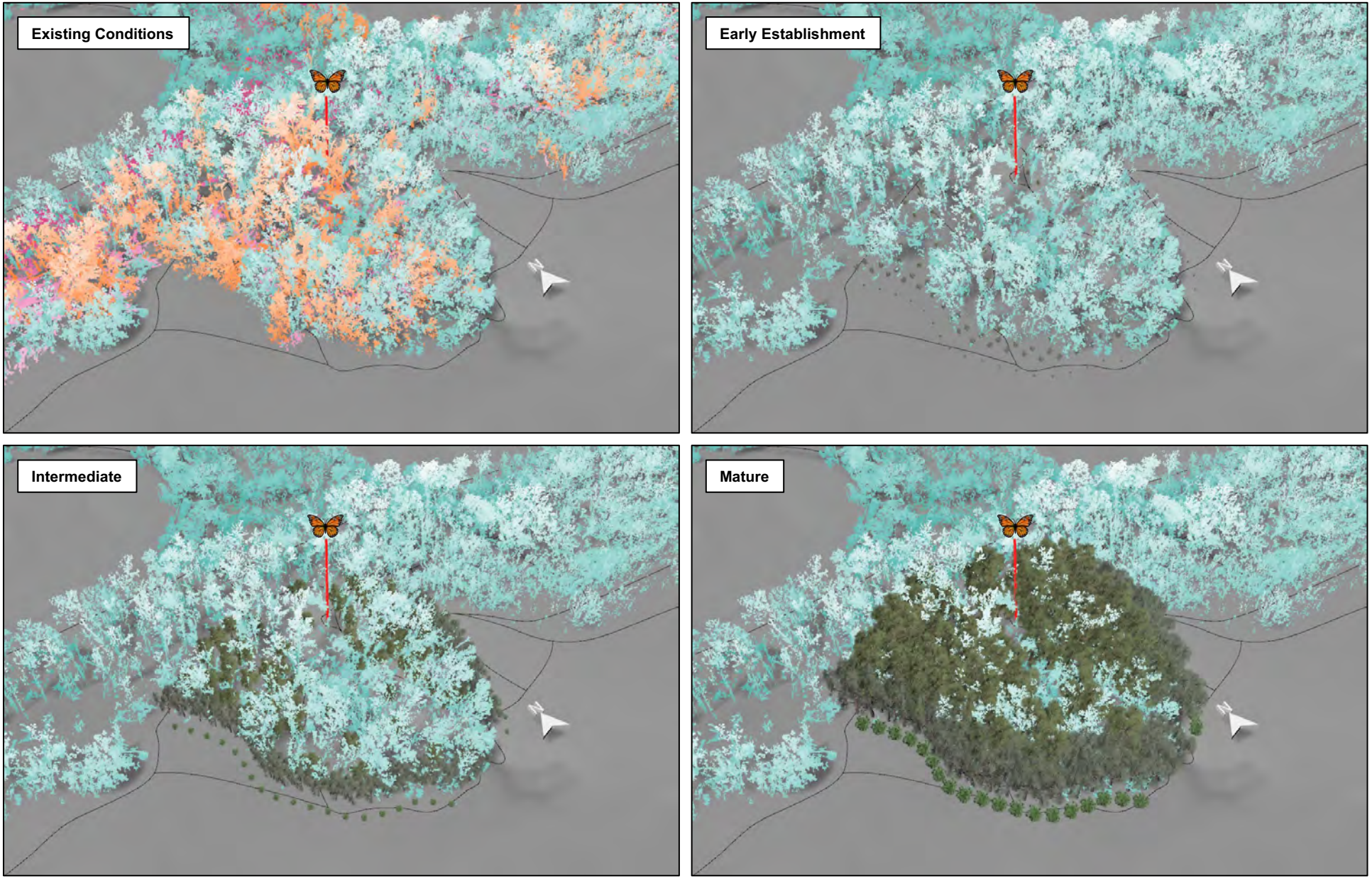
6.2.4 Wind Modeling at Ellwood Main

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.

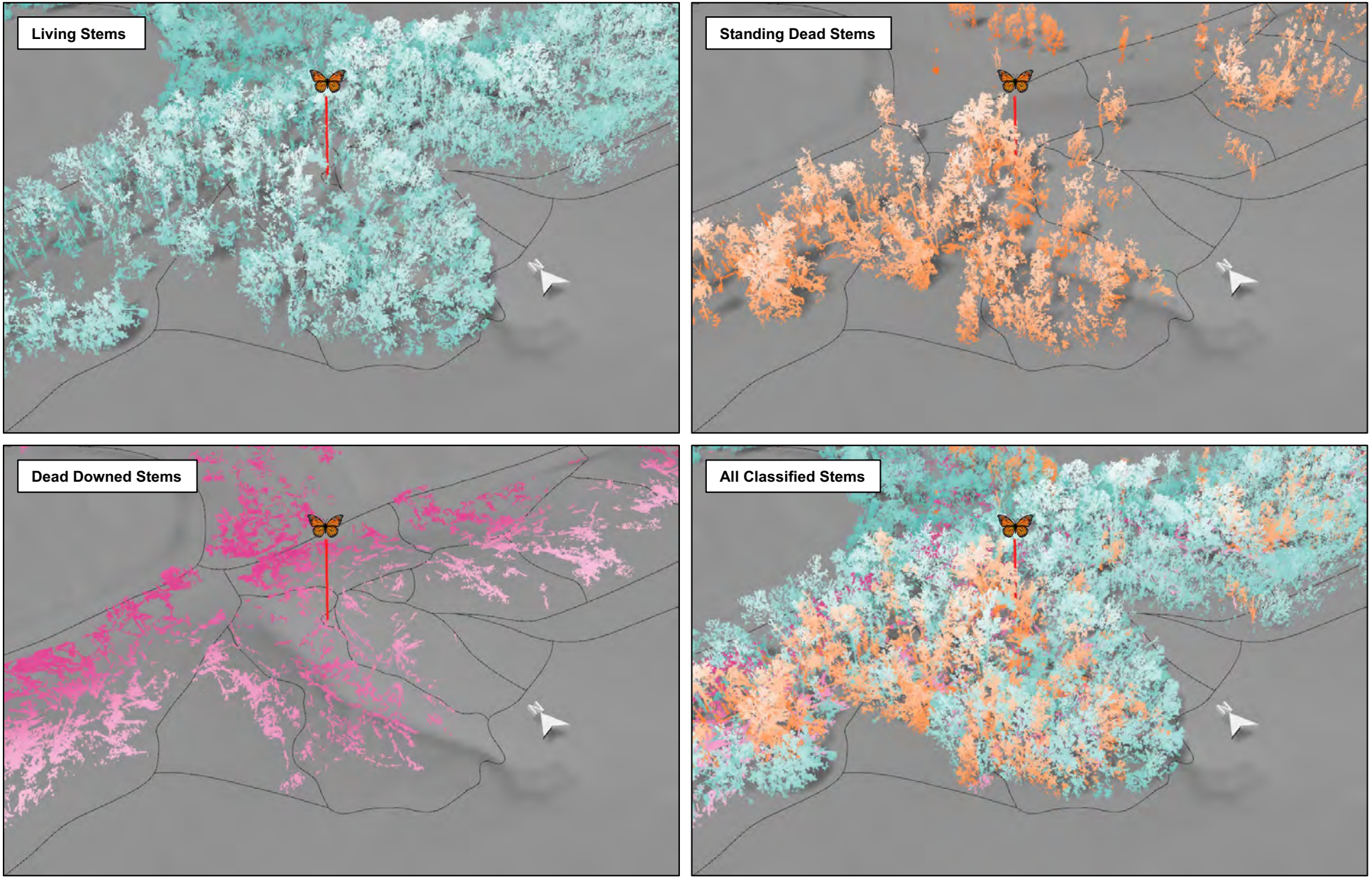
Figure 49. Wind Modeling Scenarios



Monarch viewing area

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Figure 50. Existing Conditions Classified Stems



Monarch viewing area

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Figure 51. Above Ground Wind Conditions (30 ft)

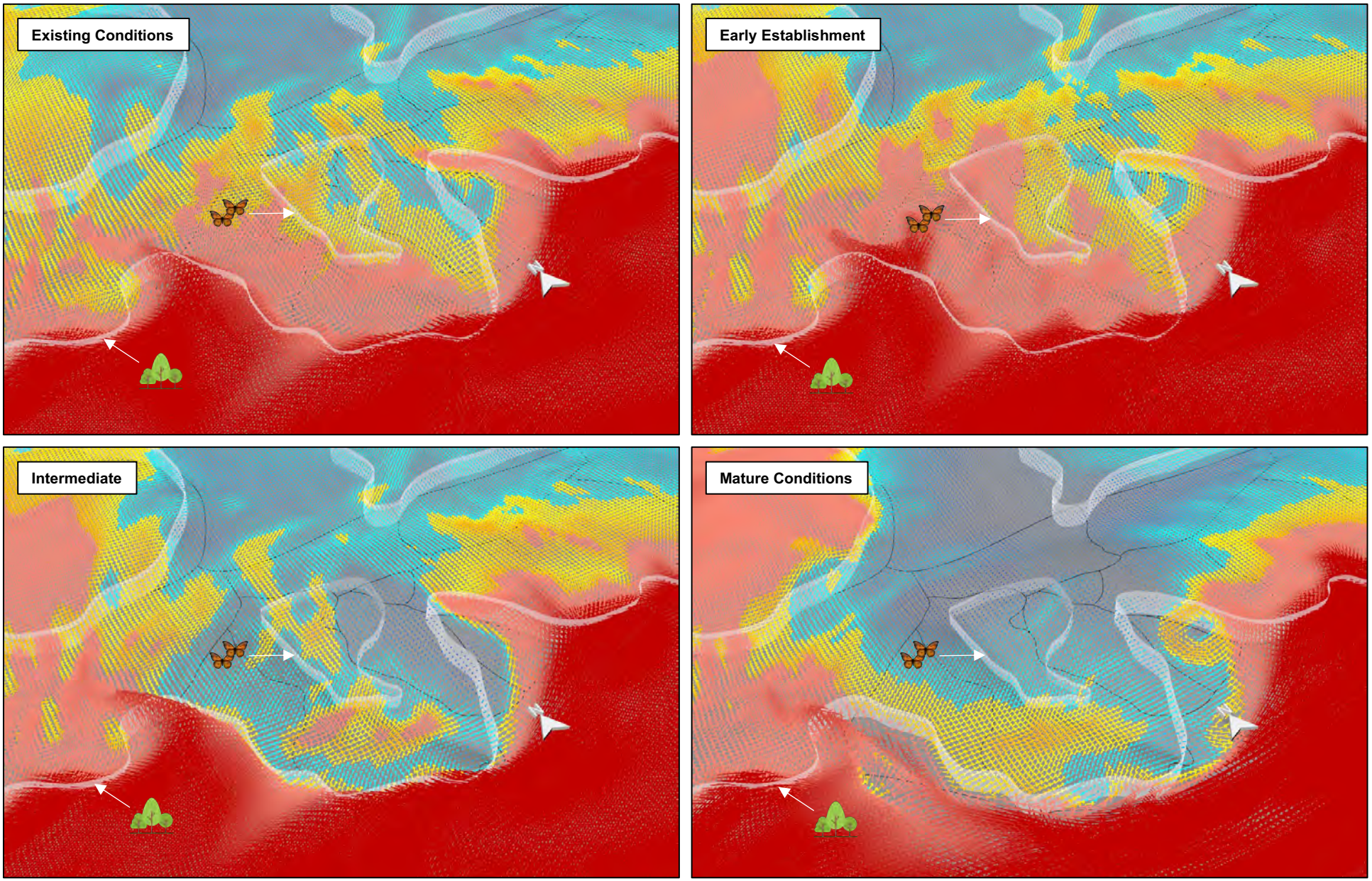


Figure 52. Wind Conditions within Clustering Area

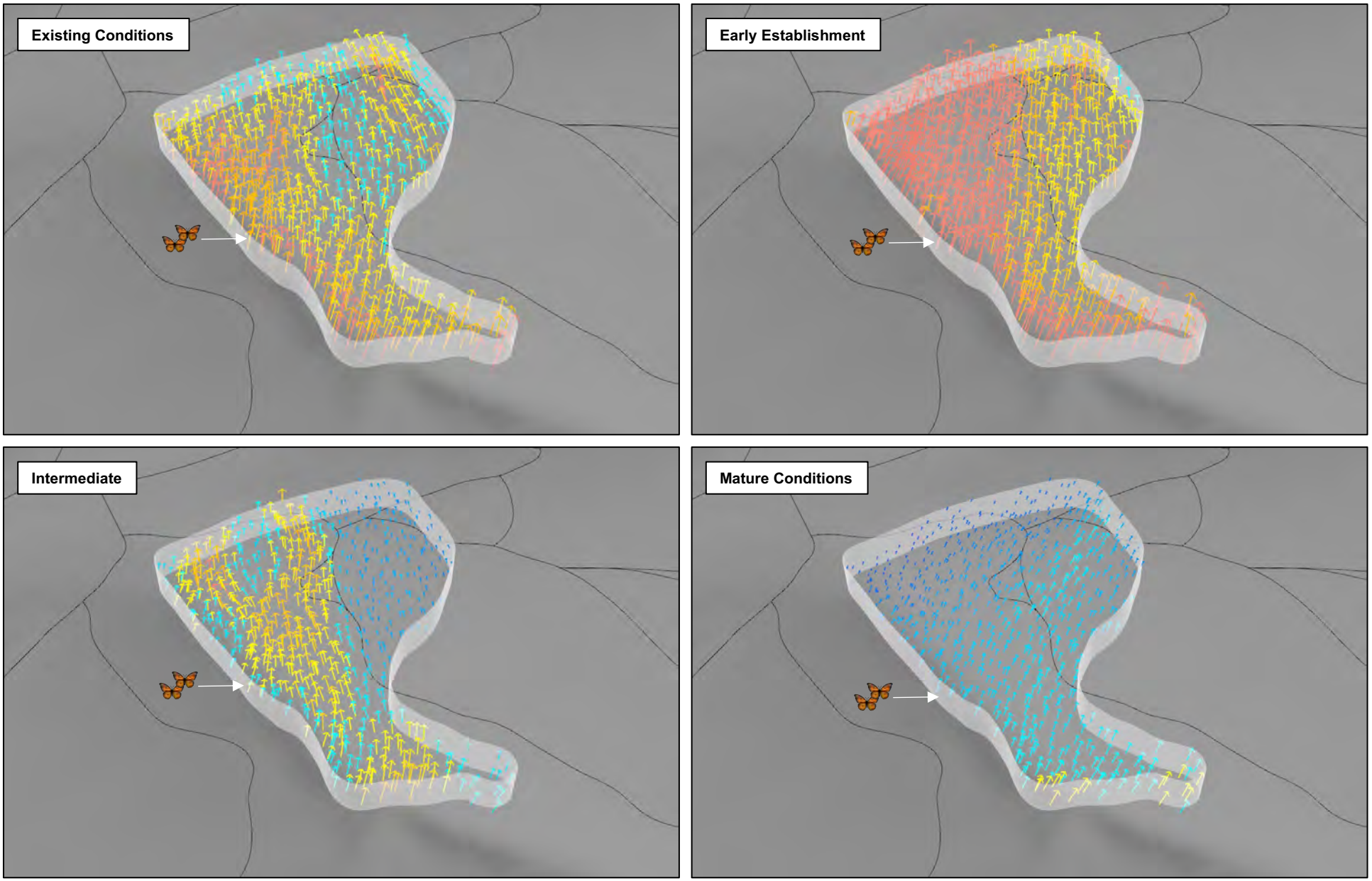
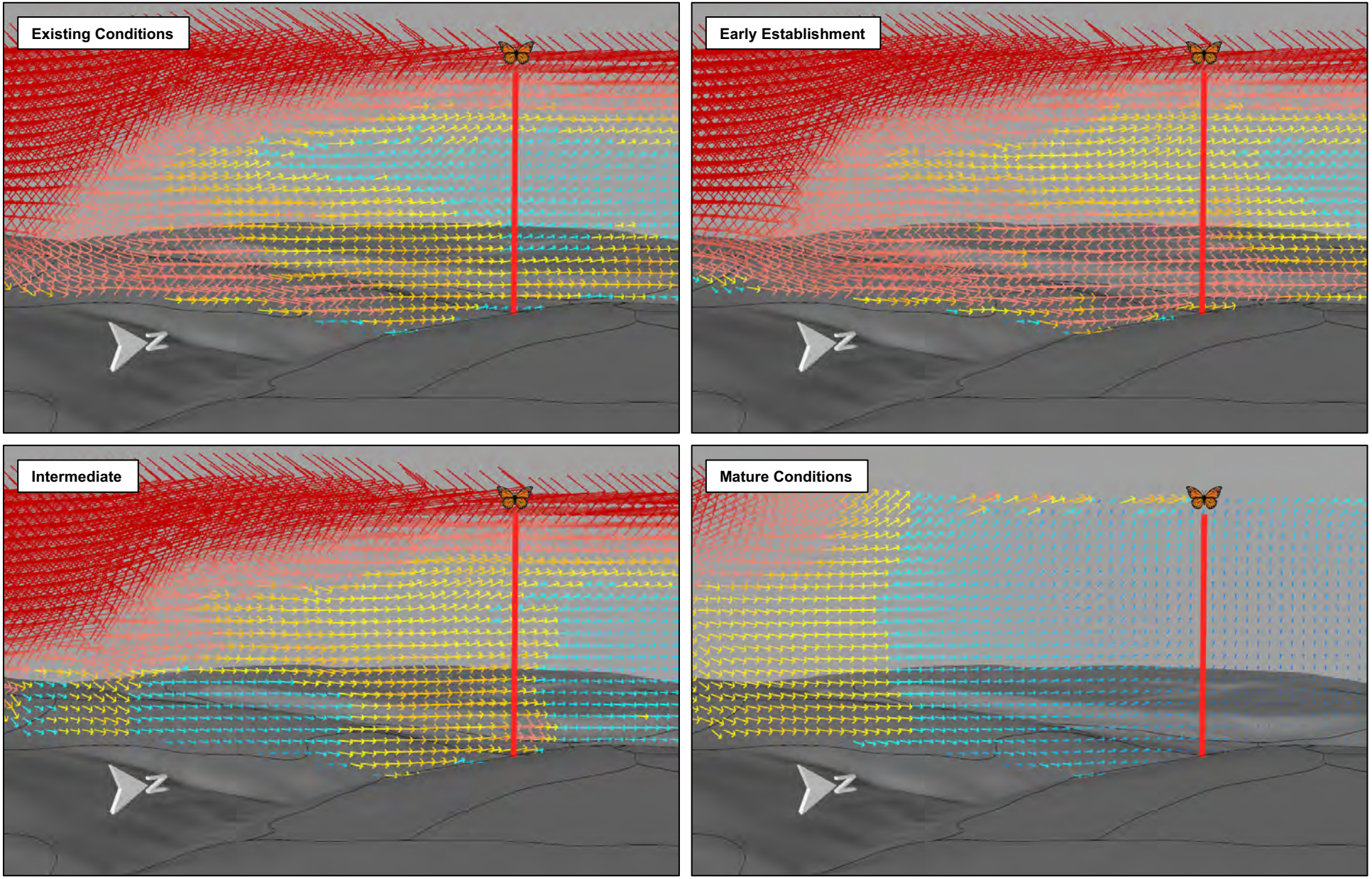


Figure 53. Vertical Profile of Wind Conditions at Viewing Area



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.

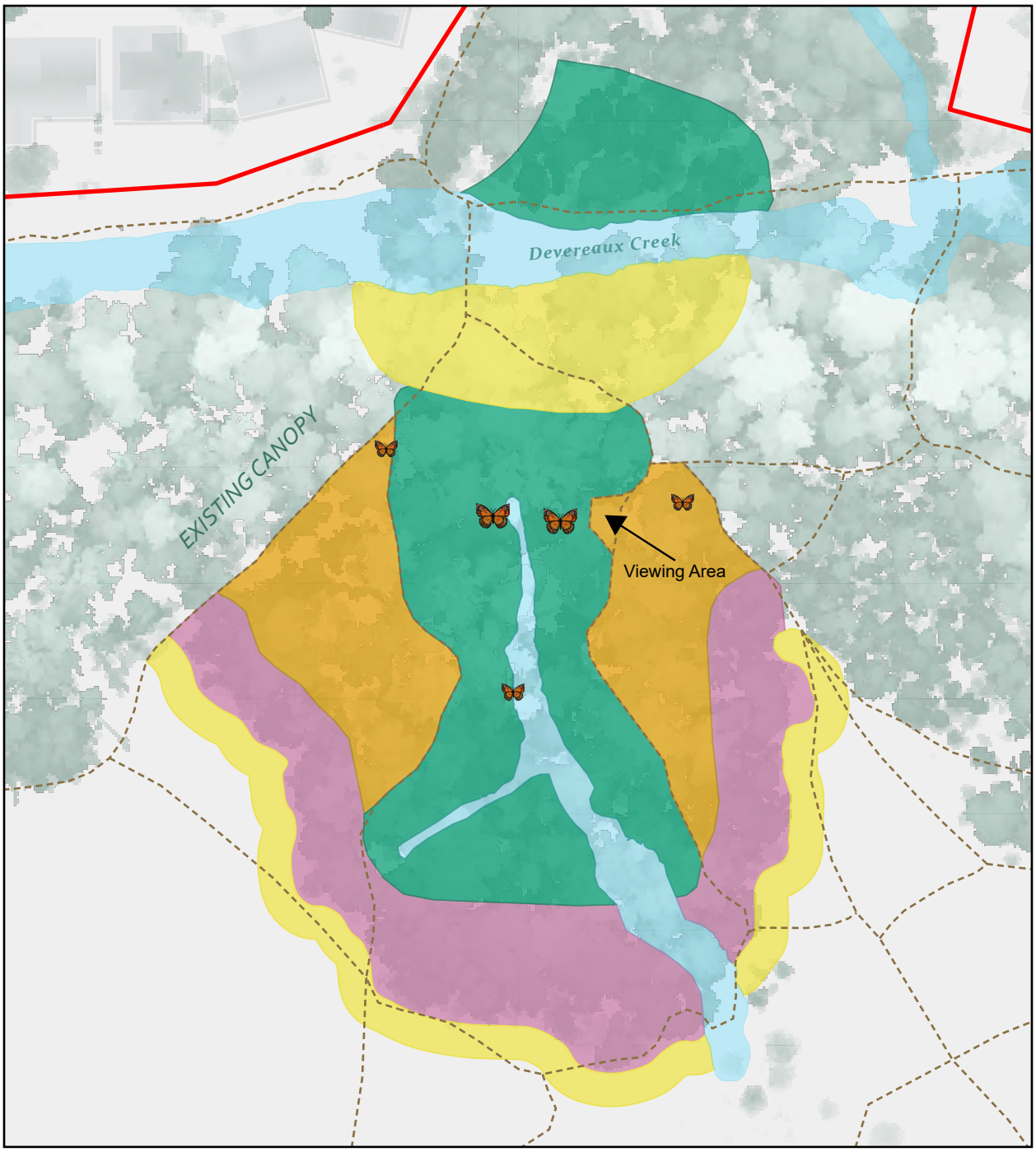
Along the southern edge of Ellwood Main, a double row planting of red ironbark (*Eucalyptus sideroxylon*) should be implemented within the boundaries of the existing canopy. Tree planting should generally follow the design outlined in Section 6.2.3; however, conditions on the ground will determine final 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.

Figure 54. Prescribed Tree Planting Areas - Ellwood Main



Legend

- Ellwood Mesa Open Space
- Jurisdictional Wetlands
- Existing Trails

Aggregation Sites

- Primary
- Secondary

Prescription Areas

- Double Wind Row
- Inner Windbreak
- Native Windbreak
- Sparse Planting

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

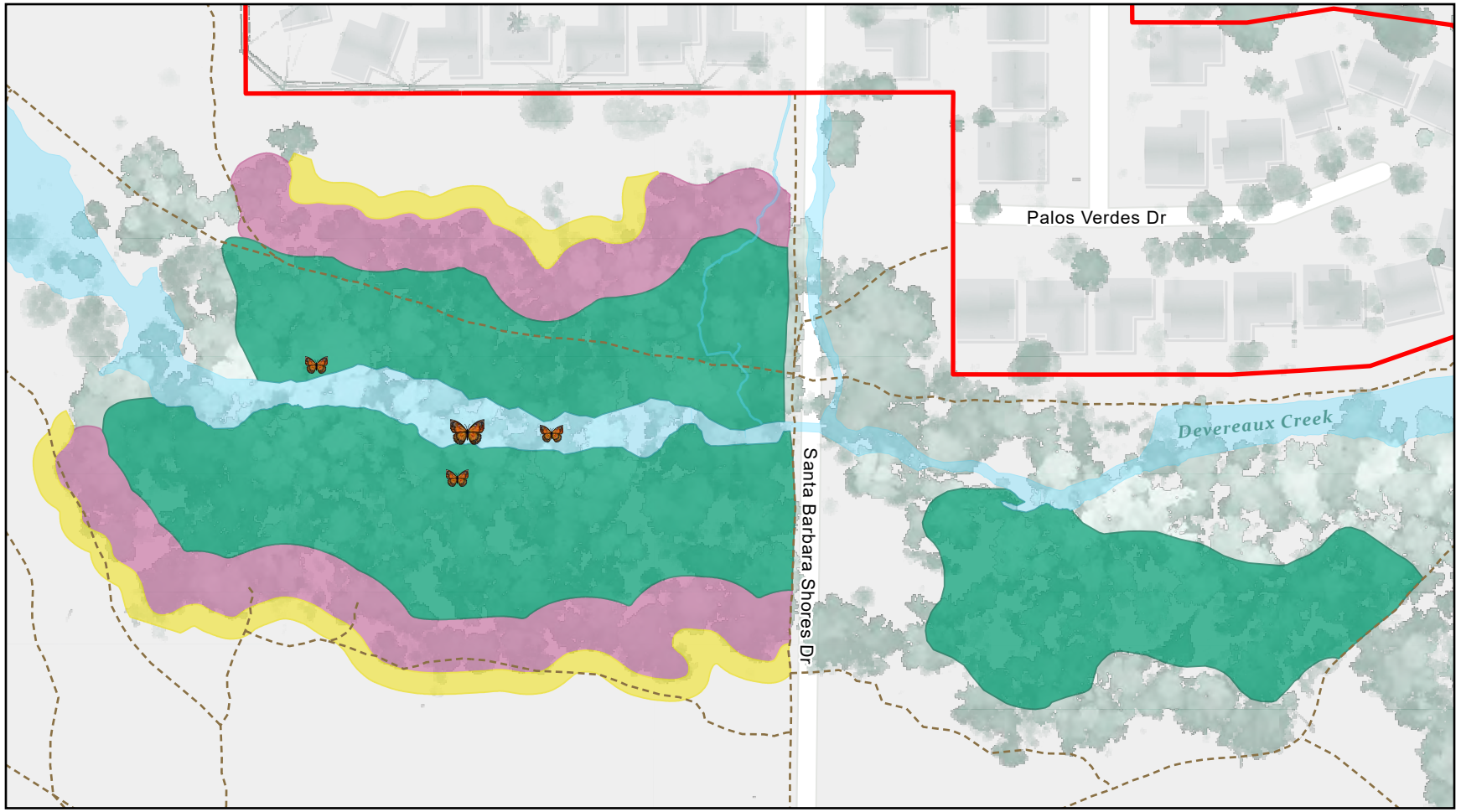
6.2.6 Ellwood West Prescriptions

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.

Figure 55. Prescribed Tree Planting Areas - Ellwood West



Legend

- Ellwood Mesa Open Space
- Jurisdictional Wetlands
- Existing Trails

Aggregation Sites

- Primary
- Secondary

Prescription Areas

- Double Wind Row
- Native Windbreak
- Sparse Planting

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:
May 02, 2023 12:04 PM by KRN

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.

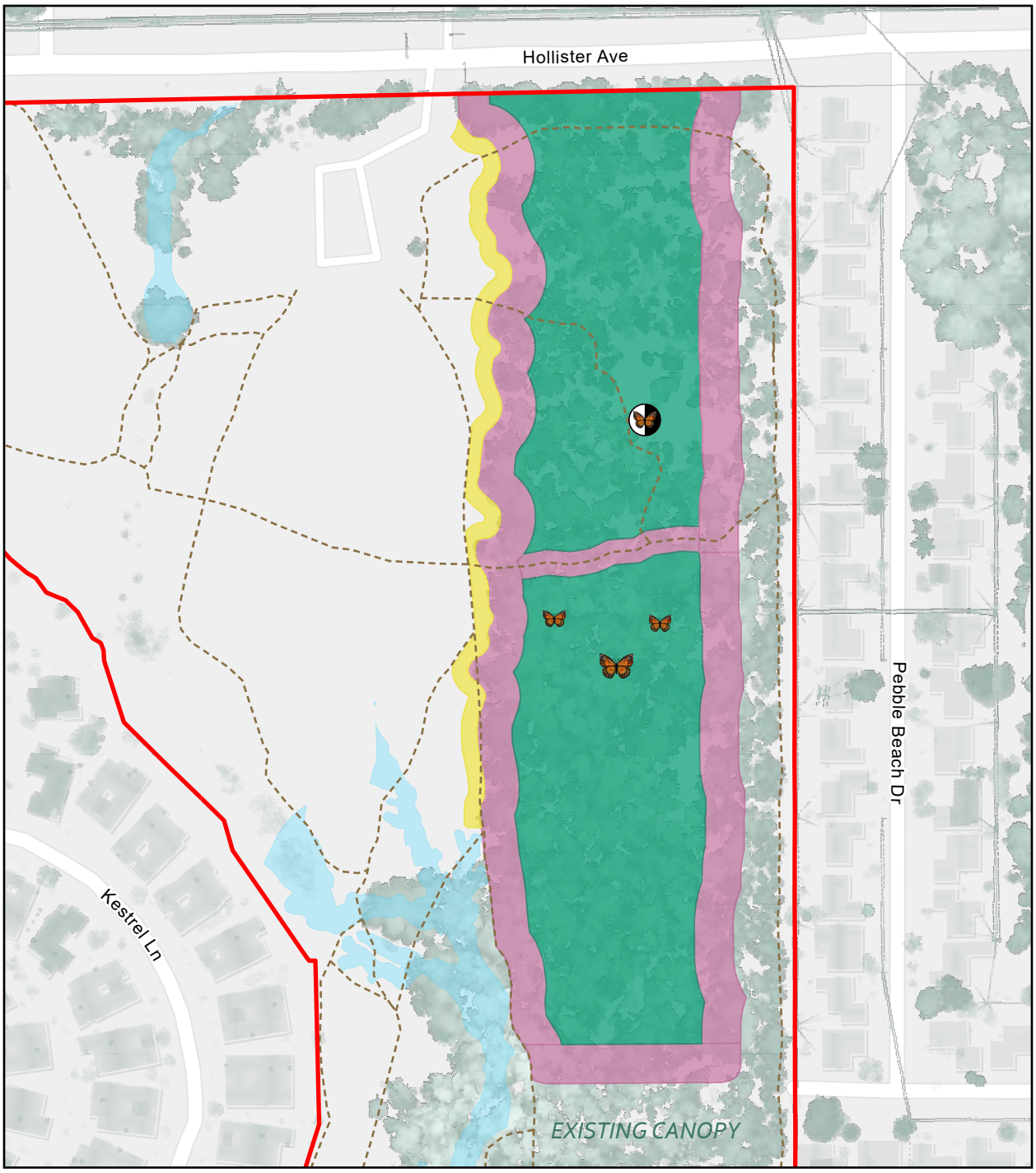
Along the eastern face, a double wind row as described above is recommended for the northern half, beginning at the trail that bisects the habitat from west to east. South of the trail on the eastern side, we recommend planting karri and red iron bark to close the wind vulnerabilities. Toyons and oaks 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.

Figure 56. Prescribed Tree Planting Areas - Ellwood North



Legend

- Ellwood Mesa Open Space
- Jurisdictional Wetlands
- Existing Trails

Aggregation Sites

- Primary
- Secondary
- Historic

Prescription Areas

- Double Wind Row
- Native Windbreak
- Sparse Planting

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

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

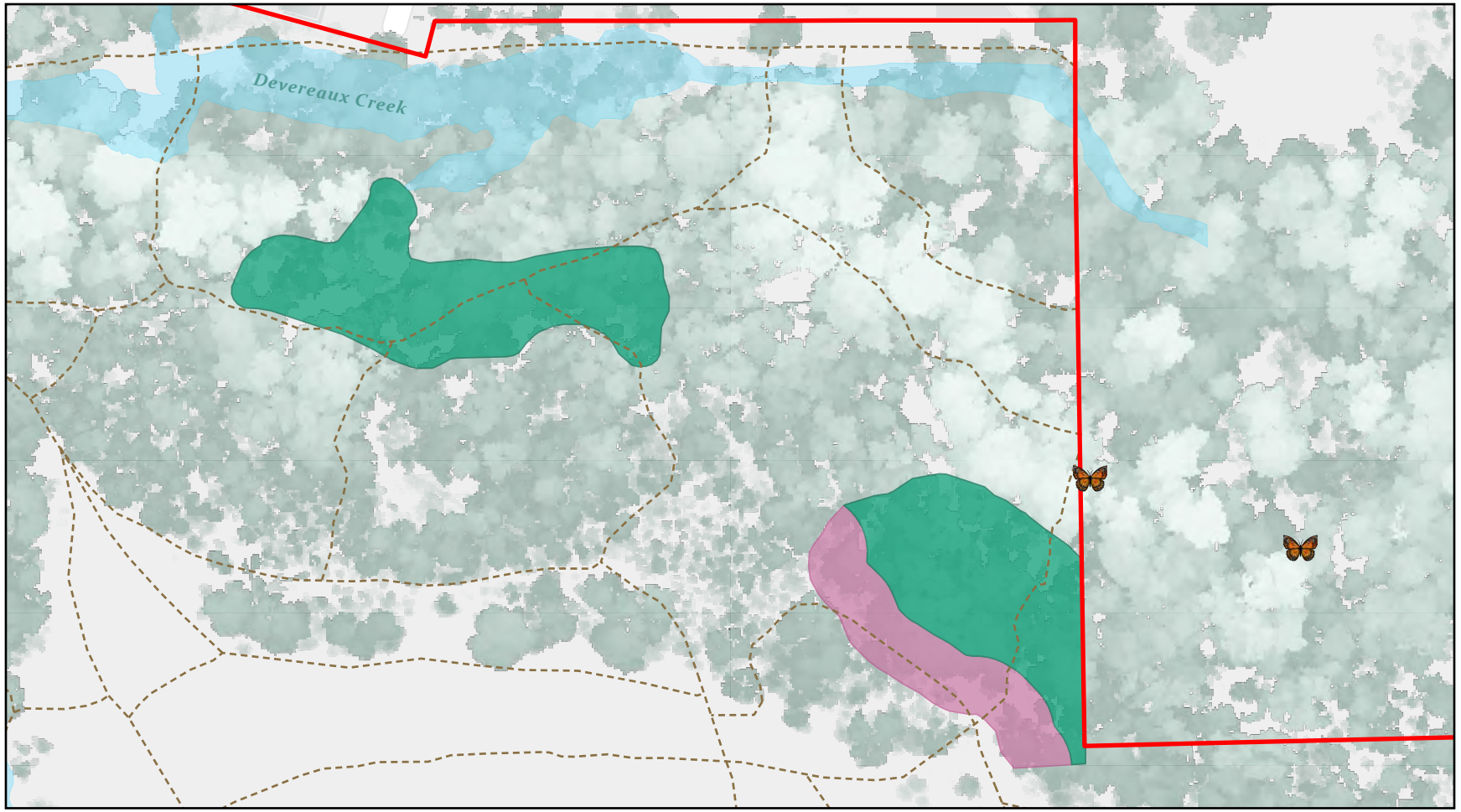
The restoration of the Sandpiper site will be addressed further in Phase 2 of the Implementation. To inform restoration efforts, a double wind row with red ironbark should be planted along the trail on the north side of Devereux Creek. Native trees, such as oak and toyons can be planted to reinforce 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.

Figure 57. Prescribed Tree Planting Areas - Ellwood East



Legend

- Ellwood Mesa Open Space
- Jurisdictional Wetlands
- Existing Trails

Aggregation Sites

- Primary

Prescription Areas

- Double Wind Row
- Sparse Planting

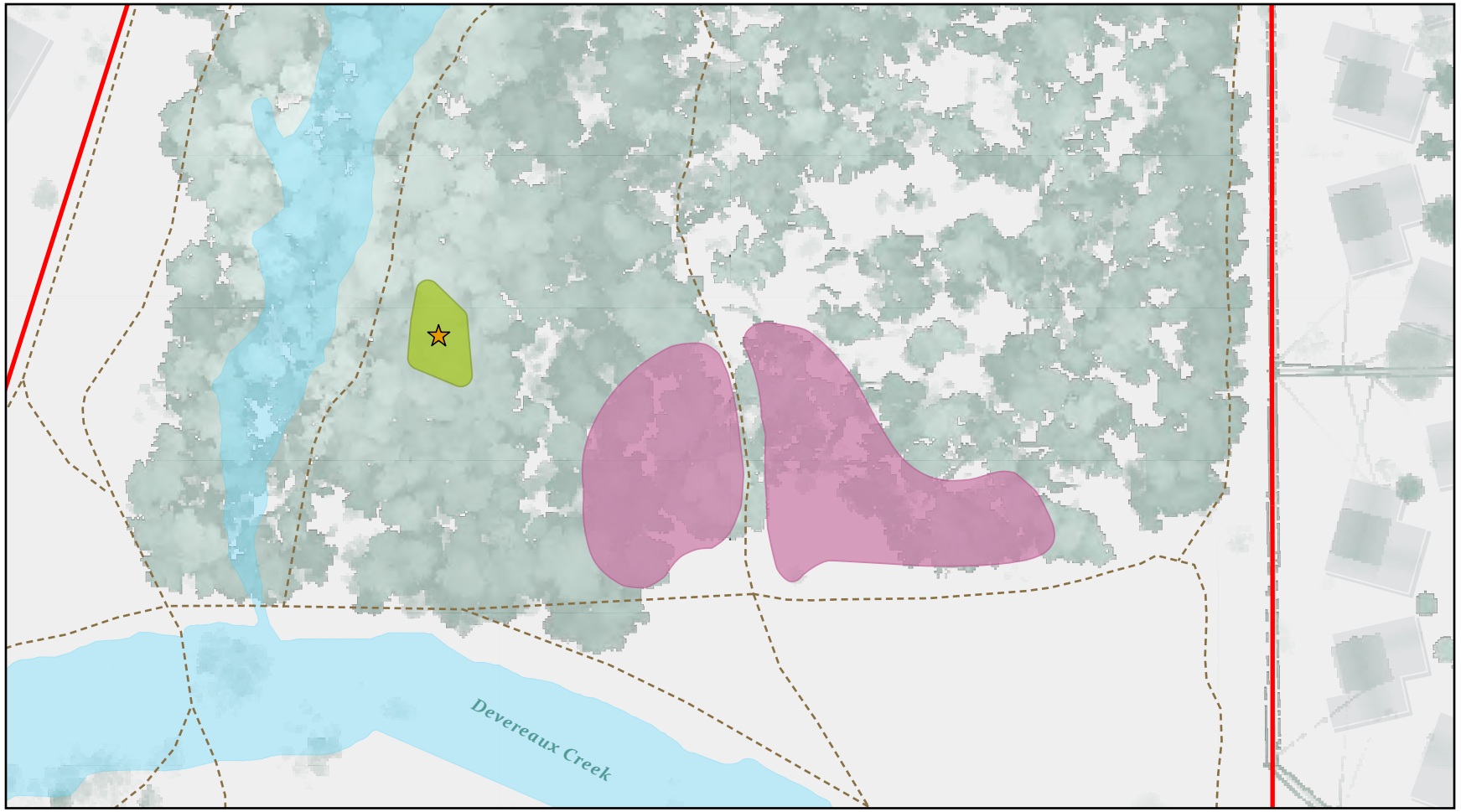
N

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

Figure 58. Prescribed Tree Planting Areas - Ellwood Ironbark



Legend

- Ellwood Mesa Open Space
- Jurisdictional Wetlands
- Existing Trails

Aggregation Sites

- Proposed

Prescription Areas

- Double Wind Row
- Selective Tree Thinning

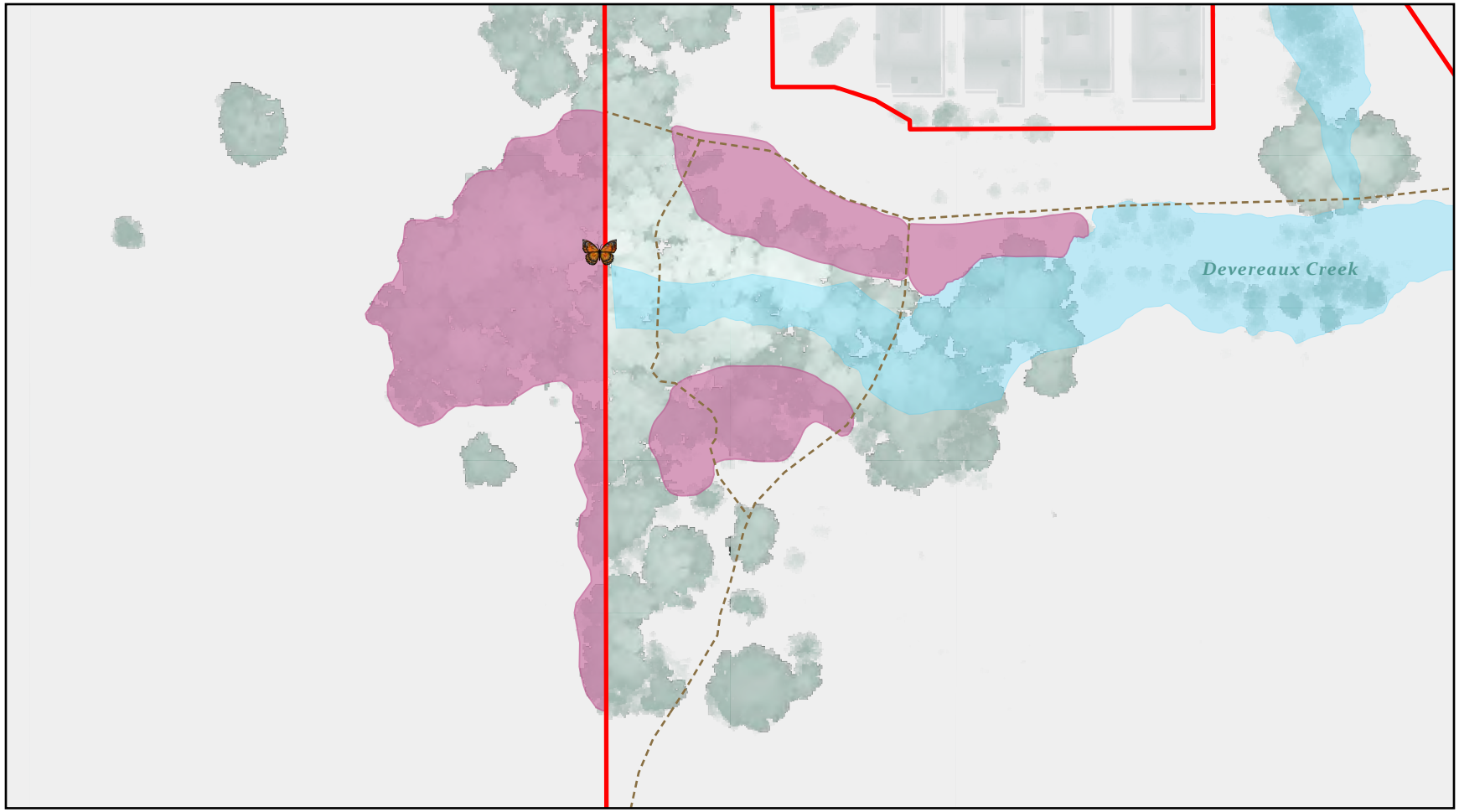
N

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

Figure 59. Prescribed Tree Planting Areas - Sandpiper



Legend

- Ellwood Mesa Open Space
- Jurisdictional Wetlands
- Existing Trails

Aggregation Sites

- Primary

Prescription Areas

- Double Wind Row

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

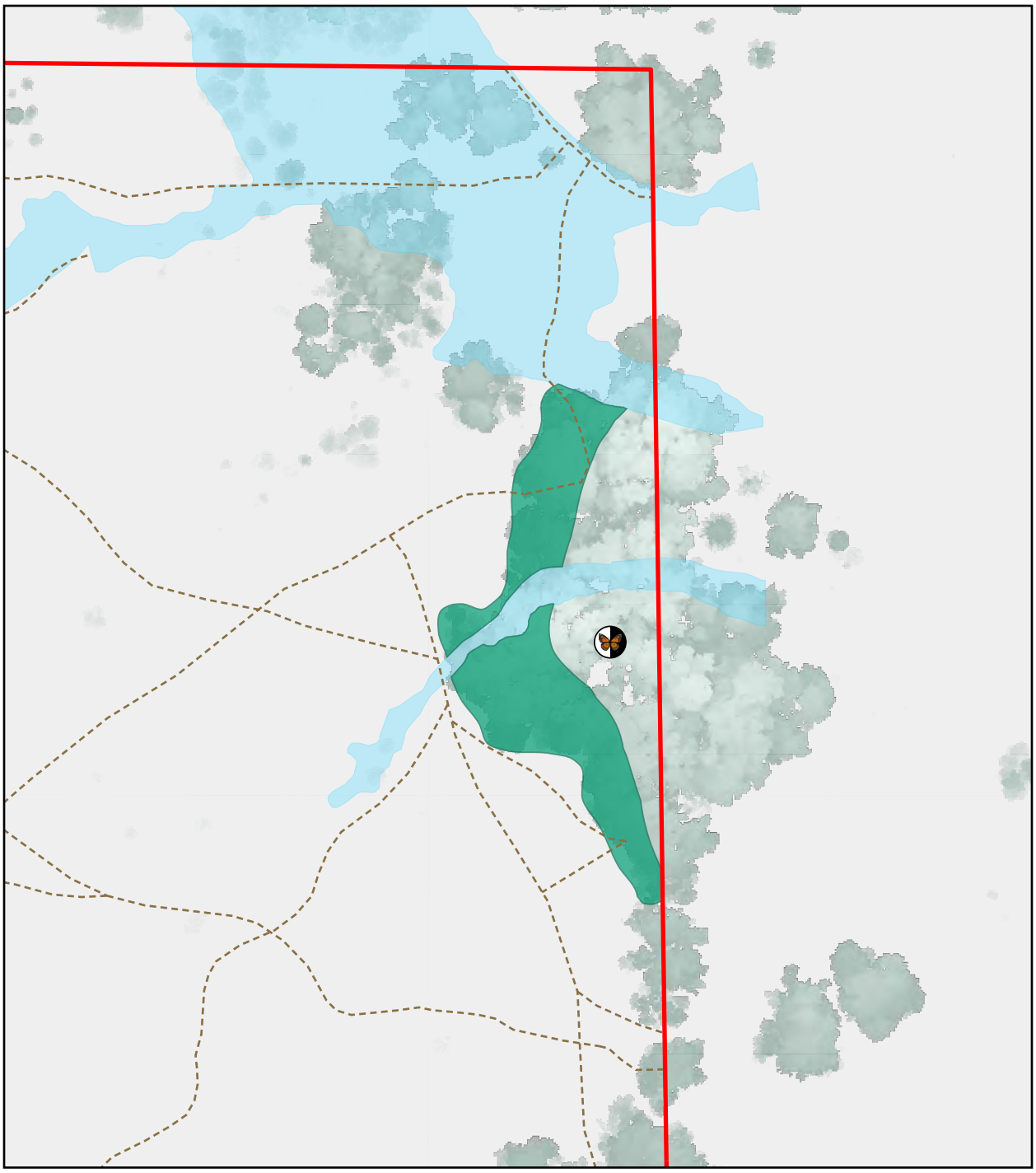
6.2.11 Ocean Meadows Prescriptions

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.

Figure 60. Prescribed Tree Planting Areas - Ocean Meadows



Legend

- Ellwood Mesa Open Space
- Jurisdictional Wetlands
- Existing Trails

Aggregation Sites

- Historic

Prescription Areas

- Sparse Planting

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

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.

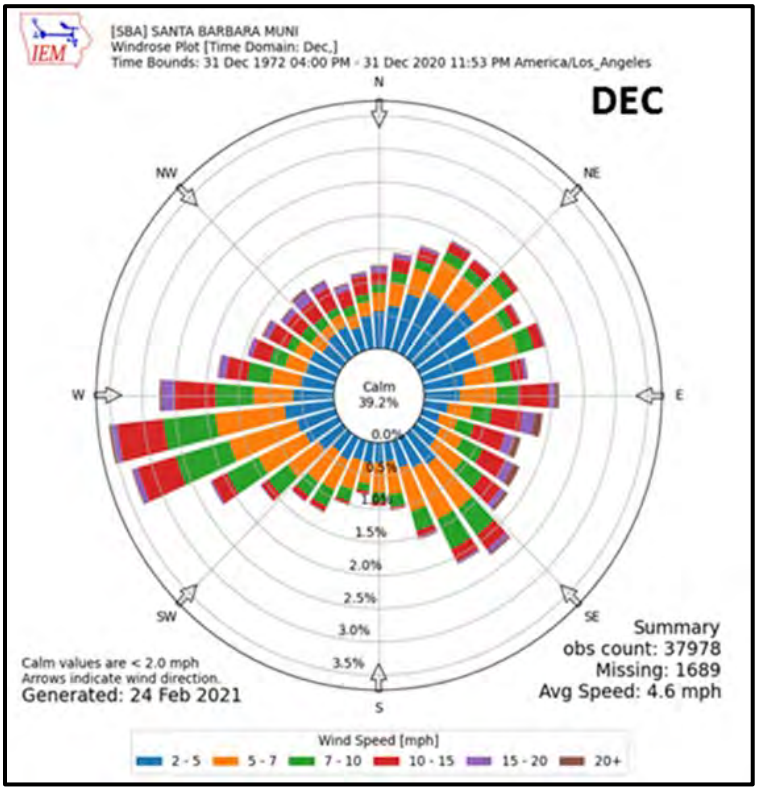
All simulated conditions were modeled using Eddy3D, a plugin for Rhino 7 that uses OpenFOAM, a computational fluid dynamic simulator, to model microclimate conditions (Weller et. al. 1998). An atmospheric flow boundary condition, informed by weather data collected at Santa Barbara Municipal Airport, 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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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

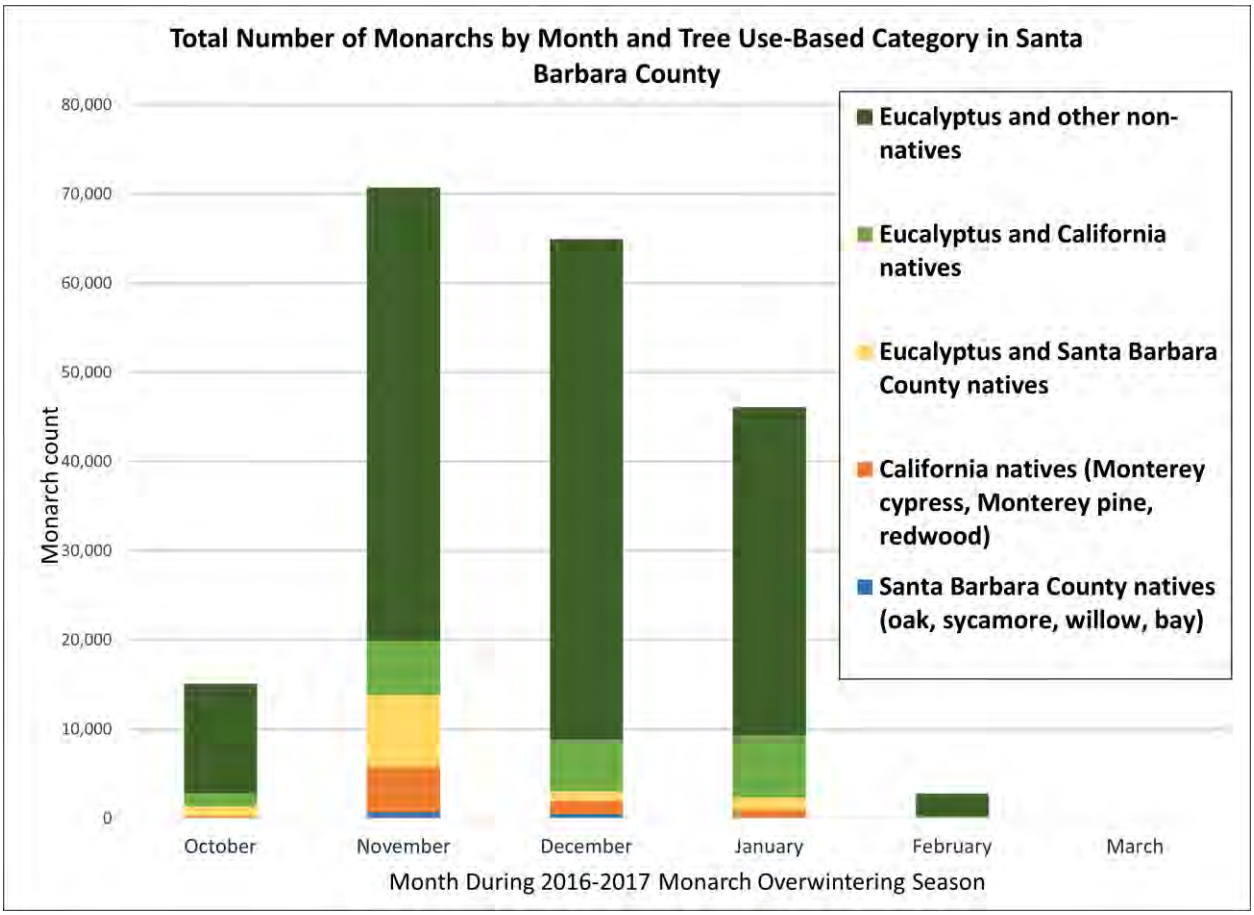
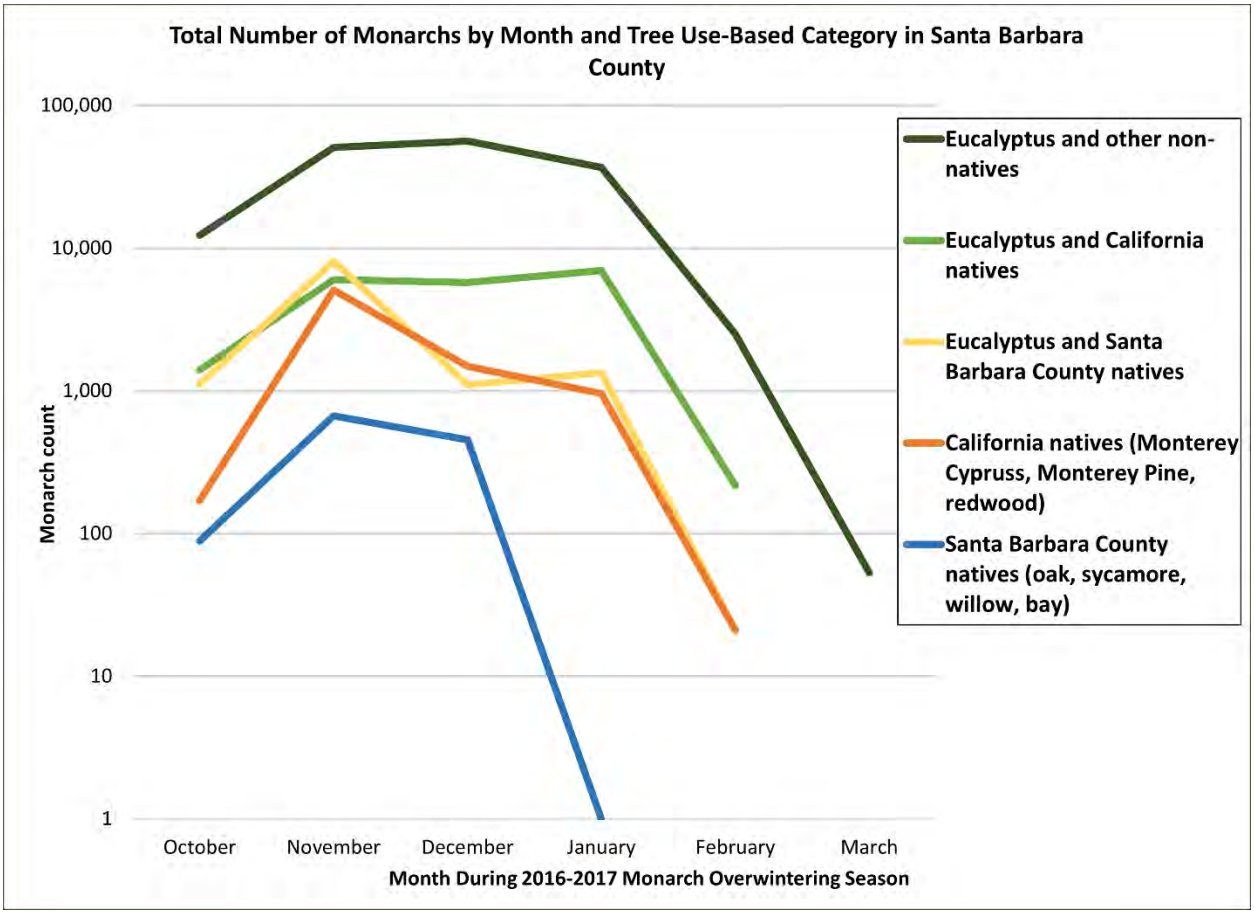


FIGURE 2. MONARCH BUTTERFLY USE OF SITES IN FIVE TREE COMPOSITION CATEGORIES IN SANTA BARBARA COUNTY BY MONTH IN LOGARITHMS



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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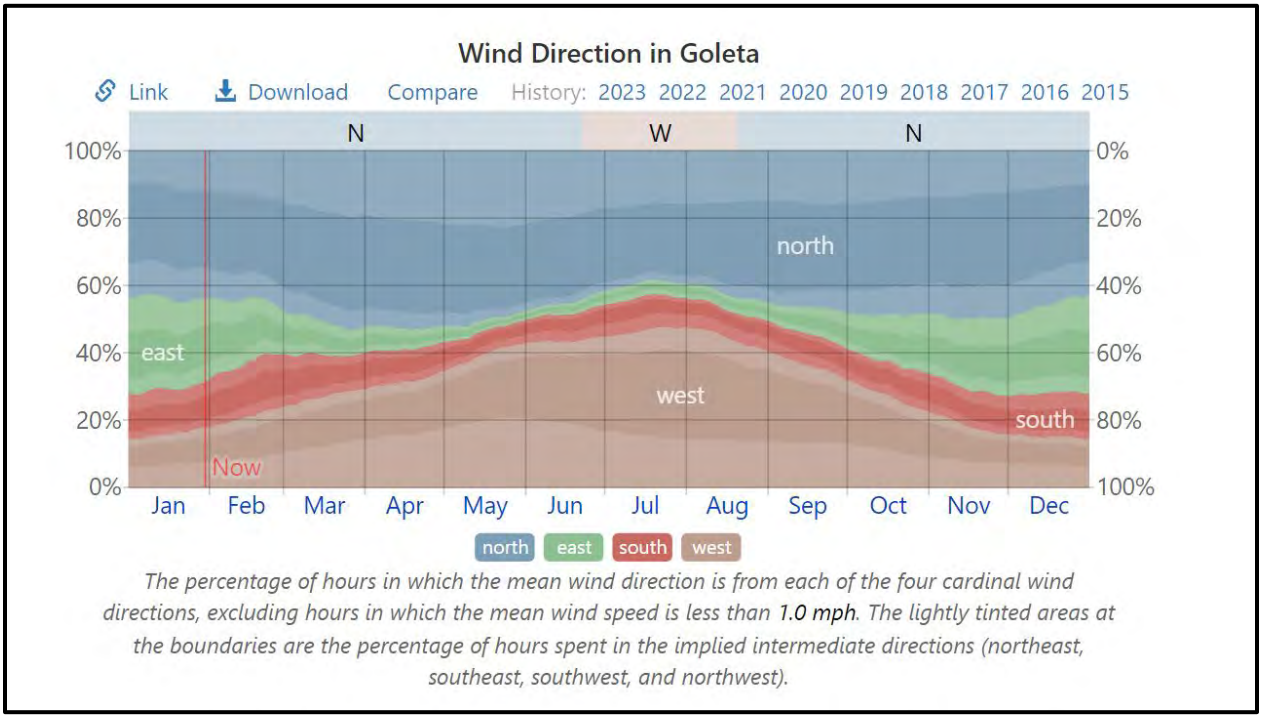
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ATTACHMENT A. TREE COMPARISON FOR CHARACTERISTICS IMPORTANT TO MONARCH BUTTERFLY AGGREGATION SITES

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

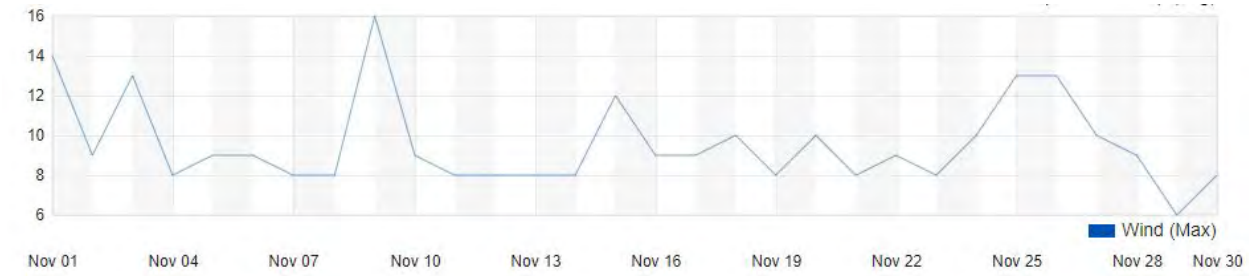


FIGURE 1. NOVEMBER 2021

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

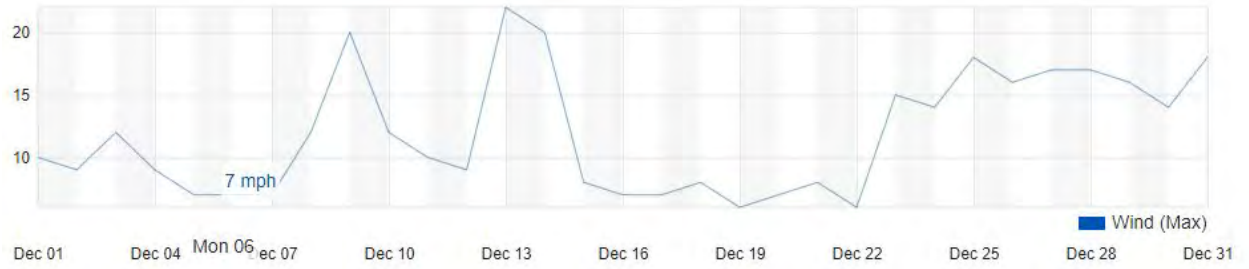


FIGURE 2. DECEMBER 2021

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)

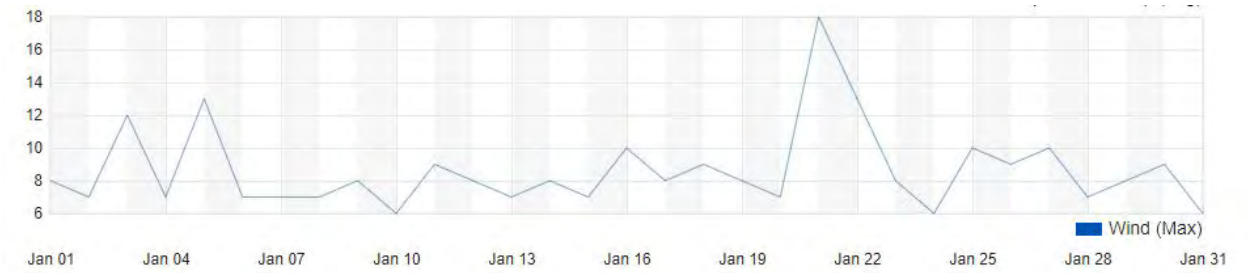


FIGURE 3. JANUARY 2022

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

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
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

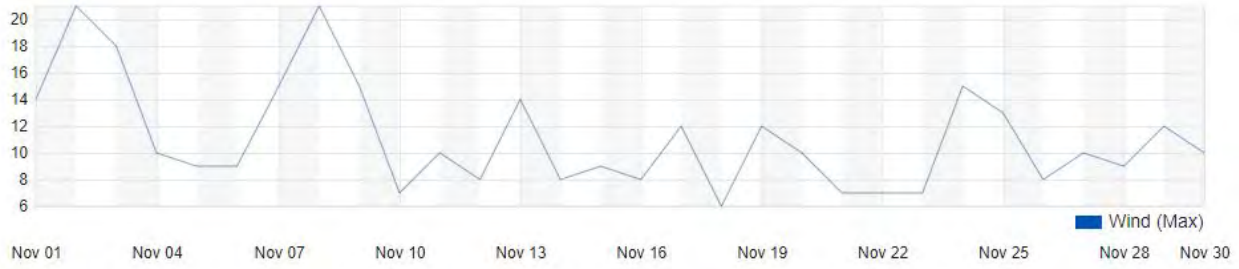


FIGURE 4. NOVEMBER 2022

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)

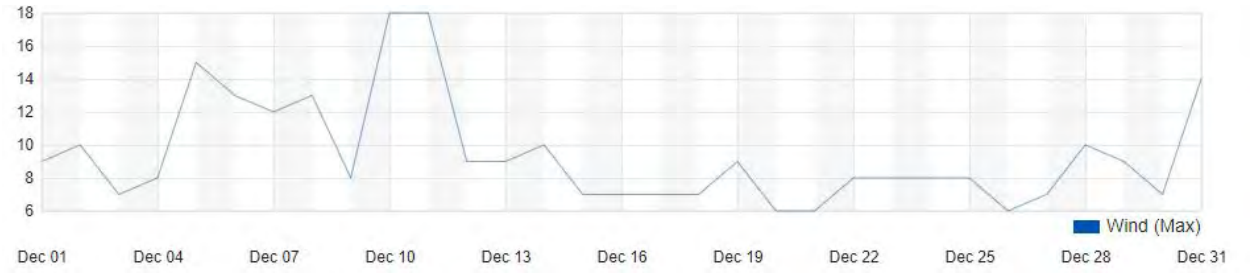


FIGURE 5. DECEMBER 2022

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)

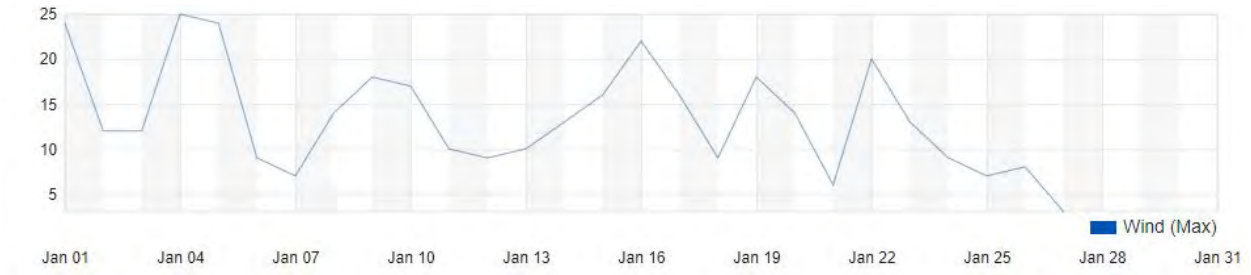


FIGURE 6. JANUARY 2023

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

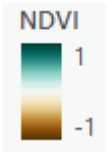
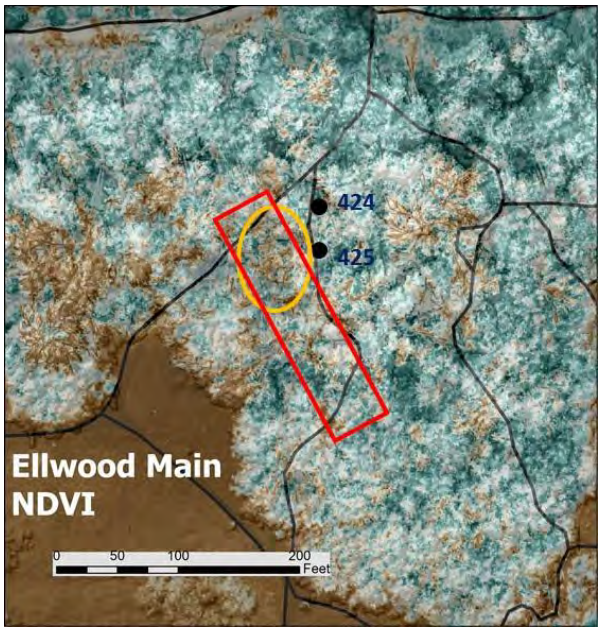


Photo 3

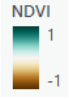
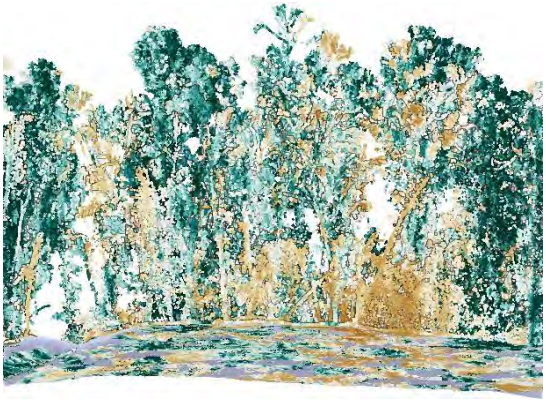
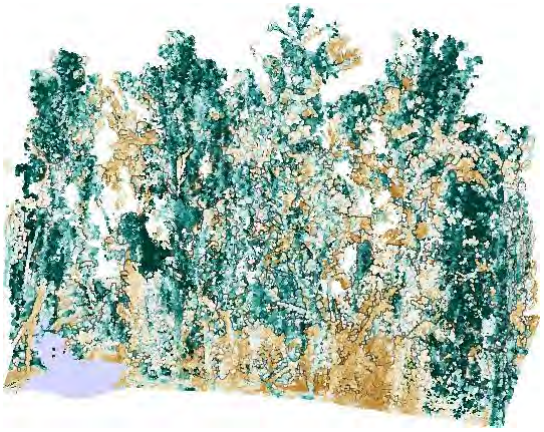


The map below shows a measure of canopy greenness (Normalized Difference Vegetation Index, NDVI) where the blue-green shows healthy foliage and the brown shows dead canopy (and brown grass outside of the forest). Note how much of the canopy around Ellwood Main has died, leaving dead standing trees, and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

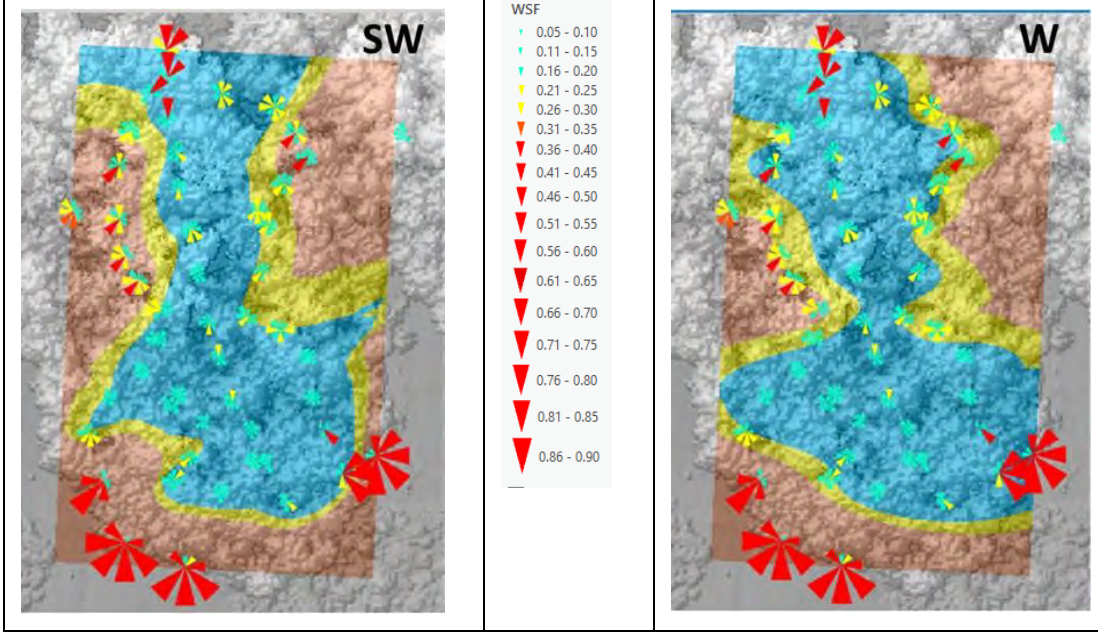
Below is a profile of forest, with the same NDVI color scale as Map 1, taken along the west edge of Ellwood Main (red rectangle). The small dip at the left is the road from the mesa going down to Deveraux Creek. The large masses of brown dead trees stand out, with a particularly dense mass of dead trees 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

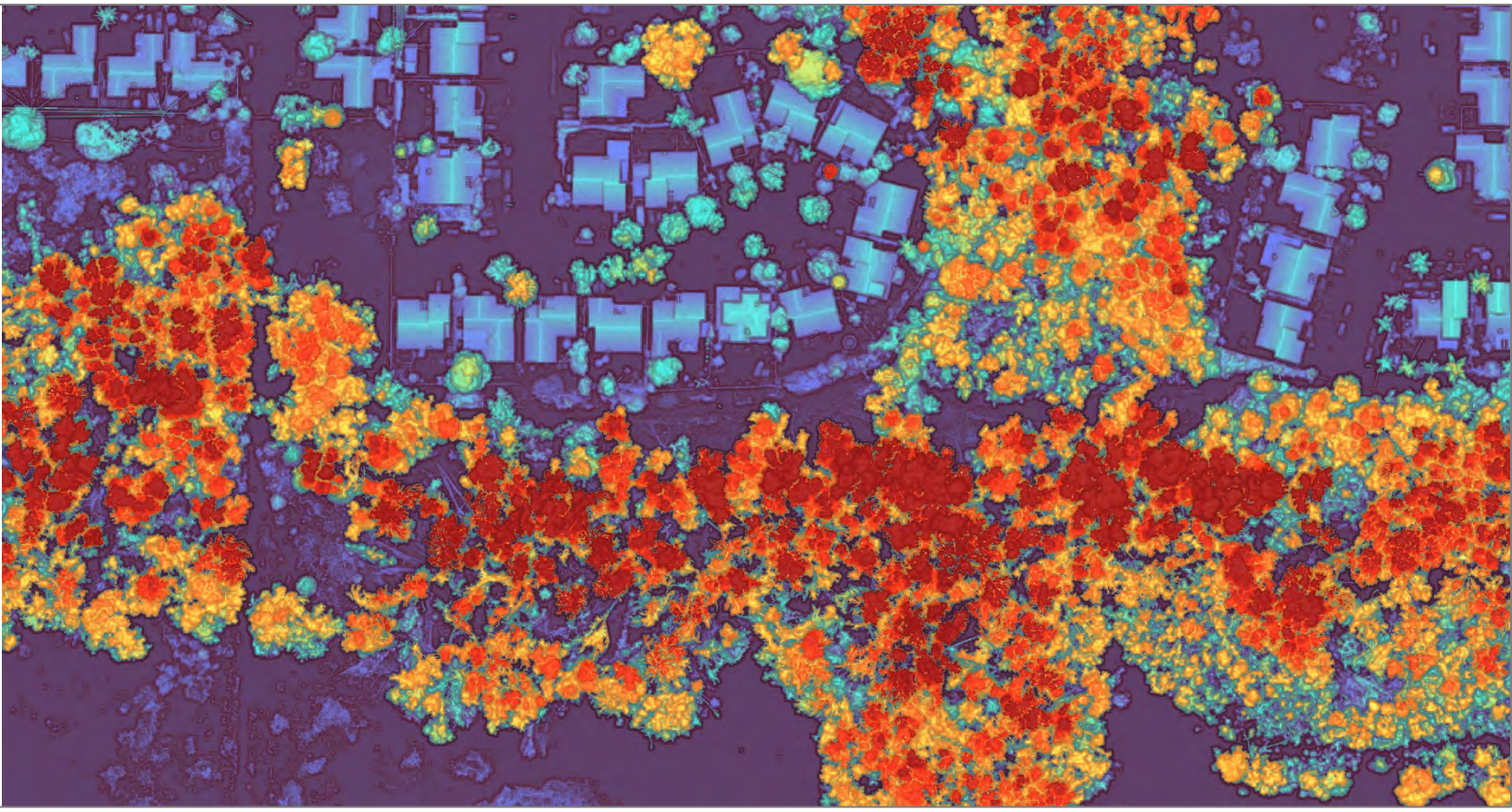
Prepared by NV5 dated October 24, 2022

ELLWOOD MESA MONARCH BUTTERFLY HABITAT CHARACTERIZATION

October 24, 2022

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Ellwood Mesa Monarch Butterfly Habitat Characterization

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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
		  o Standing Dead Wood – 6-inch and 12-inch voxel
		  o 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

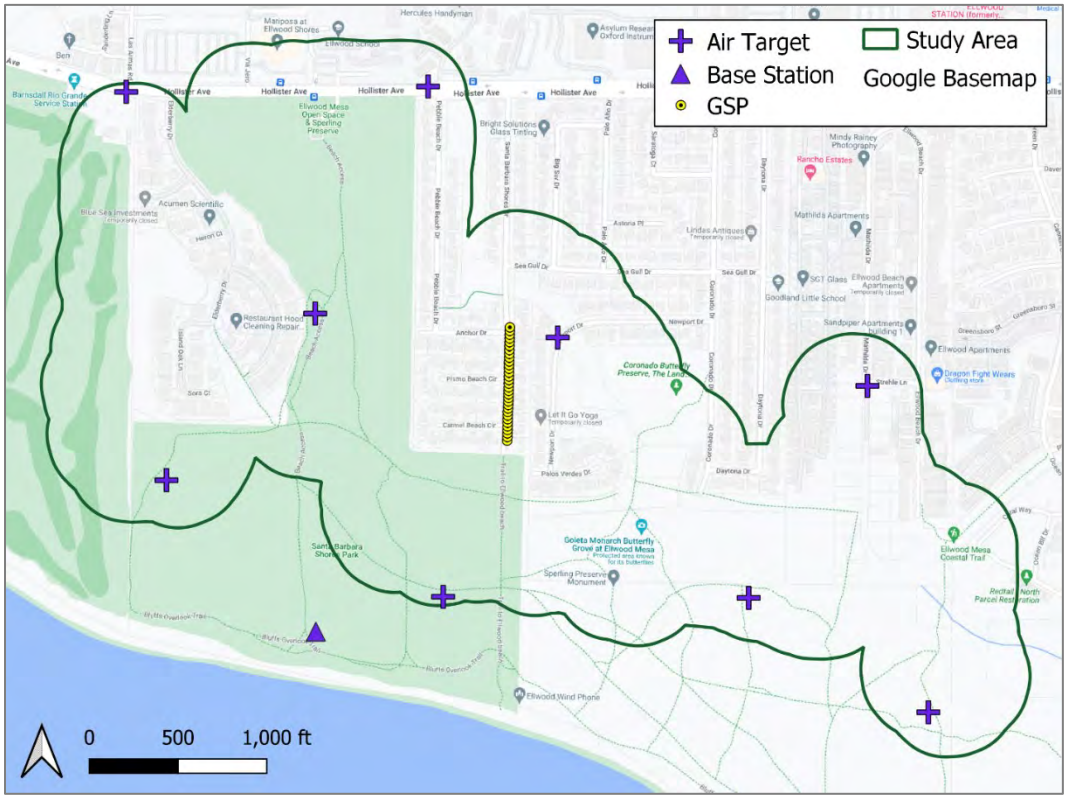


Figure 3: Ground survey location map.

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.

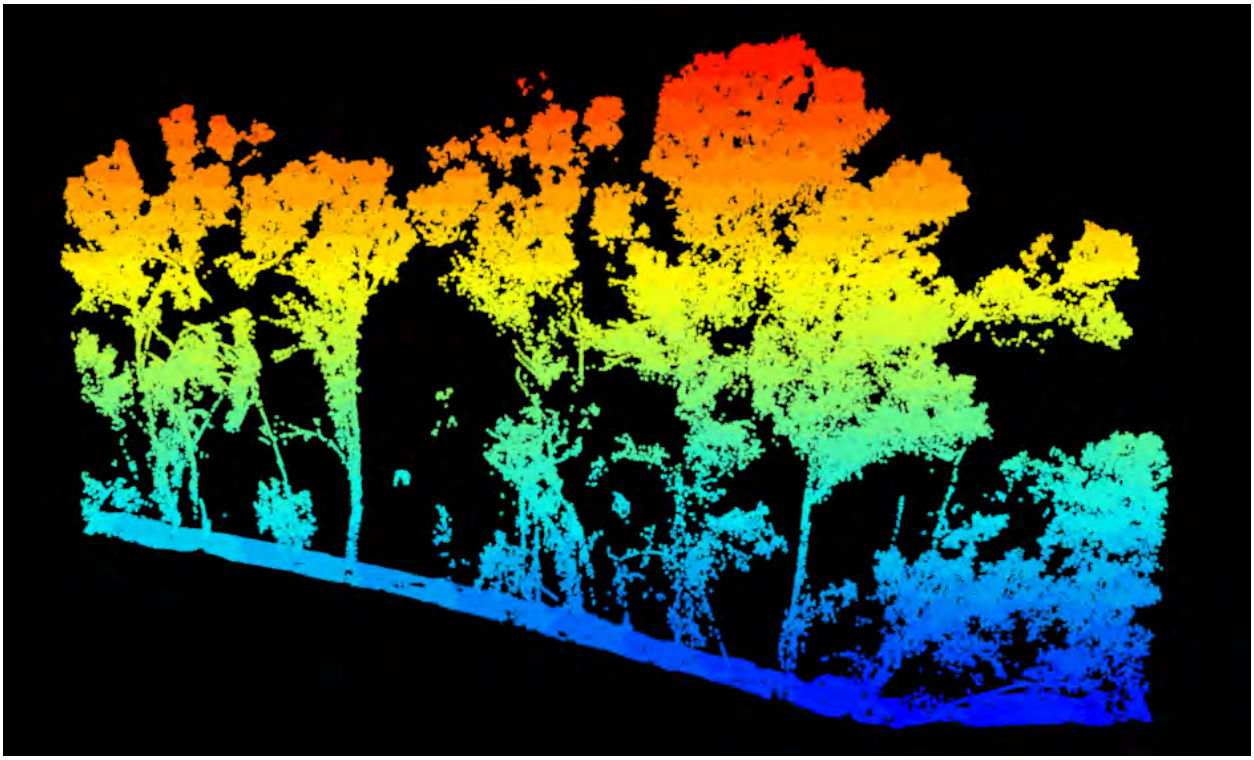


Figure 4: Cross section of the lidar point cloud in Ellwood.

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

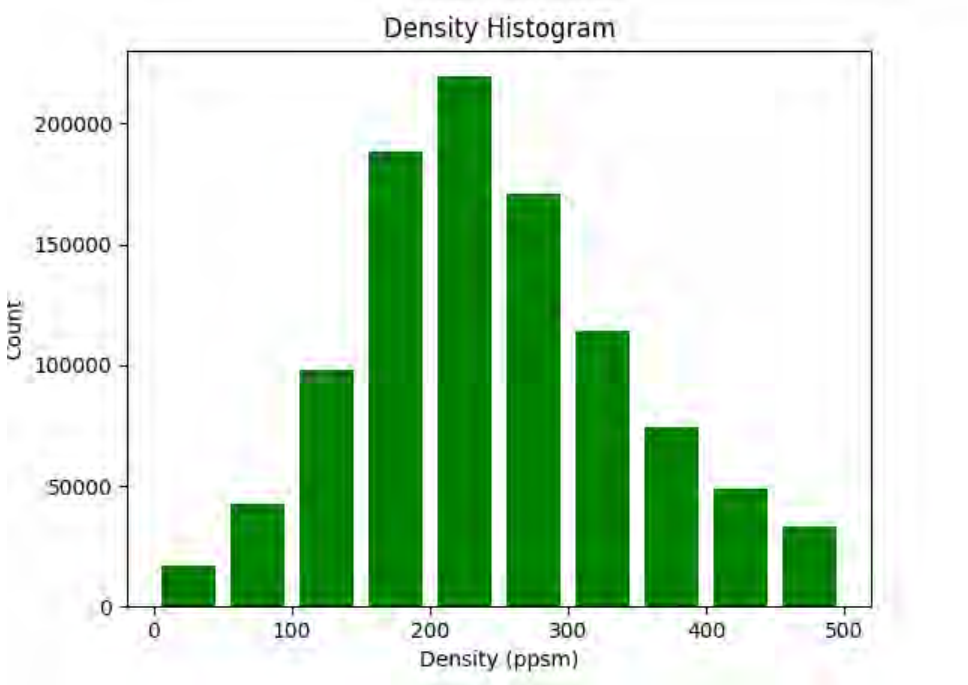


Figure 5: Frequency distribution of first return point density values per 1 x 1 meter cell.

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.

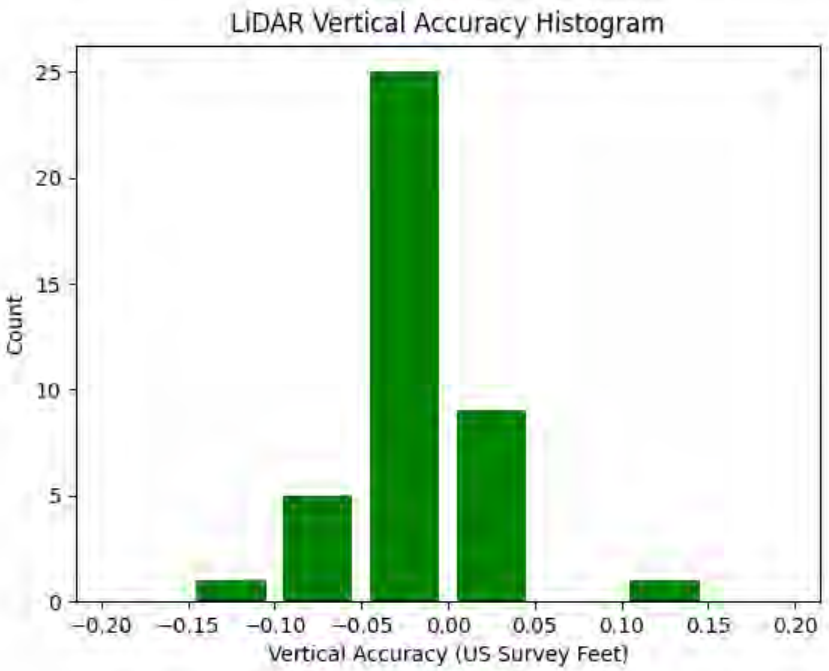


Figure 6: Frequency histogram for lidar classified LAS deviation from ground check point values (NVA).

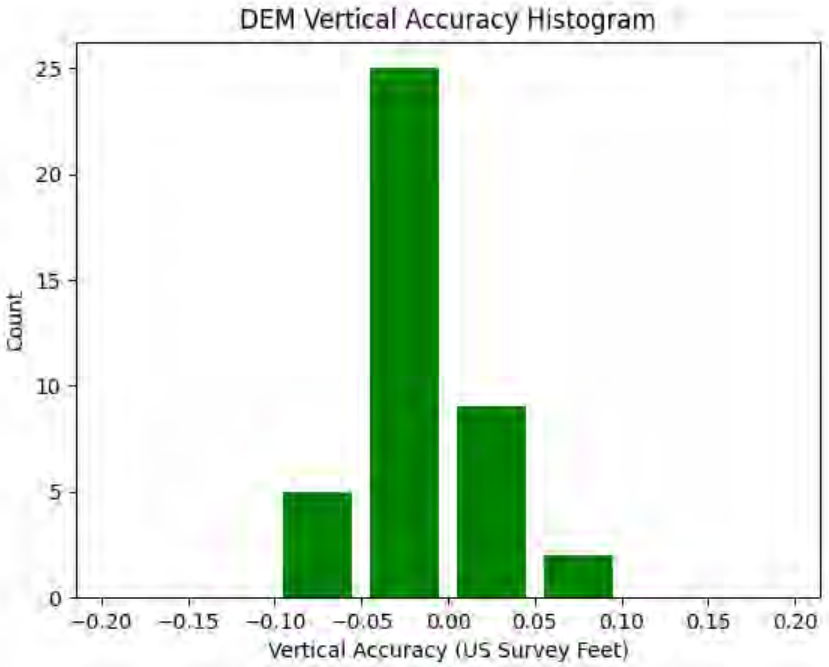


Figure 7: Frequency histogram for the lidar bare earth DEM surface deviation from ground check point values (NVA)

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

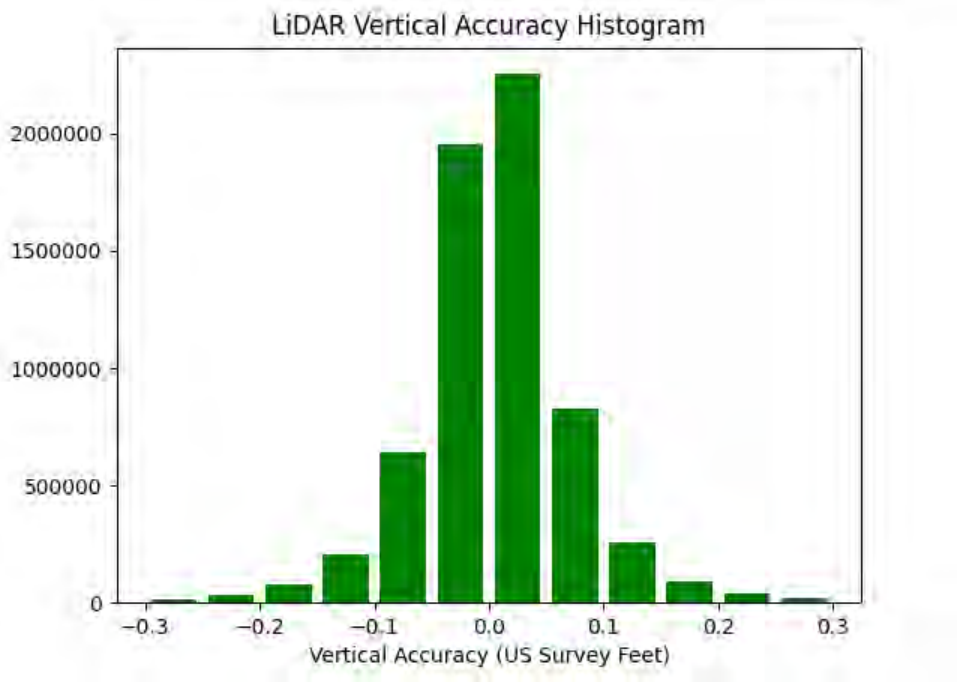


Figure 8: Frequency plot for relative vertical accuracy between flight lines

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^{o} 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.

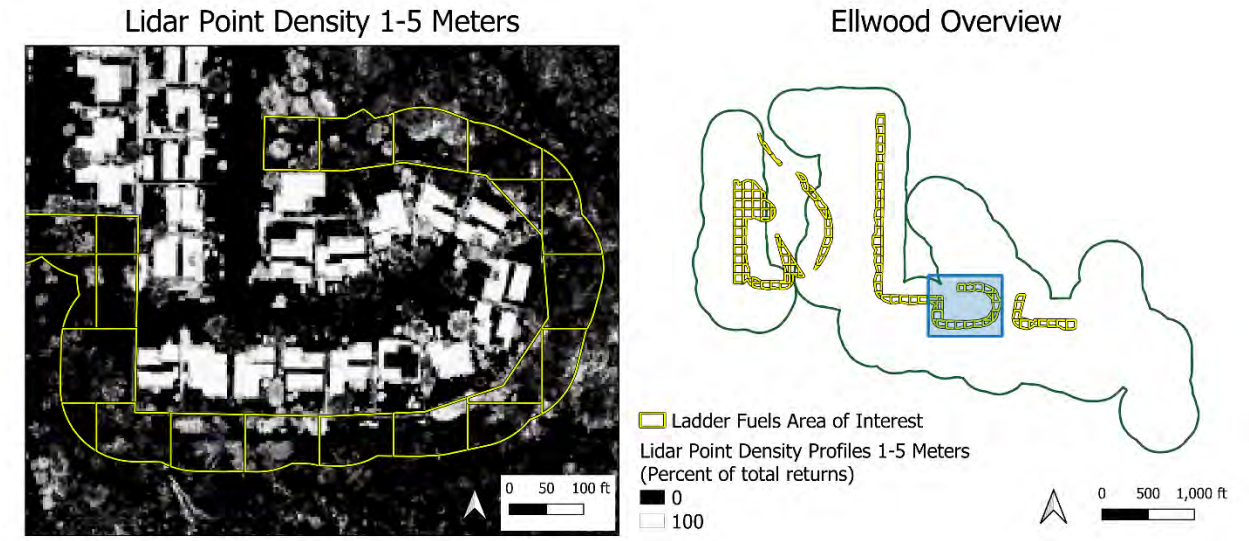


Figure 10: [Left] Demonstration of lidar point density percentage from 1-5 meters above ground. Houses, shrubs, leaning eucalyptus stems, and the lower levels of the tree canopy are visible in this map. [Right] Ladder fuels AOI within the Ellwood project area.

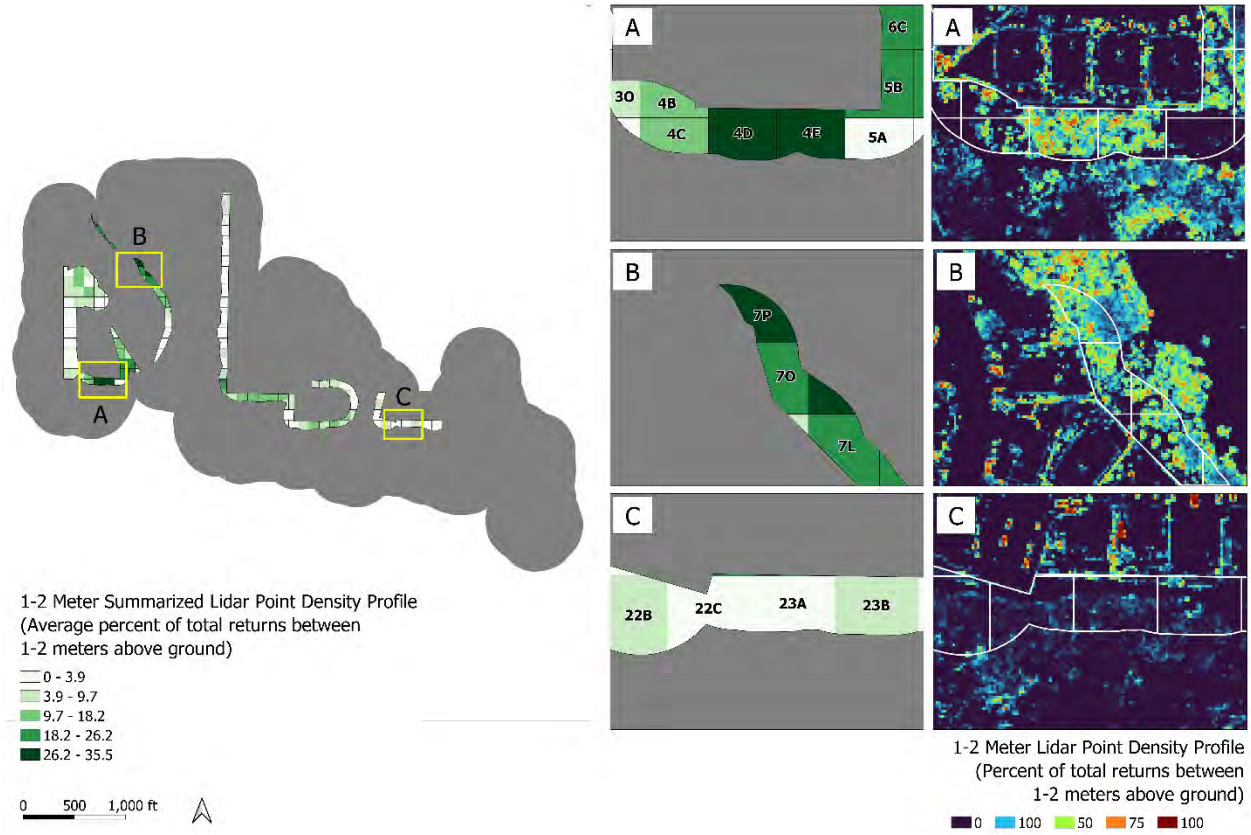


Figure 11: Summarized ladder fuels AOI showing average lidar point density for the 1-2 meter profile.

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).

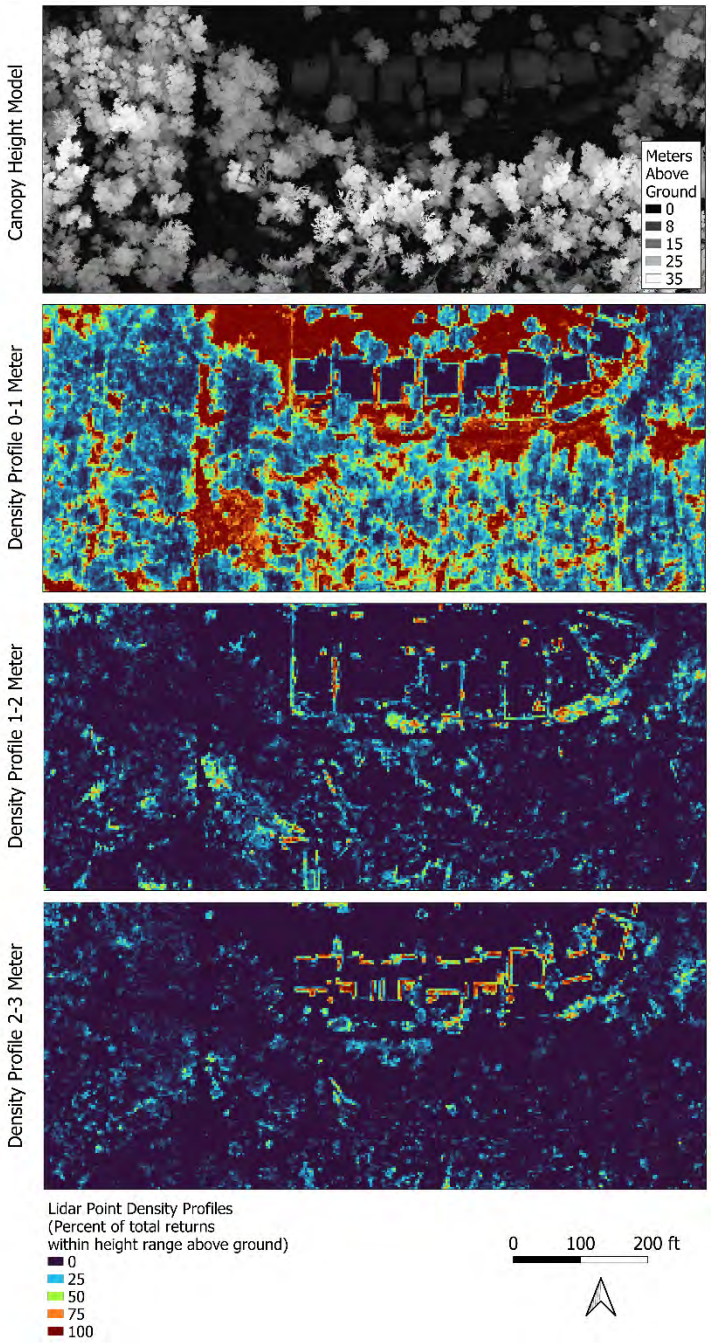


Figure 12: Map displaying lidar point density profiles for an example region of Ellwood. Top to bottom: Canopy Height Model shows a surface model of the highest returns captured in the height normalized point cloud. The density profiles from 0-1 meters above ground, 1-2 meters above ground, and 2-3 meters above ground, respectively.

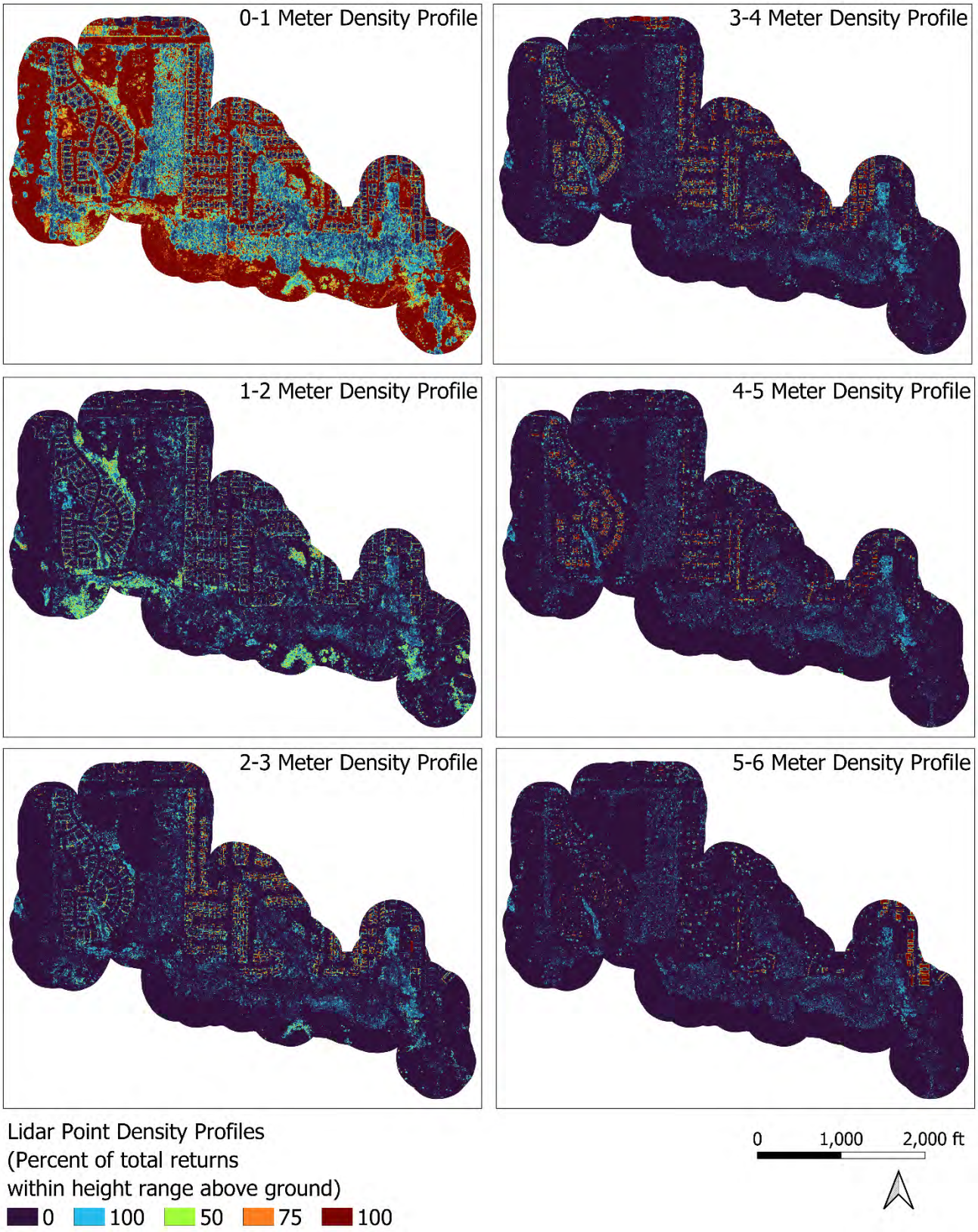


Figure 13: Overview of lidar point density profile rasters for the Ellwood Mesa AOI. Top to bottom and left to right: 0-1 meter density profile, 1-2 meter density profile, 2-3 meter density profile, 3-4 meter density profile, 4-5 meter density profile, and 5-6 meter density profile.

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.

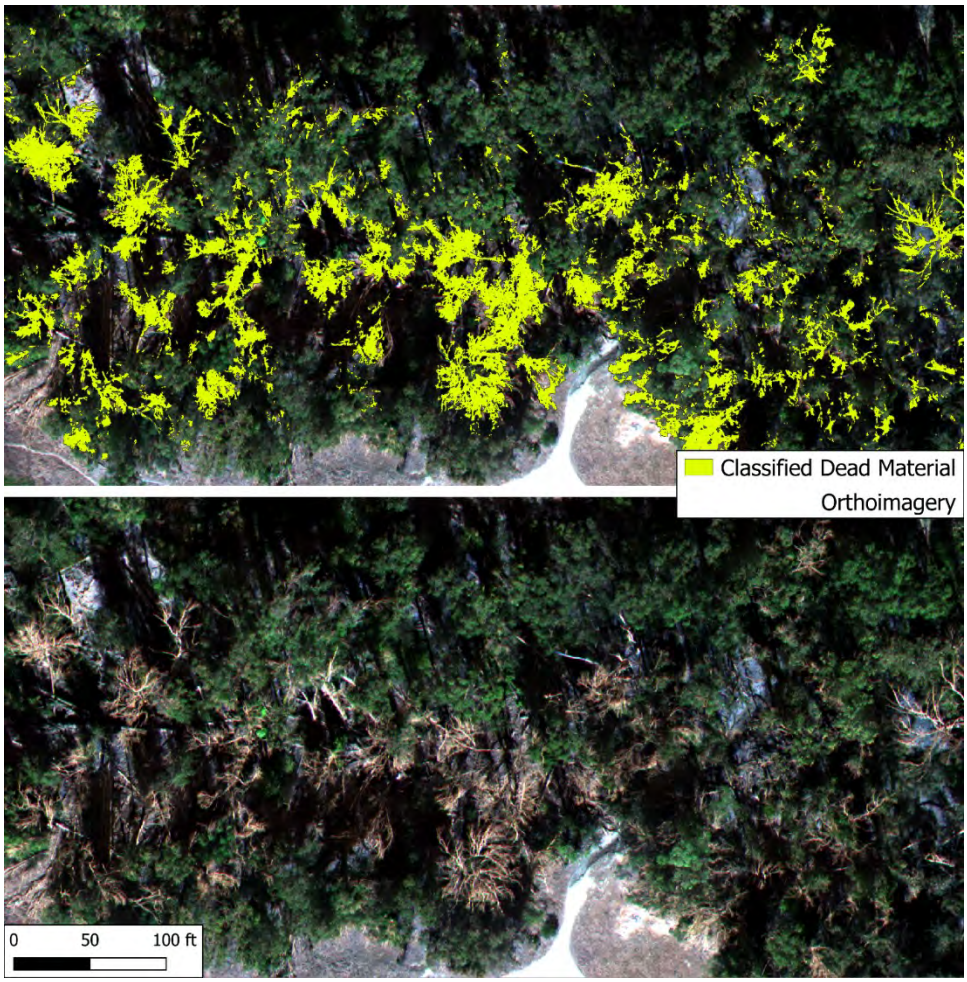


Figure 14: Example of dead trees identified in the orthoimagery.

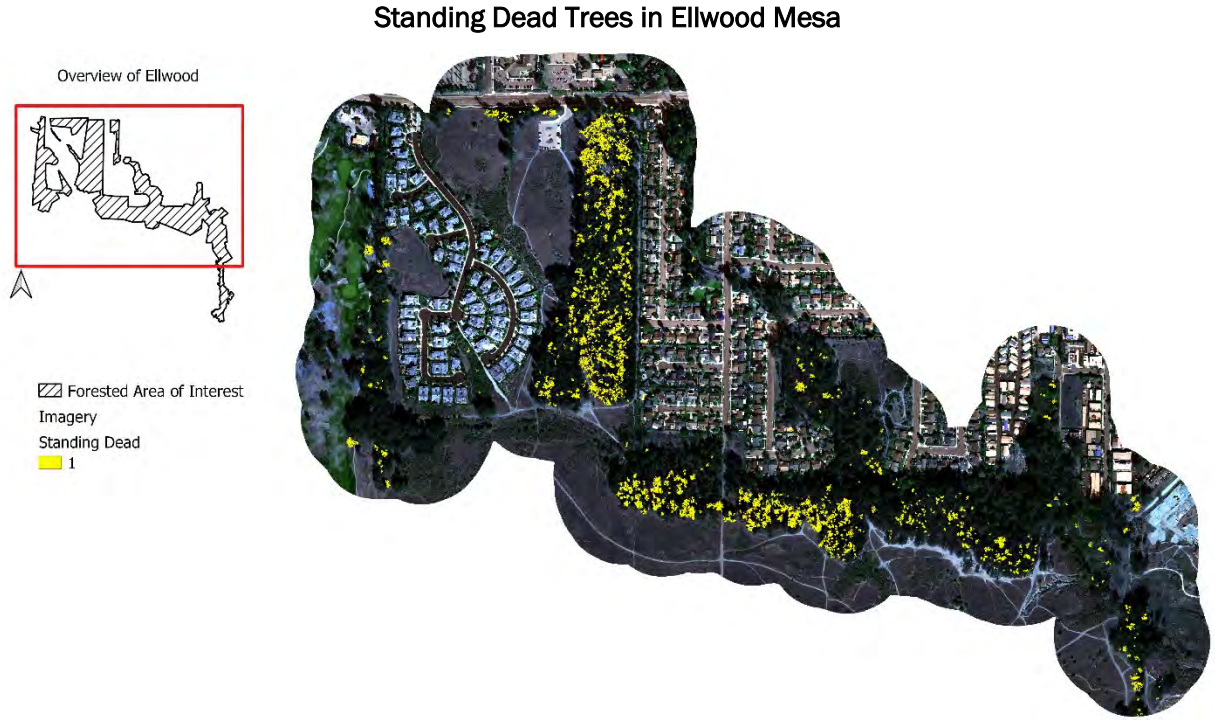


Figure 15: Mapped results of the identified standing dead trees within the Ellwood area of interest.

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.

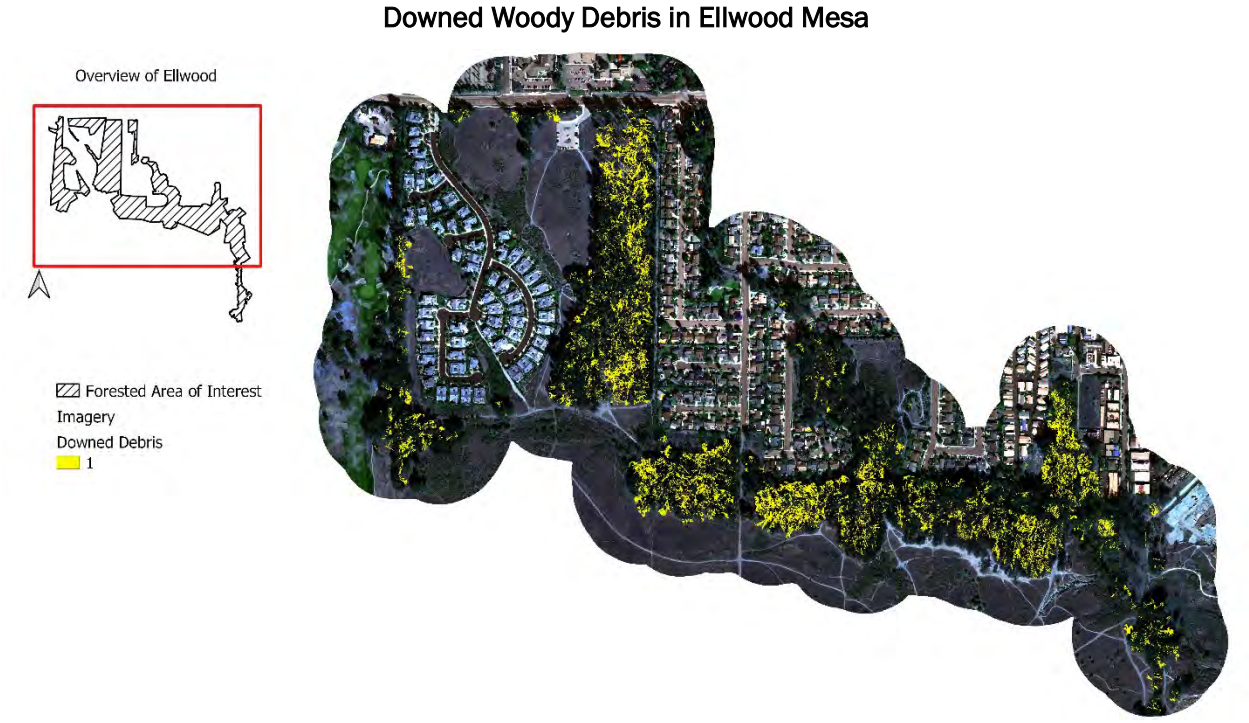


Figure 16: Mapped results of the identified downed woody debris within the Ellwood area of interest.

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.

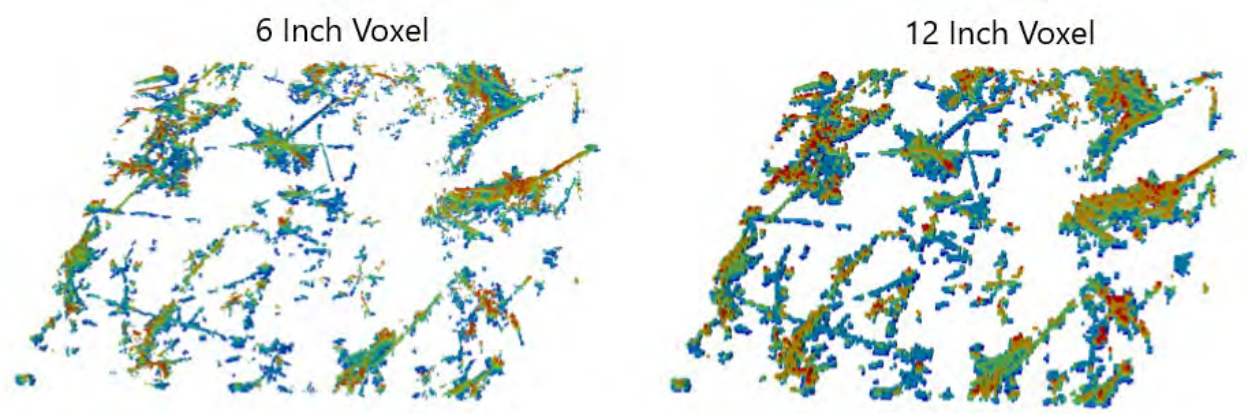


Figure 17: Voxel representations of classified downed woody debris for a lidar tile. A six-inch voxel size is shown on the left and a 12-inch voxel size is shown on the right. Voxel visualizations are colored by elevation above ground. Cool colors represent features closer to ground level, while warmer 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

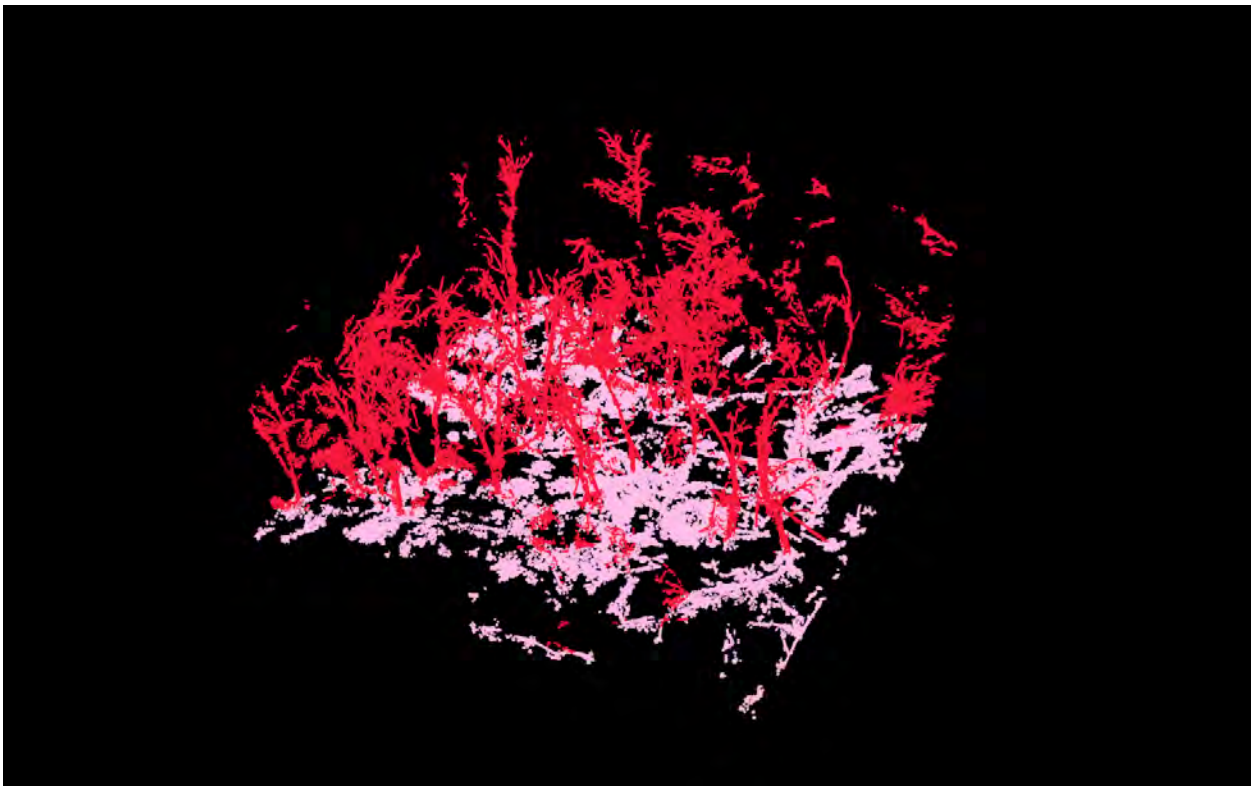


Figure 22: Example image of the classified lidar point cloud showing the identified standing dead material and downed woody debris for a particular unhealthy region of the Ellwood project area.

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.

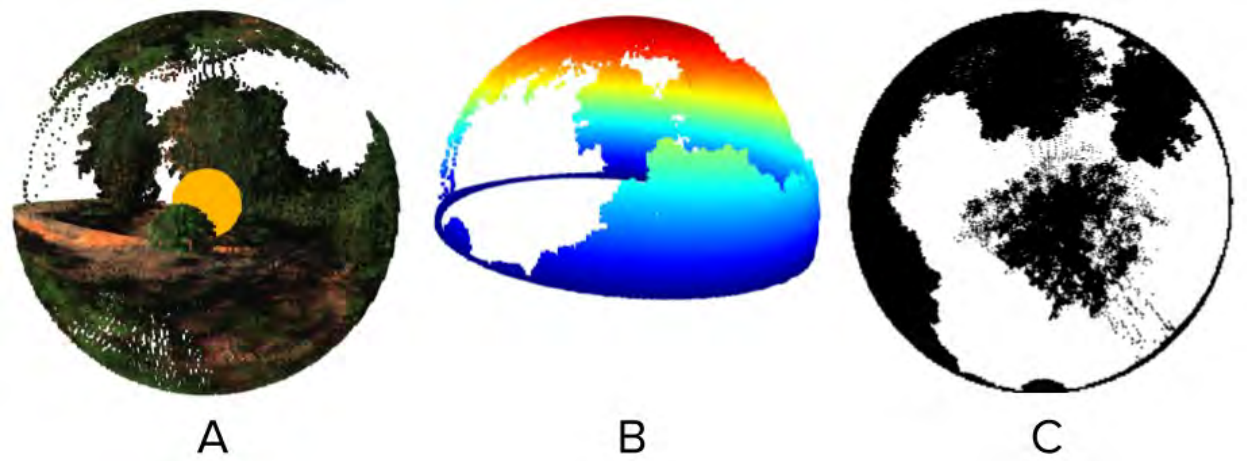


Figure 24: (A) Projected Point Cloud: An example of a point cloud projected to a sphere. The small yellow sphere located in the center of the projected point cloud represents the center of the projection sphere and the point of view for the simulated photo. (B) Cropped Projected Point Cloud: The projected 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.

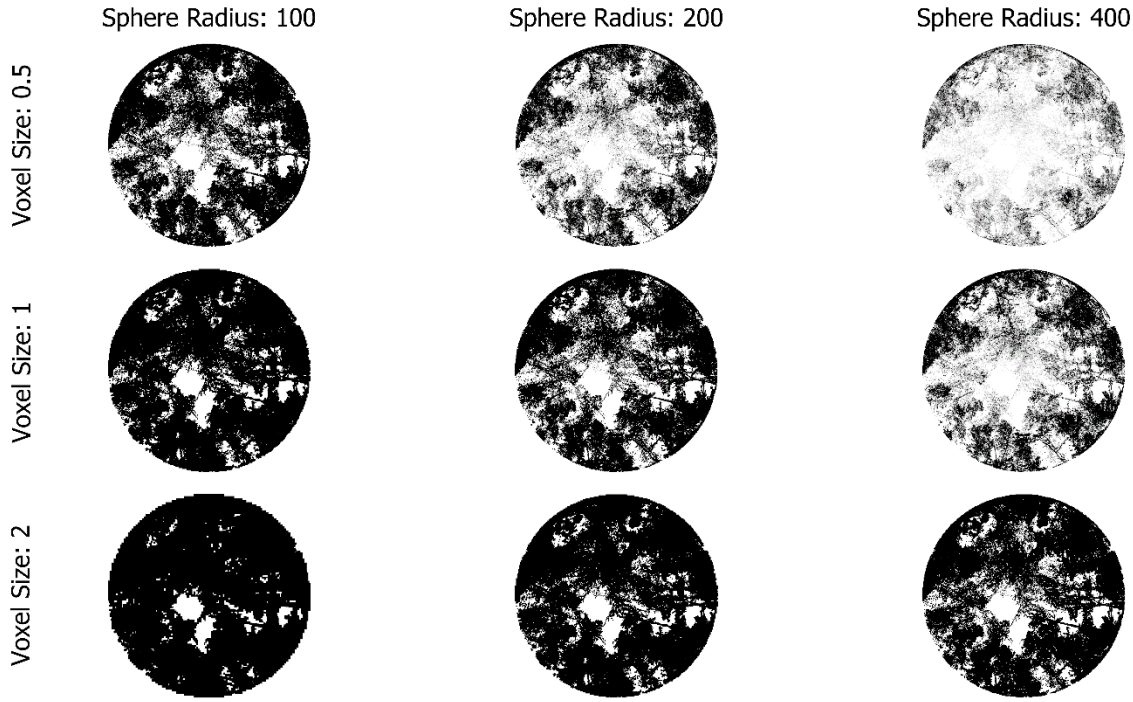


Figure 25: Image matrix showing various sphere radius and voxel size pairs. The selected parameters with the best look and feel compared to field photographs was a 400 foot radius and 2 foot voxel size (shown in the bottom right).

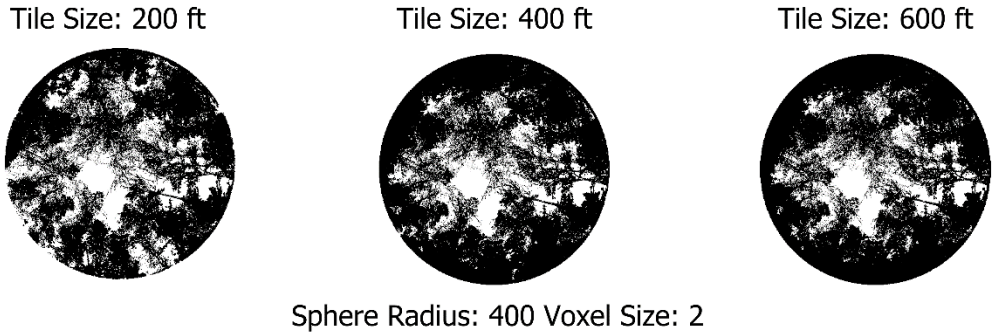


Figure 26: Image matrix showing how the input data tile size changes the resulting simulated image. A tile size of 400 feet was selected to balance the inclusion of features represented in the image and memory limitations.

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).

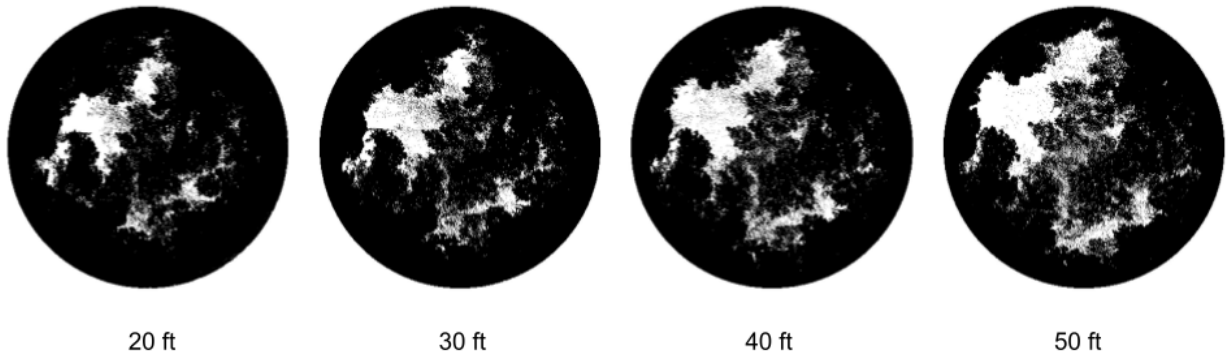


Figure 27: Examples of simulated fisheye photos centered on a historic monarch cluster site and moving upwards through the canopy. Left to right images show the camera point of view situated 20 feet, 30 feet, 40 feet, and 50ft above the ground.

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.

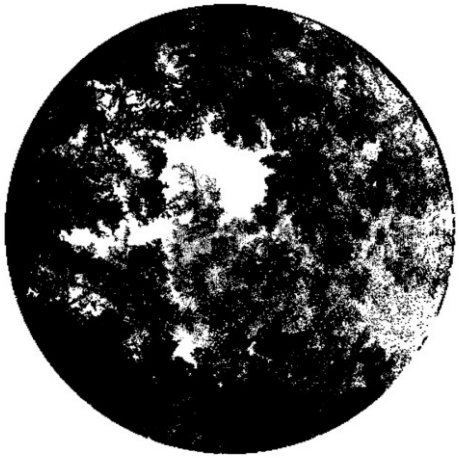
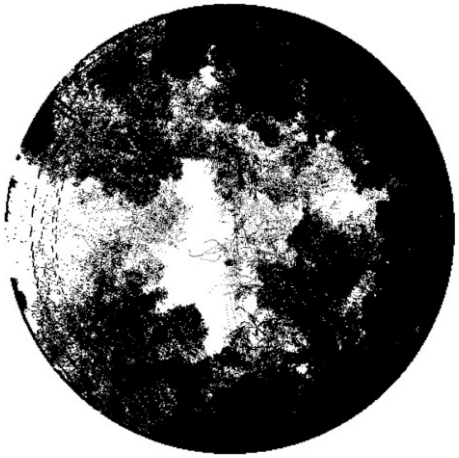
The work done for this project has explored a variety of methods for transforming and analyzing lidar and imagery collected across the Ellwood Mesa project area. The deliverable dataset demonstrates the high level of flexibility and analytical opportunity that comes with a high-density three-

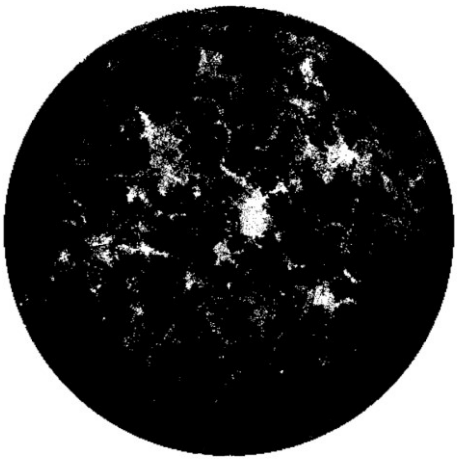
dimensional dataset. A key achievement of this project was the development of a method for simulating fisheye photographs from lidar point clouds. However, the simulated fisheye photos should be evaluated for classification accuracy once the fisheye photos captured in the field have been processed into 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.

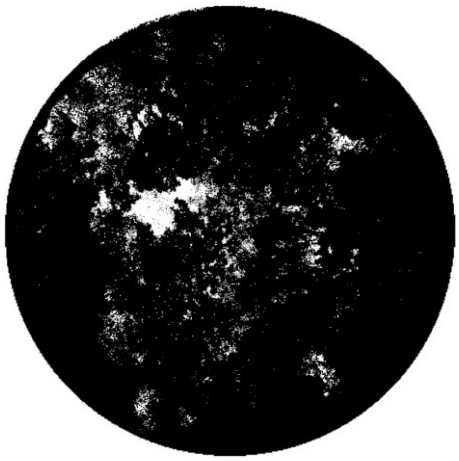
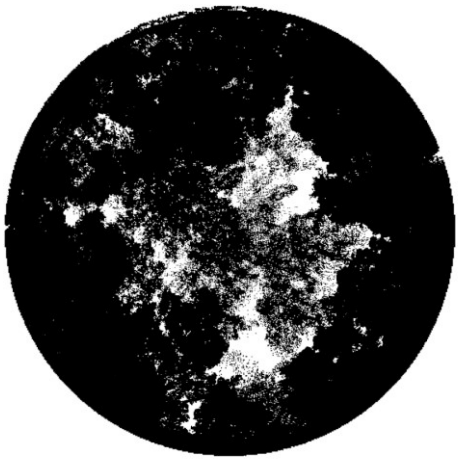
A future area of investigation is to understand whether similar products and results can be generated with lower density lidar. The UAS collected lidar had excellent canopy penetration and high first return densities (average 277.81 points/m^2) creating an ideal foundation for analytical work. Future efforts should study the capabilities of downed woody debris detection and fisheye photo simulation using lower density lidar datasets.

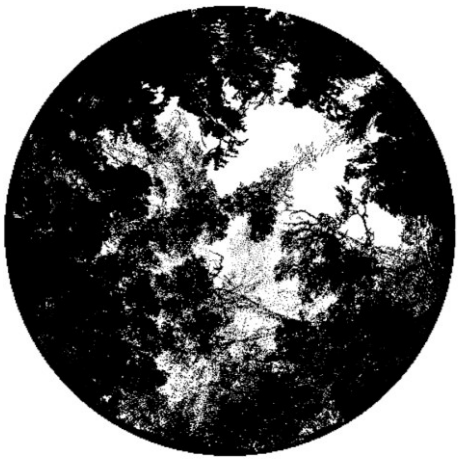
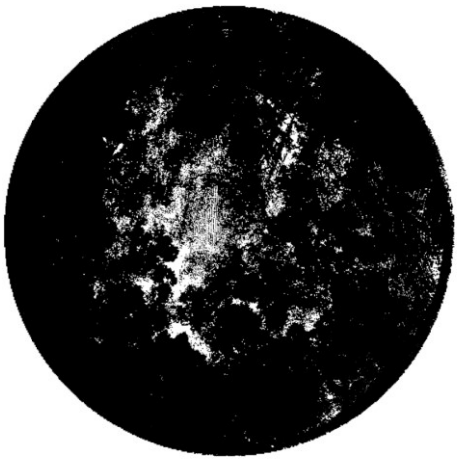
7.0 FISHEYE PLOT PHOTO COMPARISON

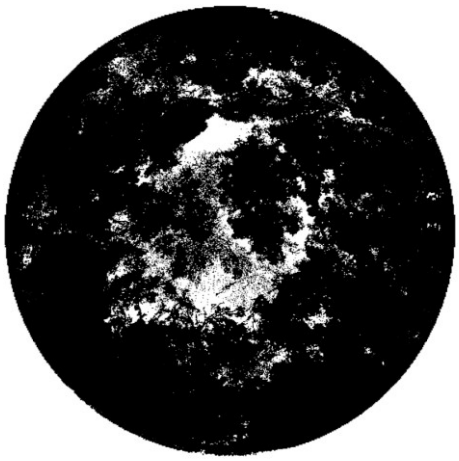
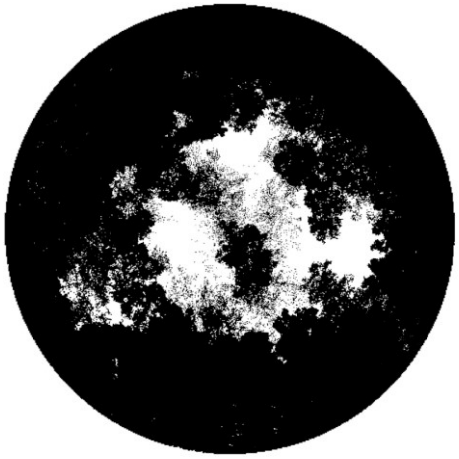
Table 20: Field photo and simulated fisheye photo comparison. Simulated fisheyes are generated from the lidar point cloud at 1.75-meter height above ground. The asterisk (*) on a plot number indicates that a confident plot geolocation adjustment could not be made and that there is not confidence in the simulated fisheye results.

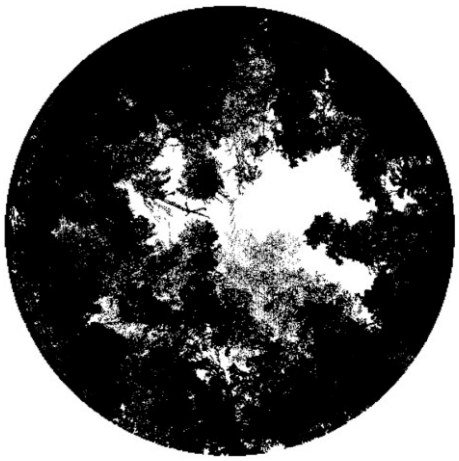
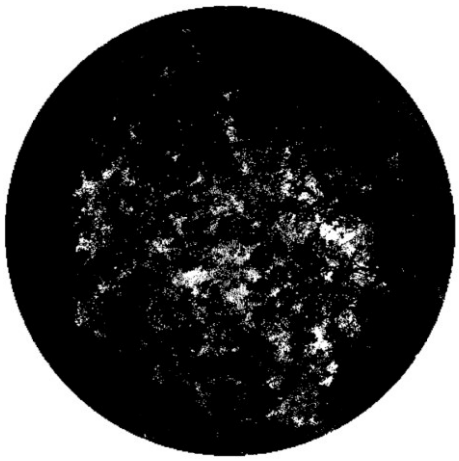
Plot Number	Field Photo	Simulated Fisheye Photo
1		
2		
3		

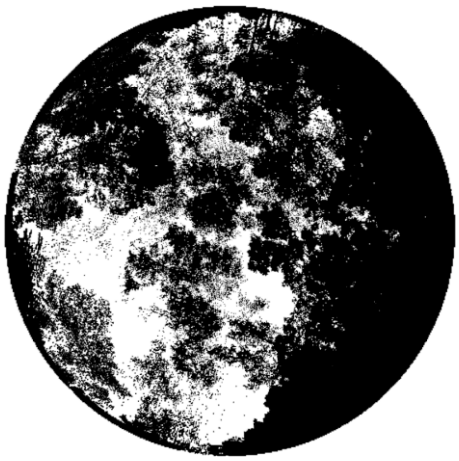
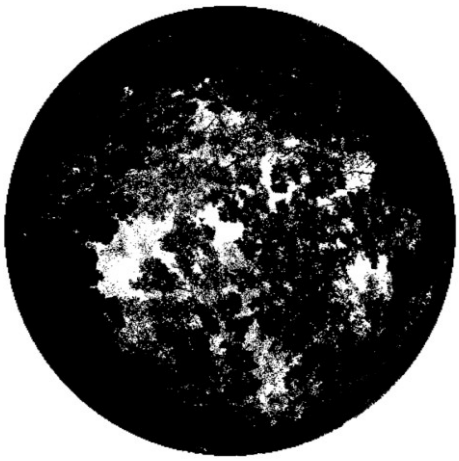
Plot Number	Field Photo	Simulated Fisheye Photo
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5		
6		

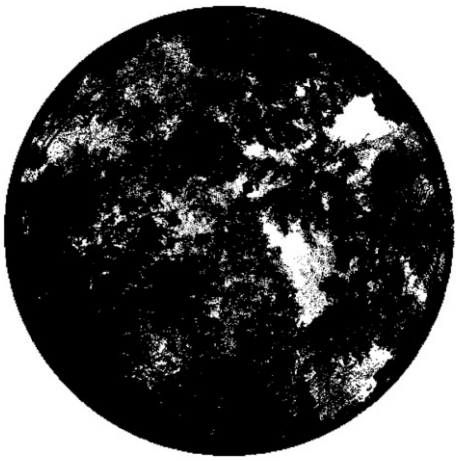
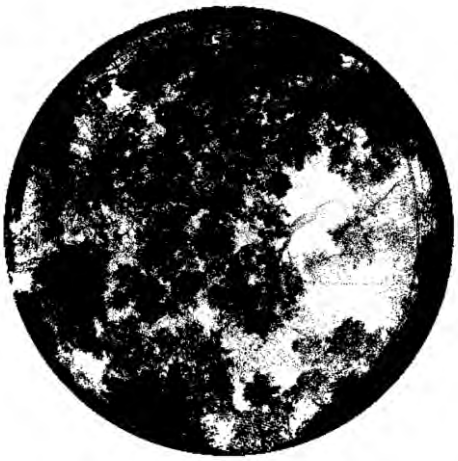
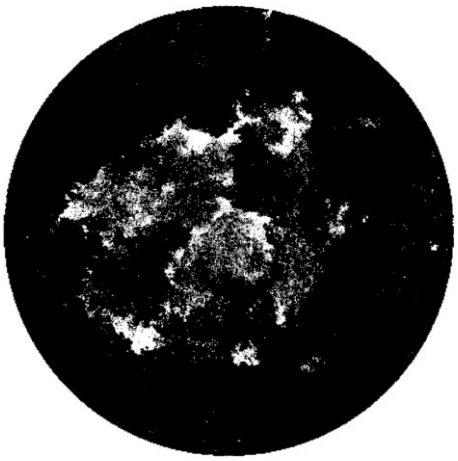
Plot Number	Field Photo	Simulated Fisheye Photo
7		
8		
9		

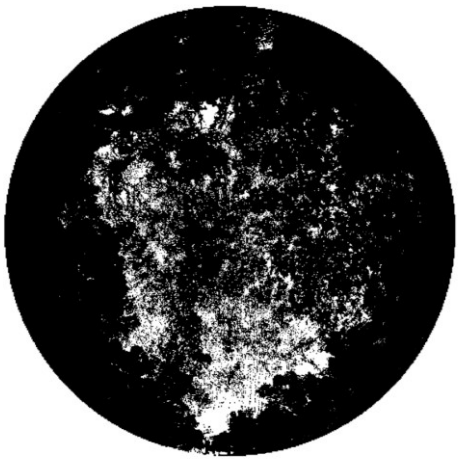
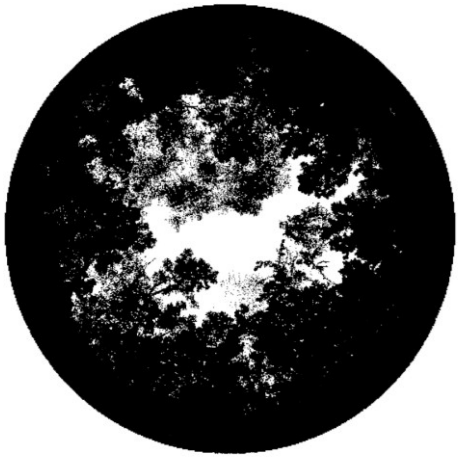
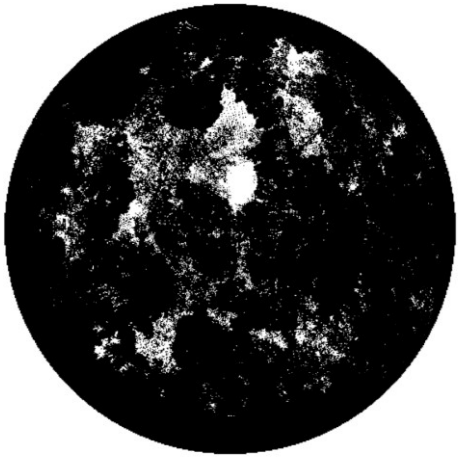
Plot Number	Field Photo	Simulated Fisheye Photo
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11		
12		

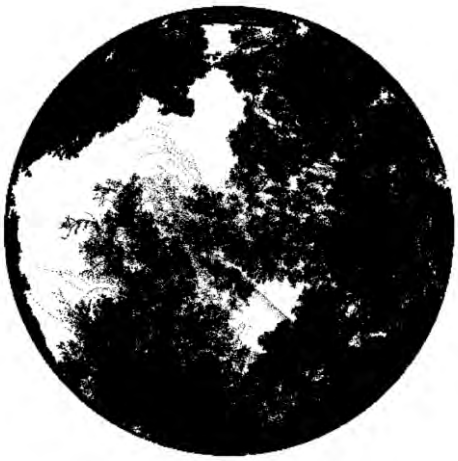
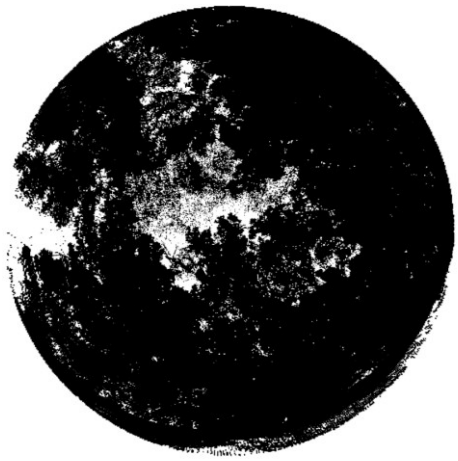
Plot Number	Field Photo	Simulated Fisheye Photo
13		
14		
15		

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).

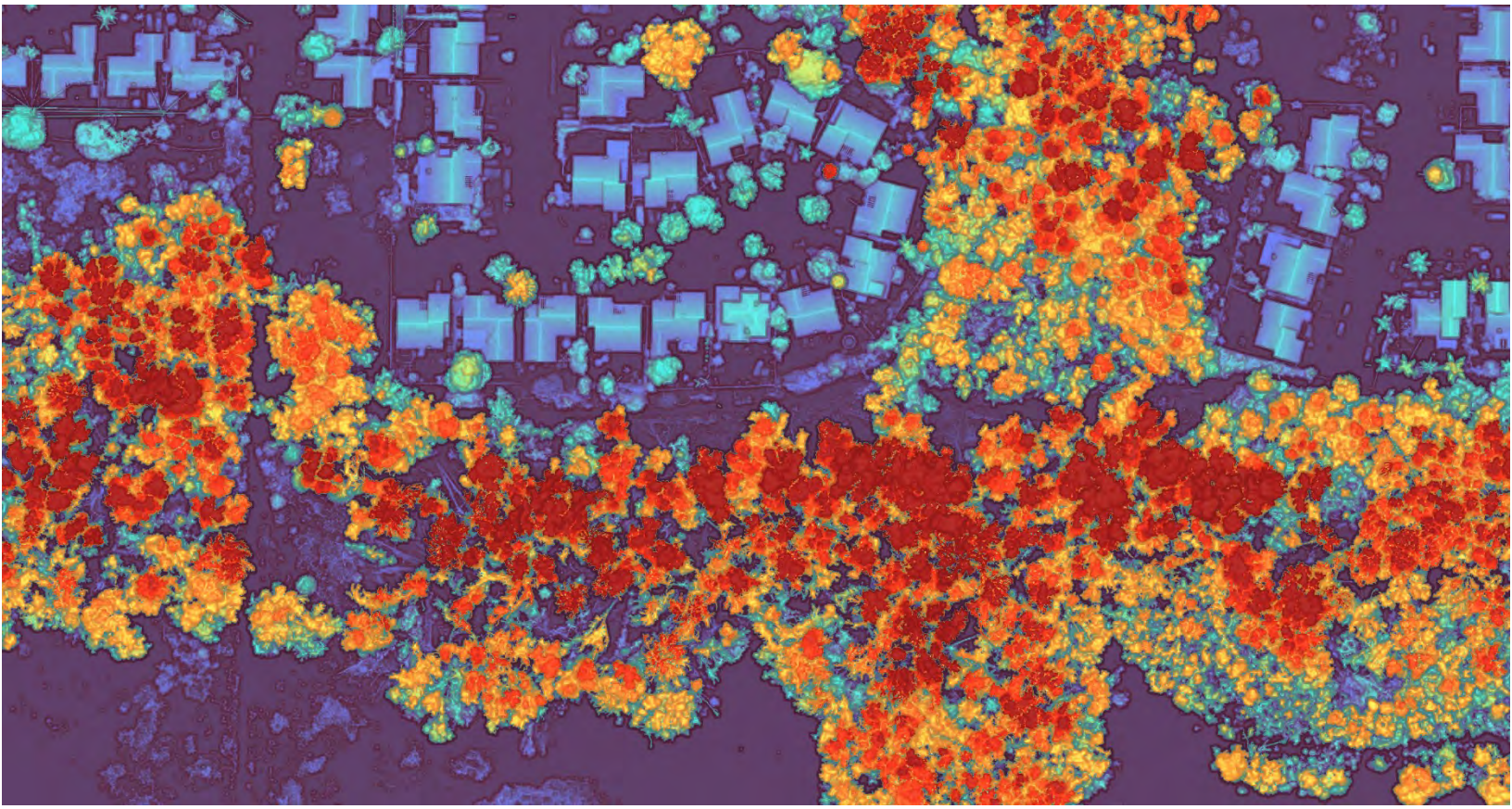
Pulse Returns: For every laser pulse emitted, the number of wave forms (i.e., echoes) reflected back to the sensor. Portions of the wave form that return first are the highest element in multi-tiered surfaces such as vegetation. Portions of the wave form that return last are the lowest element in multi-tiered 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.



NV5 GEOSPATIAL

powered by QUANTUM SPATIAL

Appendix E

Construction Documents

CITY OF GOLETA

HABITAT ENHANCEMENT PLAN

GOLETA MONARCH BUTTERFLY GROVE

AT ELLWOOD MESA

COASTAL DEVELOPMENT PERMIT SUBMITTAL

PROJECT DIRECTORY

CITY
CITY OF GOLETA (PUBLIC WORKS DEPT)
130 CREMONA DR, STE B — Phone: (805) 961-7500
GOLETA, CA 93117 — gthomson@cityofgoleta.org
CONTACT: GEORGE THOMSON

LANDSCAPE ARCHITECT
RRM DESIGN GROUP
3765 S HIGUERA ST, STE 102 — Phone: (805) 543-1794
SAN LUIS OBISPO, CA 93401 — jrminnick@rrmdesign.com
CONTACT: JAKE MINNICK

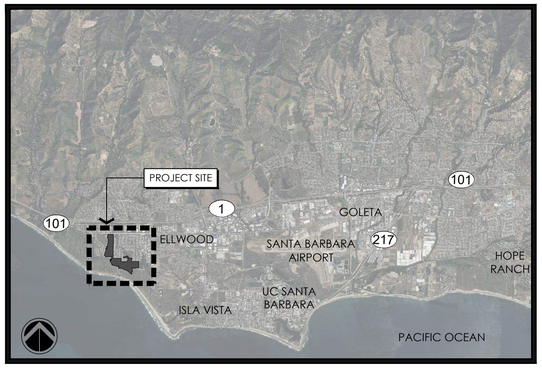
CIVIL ENGINEER
RRM DESIGN GROUP
10 FIGUEROA ST, STE 200 — Phone: (805) 963-8283
SANTA BARBARA, CA 93101 — mchamilton@rrmdesign.com
CONTACT: MICHAEL HAMILTON

PROJECT BIOLOGIST/ARBORIST
RINCON CONSULTANTS, INC.
209 EAST VICTORA ST — Phone: (805) 644-4455
SANTA BARBARA, CA 93101 — slopez@rinconconsultants.com
CONTACT: STEPHANIE LOPEZ

PERMITTING CONSULTANT
RINCON CONSULTANTS, INC.
209 EAST VICTORA ST — Phone: (805) 644-4455
SANTA BARBARA, CA 93101 — cjulian@rinconconsultants.com
CONTACT: CHRISTOPHER JULIAN

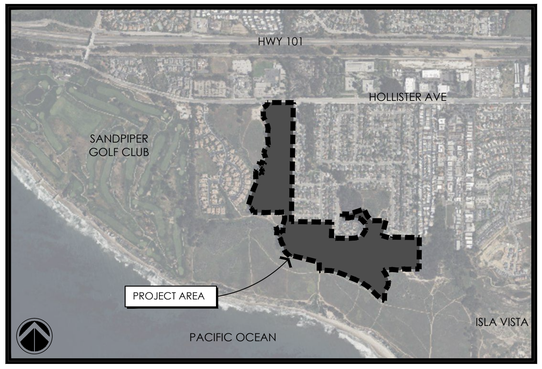
BIOLOGIST/BUTTERFLY SPECIALIST
ALTHOUSE AND MEADE, INC.
1650 RAMADA DRIVE, STE 180 — Phone: (805) 453-6801
PASO ROBLES, CA 93446 — charisvdh@althouseandmeade.com
CONTACT: CHARIS VAN DER HEIDE

BIOLOGIST/ BUTTERFLY SPECIALIST
CREEKSIDE SCIENCE
MENLO PARK, CA 94025 — Phone: (650) 269-2876
CONTACT: STUART WEISS — stu@creeksidescience.com



VICINITY MAP

NOT TO SCALE



LOCATION MAP

NOT TO SCALE

SHEET INDEX

GENERAL
G1.0 TITLE SHEET
G1.1 SHEET INDEX MAP

LANDSCAPE ARCHITECTURE
L1.0 TRAIL ENHANCEMENT AND REPAIR NOTES
L1.1-1.6 PUBLIC ACCESS PLAN
L1.7-1.10 PUBLIC ACCESS PLAN DETAILS
L1.11 PUBLIC ACCESS PLAN VISUALIZATIONS

L2.0 IRRIGATION NOTES AND SCHEDULE
L2.1-2.6 IRRIGATION PLAN
L2.7 IRRIGATION DETAILS

L3.0 TREE PLANTING PLAN
L3.1-3.6 PLANTING PLAN

CIVIL ENGINEERING
C1.0 SHEET INDEX MAP
C2.0-2.5 GRADING PLAN
C3.0-3.2 EARTHWORK
C4.0-4.2 DETAILS
C5.0-5.1 EROSION CONTROL PLAN

PROJECT DESCRIPTION

- THE PROJECT GENERALLY CONSISTS OF MONARCH BUTTERFLY HABITAT RESTORATION AND PUBLIC ACCESS IMPROVEMENTS IN AN APPROXIMATELY 60-ACRE WORK AREA DEFINED WITHIN THE CITY OF GOLETA'S ELLWOOD MESA OPEN SPACE. PROPOSED TREE WORK INCLUDES THE REMOVAL OF DOWNED DEAD TREES AND STANDING DEAD TREES, THE PRUNING OF EXISTING TREES, AND THE PLANTING OF NEW TREES. APPROXIMATELY 60-ACRES OF NATIVE RESTORATION PLANTING IS PROPOSED THROUGHOUT THE WORK AREA.
- NEW IMPROVEMENTS WILL GENERALLY INCLUDE THE REROUTING OF EARTHEN TRAILS, PEDESTRIAN AND VEHICULAR CREEK CROSSINGS, IMPROVEMENTS TO MONARCH BUTTERFLY VIEWING AREAS, WAYFINDING, AND INTERPRETIVE SIGNAGE.
- ALL IMPROVEMENTS SHALL MEET THE 2022 CALIFORNIA BUILDING CODE & 2010 ADA ACCESSIBILITY REQUIREMENTS.
- PUBLIC ACCESS TO THE BEACH SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.

PROJECT FUNDED BY:

Coastal Conservancy

PROJECT CONSULTANTS:

Rincon Consultants, Inc.
rrm design group
CREEKSIDE SCIENCE
ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES

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SHEET INDEX MAP LEGEND

- CDP PROJECT AREA
- ELLWOOD MESA SITE BOUNDARY
- ELLWOOD MAIN — MONARCH BUTTERFLY AGGREGATION SITE

0 100 200 400 600 feet

1"=200'

H:\1800\1981.01-RC20-Elwood-Monarch-Butterfly-Mgmt Plan\Landscape-Architecture\Tasks & Dlv\Coastal Development Permit Package\Sheet Files\G1.1981.01-RC20.dwg, G1.1, Apr 26, 2023 11:21am, jmmicks

CITY OF GOLETA | Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

SHEET INDEX MAP

G1.1

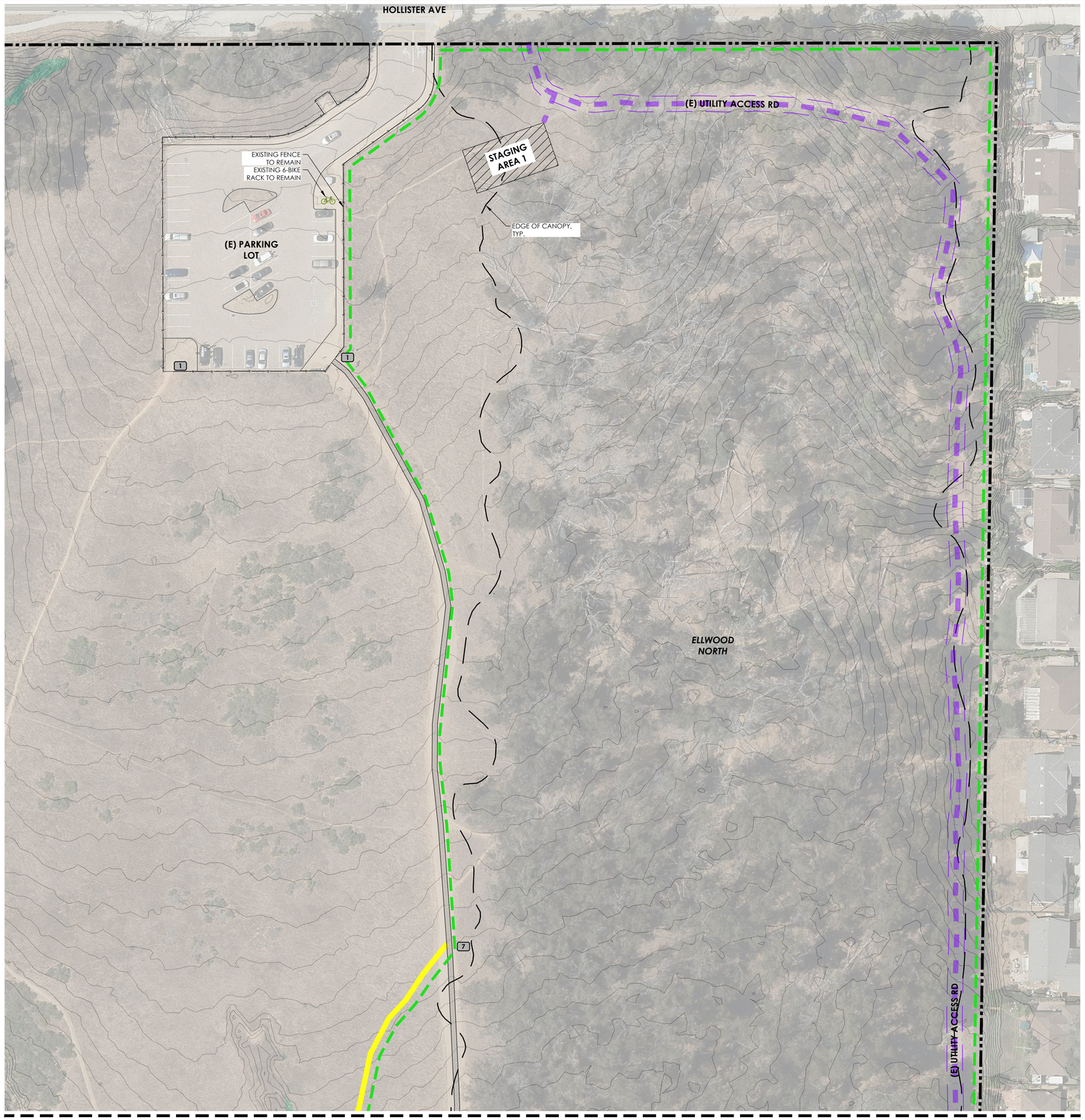
CONSTRUCTION RESPONSIBILITIES

1. 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 AN NECESSARY TO AVOID IMPACT TO ESHA. AREAS. CLEARING SHALL BE LIMITED TO THE MINIMAL FOOTPRINT NECESSARY AND FOR THE SHORTEST TIME NECESSARY TO AVOID IMPACT TO ESHA.
2. 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.
3. TEMPORARY 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.
4. 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).
5. 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.
6. 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.
7. THE DISCHARGE OF ANY HAZARDOUS MATERIALS, INCLUDING HERBICIDES, INTO ANY RECEIVING WATERS SHALL BE PROHIBITED.
8. 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.
9. ALL BMPS SHALL BE MAINTAINED IN A FUNCTIONAL CONDITION THROUGHOUT THE DURATION OF ENHANCEMENT ACTIVITIES.

TRAIL ENHANCEMENT AND REPAIR NOTES

1. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS FOR GRADING, DRAINAGE, AND UNDERGROUND FACILITIES, INCLUDING LOCATION AND ELEVATION OF EXISTING FACILITIES AT CROSSINGS WITH PROPOSED UNDERGROUND FACILITIES. IF CONDITIONS DIFFER FROM THOSE SHOWN ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE OWNER AND SHALL NOT BEGIN CONSTRUCTION UNTIL THE CHANGED CONDITIONS HAVE BEEN EVALUATED AND RESOLVED.
2. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE PLANS AND SITE CONDITIONS PRIOR TO BEGINNING WORK. SHOULD CONFLICTING INFORMATION BE FOUND ON THE PLANS, THE CONTRACTOR SHALL NOTIFY AND RECEIVE DIRECTION FROM THE OWNER BEFORE PROCEEDING WITH THE WORK IN QUESTION.
3. NO CHANGES OR MODIFICATIONS TO THE PLANS SHALL BE MADE WITHOUT THE PRIOR WRITTEN APPROVAL OF THE OWNER.
4. CONSULT WITH THE OWNER'S ARBORIST PRIOR TO PRUNING OR WORKING WITHIN THE DRIPLINE OF ANY TREE. ALL PRUNING OF TREES SHALL BE KEPT TO A MINIMUM AND MUST FOLLOW CITY OF GOLETA'S STANDARDS.
5. NO MATERIALS OR EQUIPMENT SHALL BE STORED WITHIN THE DRIPLINE OF ANY TREE.
6. ALL NUMERIC AND WRITTEN DIMENSIONS SHALL HAVE PRECEDENCE OVER ALL SCALE DIMENSIONS.
7. DETAILS AND NOTES ON THE DRAWINGS TAKE PRECEDENCE OVER TYPICAL DETAILS AND GENERAL NOTES.
8. ALL CONSTRUCTION SHALL CONFORM TO THE APPROVED PLANS AND SPECIFICATIONS. IN THE ABSENCE OF A SPECIFIED STANDARD OR SPECIFICATION, WORK SHALL CONFORM TO THE CURRENT CITY OF GOLETA STANDARDS. IF NONE EXISTS, STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK), SHALL APPLY.
9. ALL WORK SHALL CONFORM TO THE RECOMMENDATIONS CONTAINED IN THE PROJECT SOILS ENGINEERING REPORT PROVIDED BY TBD.
10. CONTRACTOR SHALL TAKE ALL CARE TO PREVENT DISRUPTION OF PROJECT SITE IN AREAS OUTSIDE CONSTRUCTION ZONE.
11. THE CONTRACTOR SHALL NOTIFY THE OWNER AT LEAST 48 HOURS BEFORE COMMENCING WORK.
12. PROPOSED DEVIATIONS FROM THE PLANS MUST BE SUBMITTED TO THE OWNER FOR REVIEW AND APPROVAL, INCLUDING FIELD REVISIONS REQUESTED BY THE INSPECTOR.
13. THE CONTRACTOR SHALL EMPLOY ALL LABOR, EQUIPMENT, AND METHODS REQUIRED TO PREVENT HIS OPERATIONS FROM PRODUCING DUST IN AMOUNTS DAMAGING TO PROPERTY, CULTIVATED OR NATIVE VEGETATION, AND DOMESTIC AND NON-DOMESTIC ANIMALS OR CAUSING A NUISANCE TO PERSONS OCCUPYING BUILDINGS IN THE VICINITY OF THE JOB SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE CAUSED BY DUST RESULTING FROM THEIR OPERATIONS.
14. CONSTRUCTION LINE AND GRADE STAKES SHALL BE SET BY A CIVIL ENGINEER OR SURVEYOR LICENSED IN THE STATE OF CALIFORNIA.
15. CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OR PROPER RESETTING OF ALL EXISTING MONUMENTS AND OTHER SURVEY MARKERS. ANY SURVEY MONUMENTS DESTROYED BY THE CONTRACTOR SHALL BE REPLACED IN ACCORDANCE WITH THE STATE LAND SURVEYORS ACT AT THE CONTRACTOR'S EXPENSE.
16. ALL PROTECTIVE DEVICES TO BE INSTALLED BY THE CONTRACTOR, SHALL BE IN PLACE AT THE END OF EACH WORK DAY. A SAFE PEDESTRIAN PATH OF TRAVEL SHALL BE PROVIDED AT ALL TIMES TO AND FROM OPEN SPACE ENTRANCES AND PARKING FACILITIES. COORDINATE PEDESTRIAN PATH CLOSURES WITH OWNER PRIOR TO CONSTRUCTION.
17. CONTRACTOR SHALL REFER TO MATERIALS SPECIFICATIONS THROUGHOUT THE APPROVED PLAN SET AND SPECIFICATIONS. ANY SUBSTITUTIONS OF THE MATERIALS SPECIFIED IN THESE DOCUMENTS SHALL REQUIRE WRITTEN APPROVAL FROM THE OWNER.
18. DURING THE COURSE OF WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CALLING THE CITY OF GOLETA FOR TESTING AND INSPECTION 24 HOURS IN ADVANCE. WORK NOT PROPERLY TESTED AND INSPECTED WILL BE SUBJECT TO REJECTION.
19. WORK IN AND ALONG PUBLIC STREETS AND PARKING LOTS, ONCE BEGUN, SHALL PROCEED TO COMPLETION WITHOUT DELAY SO AS TO PROVIDE MINIMUM INCONVENIENCE TO THE PUBLIC.
20. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING UTILITIES IN THE FIELD PRIOR TO CONSTRUCTION. ALL UTILITIES SHALL BE PROTECTED AND REPAIRED BY THE CONTRACTOR IF DAMAGED.
21. CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFICATION OF ALL UTILITY COMPANIES 48 HOURS PRIOR TO THE BEGINNING OF WORK. BRING ANY CONFLICTS WITH NEW IMPROVEMENTS IMMEDIATELY TO THE ATTENTION OF THE OWNER.
22. NOTIFY UNDERGROUND SERVICE ALERT (USA) TOLL FREE AT 811 A MINIMUM OF FORTY-EIGHT WORKING HOURS PRIOR TO THE START OF CONSTRUCTION.
23. CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR LOCATING OR HAVING LOCATED ALL UNDERGROUND UTILITIES AND RELATED FACILITIES AND FOR PROTECTING SAME DURING THE COURSE OF CONSTRUCTION. ALL UTILITIES THAT ARE NOT A MEMBER OF USA MUST ALSO BE NOTIFIED.
24. CONTRACTOR SHALL PROVIDE A LEGIBLE AND COMPLETE SET OF PLANS IDENTIFYING ALL MODIFICATIONS MADE DURING CONSTRUCTION TO THE OWNER FOR THE PREPARATION OF RECORD DRAWINGS.
25. ALL CONSTRUCTION SHALL CONFORM TO THE 2022 EDITION OF CALIFORNIA BUILDING CODE TITLE 24.
26. TRAILS SHOWN ARE CONSISTENT WITH THOSE SHOWN IN THE CITY OF GOLETA GENERAL PLAN.
27. PROPOSED TRAIL LOCATIONS ARE BASED ON GPS ACCURACY OF +/- 5 FEET, AND MUST BE CONSIDERED AS 'DESIRED PATH OF TRAVEL' UNTIL FURTHER SURVEY DATA CAN BE COLLECTED ON SITE.
28. FOR ' TRAIL TYPE' DESCRIPTIONS, REFER TO 'DRAFT ELLWOOD-DEVEREUX COAST OPEN SPACE AND HABITAT MANAGEMENT PLAN (03/2004), PAGE 113.
29. TEMPORARY STAGING AREA TO BE PROVIDED BY CONTRACTOR FOR EQUIPMENT STORAGE AND PARKING DURING CONSTRUCTION ONLY. AREA SHALL BE VACATED PRIOR TO PLANTING AND RESTORATION.

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TRAIL FEATURE KEY

SYMBOL	DESCRIPTION
1	INSTALL TRAIL MAP AND REGULATORY SIGNAGE, WASTE AND RECYCLING RECEPTACLES, AND DOG BAG DISPENSER
2	INSTALL REGULATORY SIGNAGE, WASTE RECEPTACLE, AND DOG BAG DISPENSER
3	INSTALL REGULATORY SIGNAGE ON EXISTING FENCING, WASTE RECEPTACLE, AND DOG BAG DISPENSER
4	INSTALL REGULATORY SIGNAGE ON EXISTING OR PROPOSED FENCING
5	INSTALL REGULATORY SIGNAGE, WAYFINDING SIGNAGE, AND BUTTERFLY GROVE CONDUCT SIGNAGE
6	INSTALL TRAIL MAP, REGULATORY SIGNAGE, BUTTERFLY GROVE CONDUCT, AND WAYFINDING SIGNAGE
7	INSTALL TRAIL WAYFINDING SIGN
8	INSTALL SENSITIVE HABITAT SIGNAGE

SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-
	BICYCLE PARKING	6 / L1.7
	CONSTRUCTION STAGING AREA	2 / L1.10
	CONSTRUCTION STAGING ACCESS ROUTE	-

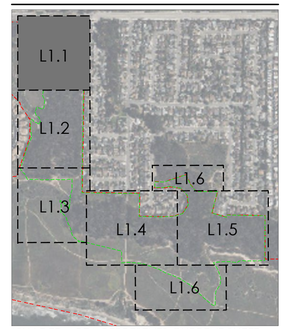
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L1.0 FOR TRAIL ENHANCEMENT AND REPAIR NOTES

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

N:\1800\1981.01-BCDI-Ellwood-Monarch-Butterfly-Mgmt-Plan\Landscape-Architecture\Task 8.04-Coastal Development Permit Package\Sheet Files\L1.1-BCDI.dwg, L1.1, Apr 26, 2023 - 11:33am, jmirwick

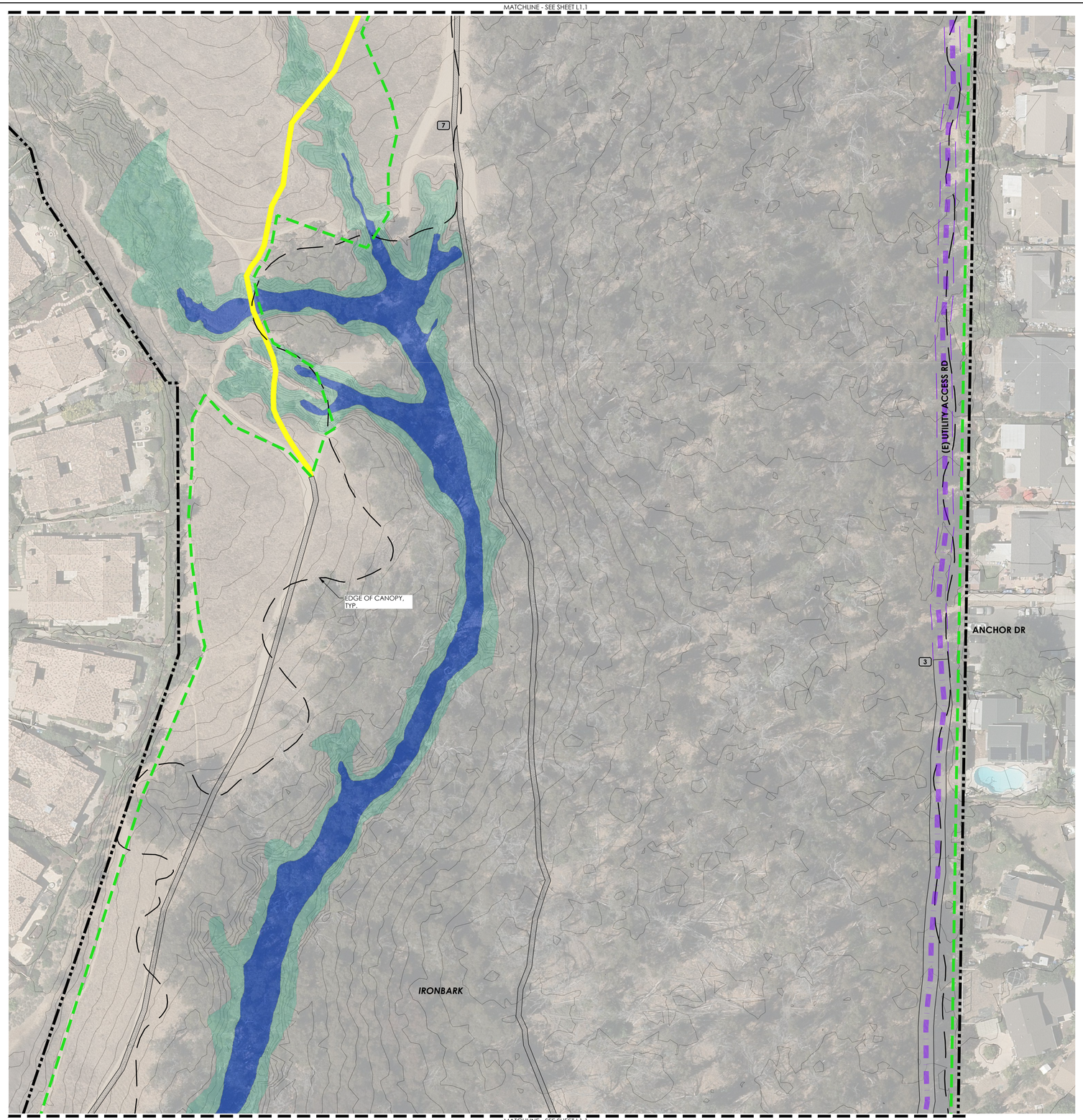
CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

PUBLIC ACCESS PLAN

L1.1



TRAIL FEATURE KEY

SYMBOL	DESCRIPTION
1	INSTALL TRAIL MAP AND REGULATORY SIGNAGE, WASTE AND RECYCLING RECEPTACLES, AND DOG BAG DISPENSER
2	INSTALL REGULATORY SIGNAGE, WASTE RECEPTACLE, AND DOG BAG DISPENSER
3	INSTALL REGULATORY SIGNAGE ON EXISTING FENCING, WASTE RECEPTACLE, AND DOG BAG DISPENSER
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6	INSTALL TRAIL MAP, REGULATORY SIGNAGE, BUTTERFLY GROVE CONDUCT, AND WAYFINDING SIGNAGE
7	INSTALL TRAIL WAYFINDING SIGN
8	INSTALL SENSITIVE HABITAT SIGNAGE

SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-
	BICYCLE PARKING	6 / L1.7
	CONSTRUCTION STAGING AREA	2 / L1.10
	CONSTRUCTION STAGING ACCESS ROUTE	-

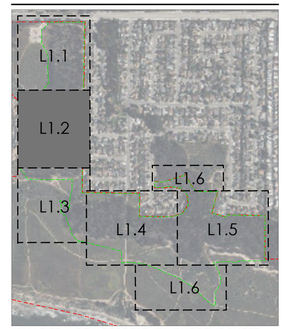
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L1.0 FOR TRAIL ENHANCEMENT AND REPAIR NOTES

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

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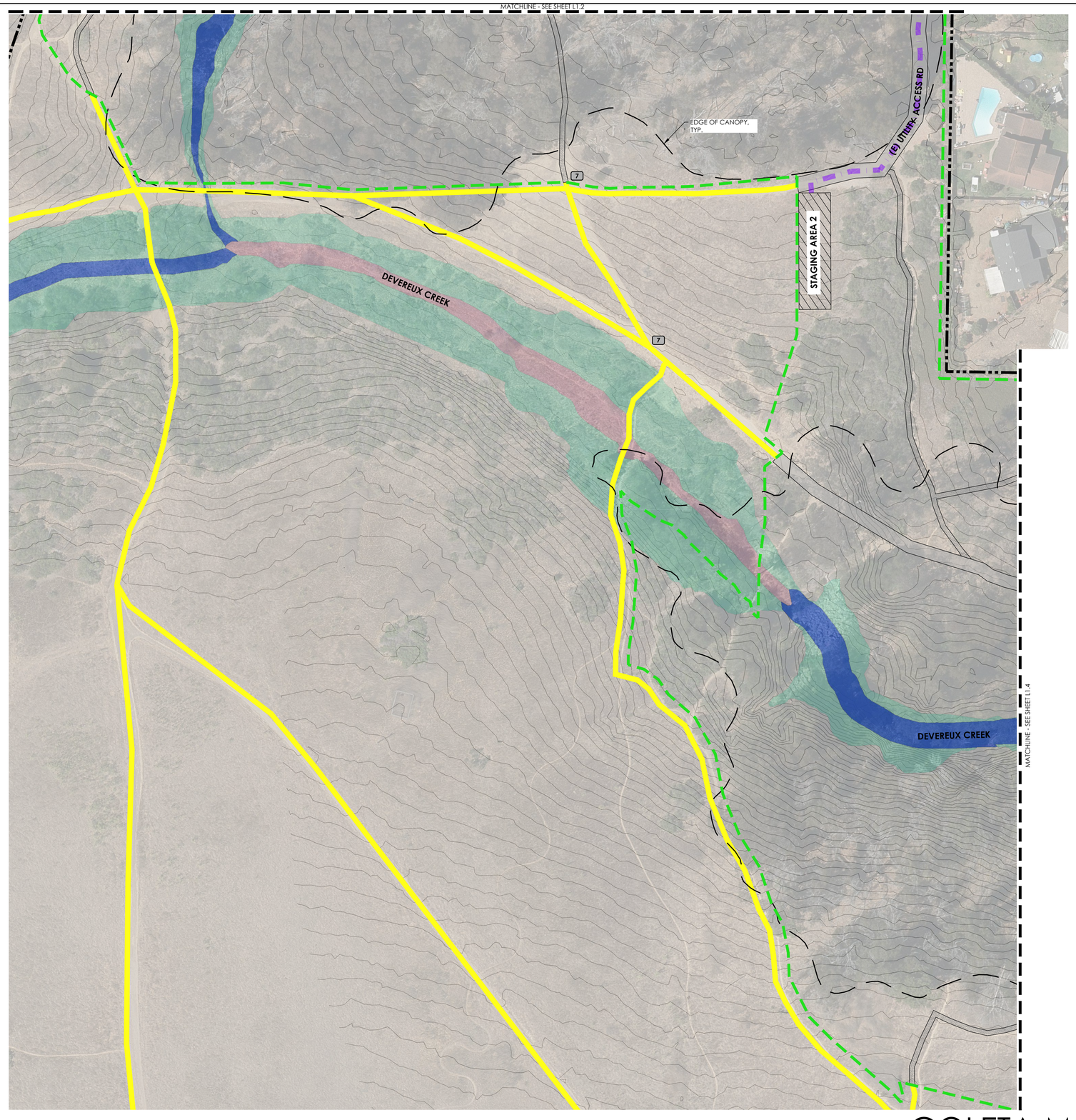
CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

PUBLIC ACCESS PLAN

L1.2



TRAIL FEATURE KEY

SYMBOL	DESCRIPTION
1	INSTALL TRAIL MAP AND REGULATORY SIGNAGE, WASTE AND RECYCLING RECEPTACLES, AND DOG BAG DISPENSER
2	INSTALL REGULATORY SIGNAGE, WASTE RECEPTACLE, AND DOG BAG DISPENSER
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SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-
	BICYCLE PARKING	6 / L1.7
	CONSTRUCTION STAGING AREA	2 / L1.10
	CONSTRUCTION STAGING ACCESS ROUTE	-

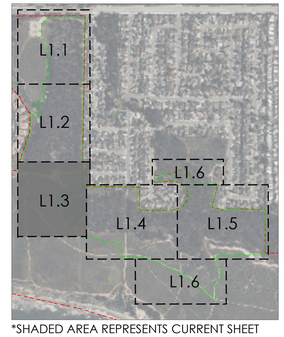
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L1.0 FOR TRAIL ENHANCEMENT AND REPAIR NOTES

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

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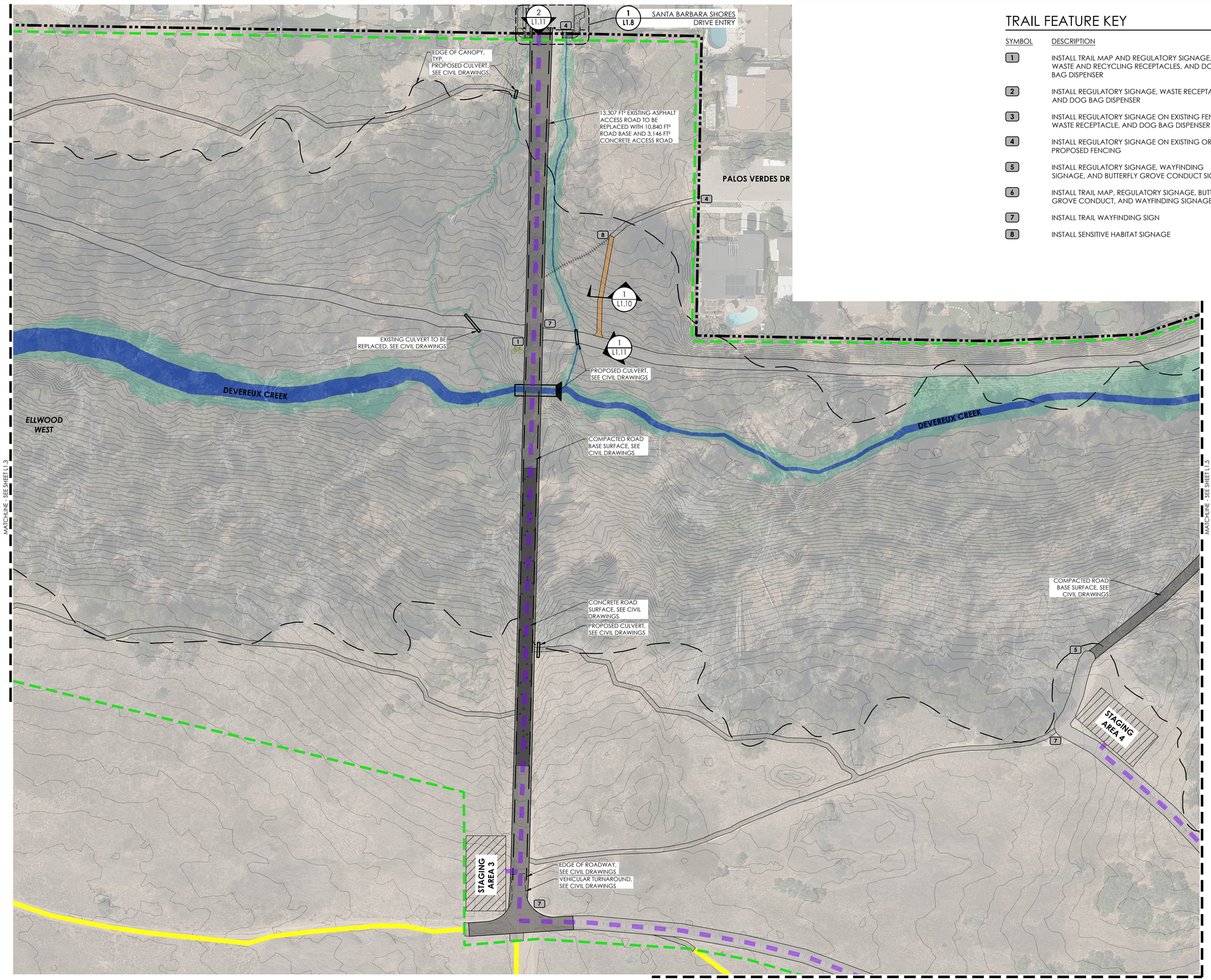
CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

PUBLIC ACCESS PLAN

L1.3



TRAIL FEATURE KEY

SYMBOL	DESCRIPTION
1	INSTALL TRAIL MAP AND REGULATORY SIGNAGE, WASTE AND RECYCLING RECEPTACLES, AND DOG BAG DISPENSER
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SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-
	BICYCLE PARKING	6 / L1.7
	CONSTRUCTION STAGING AREA	2 / L1.10
	CONSTRUCTION STAGING ACCESS ROUTE	-

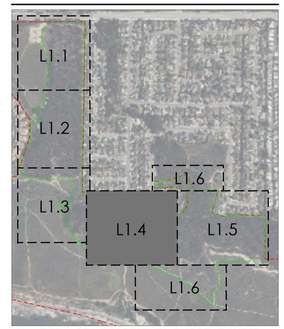
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
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	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L1.0 FOR TRAIL ENHANCEMENT AND REPAIR NOTES

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

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CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

PUBLIC ACCESS PLAN

L1.4

MATCHLINE - SEE SHEET L1.6

MATCHLINE - SEE SHEET L1.3

MATCHLINE - SEE SHEET L1.6

DAYTONA DR

CORONADO DR

DEVEREUX CREEK

DEVEREUX CREEK

ELLWOOD MAIN

BOARDWALK

1 L1.9

4 L1.11

COMPACTED ROAD BASE SURFACE, SEE CIVIL DRAWINGS

REVEGETATED TRAIL SECTION

8 L1.7

1 L1.10

1 L1.7

3 L1.11

3 L1.7

PROPOSED EARTHEN CHECK DAM WITH SANDSTONE BOULDER SUPPORT, TYP. SEE CIVIL DRAWINGS

EDGE OF CANOPY, TYP.

PROPOSED FLEXIBLE CONCRETE EROSION CONTROL FABRIC, SEE CIVIL DRAWINGS

1 L1.10

TRAIL FEATURE KEY

SYMBOL	DESCRIPTION
1	INSTALL TRAIL MAP AND REGULATORY SIGNAGE, WASTE AND RECYCLING RECEPTACLES, AND DOG BAG DISPENSER
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SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 L1.9
	RECLAIMED TRAIL SECTION	8 L1.7
	TRAIL DELINEATOR	5 L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-
	BICYCLE PARKING	6 L1.7
	CONSTRUCTION STAGING AREA	2 L1.10
	CONSTRUCTION STAGING ACCESS ROUTE	-

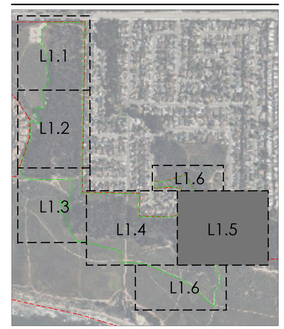
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L1.0 FOR TRAIL ENHANCEMENT AND REPAIR NOTES

SITE KEY MAP



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0 20 40 80 120 feet

1"=40'

CITY OF GOLETA

Coastal Conservancy

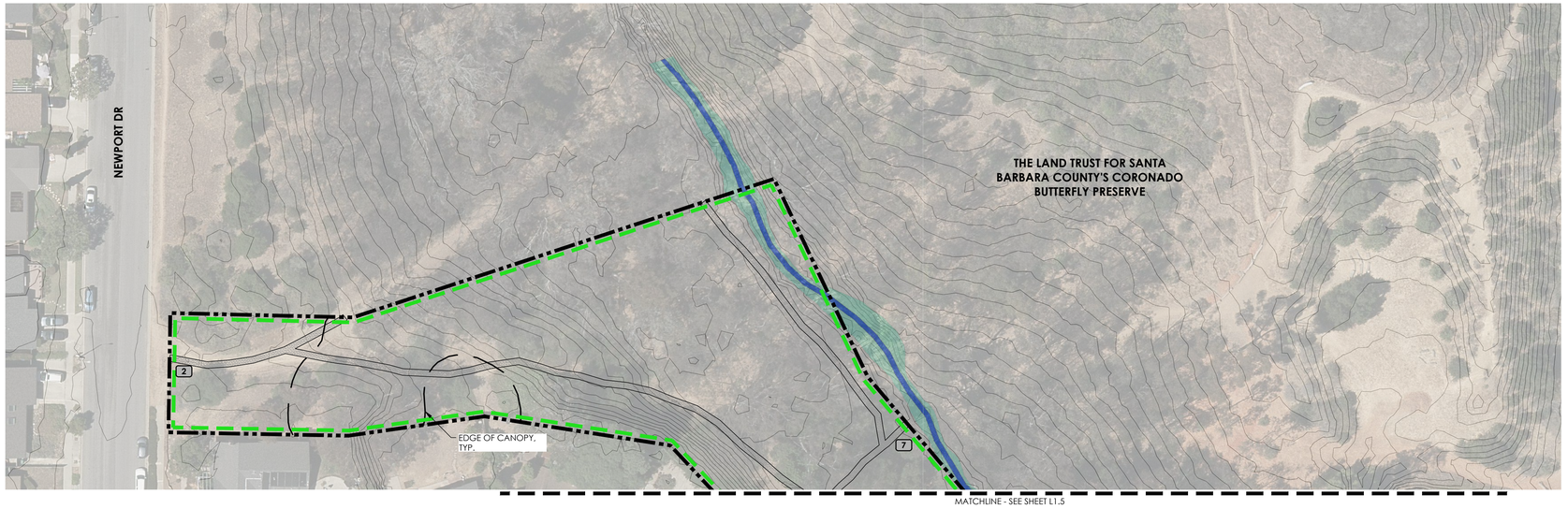
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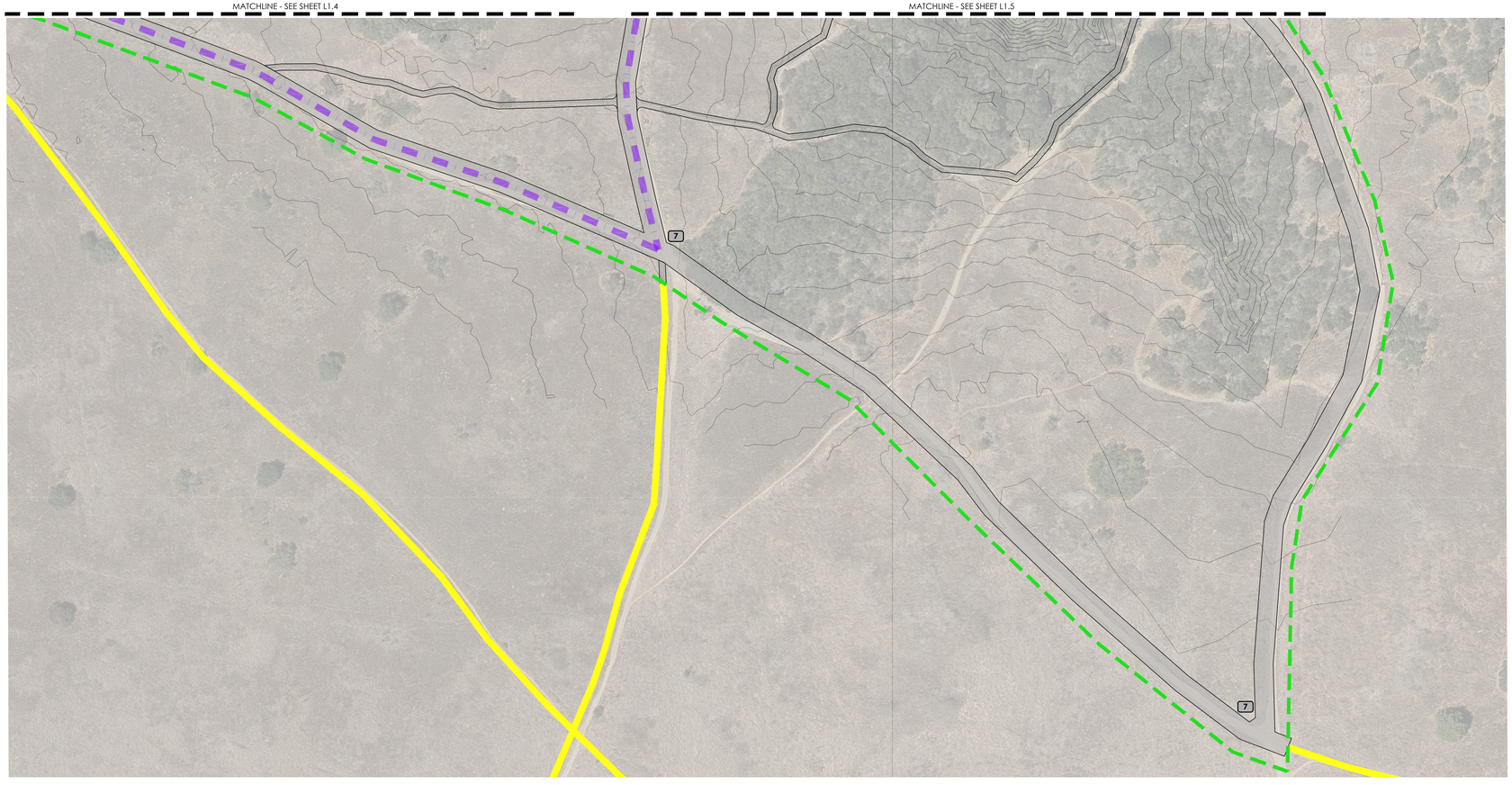
GOLETA MONARCH BUTTERFLY GROVE

PUBLIC ACCESS PLAN

L1.5

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TRAIL FEATURE KEY

SYMBOL	DESCRIPTION
1	INSTALL TRAIL MAP AND REGULATORY SIGNAGE, WASTE AND RECYCLING RECEPTACLES, AND DOG BAG DISPENSER
2	INSTALL REGULATORY SIGNAGE, WASTE RECEPTACLE, AND DOG BAG DISPENSER
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SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
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	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-
	BICYCLE PARKING	6 / L1.7
	CONSTRUCTION STAGING AREA	2 / L1.10
	CONSTRUCTION STAGING ACCESS ROUTE	-

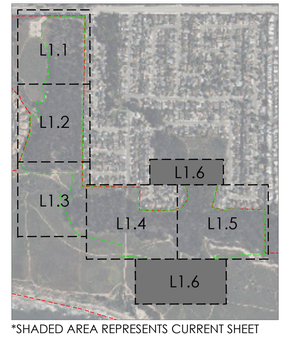
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L1.0 FOR TRAIL ENHANCEMENT AND REPAIR NOTES

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

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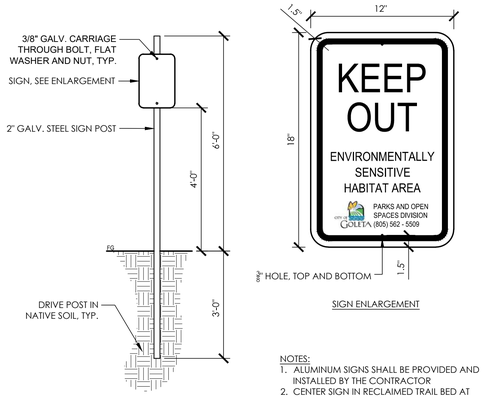
CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

PUBLIC ACCESS PLAN

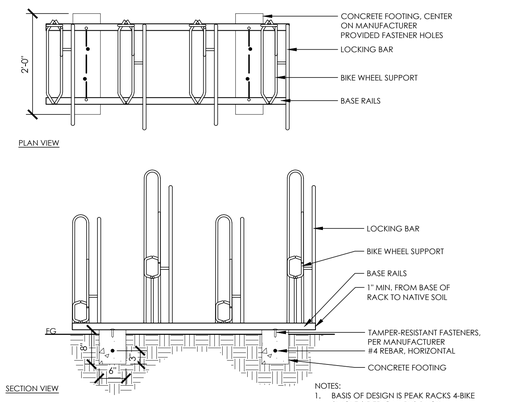
L1.6



NOTES:
1. ALUMINUM SIGNS SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR
2. CENTER SIGN IN RECLAIMED TRAIL BED AT TRAIL JUNCTION, TYP.

9 SENSITIVE HABITAT SIGNAGE

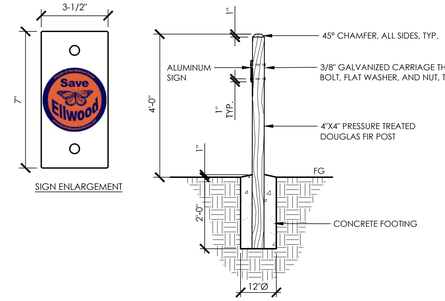
1/2" = 1'-0" RRM-1981.01-16



NOTES:
1. BASIS OF DESIGN IS PEAK RACKS 4-BIKE SINGLE-SIDED CAMPUS RACK
2. FASTENERS PER MANUFACTURER SPECIFICATIONS

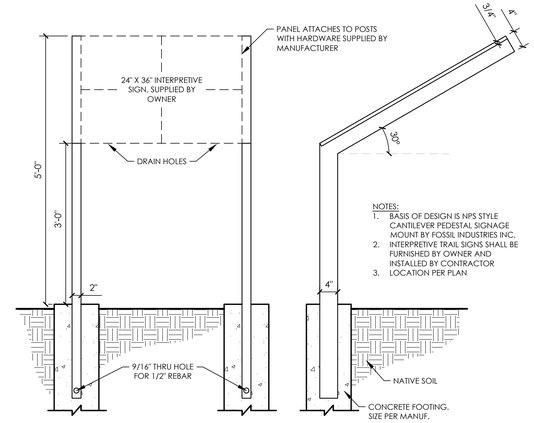
6 4-BIKE RACK

3/4" = 1'-0" RRM-1981.01-107



4 WAYFINDING TRAIL SIGNS

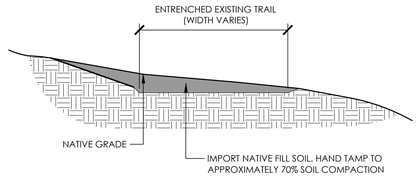
1/2" = 1'-0" RRM-1981.01-15



NOTES:
1. BASIS OF DESIGN IS NPS STYLE CANTILEVER PEDESTAL SIGNAGE MOUNT BY FOSSIL INDUSTRIES INC.
2. INTERPRETIVE TRAIL SIGNS SHALL BE FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR
3. LOCATION PER PLAN

2 INTERPRETIVE SIGN PANEL

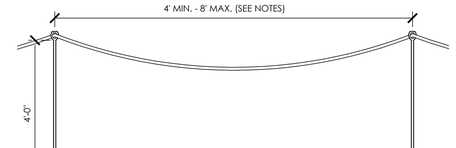
3/4" = 1'-0" RRM-1981.01-103



NOTES:
1. SEE PUBLIC ACCESS PLANS FOR REVEGETATED TRAIL LOCATIONS
2. CONTRACTOR SHALL APPLY A 3" THICK LAYER OF SITE-SOURCED MULCH TO THE SURFACE OF REVEGETATED TRAILS. MULCH SHALL EXTEND 3' MINIMUM BEYOND THE SURFACE OF REVEGETATED TRAIL SECTIONS

8 REVEGETATED TRAIL SECTION

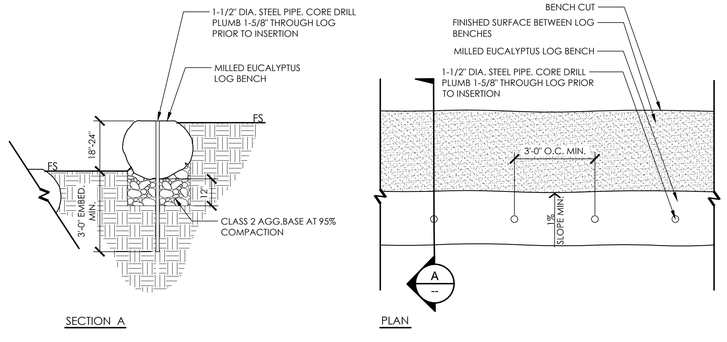
NTS RRM-1981.01-97



NOTES:
1. HELICAL AUGERS TO BE DRILLED AT LEAST 24" INTO THE GROUND
2. SPACING BETWEEN AUGER POSTS TO BE A MINIMUM OF 4', AND A MAXIMUM OF 8'. POST PLACEMENT TO BE DETERMINED ON-SITE
3. 1" DIAMETER ROPE TO BE THREADED THROUGH POST EYELETS, AND HAVE A MAXIMUM DROP, OF 1' PER SPAN BETWEEN HELICAL AUGERS

5 TRAIL DELINEATOR

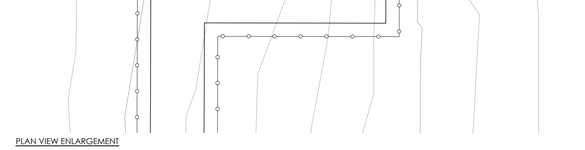
1/2" = 1'-0" RRM-1981.01-40



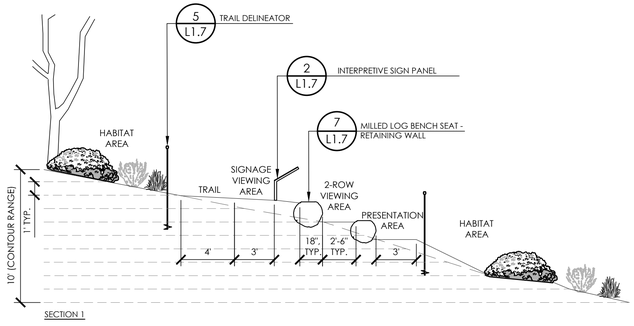
NOTES:
1. EUCALYPTUS LOGS TO BE SOURCED FROM CLIENT-SELECTED DEAD/DOWNED TREES ON-SITE
2. EACH LOG TO HAVE A SEAT HEIGHT RANGING 18-24" INCHES
3. CONTRACTOR TO PROVIDE LEVEL FINISHED SITTING SURFACE WITH 1% MINIMUM DOWNHILL PITCH TO SHED WATER

7 MILLED LOG BENCH SEATING

3/8" = 1'-0" RRM-1981.01-106



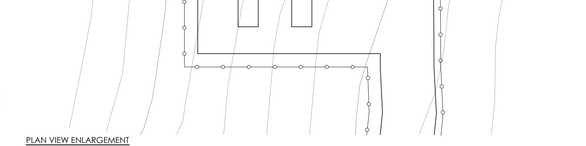
PLAN VIEW ENLARGEMENT



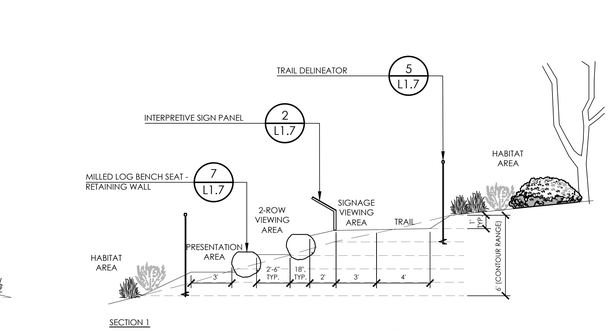
NOTES:
1. SEE CIVIL DRAWINGS FOR PROPOSED GRADES

3 ELLWOOD MAIN WESTERN MONARCH OVERLOOK

3/16" = 1'-0" RRM-1981.01-114



PLAN VIEW ENLARGEMENT



NOTES:
1. SEE CIVIL DRAWINGS FOR PROPOSED GRADES

1 ELLWOOD MAIN EASTERN MONARCH OVERLOOK

3/16" = 1'-0" RRM-1981.01-105

N:\1800\1981.01 RCD\Elwood\Monarch Butterfly Mgmt Plan\Landscape Architecture\Task 8.0\4 Coastal Development Permit Package\Sheet Files\LA-1981.01-RCD-Details.dwg, L1.7, Apr 26, 2023, 1:12:01pm, jmmirick

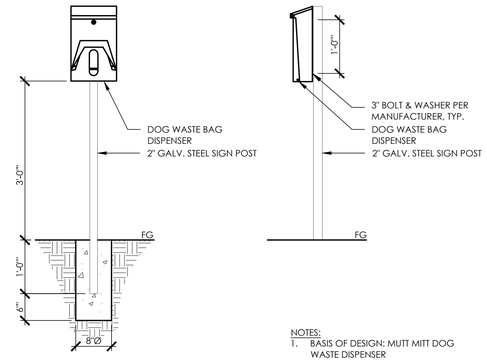
CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

PUBLIC ACCESS PLAN DETAILS

L1.7

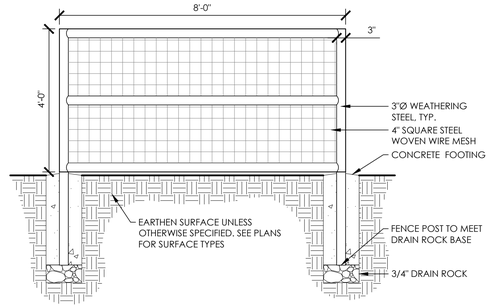


NOTES:
1. BASIS OF DESIGN: MUTT MITT DOG WASTE DISPENSER

4 DOG PICK-UP STATION

3/4" = 1'-0"

RRM-1981.01-44

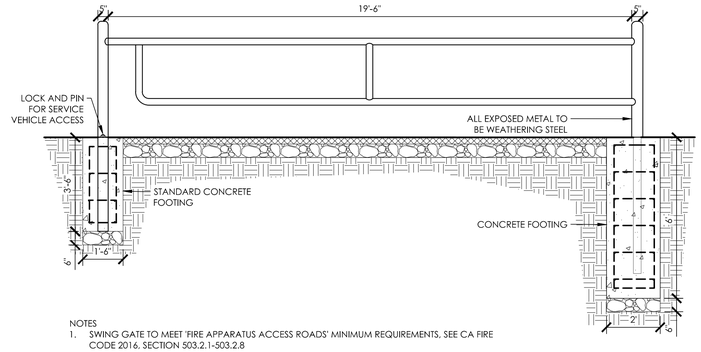


NOTES
1. VERTICAL PIPE SPACING TO BE A MINIMUM 4', AND A MAXIMUM OF 8'

3 STEEL PIPE FENCE

1/2" = 1'-0"

RRM-1981.01-108

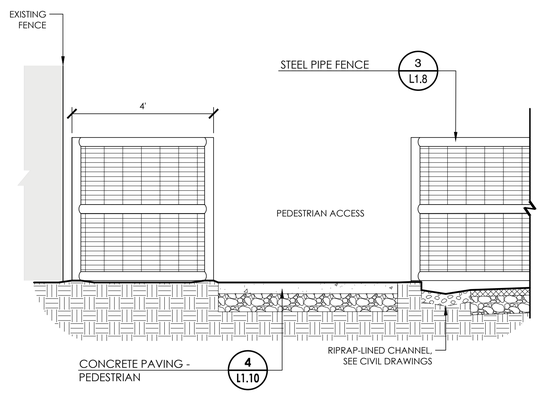


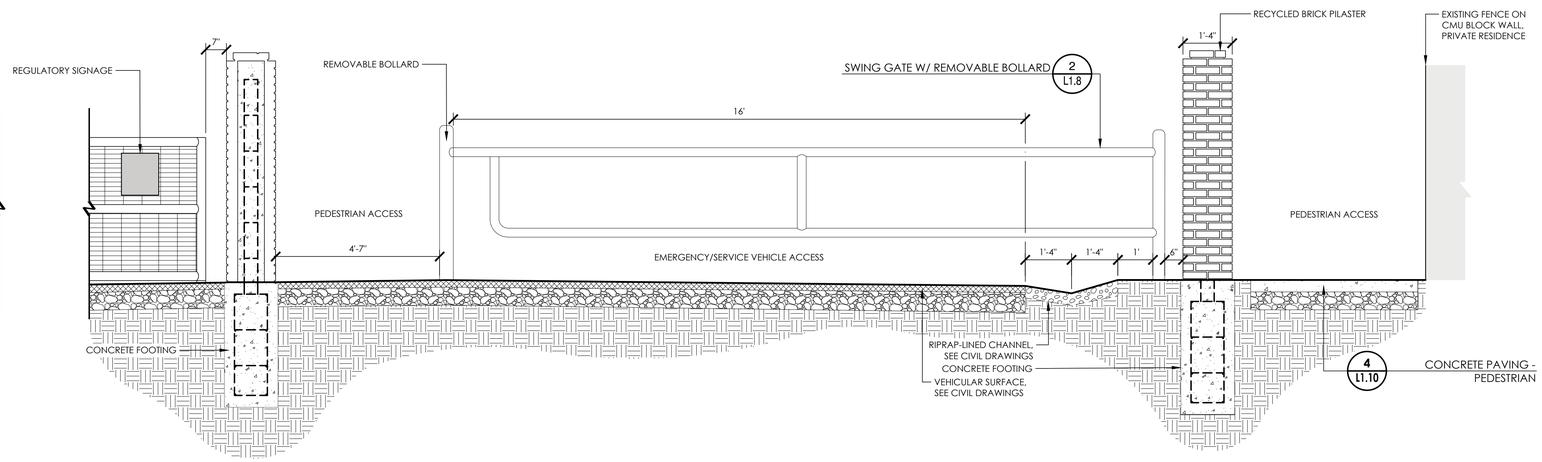
NOTES
1. SWING GATE TO MEET 'FIRE APPARATUS ACCESS ROADS' MINIMUM REQUIREMENTS, SEE CA FIRE CODE 2016, SECTION 503.2.1-503.2.8

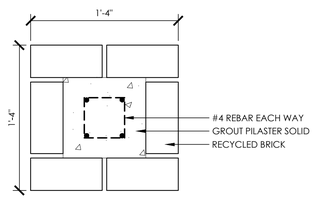
2 SWING GATE W/ REMOVABLE BOLLARD

3/8" = 1'-0"

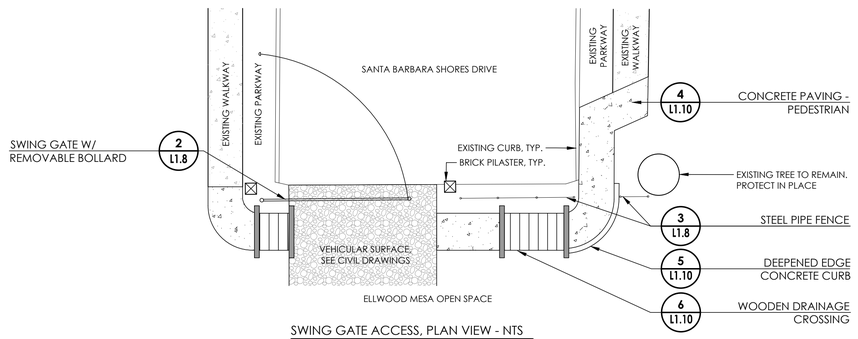
RRM-1981.01-109







PILASTER SECTION - NTS



SWING GATE ACCESS, PLAN VIEW - NTS

NOTES:
1. SPACING REFLECTS THE KEY DIMENSIONS OF BUILT ELEMENTS AND THE MINIMUM ACCESS REQUIREMENTS FOR EMERGENCY AND MAINTENANCE VEHICLES.

1 SANTA BARBARA SHORES DRIVE ENTRY

1/2" = 1'-0"

RRM-1981.01-104

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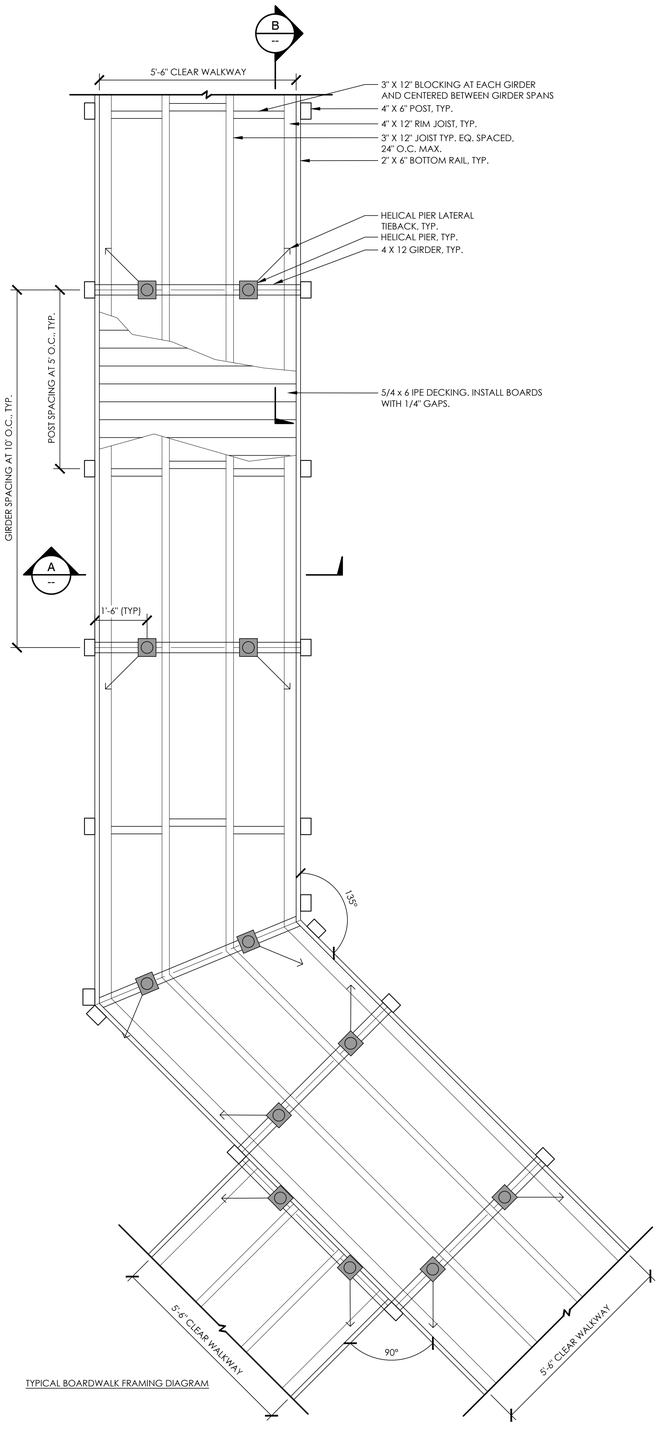
CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

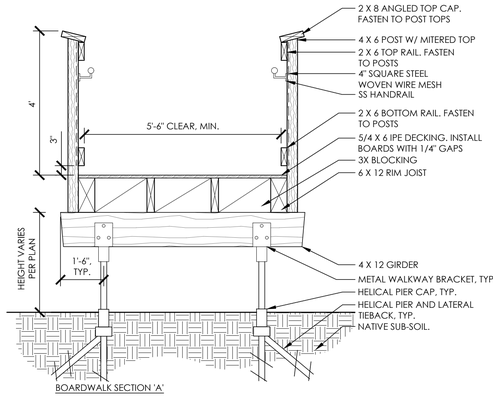
GOLETA MONARCH BUTTERFLY GROVE

PUBLIC ACCESS PLAN DETAILS

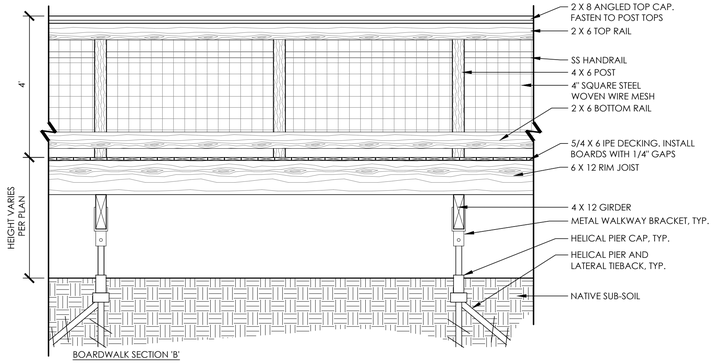
L1.8



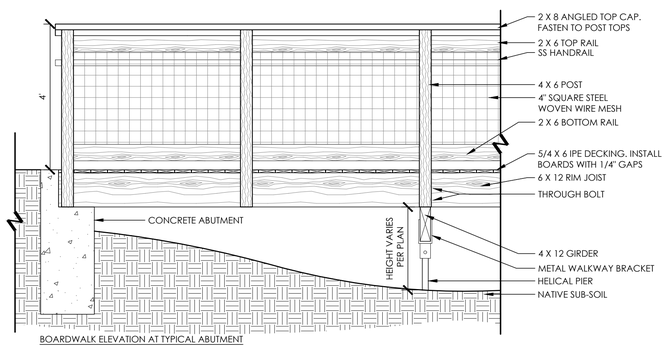
TYPICAL BOARDWALK FRAMING DIAGRAM



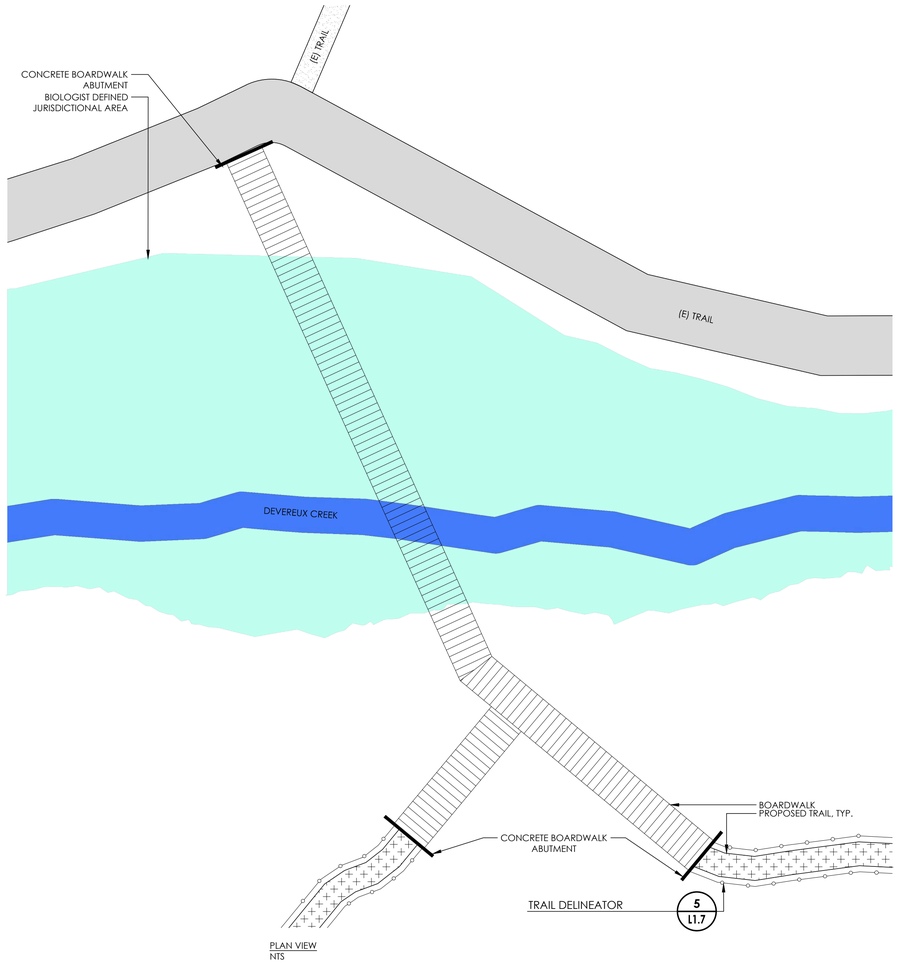
BOARDWALK SECTION 'A'



BOARDWALK SECTION 'B'



BOARDWALK ELEVATION AT TYPICAL ABUTMENT



PLAN VIEW
NTS

NOTES
1. BOARDWALK LENGTHS AND POST HEIGHTS VARY PER PLAN
2. SEE SHEET L1.5 OF THE PUBLIC ACCESS PLANS FOR BOARDWALK LOCATION

1 BOARDWALK
1/2" = 1'-0"

RRM-1981.01-112

CITY OF GOLETA Coastal Conservancy

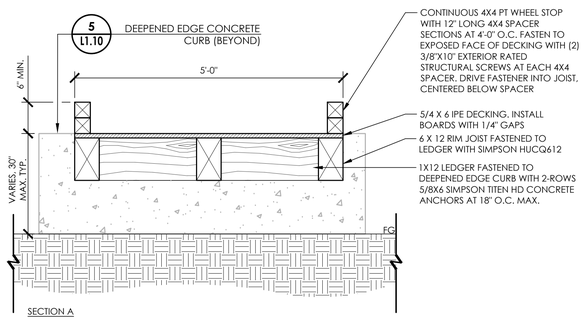
APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE
PUBLIC ACCESS PLAN DETAILS

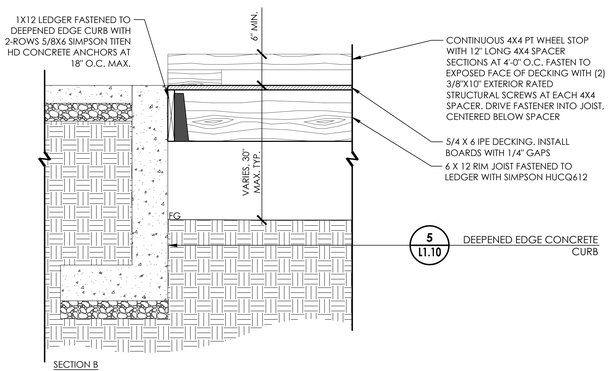
L1.9

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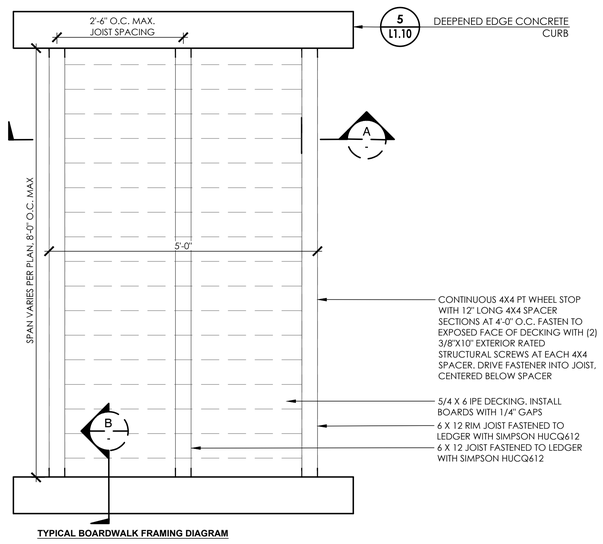
NOTES:
1. SEE PLANS FOR BOARD ORIENTATION
2. BOARDWALK LENGTHS VARY PER PLAN
3. STAINLESS STEEL FASTENERS AND HARDWARE TO BE USED AS AVAILABLE



SECTION A



SECTION B

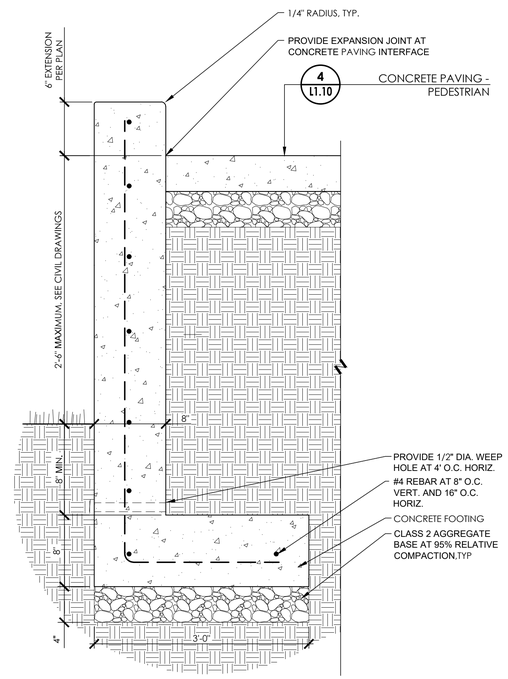


TYPICAL BOARDWALK FRAMING DIAGRAM

6 WOODEN DRAINAGE CROSSING

3/4" = 1'-0" RRM-1981.01-46

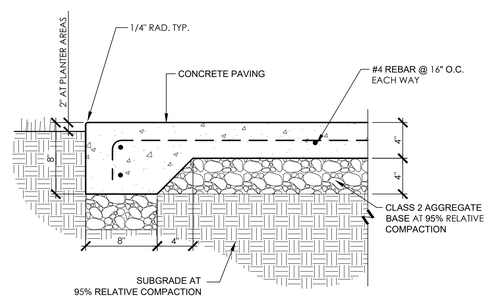
NOTES:
1. MATCH ADJACENT CONCRETE FINISH



5 DEEPENED EDGE CONCRETE CURB

1 1/2" = 1'-0" RRM-1981.01-118

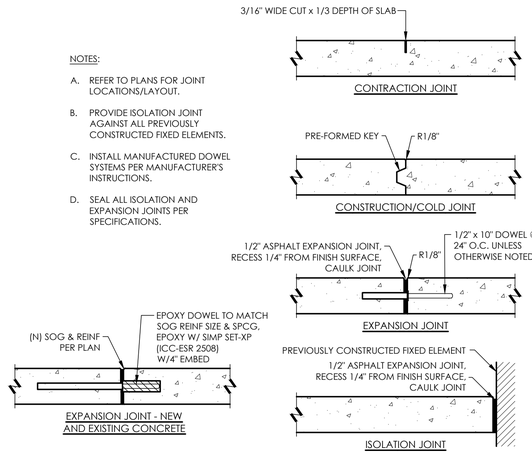
NOTES:
1. PROVIDE JOINTS AT LOCATIONS SHOWN ON PLANS. JOINTS SHALL OCCUR @ 10' O.C. MAX SPACING.
2. SEE MATERIALS LIST ON SHEET LC001 FOR PAVING COLOR, TYPE, AND FINISH.



4 CONCRETE PAVING - PEDESTRIAN

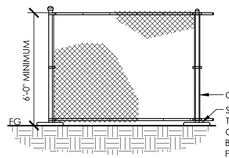
1 1/2" = 1'-0" RRM-1981.01-47

NOTES:
A. REFER TO PLANS FOR JOINT LOCATIONS/LAYOUT.
B. PROVIDE ISOLATION JOINT AGAINST ALL PREVIOUSLY CONSTRUCTED FIXED ELEMENTS.
C. INSTALL MANUFACTURED DOWEL SYSTEMS PER MANUFACTURER'S INSTRUCTIONS.
D. SEAL ALL ISOLATION AND EXPANSION JOINTS PER SPECIFICATIONS.



3 CONCRETE JOINTS

1 1/2" = 1'-0" RRM-1981.01-45

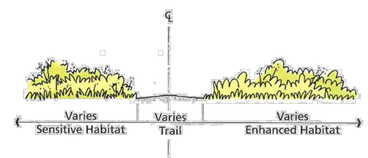


NOTES:
1. LOCATIONS PER PLAN
2. FENCING SHALL BE SUPPORTED BY VERTICAL POSTS MOUNTED TO STABILIZED SURFACE MOUNT TEMPORARY FENCE PANEL STANDS AND SPACED NOT MORE THAN 10 FEET APART
3. CONTRACTOR TO PROVIDE A LOCKING OPERABLE SECTION OF GATE AS AN ENTRANCE/EXIT AT EACH LOCATION

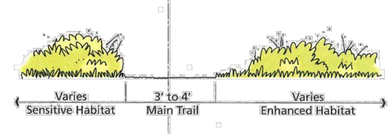
2 CONSTRUCTION STAGING FENCING

1/2" = 1'-0" RRM-1981.01-51

Trail Type A: Existing Native Trails
Width varies. Designed for pedestrians.



Trail Type B: Improved Native Trails
Smooth and compact existing surface.
Designed for pedestrians.



Trail Type C: Improved Trails - Varying Surface
Improved existing surface with imported compacted fines in selected areas.



Trail Type D: Improved Trails - Uniform Surface
Imported compacted fines with or without stabilizer.



NOTES:
1. TRAIL TYPES EXCERPTED FROM FIGURE 18 OF THE 2004 ELLWOOD-DEVEREUX COAST OPEN SPACE MANAGEMENT PLAN
2. ABOVE DIAGRAM IS A GUIDELINE AND NATURAL CONDITIONS WILL DICTATE TRAIL FOOTPRINT

1 TRAIL TYPES

1" = 1'-0" RRM-1981.01-115

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CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

PUBLIC ACCESS PLAN DETAILS L1.10



VIEW 1: CULVERT REPLACEMENT AT SANTA BARBARA SHORES TRAIL INTERSECTION



VIEW 2: ENTRY GATE REPLACEMENT AT SANTA BARBARA SHORES ENTRY



VIEW 3: WESTERN MONARCH VIEWING AREA AT ELLWOOD MAIN AGGREGATION SITE



VIEW 4: WOODEN BOARDWALK CROSSING OVER DEVEREUX CREEK AT ELLWOOD MAIN

NOTE:
1. SEE SHEETS L1.4 - L1.5 FOR VISUALIZATION LOCATIONS

N:\1800\1981.01-RCD\Elwood-Monarch-Butterfly-Mgmt-Plan\Landscape Architecture\Task B-04-Coastal Development Permit Package\Sheet Files\L4.1 1981.01-RCD Details.dwg, L1.11, Apr 26, 2023, 11:21am, jmirwick

CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

PUBLIC ACCESS PLAN VISUALIZATIONS

L1.11

PRELIMINARY WATER CALCULATIONS

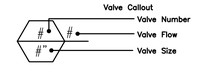
IRRIGATION NOTES

1. IRRIGATION PLAN IS DIAGRAMMATIC. FINAL LOCATION OF PIPING WILL BE DETERMINED AT THE TIME OF INSTALLATION. MAINLINE AND LATERALS SHALL BE PLACED IN THE SAME TRENCH WHERE POSSIBLE. ALL Q.C. VALVES ARE TO BE LOCATED 24 INCHES FROM TRAIL EDGE.
2. CONTRACTOR SHALL SLEEVE ALL LATERALS AND MAINLINES RUNNING UNDER TRAILS AND HARDSCAPE. PIPE SLEEVE SIZE SHALL ALLOW FOR IRRIGATION PIPING AND RELATED COUPLINGS TO EASILY SLIDE THROUGH SLEEVING MATERIAL. EXTEND SLEEVES MINIMUM 18 INCHES (SEE ABOVE) BEYOND TRAILS EDGE.
4. ALL EQUIPMENT REQUIRED BUT NOT SPECIFIED ON THE DRAWING, TO COMPLETE THE WORK, SHALL BE PROVIDED BY THE IRRIGATION CONTRACTOR.
5. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND/OR SPECIFICATIONS.
6. CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH THE PLANS AND SITE CONDITIONS PRIOR TO BEGINNING WORK. SHOULD CONFLICTING INFORMATION BE FOUND ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE PROJECT LANDSCAPE ARCHITECT BEFORE PROCEEDING WITH THE WORK IN QUESTION.
7. DO NOT WILLFULLY INSTALL THE IRRIGATION SYSTEM AS SHOWN ON THE DRAWINGS WHEN IT IS OBVIOUS IN THE FIELD THAT OBSTRUCTIONS, PLANT MATERIAL SPACING, GRADE DIFFERENCES OR DIFFERENCES IN THE AREA DIMENSIONS EXIST THAT MIGHT NOT HAVE BEEN CONSIDERED IN THE ENGINEERING. SUCH OBSTRUCTIONS OR DIFFERENCES SHOULD BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT. IN THE EVENT THIS NOTIFICATION IS NOT PERFORMED, THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY REVISIONS NECESSARY AT NO EXPENSE TO THE OWNER.
8. CONTRACTOR SHALL ADJUST HEADS AS NEEDED TO MINIMIZE OVERSPRAY ONTO HARDSCAPE, RIGHT OF WAYS, AND PRIVATE PROPERTY.
9. WIRE BETWEEN CONTROLLER AND VALVES TO BE COLOR STRANDED AND NOT A 2-WIRE SYSTEM.
10. SPLICING OF 24 VOLT WIRES WILL NOT BE PERMITTED EXCEPT IN VALVE BOXES. LEAVE A 24" COIL OF EXCESS WIRE AT EACH SPLICE. LABEL ALL WIRES W/ WATERPROOF MARKERS AT ALL SPLICES AND VALVE MANIFOLDS.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL MATERIAL APPEARING ON PLAN.
12. ALL EXISTING UTILITIES, WATER LINES AND FIRE HYDRANTS SHALL REMAIN CONNECTED AND IN FULL CONTINUOUS OPERATION DURING AND FOLLOWING ALL CONTRACT WORK.
13. ALL NEW IRRIGATION BOXES, AND ADDITIONAL BOXES SHALL BE LOCATED IN PLANTING AREAS 18" MIN. AWAY FROM ADJACENT TRAILS.

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	PSI	GPM	RADIUS
	HUNTER I-20-00 4.0 SHRUB ROTOR, FIXED RISER, ADJUSTABLE AND FULL CIRCLE, PLASTIC RISER, DRAIN CHECK VALVE, STANDARD NOZZLE.	45	4	40'

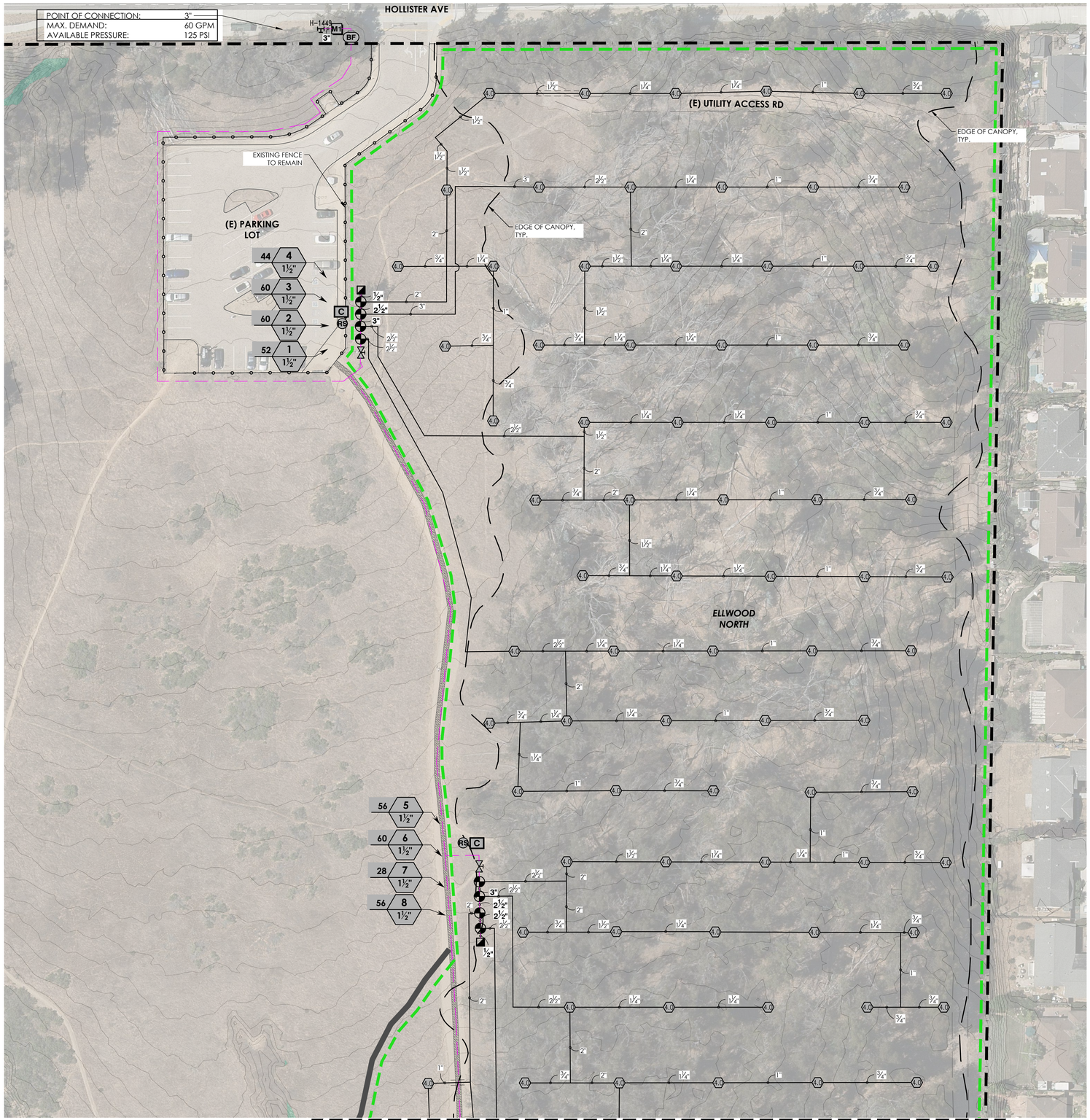
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER ICV-G 1", 1-1/2", 2", AND 3" PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	HUNTER HQ-44LRC QUICK COUPLER VALVE, YELLOW RUBBER LOCKING COVER, RED BRASS AND STAINLESS STEEL, WITH 1IN. NPT INLET, 2-PIECE BODY.
	LANDSCAPE PRODUCTS INC. CWV THREADED PVC BALL VALVE, LINE SIZE
BF	FEBCO 825Y 2" REDUCED PRESSURE BACKFLOW PREVENTER
C	HUNTER NODE-BT-400 4-STATION BLUETOOTH CONTROLLER, OUTDOOR, BATTERY POWERED. DC LATCHING SOLENOID ORDERED SEPARATELY.
RS	HUNTER MINI-CLIK RAIN SENSOR, MOUNT AS NOTED
M1	WATER METER 3" TEMPORARY 3" WATER METER ON HOLLISTER AVE.
H-1449	POINT OF CONNECTION 3" HYDRANT 1449
	IRRIGATION LATERAL LINE: PVC SCHEDULE 40 CONTRACTOR TO USE HYDRO-RAIN OR EQUAL PUSH-TO-CONNECT REUSABLE PVC FITTINGS FOR ALL LATERAL LINE CONNECTIONS
	IRRIGATION MAINLINE: PVC SCHEDULE 40
	PIPE SLEEVE: PVC SCHEDULE 40 TYPICAL PIPE SLEEVE FOR IRRIGATION PIPE. PIPE SLEEVE SIZE SHALL ALLOW FOR IRRIGATION PIPING AND THEIR RELATED COUPLINGS TO EASILY SLIDE THROUGH SLEEVING MATERIAL. EXTEND SLEEVES 18 INCHES BEYOND EDGES OF PAVING OR CONSTRUCTION.



CRITICAL ANALYSIS

Generated:	2023-04-07 16:24
P.O.C. NUMBER: 06	
Water Source Information:	Hydrant 1449
FLOW AVAILABLE	
Point of Connection Size:	3"
Flow Available	220.07 GPM
PRESSURE AVAILABLE	
Static Pressure at POC:	125 PSI
Pressure Available:	125 PSI
DESIGN ANALYSIS	
Maximum Station Flow:	60 GPM
Flow Available at POC:	220.07 GPM
Residual Flow Available:	160.07 GPM
Design Pressure:	45 PSI
Friction Loss:	7.65 PSI
Fittings Loss:	0.76 PSI
Elevation Loss:	0 PSI
Loss through Valve:	2.68 PSI
Pressure Req. at Critical Station:	56.1 PSI
Loss for Fittings:	1.8 PSI
Loss for Main Line:	18.0 PSI
Loss for POC to Valve Elevation:	0 PSI
Loss for Backflow:	12.1 PSI
Critical Station Pressure at POC:	88.0 PSI
Pressure Available:	125 PSI
Residual Pressure Available:	37.0 PSI

H:\1800\1981.01 RCD\Sheets\Monarch Butterfly Mgmt Plan\Landscape Architecture\Task 8 DA-Coastal Development Permit Package\Sheet Files\L\1981.01 RCD Landscape Architecture Task 8 DA-Coastal Development Permit Package L2.0, Apr 26, 2023 11:03am, jmirwick



SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-

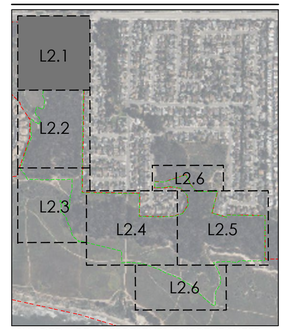
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L2.0 FOR IRRIGATION NOTES, IRRIGATION SCHEDULE, AND WATER CALCULATIONS

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

N:\1800\1981.01-RC20-Elwood-Monarch-Butterfly-Mgmt Plan\Landscape-Architecture\Tasks & Dlv\Coastal Development Permit Package\Sheet Files\L1.1981.01-RC20.dwg, L2.1, Apr 24, 2023 11:04am, jmirwick

CITY OF GOLETA Coastal Conservancy

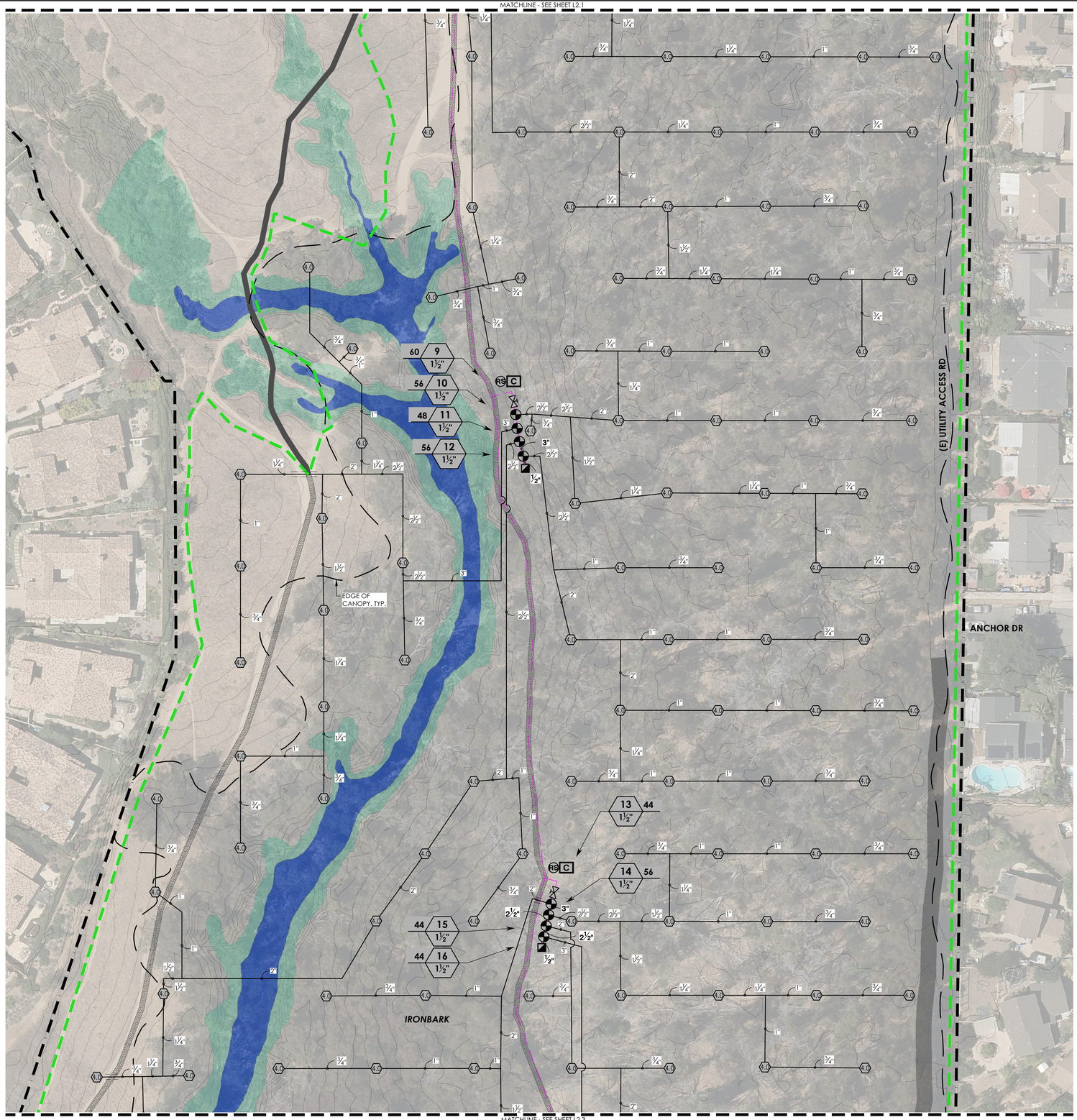
APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

IRRIGATION PLAN

L2.1

MATCHLINE - SEE SHEET L2.1



MATCHLINE - SEE SHEET L2.3

SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-

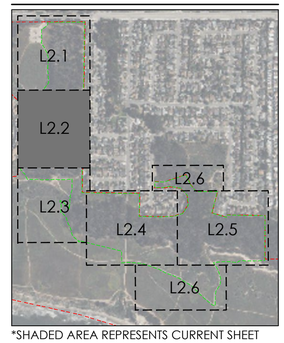
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L2.0 FOR IRRIGATION NOTES, IRRIGATION SCHEDULE, AND WATER CALCULATIONS

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

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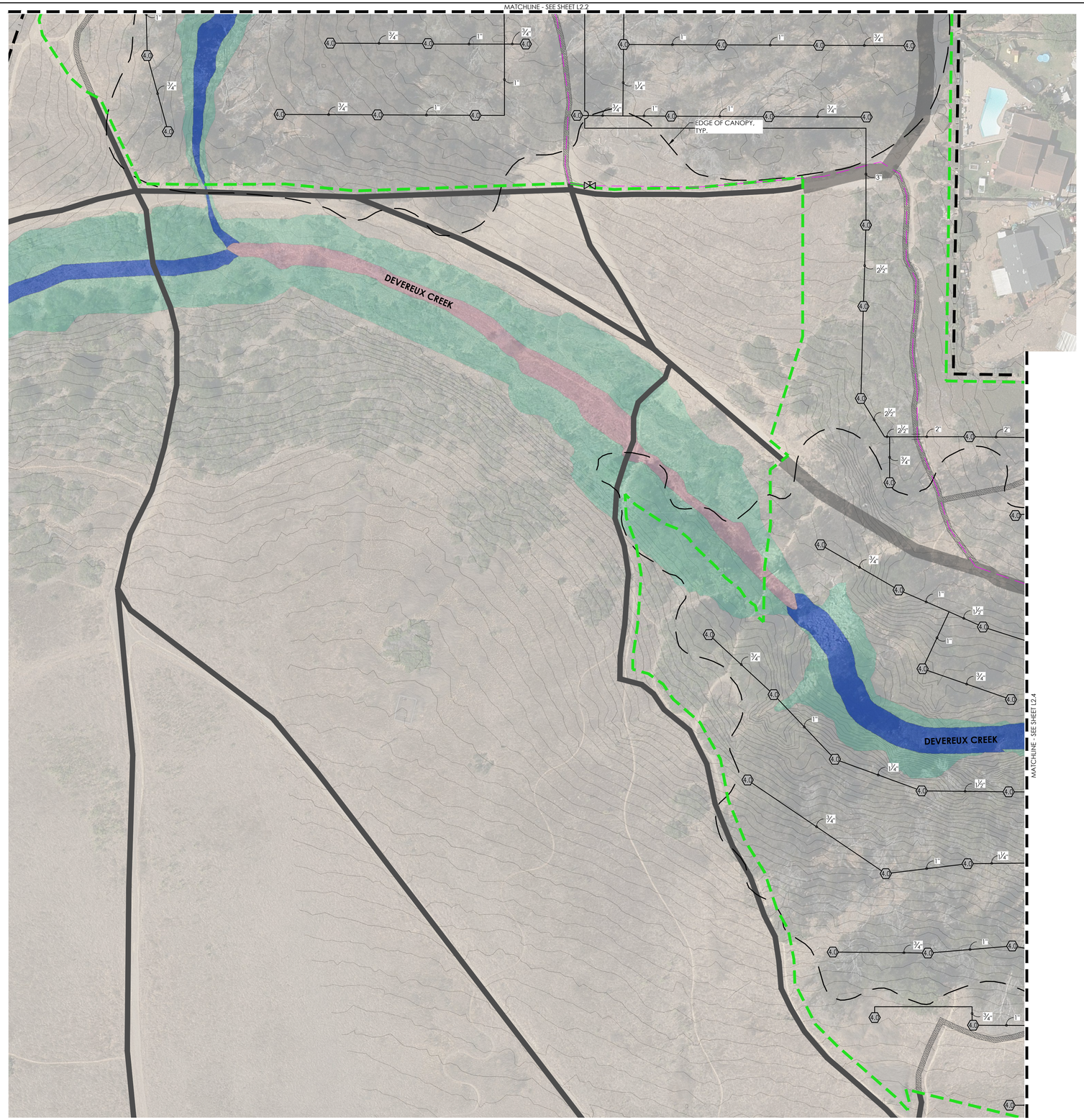
CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

IRRIGATION PLAN

L2.2



SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-

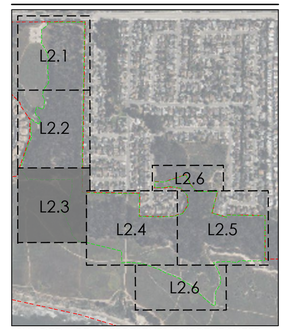
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L2.0 FOR IRRIGATION NOTES, IRRIGATION SCHEDULE, AND WATER CALCULATIONS

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

CITY OF GOLETA Coastal Conservancy

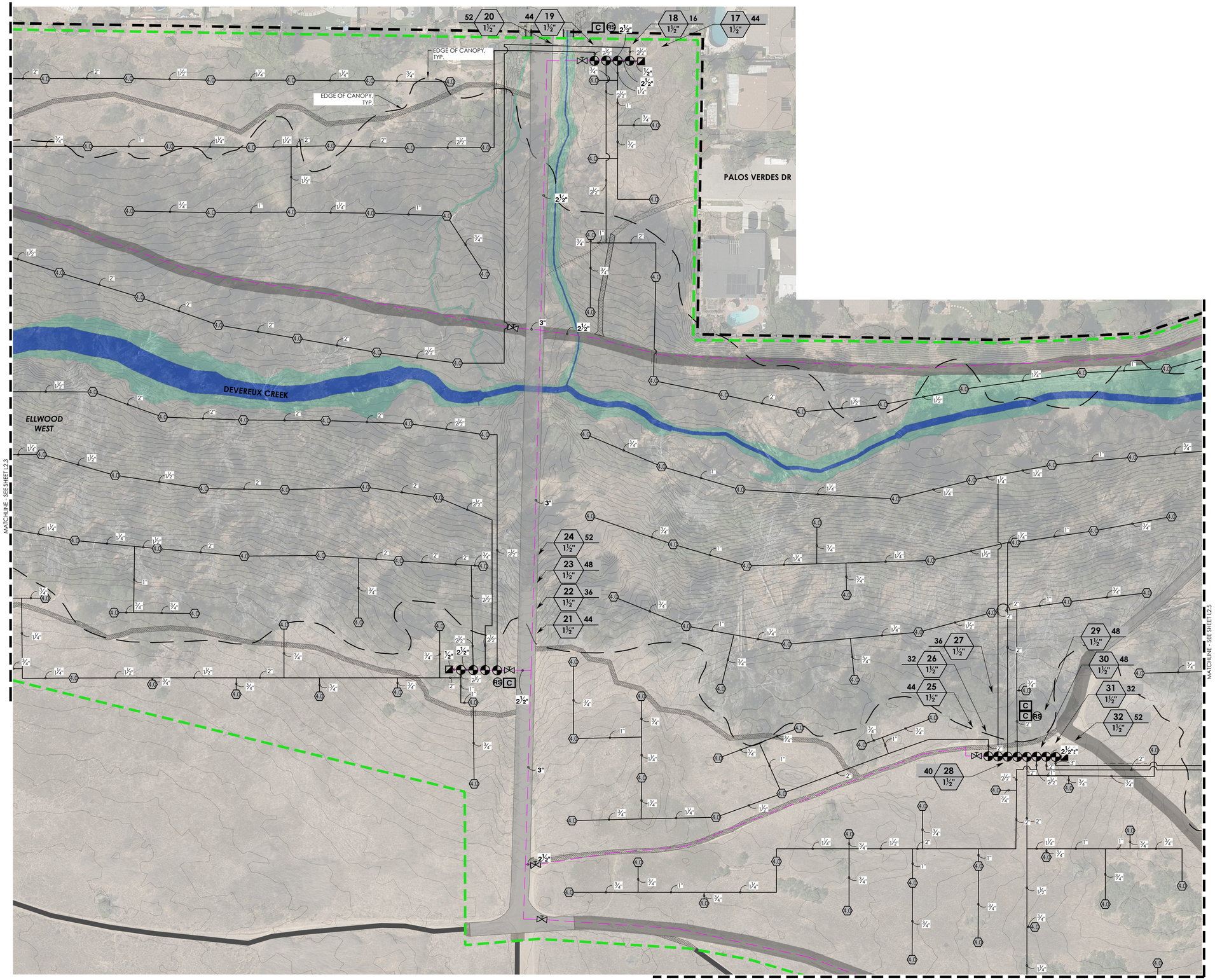
GOLETA MONARCH BUTTERFLY GROVE

IRRIGATION PLAN

APRIL 26, 2023

L2.3

N:\18001\1981.01-RCD\Elwood\Monarch Butterfly Mgmt Plan\Landscape Architecture\Task 8.04-Coastal Development Permit Package\Sheet Files\L1\1981.01-RCD0.dwg, L2.3, Apr 26, 2023, 11:07pm, jimmerick



SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-

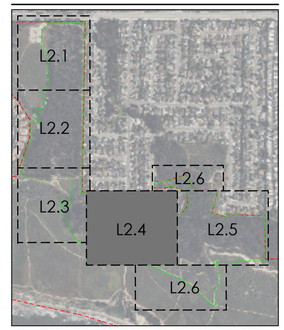
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L2.0 FOR IRRIGATION NOTES, IRRIGATION SCHEDULE, AND WATER CALCULATIONS

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

IRRIGATION PLAN

L2.4

N:\1801\1801-01-RCD\Shared\Monarch Butterfly Habitat Plan\Landscape Architecture\Task 8 DA Coastal Development Permit Package\Sheet Files\LV-1801-01-RCD\Dwg\ L2.4, Apr 26, 2023 - 11:08pm, jmirrick

MATCHLINE - SEE SHEET L2.6

MATCHLINE - SEE SHEET L2.4

MATCHLINE - SEE SHEET L2.6

DAYTONA DR

CORONADO DR

DEVEREUX CREEK

DEVEREUX CREEK

ELLWOOD MAIN

PROPOSED EARTHEN CHECK DAM WITH SANDSTONE BOULDER SUPPORT, TYP. SEE CIVIL DRAWINGS

EDGE OF CANOPY, TYP.

SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-

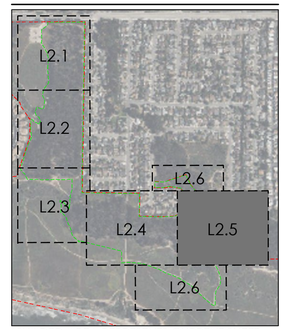
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L2.0 FOR IRRIGATION NOTES, IRRIGATION SCHEDULE, AND WATER CALCULATIONS

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet

1"=40'

N:\1800\1981.01-RCD\Shared\Monarch Butterfly Habitat Project\Landscape Architecture\Task 8 DA\Coastal Development Permit Package\Sheet Files\LV-1981.01-RCD(Shrub L2.5, Apr 26, 2023 1:10)from, jmirnick



SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-

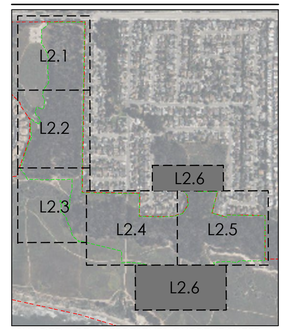
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L2.0 FOR IRRIGATION NOTES, IRRIGATION SCHEDULE, AND WATER CALCULATIONS

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

CITY OF GOLETA Coastal Conservancy

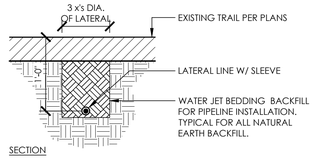
GOLETA MONARCH BUTTERFLY GROVE

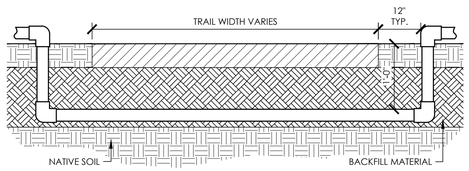
APRIL 26, 2023

IRRIGATION PLAN

L2.6

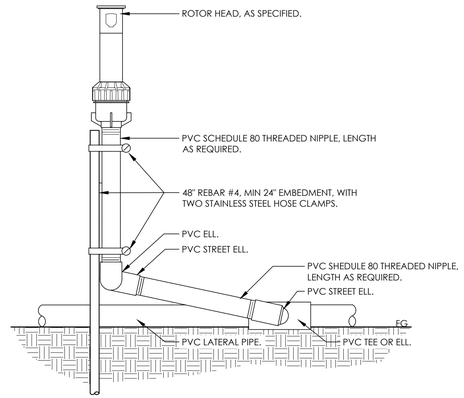
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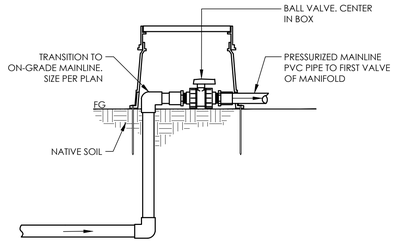
9 LATERAL LINE TRAIL CROSSING

1" = 1'-0" RRM-1981.01-116



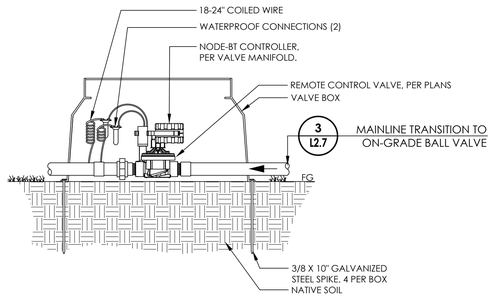
6 SHRUB ROTOR ON-GRADE

3" = 1'-0" RRM-1981.01-28



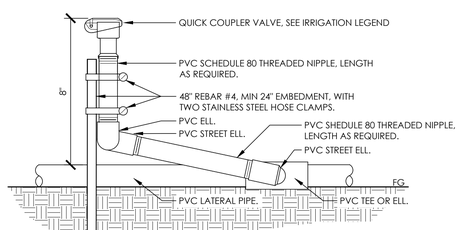
3 MAINLINE TRANSITION TO ON-GRADE BALL VALVE

1" = 1'-0" RRM-1981.01-117



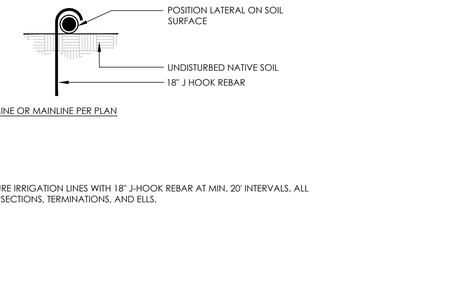
8 IRRIGATION VALVE ON-GRADE

1 1/2" = 1'-0" RRM-1981.01-42

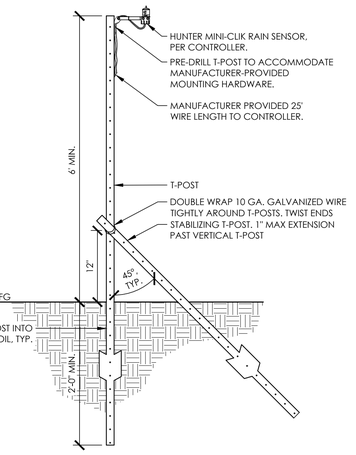


5 QUICK COUPLER ON-GRADE

3" = 1'-0" RRM-1981.01-100

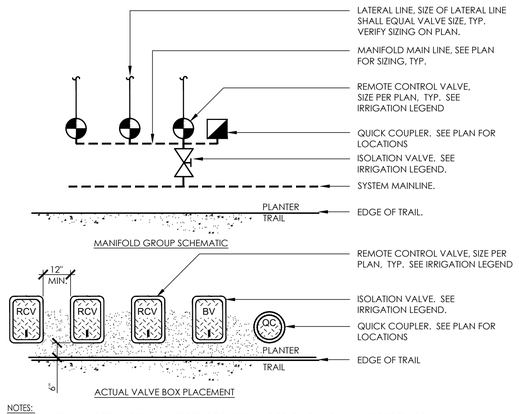


NOTES:
1. SECURE IRRIGATION LINES WITH 18" J-HOOK REBAR AT MIN. 20' INTERVALS, ALL INTERSECTIONS, TERMINATIONS, AND ELLS.



10 RAIN SENSOR ON T-POST

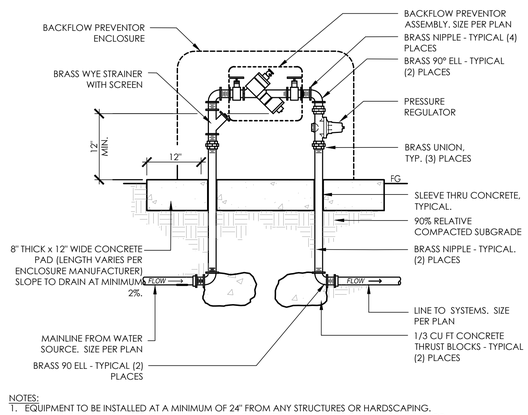
1" = 1'-0" RRM-1981.01-119



NOTES:
1. ALL VALVES SHALL BE RUN OFF A MANIFOLD GROUP SIMILAR TO THAT SHOWN IN ABOVE DIAGRAM.
2. ALL BOXES SHALL BE SQUARE TO ONE ANOTHER, AND TO EDGES OF ADJACENT FIXED OBJECTS.
3. ALL VALVE BOXES SHALL BE SET ABOVE FINISH GRADE.
4. SEE IRRIGATION PLAN FOR MAINLINE PIPE SIZING.

7 VALVE BOX LAYOUT ON-GRADE

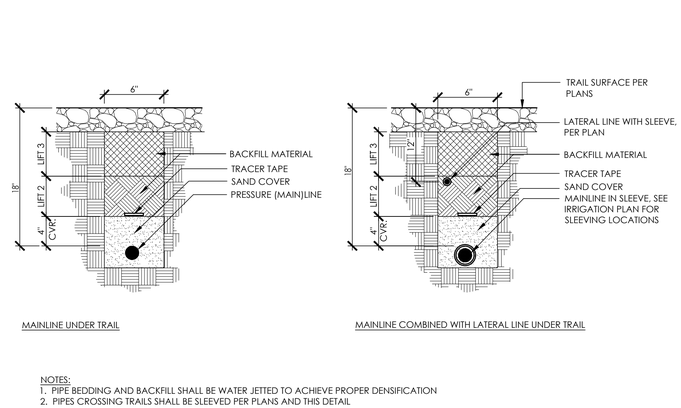
3/8" = 1'-0" RRM-1981.01-27



NOTES:
1. EQUIPMENT TO BE INSTALLED AT A MINIMUM OF 24" FROM ANY STRUCTURES OR HARDSCAPING.
2. WHEN UNIT IS NEXT TO A STRUCTURE (ie. WALL, BUILDING, ETC.,) MOUNT TEST COCKS ON OPEN OR NON-STRUCTURE SIDE.
3. MOUNT BACKFLOW PREVENTER ASSEMBLY 12" FROM GROUND OR AT THE MINIMUM HEIGHT ALLOWED.
4. PROVIDE STAINLESS STEEL, LOCKING ENCLOSURE.

4 BACKFLOW PREVENTER WITH ENCLOSURE

1 1/2" = 1'-0" RRM-1981.01-50



NOTES:
1. PIPE BEDDING AND BACKFILL SHALL BE WATER JETTED TO ACHIEVE PROPER DENSIFICATION
2. PIPES CROSSING TRAILS SHALL BE SLEEVED PER PLANS AND THIS DETAIL
3. IRRIGATION SLEEVE: TWO PIPE SIZES LARGER THAN WATER PIPE SIZE

2 IRRIGATION LINE INSTALLATION ON-GRADE

1" = 1'-0" RRM-1981.01-29

1 TRENCHING

1" = 1'-0" RRM-1981.01-30

N:\1800\1981.01-RC20\Elwood Monarch Butterfly Mgmt Plan\Landscape Architecture\Cad & DA Coastal Development Permit Package\Sheet Files\LU 1981.01-RC20.dwg, L2.7, Apr 24, 2023 11:12pm, jmmrick

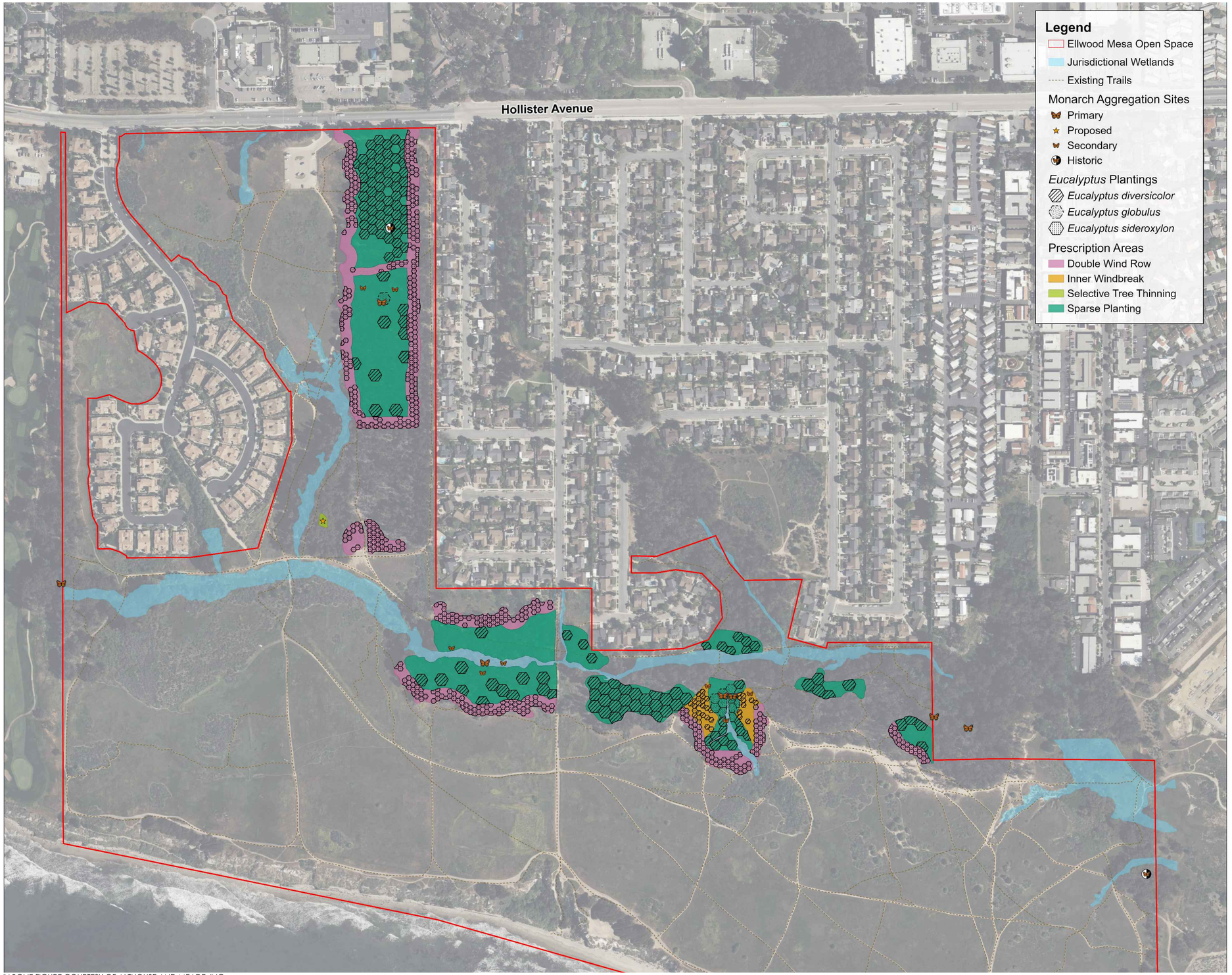
CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

IRRIGATION DETAILS

L2.7



*ABOVE FIGURE COURTESY OF ALTHOUSE AND MEADE, INC.

N:\1800\1981.01.WC20\Ellwood Monarch Butterfly Mgmt Plan\Landscape Architecture\Task 8.0\Coastal Development Permit Package\Sheet Files\LP 1981.01 WC20.dwg, L3.0, Apr 26, 2023, 10:55am, jmmrvca

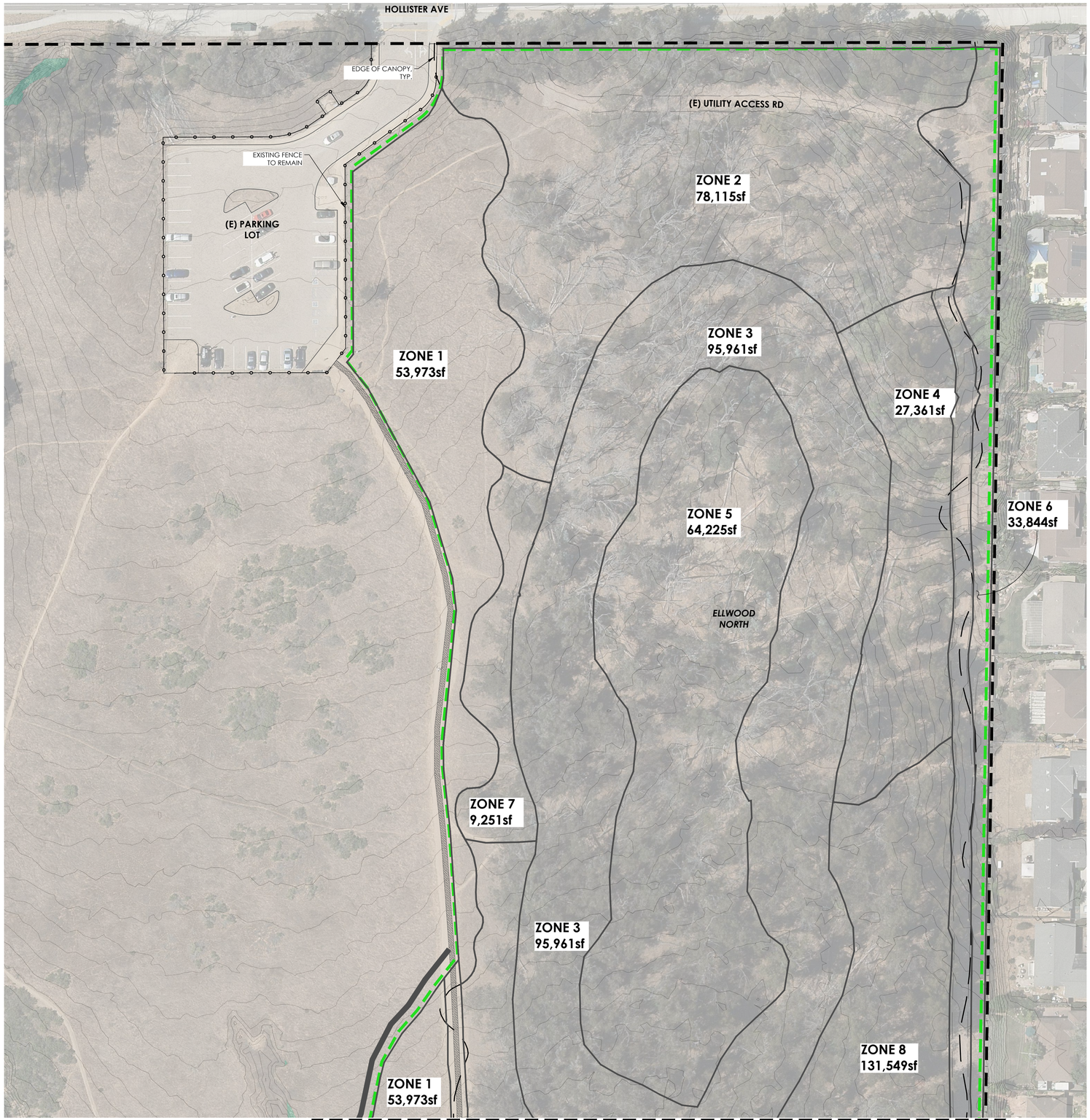
CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

TREE PLANTING PLAN

L3.0



SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-

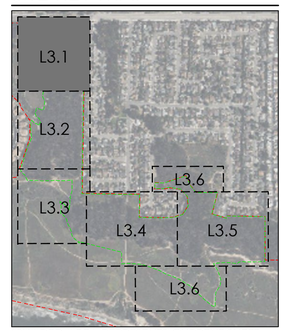
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L3.0 FOR TREE PLANTING PLAN
2. SEE SHEET L3.7-3.X FOR PLANTING NOTES AND PLANTING SCHEDULE

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

N:\1800\1891.01.RC20\Elwood Monarch Butterfly Mgmt Plan\Landscape Architecture\Task 8.0\Coastal Development Permit Package\Sheet Files\LP-1891.01.RC20.dwg, L3.1, Apr 26, 2023, 10:56am, jmmrice

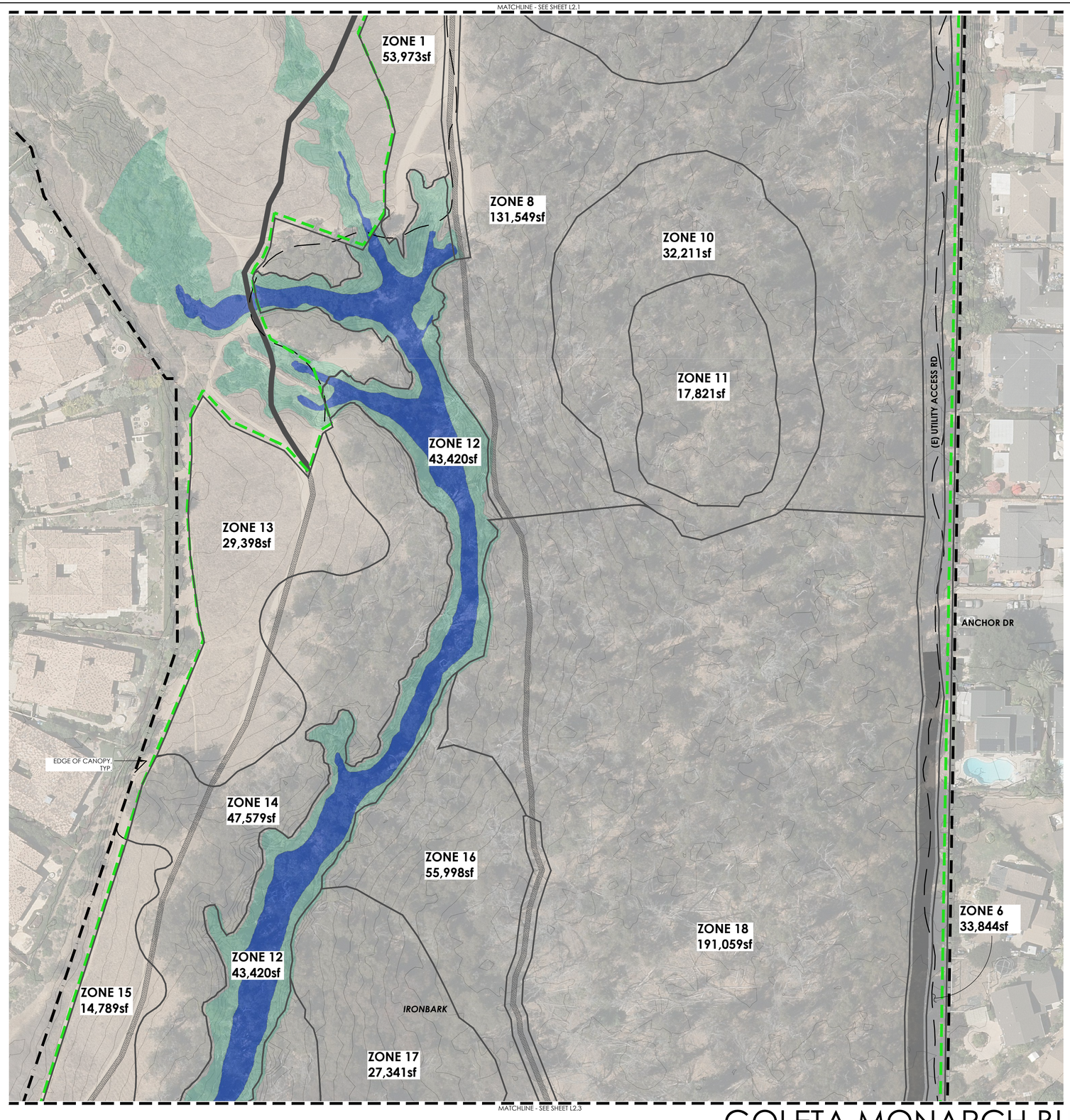
CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

PLANTING PLAN

L3.1



SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-

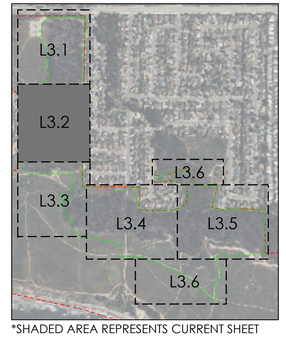
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L3.0 FOR TREE PLANTING PLAN
2. SEE SHEET L3.7-3.X FOR PLANTING NOTES AND PLANTING SCHEDULE

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

N:\1800\1981.01-RCDI-Elwood-Monarch-Butterfly-Mgmt-Plan\Landscape-Architecture\Task 8.0\4-Coastal Development Permit Package\Sheet Files\LP-1981.01-RCDI.dwg, L3.2, Apr 26, 2023 - 10:57pm, jmirrick

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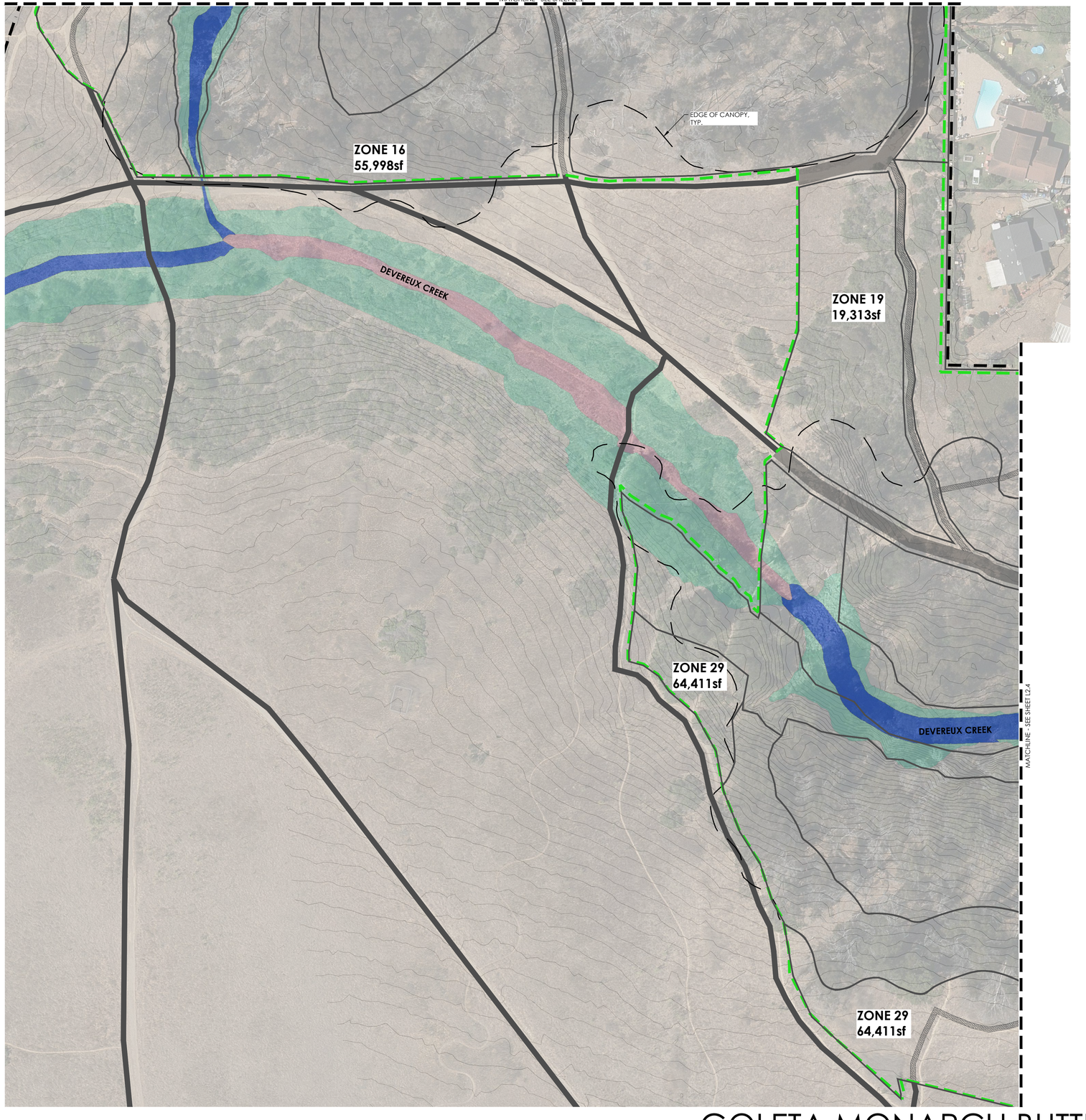
APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

PLANTING PLAN

L3.2

MATCHLINE - SEE SHEET L2.2



MATCHLINE - SEE SHEET L2.4

SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-

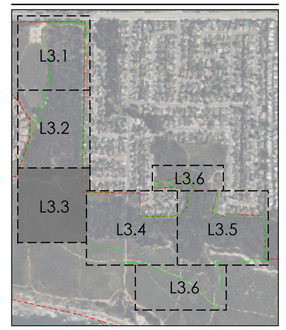
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L3.0 FOR TREE PLANTING PLAN
2. SEE SHEET L3.7-3.X FOR PLANTING NOTES AND PLANTING SCHEDULE

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

N:\1800\1981.01-RC20-Elwood-Monarch-Butterfly-Mgmt Plan\Landscape Architecture\Tasks & DA-Coastal Development Permit Package\Sheet Files\LP-1981.01-RC20.dwg, L3.3, Apr 26, 2023 - 10:58am, jmmrick

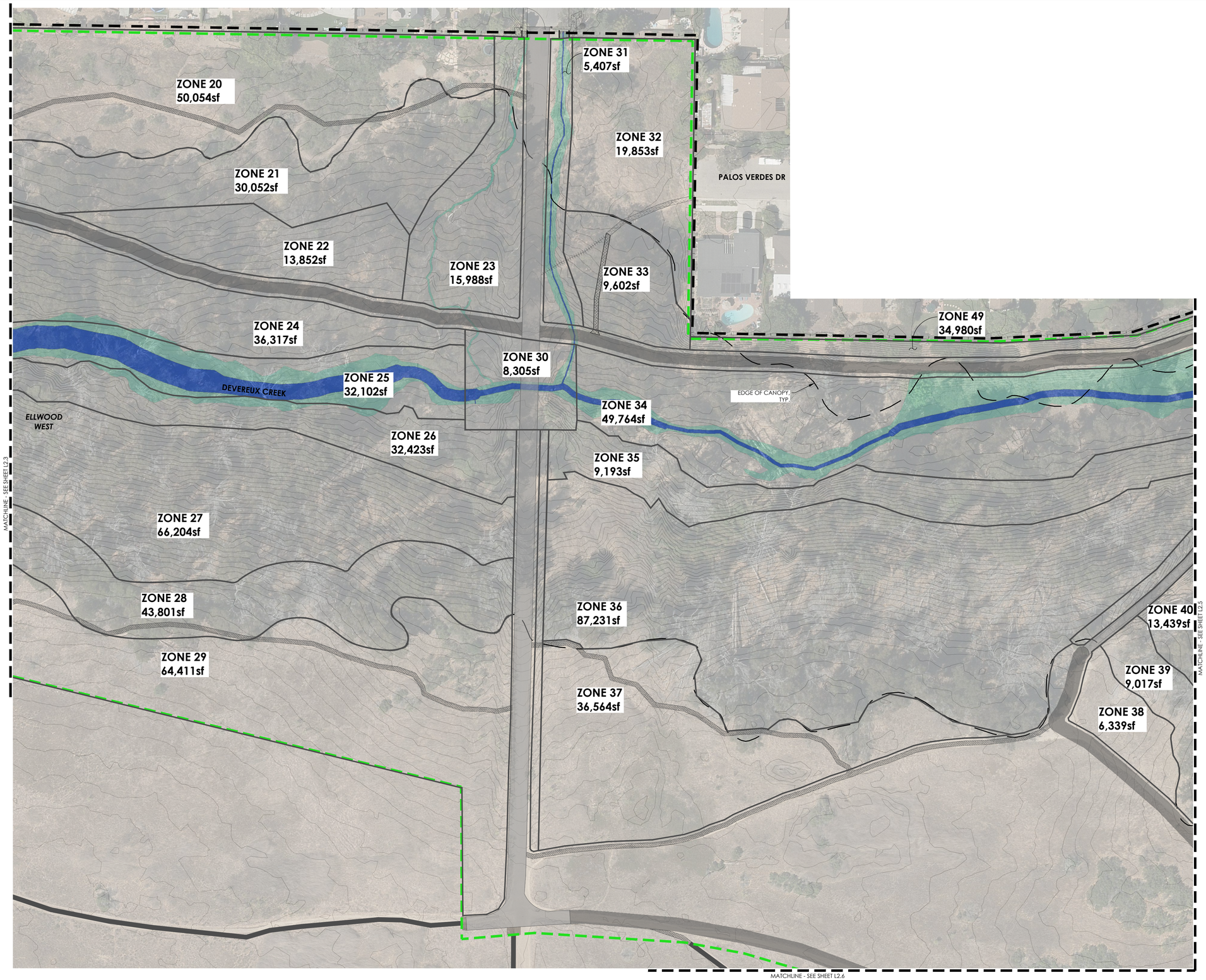
CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

PLANTING PLAN

L3.3



SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-

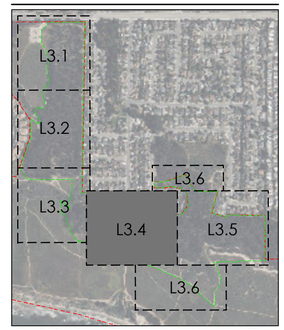
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L3.0 FOR TREE PLANTING PLAN
2. SEE SHEET L3.7-3.X FOR PLANTING NOTES AND PLANTING SCHEDULE

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

N:\18001\1981.01 (RCD)\Elwood\Monarchs Butterfly Mgmt Plan\Landscape Architecture\Task 8.0\A-Coastal Development Permit Package\Sheet Files\LP-1981.01-RCD-Elwood_L3.4 - Apr 26, 2023 - 10:59pm, jmirnick

CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

PLANTING PLAN

L3.4

MATCHLINE - SEE SHEET L2.6

MATCHLINE - SEE SHEET L2.4

DAYTONA DR

CORONADO DR

DEVEREUX CREEK

DEVEREUX CREEK

EDGE OF CANOPY, TYP.

ELLWOOD MAIN

ZONE 48
8,531sf

ZONE 47
88,557sf

ZONE 46
24,068sf

ZONE 56
32,222sf

ZONE 45
6,705sf

ZONE 41
6,606sf

ZONE 44
9,343sf

ZONE 55
28,899sf

ZONE 59
29,827sf

ZONE 58
8,751sf

ZONE 54
155,305sf

ZONE 43
16,658sf

ZONE 57
21,212sf

ZONE 40
13,439sf

ZONE 42
39,254sf

PROPOSED EARTHEN CHECK DAM WITH SANDSTONE BOULDER SUPPORT, TYP. SEE CIVIL DRAWINGS.

ZONE 50
2,790sf

ZONE 53
39,299sf

ZONE 51
23,985sf

ZONE 52
11,587sf

MATCHLINE - SEE SHEET L2.6

SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-

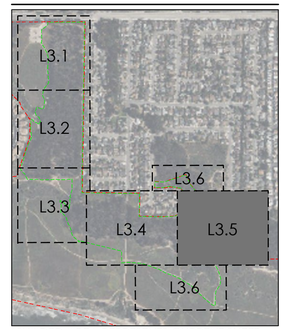
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L3.0 FOR TREE PLANTING PLAN
2. SEE SHEET L3.7-3.X FOR PLANTING NOTES AND PLANTING SCHEDULE

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet

1"=40'

N:\1800\1981.01 RCD\Elwood Monarchs Butterfly Mgmt Plan\Landscape Architecture\Task 8.0\4-Coastal Development Permit Package\Sheet Files\LP-1981.01-RCD-dwg L3.5 - Apr 26, 2023 - 11:00am, jmirnick

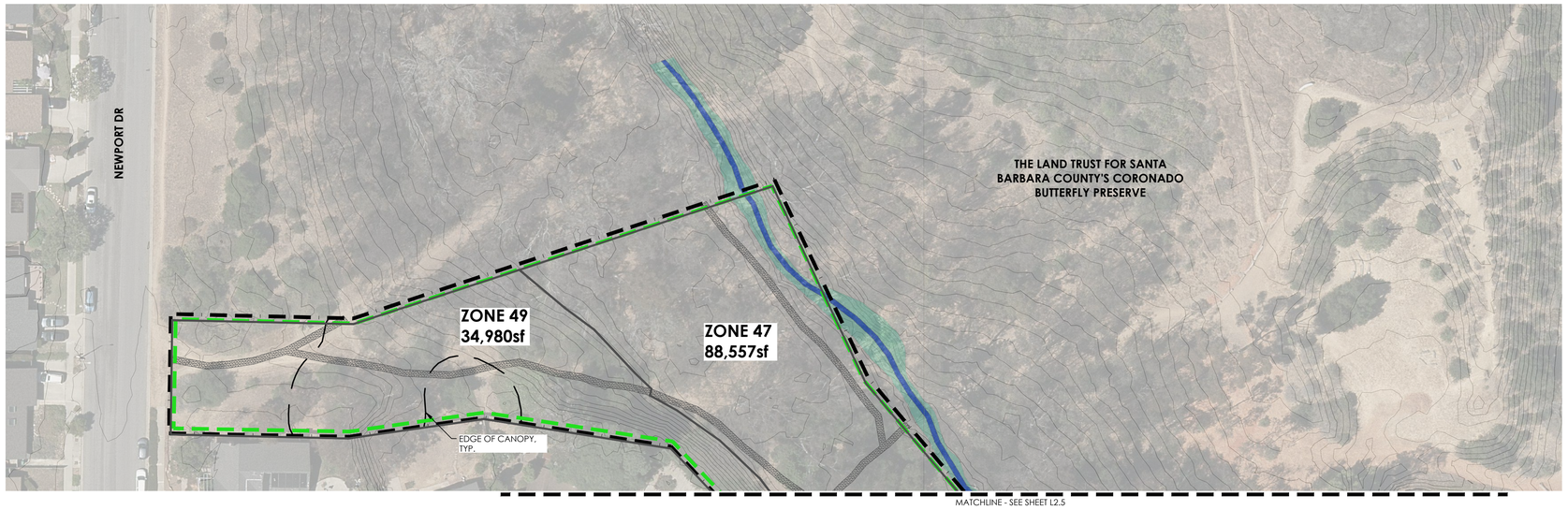
CITY OF GOLETA Coastal Conservancy

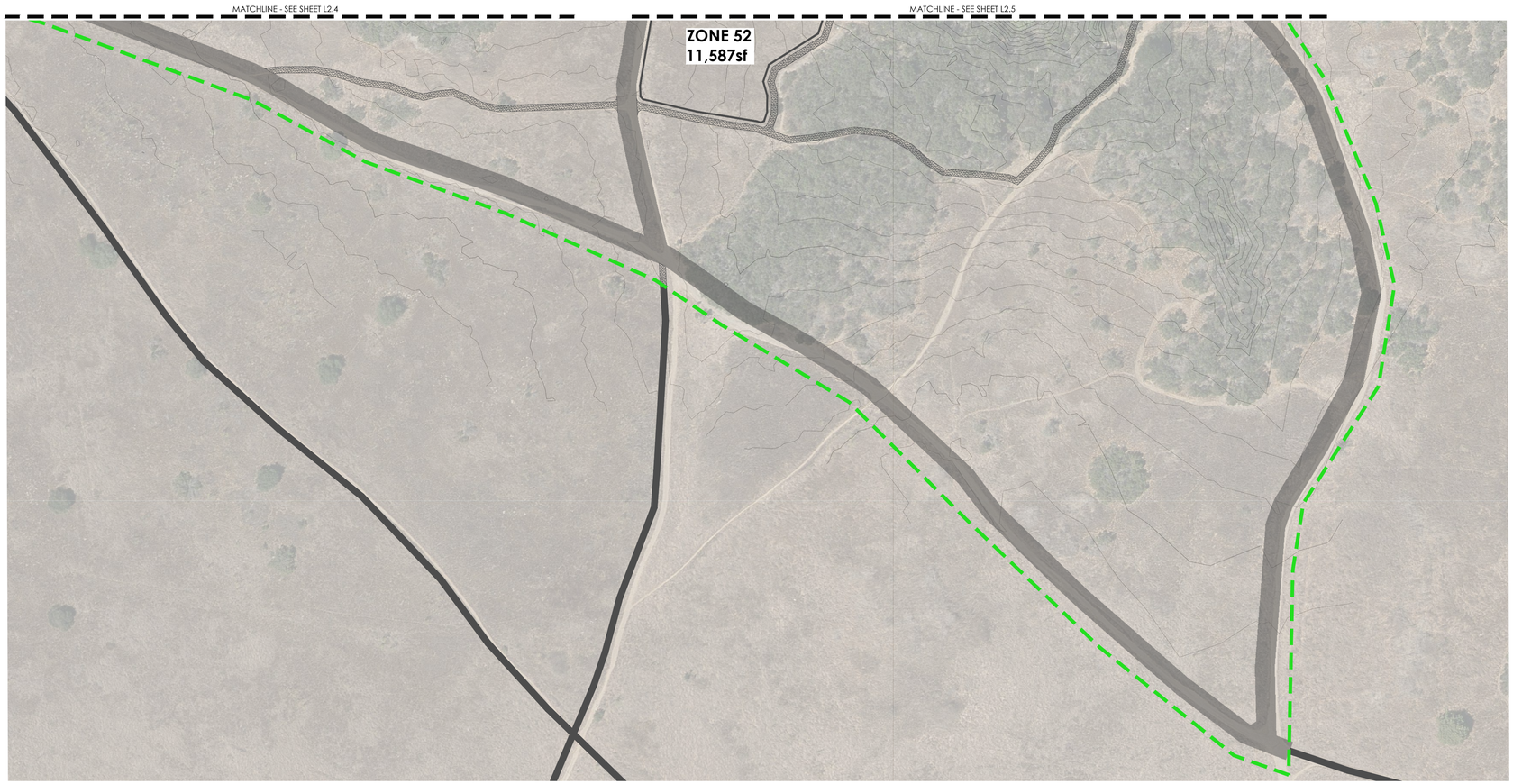
APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

PLANTING PLAN

L3.5





SYMBOL LEGEND

SYMBOL	DESCRIPTION	DETAIL
	PROPERTY BOUNDARY	-
	WORK AREA	-
	TRAIL TYPE A: EXISTING NATIVE TRAILS	1 / L1.10
	TRAIL TYPE B: IMPROVED NATIVE TRAILS	1 / L1.10
	TRAIL TYPE C: IMPROVED TRAILS VARYING SURFACES	1 / L1.10
	TRAIL TYPE D: IMPROVED TRAILS UNIFORM SURFACES	1 / L1.10
	EXISTING TRAIL TO REMAIN OUTSIDE OF WORK AREA	-
	BOARDWALK	1 / L1.9
	RECLAIMED TRAIL SECTION	8 / L1.7
	TRAIL DELINEATOR	5 / L1.7
ELLWOOD MAIN	MONARCH BUTTERFLY ROOSTING SITE	-

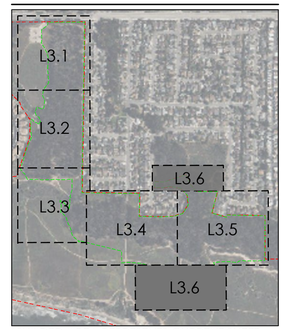
SENSITIVE RESOURCES LEGEND

SYMBOL	DESCRIPTION
	COASTAL WETLAND
	STREAMBED/NON-WETLAND WATERS OF THE STATE
	NON-WETLAND WATERS OF THE U.S.
	WETLAND WATERS OF THE STATE AND U.S.

NOTES

1. SEE SHEET L3.0 FOR TREE PLANTING PLAN
2. SEE SHEET L3.7-3.X FOR PLANTING NOTES AND PLANTING SCHEDULE

SITE KEY MAP



*SHADED AREA REPRESENTS CURRENT SHEET

0 20 40 80 120 feet
1"=40'

N:\1800\1981.01 RCD\Elwood\Monarch Butterfly Mgmt Plan\Landscape Architecture\Tech 8.0\4-Coastal Development Permit Package\Sheet Files\LP-1981.01-RCD-Sheet_L3.6_Apr 26, 2023 11:03am, jmirnick

CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

PLANTING PLAN

L3.6

SEE SHEET C2.2

SEE SHEET C2.0

SEE SHEET C2.1

SEE SHEET C3.0

SEE SHEET C2.3

SEE SHEET C2.4

SEE SHEET C2.5

SEE SHEET C3.2

LEGEND

- EXISTING EARTHEN TRAIL
- EXISTING VEHICLE ACCESS ROAD (EARTHEN)
- EXISTING ASPHALT PAVEMENT
- EXISTING CONCRETE PAVEMENT
- PROPOSED EARTHEN TRAIL
- PROPOSED VEHICLE ACCESS ROAD (EARTHEN)
- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- NON-WETLAND WATERS OF THE U.S. (USACE)
- NON-WETLAND WATERS OF THE STATE
- PROPOSED ELEVATED BOARDWALK
- PROPOSED RIPRAP
- PROPOSED SWALE
- RECLAIMED PATH SECTIONS
- SURFACE FLOW DIRECTION
- EXISTING ITEM TO BE REMOVED
- SAWCUT SECTION
- ROAD SHOULDER
- FEMA FLOOD ZONE A (100-YEAR)
- FEMA FLOODWAY

SHEET INDEX:

C1.0	INDEX SHEET
C2.0	GRADING PLAN
C2.1	GRADING PLAN
C2.2	GRADING PLAN
C2.3	GRADING PLAN
C2.4	GRADING PLAN
C2.5	GRADING PLAN
C3.0	EARTHWORK
C3.1	EARTHWORK
C3.2	EARTHWORK
C4.0	DETAILS
C4.1	DETAILS
C4.2	DETAILS
C5.0	EROSION CONTROL PLAN
C5.1	EROSION CONTROL PLAN

0 60 120 180 feet

SCALE: 1"=60'

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CITY OF GOLETA

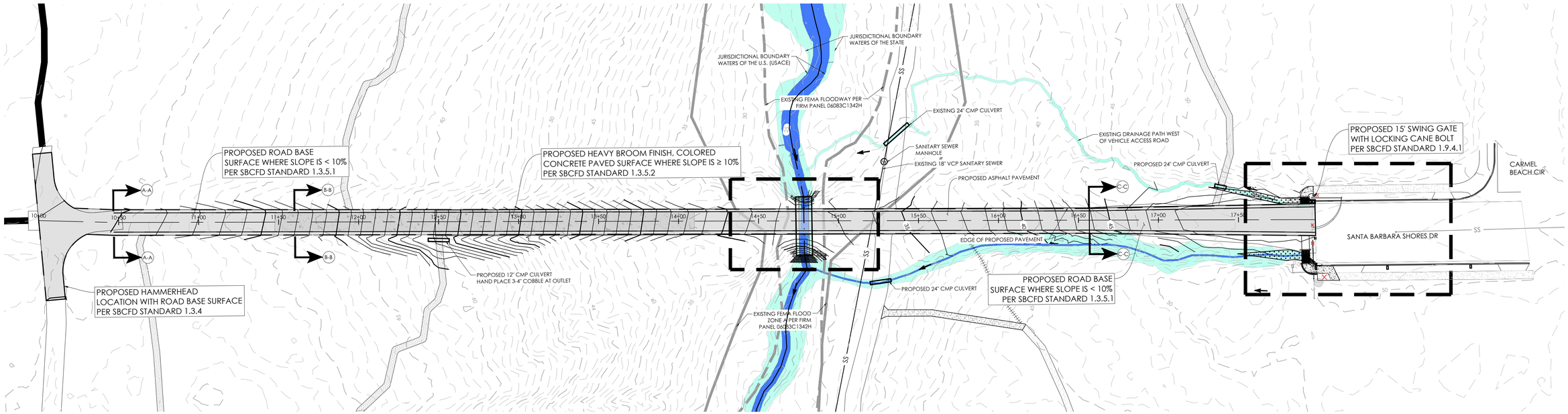
Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

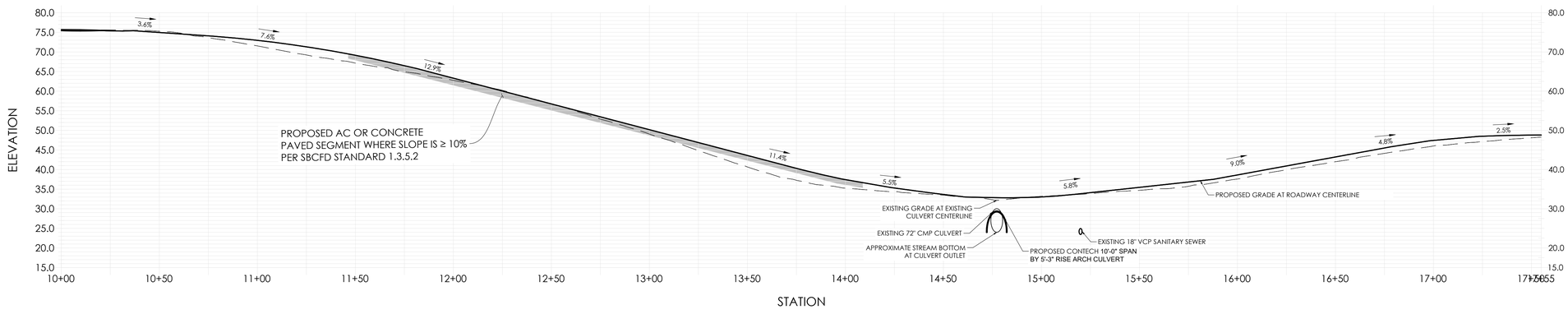
SHEET INDEX MAP

C1.0

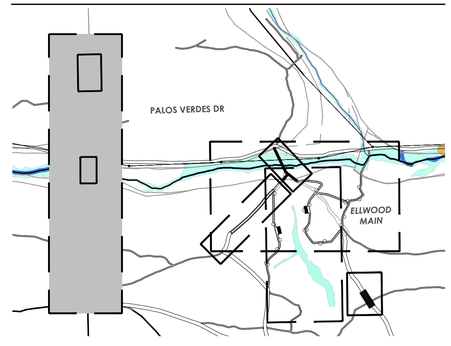


0 30 60 90 feet

SCALE: 1"=30'



KEY MAP:



LEGEND

- EXISTING EARTHEN TRAIL
- EXISTING VEHICLE ACCESS ROAD (EARTHEN)
- EXISTING ASPHALT PAVEMENT
- EXISTING CONCRETE PAVEMENT
- PROPOSED EARTHEN TRAIL
- PROPOSED VEHICLE ACCESS ROAD (EARTHEN)
- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- NON-WETLAND WATERS OF THE U.S. (USACE)
- NON-WETLAND WATERS OF THE STATE
- PROPOSED ELEVATED BOARDWALK
- PROPOSED RIPRAP
- PROPOSED SWALE
- RECLAIMED PATH SECTIONS
- SURFACE FLOW DIRECTION
- EXISTING ITEM TO BE REMOVED
- SAWCUT SECTION
- ROAD SHOULDER
- FEMA FLOOD ZONE A (100-YEAR)
- FEMA FLOODWAY

CITY OF GOLETA Coastal Conservancy

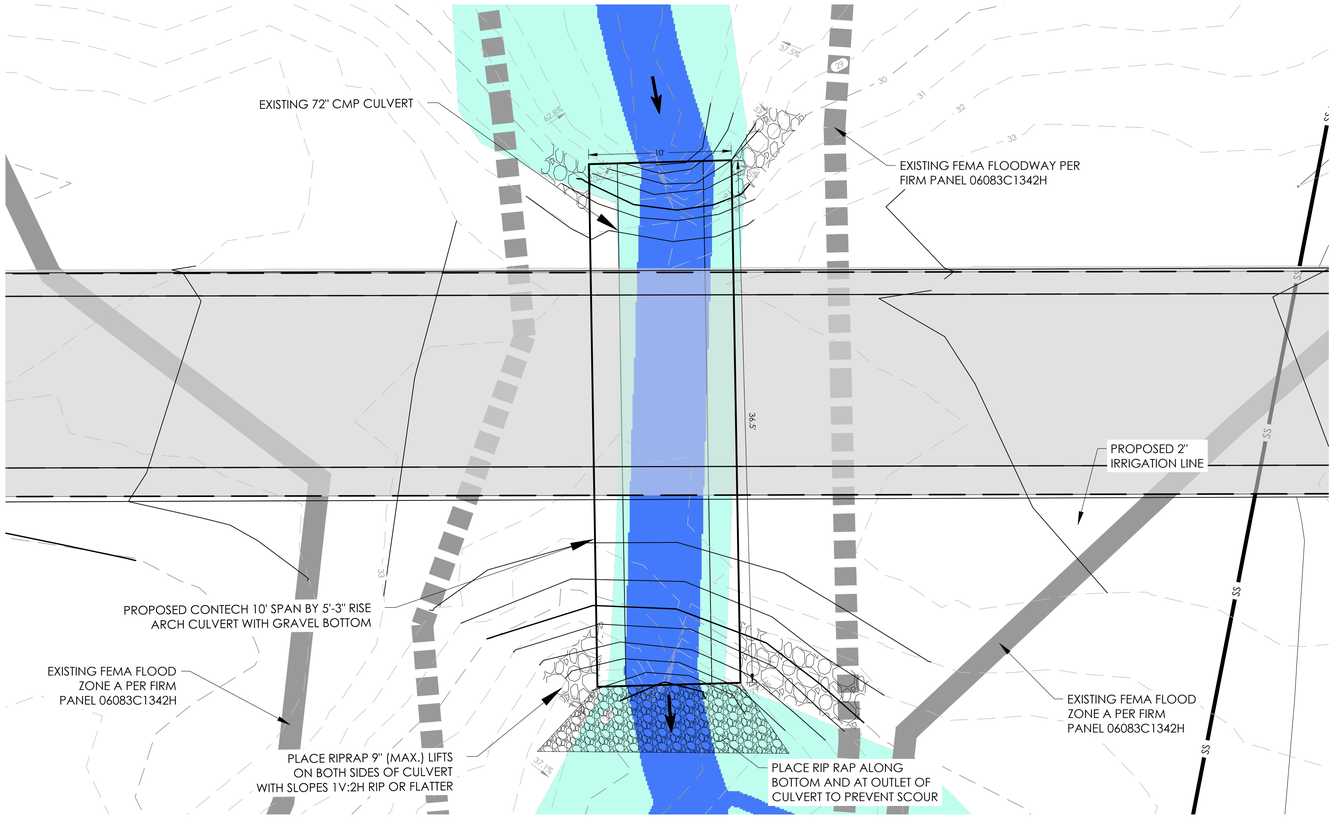
APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

GRADING PLAN

C2.0

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CULVERT DETAIL

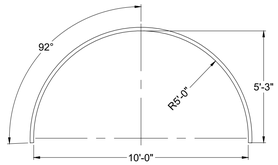
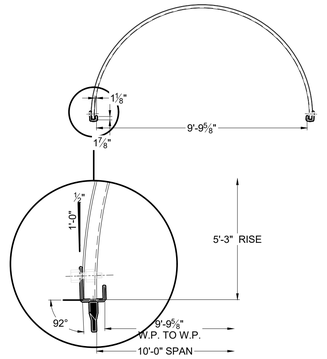


PLATE MAKE-UP: 2 @ 21Pi, 1 @ 18Pi
60 Pi Total

AREA= 41.4 SF

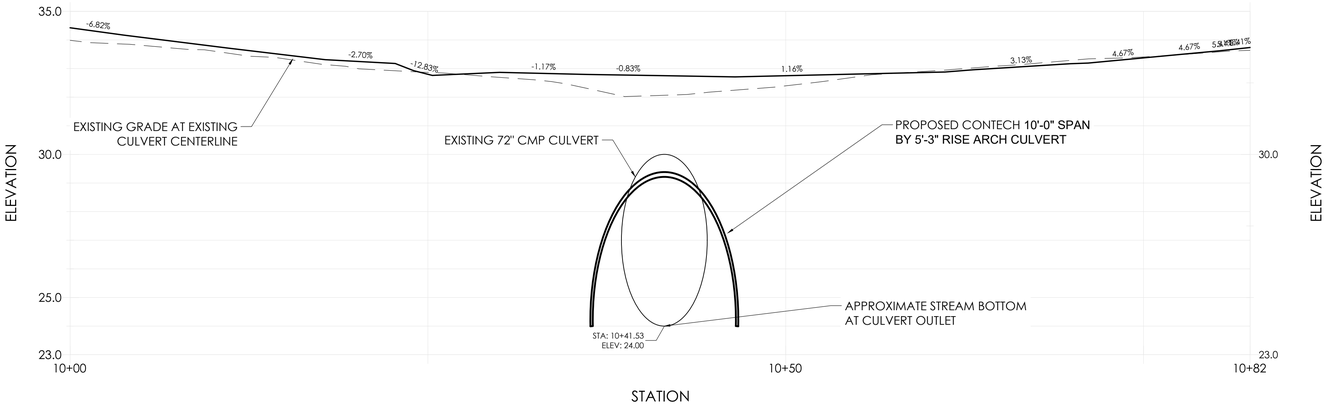
NOTES:

1. ALL DIMENSIONS ARE TO INSIDE OF CORRUGATION CREST, UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.



0 5 10 15 feet

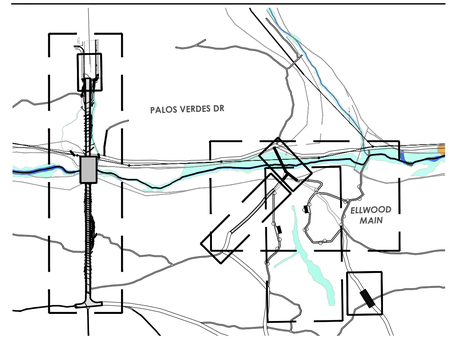
SCALE: 1"=5'



LEGEND

- EXISTING EARTHEN TRAIL
- EXISTING VEHICLE ACCESS ROAD (EARTHEN)
- EXISTING ASPHALT PAVEMENT
- EXISTING CONCRETE PAVEMENT
- PROPOSED EARTHEN TRAIL
- PROPOSED VEHICLE ACCESS ROAD (EARTHEN)
- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- NON-WETLAND WATERS OF THE U.S. (USACE)
- NON-WETLAND WATERS OF THE STATE
- PROPOSED ELEVATED BOARDWALK
- PROPOSED RIPRAP
- PROPOSED SWALE
- RECLAIMED PATH SECTIONS
- SURFACE FLOW DIRECTION
- EXISTING ITEM TO BE REMOVED
- SAWCUT SECTION
- ROAD SHOULDER
- FEMA FLOOD ZONE A (100-YEAR)
- FEMA FLOODWAY

KEY MAP:



CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

GRADING PLAN

C2.1

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SANTA BARBARA SHORES DR

GENERAL NOTES:

1. SIDEWALK CROSS SLOPES 2% MAXIMUM, 5% MAXIMUM IN DIRECTION OF TRAVEL, AND LANDINGS 2% MAXIMUM IN ANY DIRECTION.
2. PROPOSED SWALES TO TRANSITION INTO EXISTING ROADSIDE CHANNELS AND BE PLANED WITH NATIVE VEGETATION.
3. PROPOSED RIPRAP AND SWALE SLOPES 3% MAXIMUM IN DIRECTION OF FLOW, CROSS-SLOPES 5% MAXIMUM.
4. PROPOSED POST TO BE REINFORCED WITH REBAR CORE.

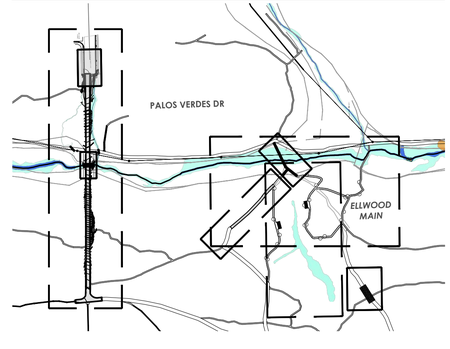
END OF EXISTING SIDEWALK
PROPOSED CONCRETE SIDEWALK
PROPOSED WOODEN CROSSING
EDGE OF EXISTING ASPHALT PAVEMENT
PROPOSED SWALE
EDGE OF PROPOSED ASPHALT PAVEMENT
PROPOSED RIPRAP
PROPOSED ASPHALT PAVEMENT
EXISTING BRICK PIER (TO BE REMOVED)
EXISTING ASPHALT PAVEMENT
EDGE OF PROPOSED ASPHALT PAVEMENT
EDGE OF EXISTING ASPHALT PAVEMENT
PROPOSED CONCRETE SIDEWALK
PROPOSED SWALE
PROPOSED CONCRETE SIDEWALK
STUB AND CAP 2.5" WATER LINE TO PROPOSED VAULT FOR FUTURE USE
PROPOSED 6" CURB
EXISTING 3/4" WATER METER AND 2" BLOWOFF TO BE REPLACED WITH 2" METER PER GWD STD. DETAIL 3-03
END OF EXISTING SIDEWALK
EXISTING CHAIN LINK FENCE
PROPOSED PIER
EXISTING 8" TREE (TO BE REMOVED)
PROPOSED GATE STOP
PROPOSED 15' SWING GATE WITH LOCKING CANE BOLT
PROPOSED FIRE LANE STRIPING
REGULATORY SIGNAGE
PROPOSED PIER
EXISTING BRICK PIER (TO BE REMOVED)
EXISTING CHAIN LINK FENCE
PROPOSED 2" IRRIGATION VALVE
PROPOSED CHAIN LINK FENCE
PROPOSED WOODEN CROSSING PER LANDSCAPE ARCHITECT'S PLAN
PROPOSED RIPRAP
EXISTING CONCRETE DRIVEWAY
PROPOSED 6" CURB
SAWCUT, REMOVE EXISTING, AND REPLACE SIDEWALK
REMOVE EXISTING SIDEWALK
EXISTING CHAIN LINK FENCE
EXISTING 32" TREE
STA. 5+63.16
END ROADWAY IMPROVEMENTS
MATCH EXISTING GRADE
EXISTING CONCRETE SIDEWALK
SANITARY SEWER CLEANOUT
SANITARY SEWER
EXISTING CONCRETE SIDEWALK
EXISTING CONCRETE SIDEWALK

0 5 10 15 feet
1"= 5'

LEGEND

- EXISTING EARTHEN TRAIL
- EXISTING VEHICLE ACCESS ROAD (EARTHEN)
- EXISTING ASPHALT PAVEMENT
- EXISTING CONCRETE PAVEMENT
- PROPOSED EARTHEN TRAIL
- PROPOSED VEHICLE ACCESS ROAD (EARTHEN)
- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- NON-WETLAND WATERS OF THE U.S. (USACE)
- NON-WETLAND WATERS OF THE STATE
- PROPOSED ELEVATED BOARDWALK
- PROPOSED RIPRAP
- PROPOSED SWALE
- RECLAIMED PATH SECTIONS
- SURFACE FLOW DIRECTION
- EXISTING ITEM TO BE REMOVED
- SAWCUT SECTION
- ROAD SHOULDER
- FEMA FLOOD ZONE A (100-YEAR)
- FEMA FLOODWAY

KEY MAP:

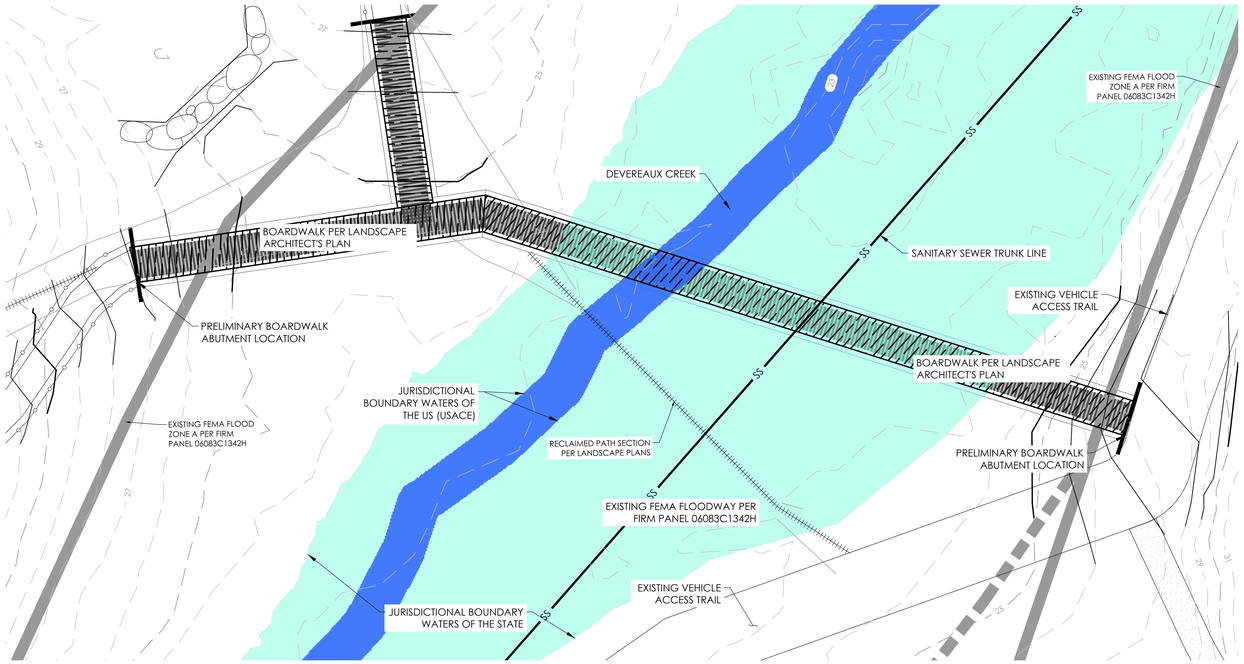


CITY OF GOLETA
Coastal Conservancy

APRIL 26, 2023

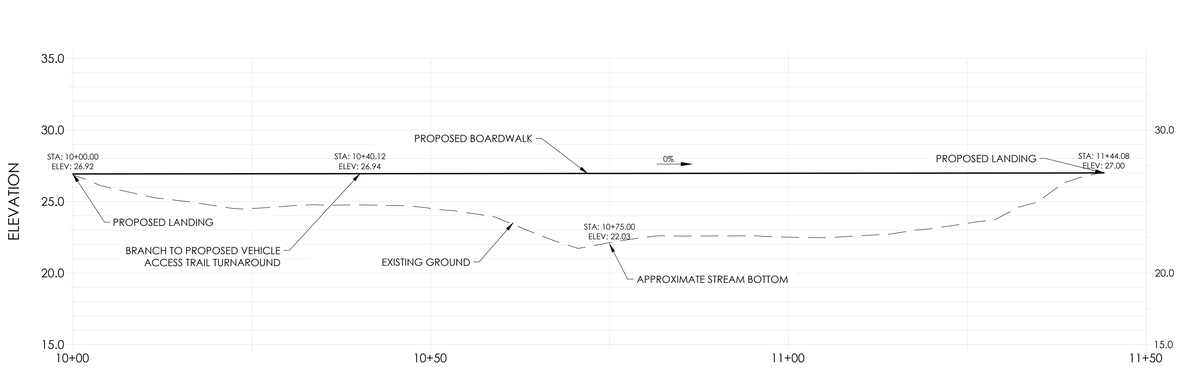
GOLETA MONARCH BUTTERFLY GROVE
GRADING PLAN
C2.2

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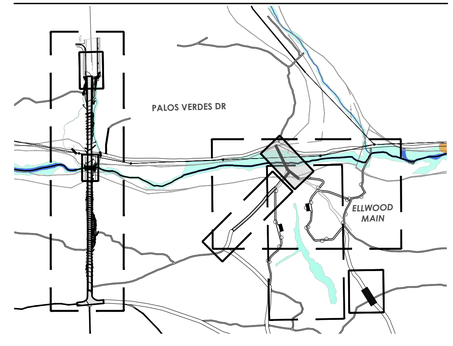
WEST BOARDWALK PLAN
SCALE: 1"=10'

0 10 20 30 feet
1"=10'



WEST BOARDWALK PROFILE
SCALE: H: 1"=10' V: 1"=2'

KEY MAP:



LEGEND

- EXISTING EARTHEN TRAIL
- EXISTING VEHICLE ACCESS ROAD (EARTHEN)
- EXISTING ASPHALT PAVEMENT
- EXISTING CONCRETE PAVEMENT
- PROPOSED EARTHEN TRAIL
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CITY OF GOLETA
Coastal Conservancy

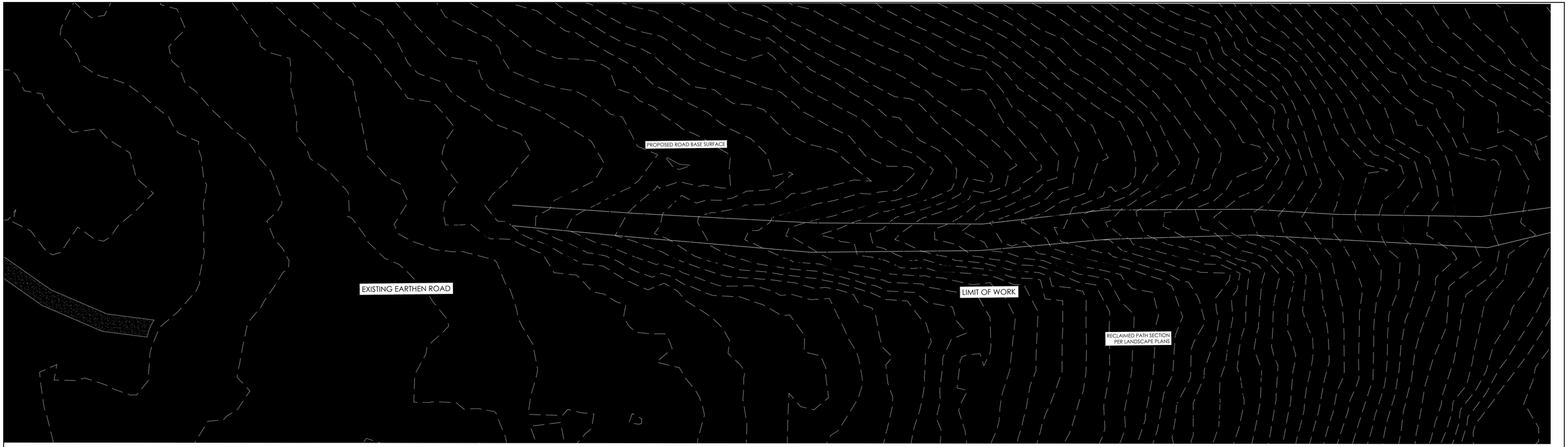
APRIL 26, 2023

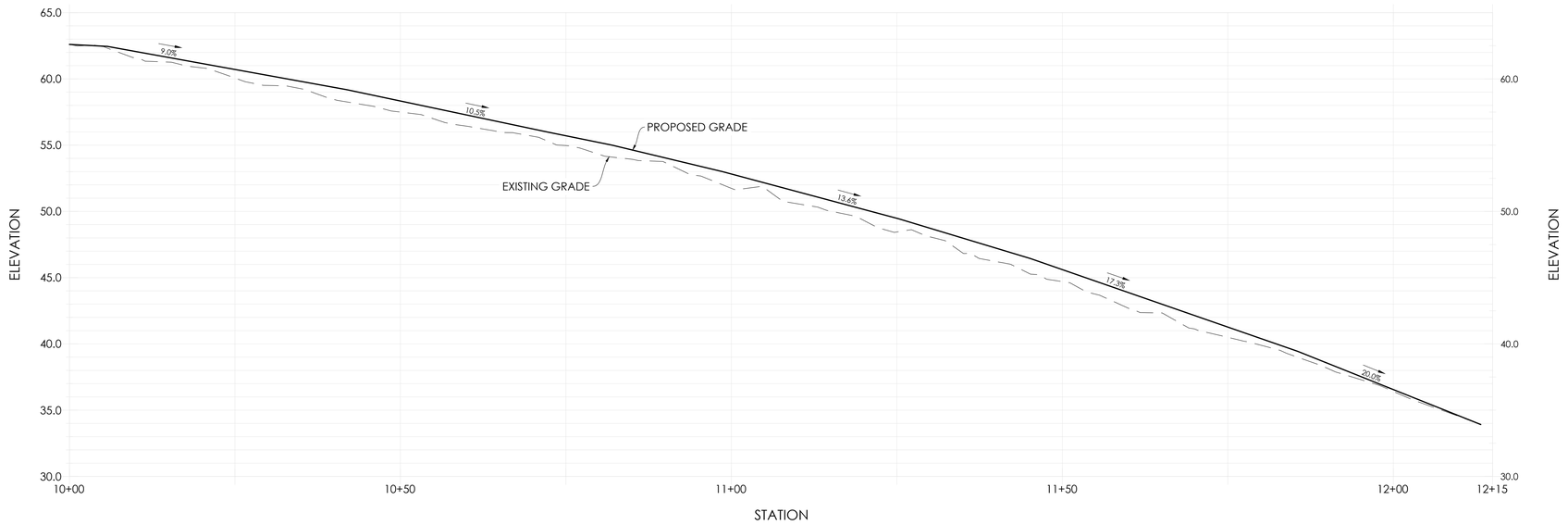
GOLETA MONARCH BUTTERFLY GROVE

GRADING PLAN

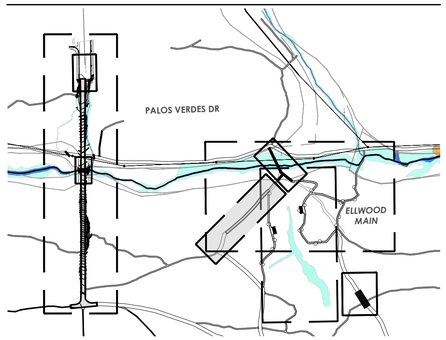
C2.3

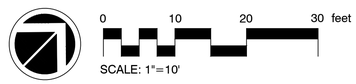
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KEY MAP:





CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

GRADING PLAN

C2.4

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SANDSTONE BOULDER
ROCK CHECK DAM
WITH MINOR GRADING (TYP.)

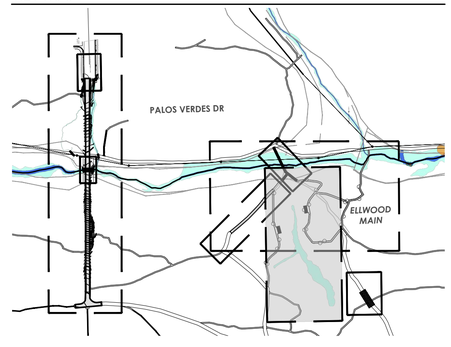
SANDSTONE BOULDER
ROCK CHECK DAM
WITH MINOR GRADING (TYP.)

SANDSTONE BOULDER
ROCK CHECK DAM
WITH MINOR GRADING (TYP.)

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- EXISTING ITEM TO BE REMOVED
- SAWCUT SECTION
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- FEMA FLOOD ZONE A (100-YEAR)
- FEMA FLOODWAY

KEY MAP:



0 20 40 30 feet

SCALE: 1"=20'

CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

GRADING PLAN

C2.5

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EXISTING FEMA FLOOD
ZONE A PER FIRM
PANEL 06083C1342H

EXISTING FEMA FLOOD
ZONE A PER FIRM
PANEL 06083C1342H

EXISTING FEMA FLOOD
ZONE A PER FIRM
PANEL 06083C1342H

PROPOSED TRAIL AREA
AREA = 6,405 SF
CUT = 15 CY
FILL = 35 CY

EXISTING GROVE TRAIL
AREA = 3,240 SF
CUT = 5 CY
FILL = 45 CY

PROPOSED TRAIL AREA
AREA = 2,905 SF
CUT = 15 CY
FILL = 20 CY

PROPOSED TRAIL AREA
AREA = 1,425 SF
CUT = 0 CY
FILL = 2 CY

EARTHWORK QUANTITY NOTES

QUANTITY ESTIMATES ON THESE PLANS ARE TO BE USED FOR PERMIT PURPOSES ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ACTUAL QUANTITIES FOR THE PURPOSE OF CONSTRUCTION.

THE RAW EARTHWORK QUANTITIES SHOWN HEREON REPRESENT THE ESTIMATED VOLUMETRIC DIFFERENCE BETWEEN THE PROPOSED FINISHED GRADE AND THE LIMITED TOPOGRAPHIC EXISTING GRADES. THESE ESTIMATES DO NOT MAKE CONSIDERATIONS ROAD SECTION OR FOR LOSSES OR BULKING DUE TO: SHRINKAGE, SOIL AMENDMENTS, STABILIZATION, CONSTRUCTION TECHNIQUE, FOOTING & TRENCHING SPOILS, ETC. THESE, IN ADDITION TO ACTUAL FIELD CONDITIONS, CONSTRUCTION TECHNIQUE AND THE FINAL RECOMMENDATIONS OF THE SOILS ENGINEER MAY SIGNIFICANTLY EFFECT THE FINAL IMPORT/EXPORT QUANTITIES.

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- FEMA FLOODWAY

0 60 120 180 feet
SCALE: 1"=60'

CITY OF GOLETA Coastal Conservancy

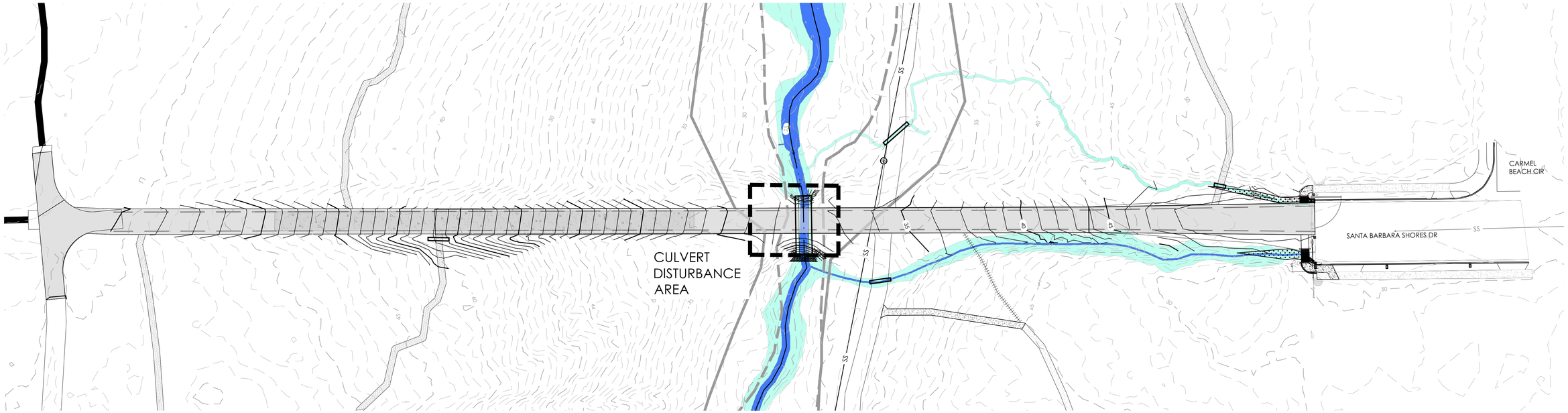
APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

EARTHWORK

C3.0

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EARTHWORK QUANTITIES

CULVERT DISTURBANCE AREA:

AREA OF DISTURBANCE 1,575 SF±

RAW CUT: 5 CY
RAW FILL: 45 CY

ROAD EXCLUDING CULVERT DISTURBANCE AREA:

AREA OF DISTURBANCE 23,080 SF±

RAW CUT: 150 CY
RAW FILL: 485 CY

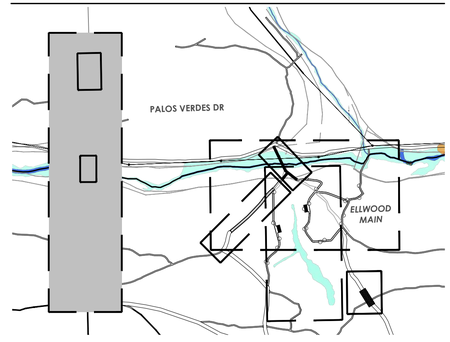
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- SAWCUT SECTION
- ROAD SHOULDER
- FEMA FLOOD ZONE A (100-YEAR)
- FEMA FLOODWAY

KEY MAP:



0 30 60 90 feet
SCALE: 1"=30'

CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

EARTHWORK

C3.1

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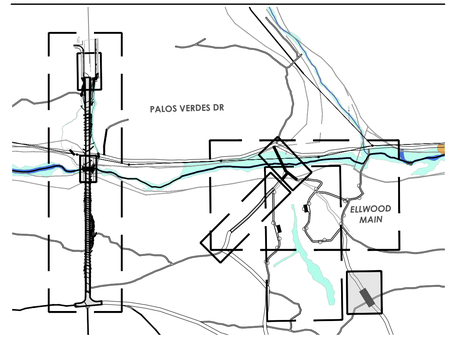
EARTHWORK QUANTITY NOTES

AREA = 5,380 SF
CUT = 20 CY
FILL = 75 CY

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KEY MAP:



LEGEND

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0 60 120 180 feet
SCALE: 1"=60'

CITY OF GOLETA
Coastal Conservancy

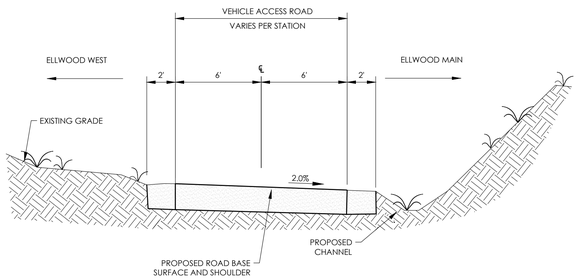
APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

EARTHWORK

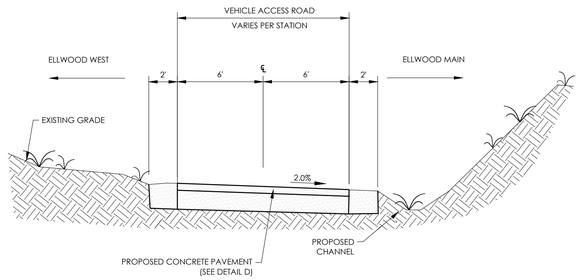
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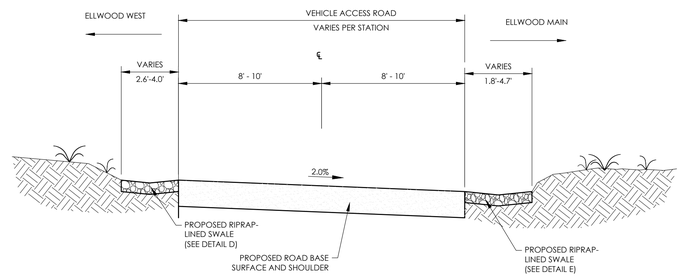
A-A CROSS-SECTION: STA.10+00 TO 11+48 AND 12+48 TO 16+57

SCALE: H: 1"= 5' V: 1" = 2.5'



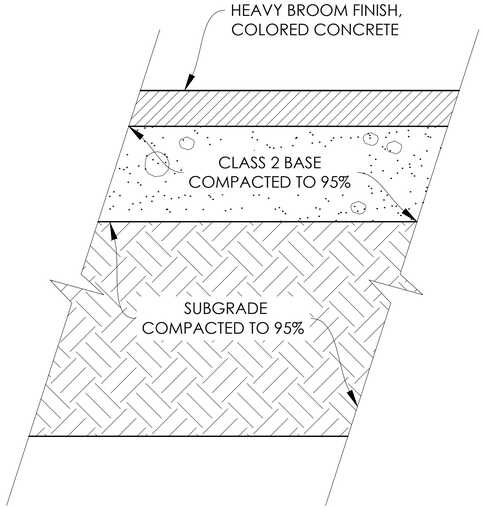
B-B CROSS-SECTION: STA.11+48 TO 12+48

SCALE: H: 1"= 5' V: 1" = 2.5'



C-C CROSS-SECTION: STA.16+57 TO 17+98

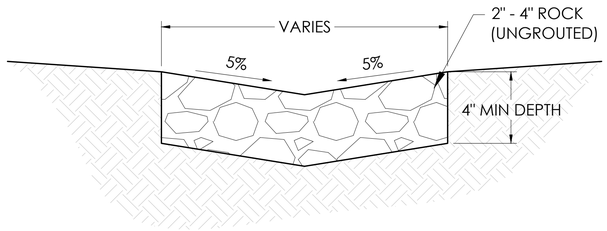
SCALE: H: 1"= 5' V: 1" = 2.5'



NOTE: SECTION PER GEOTECHNICAL ENGINEER

D STRUCTURAL SECTION ASPHALT CONCRETE ROAD

SCALE: N.T.S.



E ROCK-LINED SWALE

SCALE: N.T.S.

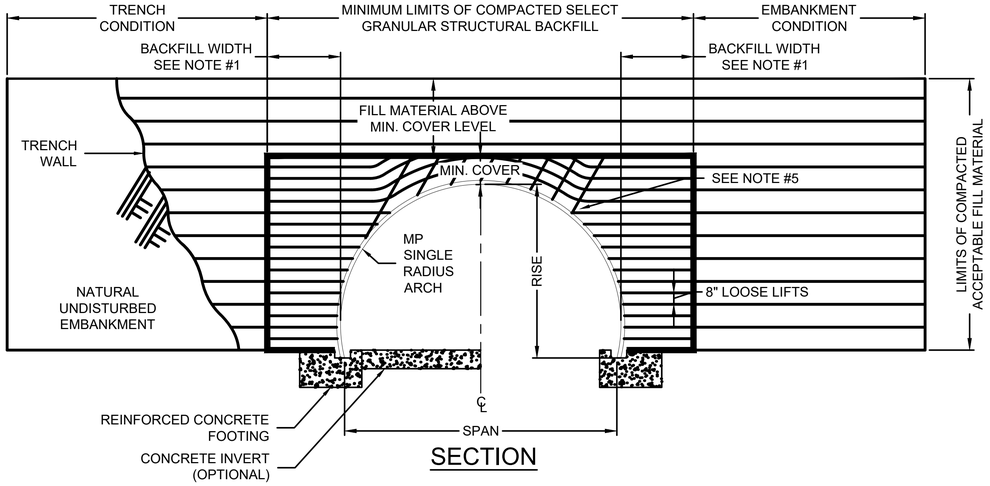
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CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

DETAILS C4.0



SECTION

SELECT GRANULAR STRUCTURAL BACKFILL LIMITS.

INITIAL LIFTS OVER THE CROWN OF STRUCTURE AS INDICATED BY SHADED AREA TO BE COMPACTED TO REQUIRED DENSITY WITH HAND OPERATED EQUIPMENT OR WITH LIGHTWEIGHT (D-4 OR LIGHTER) EQUIPMENT.

NOTES:

1. TRENCH WIDTH AND/OR SELECT BACKFILL WIDTH SHALL BE DETERMINED BY THE ENGINEER DEPENDING ON SITE SPECIFIC CONDITIONS. TYPICAL BACKFILL WIDTH IS 4 FEET FOR STRUCTURE SPANS 14 FEET AND LESS, AND 6 FEET FOR STRUCTURE SPANS GREATER THAN 14 FEET.
2. ALL SELECT GRANULAR BACKFILL TO BE PLACED IN A BALANCED FASHION IN THIN LIFTS (8" LOOSE TYPICALLY) AND COMPACTED TO 90 PERCENT DENSITY PER AASHTO T-180.
3. COMPLETE AND REGULAR MONITORING OF THE SINGLE RADIUS ARCH STRUCTURE IS NECESSARY DURING THE BACKFILL PROCESS TO AT LEAST THE MINIMUM COVER LEVEL.
4. PREVENT DISTORTION OF SHAPE AS NECESSARY BY VARYING COMPACTION METHODS AND EQUIPMENT.
5. PLACE SELECT GRANULAR BACKFILL IN RADIAL LIFTS AT APPROXIMATELY 75% OF THE RISE OF THE SINGLE RADIUS ARCH STRUCTURE.

ADDITIONAL SELECT GRANULAR STRUCTURAL BACKFILL NOTES:

SATISFACTORY BACKFILL MATERIAL, PROPER PLACEMENT, AND COMPACTION ARE KEY FACTORS IN OBTAINING MAXIMUM STRENGTH AND STABILITY.

THE BACKFILL MATERIAL SHOULD BE FREE OF ROCKS, FROZEN LUMPS, AND FOREIGN MATERIAL THAT COULD CAUSE HARD SPOTS OR DECOMPOSE TO CREATE VOIDS. BACKFILL MATERIAL SHOULD BE WELL GRADED GRANULAR MATERIAL THAT MEETS THE REQUIREMENTS OF AASHTO M-145 FOR SOIL CLASSIFICATIONS A-1, A-2-4, A-2-5 OR A-3 MODIFIED. *SEE THE STRUCTURAL PLATE BACKFILL GROUP CLASSIFICATION TABLE ON THIS SHEET.* BACKFILL MUST BE PLACED SYMMETRICALLY ON EACH SIDE OF THE STRUCTURE IN 8" LOOSE LIFTS. EACH LIFT IS TO BE COMPACTED TO A MINIMUM OF 90% DENSITY PER AASHTO T-180.

A HIGH PERCENTAGE OF SILT OR FINE SAND IN THE NATIVE SOILS SUGGESTS THE NEED FOR A WELL GRADED GRANULAR BACKFILL MATERIAL TO PREVENT SOIL MIGRATION. IF THE PROPOSED BACKFILL IS NOT A WELL GRADED GRANULAR MATERIAL, A NON-WOVEN GEOTEXTILE FILTER FABRIC SHALL BE PLACED BETWEEN THE SELECT BACKFILL AND THE IN SITU MATERIAL.

DURING BACKFILL, ONLY LIGHTWEIGHT TRACKED VEHICLES (D-4 OR LIGHTER) SHOULD BE NEAR THE STRUCTURE AS FILL PROGRESSES ABOVE THE CROWN AND TO THE FINISHED GRADE. THE ENGINEER AND CONTRACTOR ARE CAUTIONED THAT THE MINIMUM COVER MAY NEED TO BE INCREASED TO HANDLE TEMPORARY CONSTRUCTION VEHICLE LOADS (HEAVIER THAN D-4).

GROUP CLASSIFICATION	**A-1-a**	**A-1-b**	**A-2-4**	**A-2-5**	**A-3**
Sieve Analysis Percent Passing					
No. 10 (2.000 mm)	**50 max.**	----	----	----	----
No. 40 (0.425 mm)	**30 max.**	**50 max.**	----	----	**51 max.***
No. 200 (0.075 mm)	**15 max.**	**25 max.**	**35 max.**	**35 max.**	**10 max.**
Atterberg Limits for Fraction Passing No. 40 (0.425 mm)					
Liquid Limits	----	----	**40 max.**	**41 min.**	----
Plasticity Index	**6 max.**	**6 max.**	**10 max.**	**10 max.**	**Non Plastic**
Usual Materials	**Stone Fragment, Gravel and Sand**		**Silty or Clayey Gravel and Sand**		**Coarse Sand**

*Modified from AASHTO M-145.

Fine beach sands, windblown sands, stream deposited sands, etc., exhibiting fine, rounded particles and typically classified by AASHTO M-145 as A-3 Materials should not be used.

Reference the most current version of ASTM D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System), for comparable soil groups.

1.0 STANDARDS AND DEFINITIONS

1.1 STANDARDS - All standards refer to the current ASTM/AASHTO edition unless otherwise noted.

1.1.1 ASTM A761 "Corrugated Steel Structural Plate, Zinc Coated for Field-Bolted Pipe, Pipe-Arches and Arches" (AASHTO Designation M-167).

1.1.2 AASHTO Standard Specification for Highway Bridges - Section 12 Division I - Design, AASHTO LRFD Bridge Design Specifications Section 12.

1.1.3 AASHTO Standard Specification for Highway Bridges - Section 26 Division II - Construction, AASHTO LRFD Bridge Construction Specifications - Section 26. ASTM A807, Standard Practice for Installing Corrugated Steel Structural Plate Pipe.

1.2 DEFINITIONS

1.2.1 Owner - In these specifications the word "Owner" shall mean ############.

1.2.2 Engineer - In these specifications the word "Engineer" shall mean the Engineer of Record or Owner's designated engineering representative.

1.2.3 Manufacturer - In these specifications the word "Manufacturer" shall mean CONTECH ENGINEERED SOLUTIONS 800-338-1122 ##########.

1.2.4 Contractor - In these specifications the word "Contractor" shall mean the firm or corporation undertaking the execution of any installation work under the terms of these specifications.

1.2.5 Approved - In these specifications the word "approved" shall refer to the approval of the Engineer or his designated representative.

1.2.6 As Directed - In these specifications the words "as directed" shall refer to the directions to the Contractor from the Owner or his designated representative.

2.0 GENERAL CONDITIONS

2.1 Any installation guidance provided herein shall be endorsed by the Engineer; discrepancies herein are governed by the Engineer's plans and specifications.

2.2 The Contractor shall furnish all labor, material and equipment and perform all work and services except those set out and furnished by the Owner, necessary to complete in a satisfactory manner the site preparation, excavation, filling, compaction, grading as shown on the plans and as described therein. This work shall consist of all mobilization clearing and grading, grubbing, stripping, removal of existing material unless otherwise stated, preparation of the land to be filled, filling of the land, spreading and compaction of the fill, and all subsidiary work necessary to complete the grading of the cut and fill areas to conform with the lines, grades, slopes, and specifications. This work is to be accomplished under the observation of the Owner or his designated representative.

2.3 Prior to bidding the work, the Contractor shall examine, investigate and inspect the construction site as to the nature and location of the work, and the general and local conditions at the construction site, including without limitation, the character of surface or subsurface conditions and obstacles to be encountered on and around the construction site and shall make such additional investigation as he may deem necessary for the planning and proper execution of the work.

If conditions other than those indicated are discovered by the Contractor, the Owner shall be notified immediately. The material which the Contractor believes to be a changed condition shall not be disturbed so that the owner can investigate the condition.

2.4 The construction shall be performed under the direction of the Engineer.

2.5 All aspects of the structure design and site layout including foundations, backfill, end treatments and necessary scour consideration shall be performed by the Engineer.

3.0 ASSEMBLY AND INSTALLATION

3.1 Bolts and nuts shall conform to the requirements of ASTM A449. The single radius arch structure shall be assembled in accordance with the plate layout drawings provided by the Manufacturer and per the Manufacturer's recommendations.

Bolts shall be tightened using an applied torque of between 100 and 300 ft.-lbs.

3.2 The single radius arch structure shall be installed in accordance with the plans and specifications, the Manufacturer's recommendations, and AASHTO Standard Specification for Highway Bridges - Section 26 Division II - Construction/AASHTO LRFD Bridge Construction Specifications - Section 26.

3.3 Trench excavation shall be made in embankment material that is structurally adequate. The trench width shall be shown on the plans. Poor quality in situ embankment material must be removed and replaced with suitable backfill as directed by the Engineer.

3.4 Bedding preparation is critical to both structure performance and service life. The bed should be constructed to uniform line and grade to avoid distortions that may create undesirable stresses in the structure and/or rapid deterioration of the roadway. The bed should be free of rock formations, protruding stones, frozen lumps, roots, and other foreign matter that may cause unequal settlement.

3.5 The structure shall be assembled in accordance with the Manufacturer's instructions. All plates shall be unloaded and handled with reasonable care. Plates shall not be rolled or dragged over gravel rock and shall be prevented from striking rock or other hard objects during placement in trench or on bedding.

3.6 The structure shall be backfilled using clean well graded granular material that meets the requirements for soil classifications A-1, A-2-4, A-2-5 or A-3 modified per AASHTO M-145. See the structural plate backfill group classification table on this sheet.

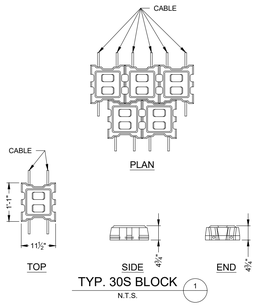
Backfill must be placed symmetrically on each side of the structure in 8 inch loose lifts. Each lift shall be compacted to a minimum of 90 percent density per AASHTO T-180.

3.7 If temporary construction vehicles are required to cross the structure, it is the Contractor's responsibility to contact the Engineer to determine the amount of additional minimum cover necessary to handle the specific loading condition.

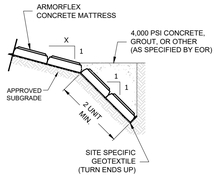
Normal highway traffic is not allowed to cross the structure until the structure has been backfilled and paved. If the road is unpaved, cover allowance to accommodate rutting shall be as directed by the Engineer.

3.8 If a metal headwall and/or wingwall system is specified, the select granular structural backfill limits shall extend past the deadman anchor system. Contact the Engineer if stiff material or rock is encountered where the wingwalls and deadmen are to be installed.

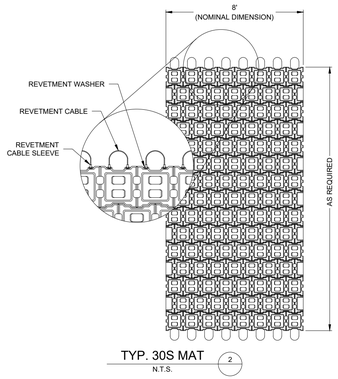
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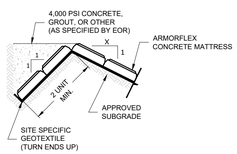
TYP. 30S BLOCK (1)
N.T.S.



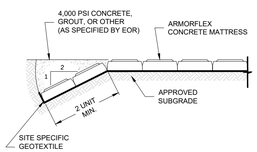
TOE TERMINATION
N.T.S.



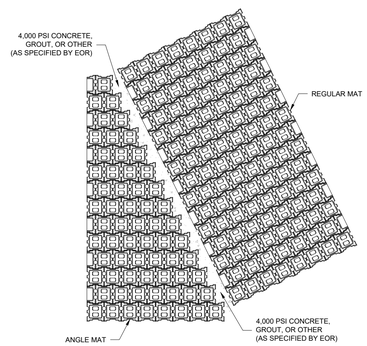
TYP. 30S MAT (2)
N.T.S.



TOP TERMINATION
N.T.S.

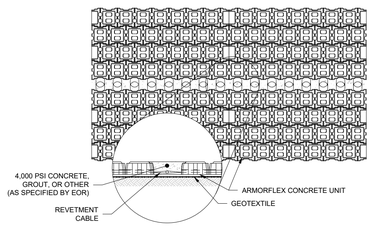


FLANK TERMINATION
N.T.S.



NOTE:
ANGLE MATS WILL BE CONSTRUCTED BY OMITTING THE REQUIRED UNITS SO THE REQUIRED MAT DIMENSIONS CAN BE OBTAINED.

TYP. ANGLE MAT (3)
N.T.S.



TYP. MAT TO MAT (4)
N.T.S.

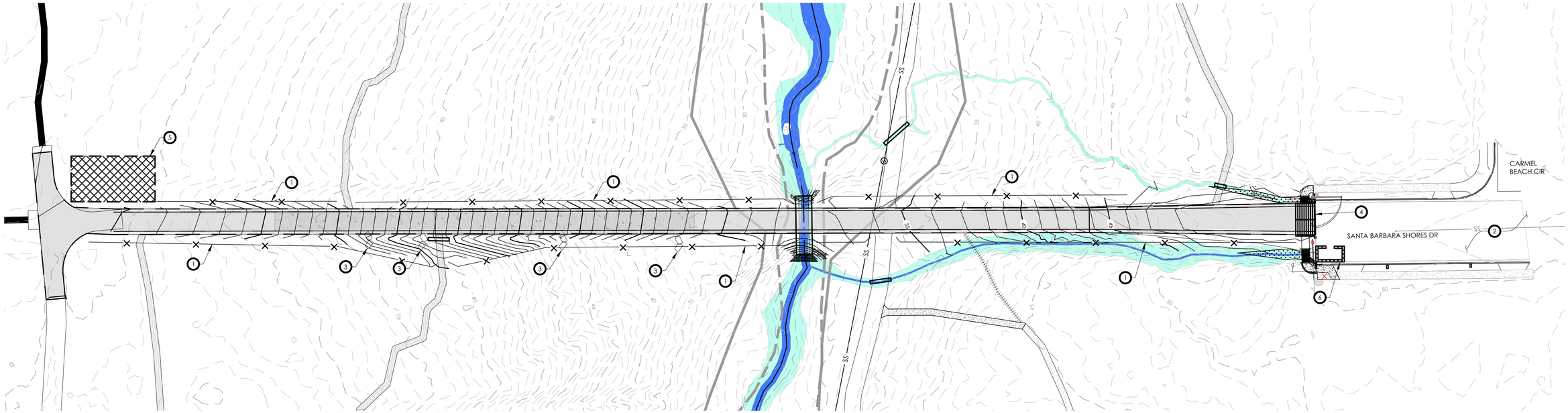
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CITY OF GOLETA | Coastal Conservancy

GOLETA MONARCH BUTTERFLY GROVE

DETAILS

C4.2



0 30 60 90 feet

SCALE: 1"=30'

STORMWATER POLLUTION PREVENTION BMPs

	BMP*	NAME	SYMBOL
1	SE-1	SILT FENCE	
2	SE-7	STREET SWEEPING & VACUUMING	
3	SE-10	STORM DRAIN INLET PROTECTION	
4	TC-1	STABILIZED CONSTRUCTION ENTRANCE	
5	WM-1	MATERIAL DELIVERY & STORAGE AREA CONSTRUCTION STAGING AREA	
6	WM-8	CONCRETE WASTE MANAGEMENT	

* REFERS TO BMP DESIGNATION GIVEN IN THE CASQA STORMWATER BEST MANAGEMENT PRACTICE CONSTRUCTION HANDBOOK. SEE HANDBOOK FOR BMP DETAILS AND IMPLEMENTATION STRATEGIES.

GENERAL NOTES

1. THESE PLANS ARE INTENDED TO REPRESENT DIFFERENT PHASES DURING CONSTRUCTION. THE CONTRACTOR SHALL IMPLEMENT THE BMP'S SHOWN AND/OR ANY OTHER MEASURES NECESSARY DURING CONSTRUCTION TO BE IN COMPLIANCE WITH THE GENERAL PERMIT. IMPLEMENTATION OF THE THE BMP'S SHOWN ON THESE PLANS, DO NOT RELIEVE THE OWNER OR HIS/HER REPRESENTATIVE FROM RESPONSIBILITY OF IMPLEMENTING ALL MEASURES NEEDED TO BE IN COMPLIANCE.
2. CONSTRUCTION THAT INCLUDES DEMOLITION AND REPLACEMENT OF EXISTING ASPHALT SHALL BE COMPLETED WHEN THERE IS NO FORECAST RAIN EVENTS. AREAS THAT WILL BE IDLE FOR EXTENDED PERIODS OF TIME SHALL BE COVERED WITH TEMPORARY ASPHALT PATCHING, (COLD MIX).
3. GRAVEL BAGS SHOWN IN THE CURB AND GUTTER FLOW LINES SHALL BE ORIENTED TO TEMPORARILY SLOW AND DAM THE FLOWING STORM WATER IN THE GUTTERS TO HELP FILTER OUT ANY SEDIMENTS. THESE GRAVEL BAGS SHALL BE SPACED AT 50' O/C OR CLOSER AS CONDITIONS WARRANT.
4. STREETS SHALL BE CLEANED AS NEEDED BY MEANS OF MOBILE STREET SWEEPERS.



NOTES:

1. ALL CONCRETE TRUCKS AND FINISHING TOOLS SHALL BE WASHED AT THE WASH OFF AREA.
2. ALL CONCRETE WASTE COLLECTED IN WASH OFF AREA SHALL BE RECYCLED OR APPROPRIATELY DISPOSED OF OFF-SITE.
3. LOCATION AND SIZE OF WASH-OFF AREA MAY BE ADJUSTED TO ACCOMMODATE SITE CONDITIONS.

TYPICAL CONCRETE WASH-OFF AREA SECTION

SCALE: N.T.S.



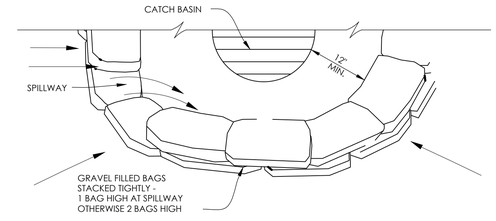
FILL GRAVEL BAGS ONE HALF FULL WITH GRAVEL.

GATHER TOP OF GRAVEL BAG AND TIE SECURELY WITH HEAVY STRING.

CARE SHOULD BE TAKEN TO STACK GRAVEL BAGS IN ACCORDANCE WITH THE ILLUSTRATIONS. STAMP EACH GRAVEL BAG INTO PLACE, COMPLETING EACH LAYER PRIOR TO STARTING THE NEXT LAYER.

GRAVEL BAG INSTALLATION

SCALE: N.T.S.

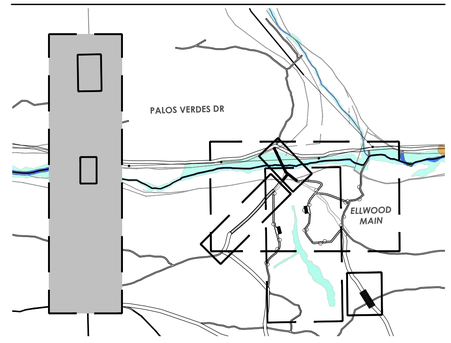


CATCH BASIN INLET SEDIMENT BARRIER

SCALE: N.T.S.

LEGEND

- EXISTING EARTHEN TRAIL
- EXISTING VEHICLE ACCESS ROAD (EARTHEN)
- EXISTING ASPHALT PAVEMENT
- EXISTING CONCRETE PAVEMENT
- PROPOSED EARTHEN TRAIL
- PROPOSED VEHICLE ACCESS ROAD (EARTHEN)
- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- NON-WETLAND WATERS OF THE U.S. (USACE)
- NON-WETLAND WATERS OF THE STATE
- PROPOSED ELEVATED BOARDWALK
- PROPOSED RIPRAP
- PROPOSED SWALE
- RECLAIMED PATH SECTIONS
- SURFACE FLOW DIRECTION
- EXISTING ITEM TO BE REMOVED
- SAWCUT SECTION
- ROAD SHOULDER
- FEMA FLOOD ZONE A (100-YEAR)
- FEMA FLOODWAY



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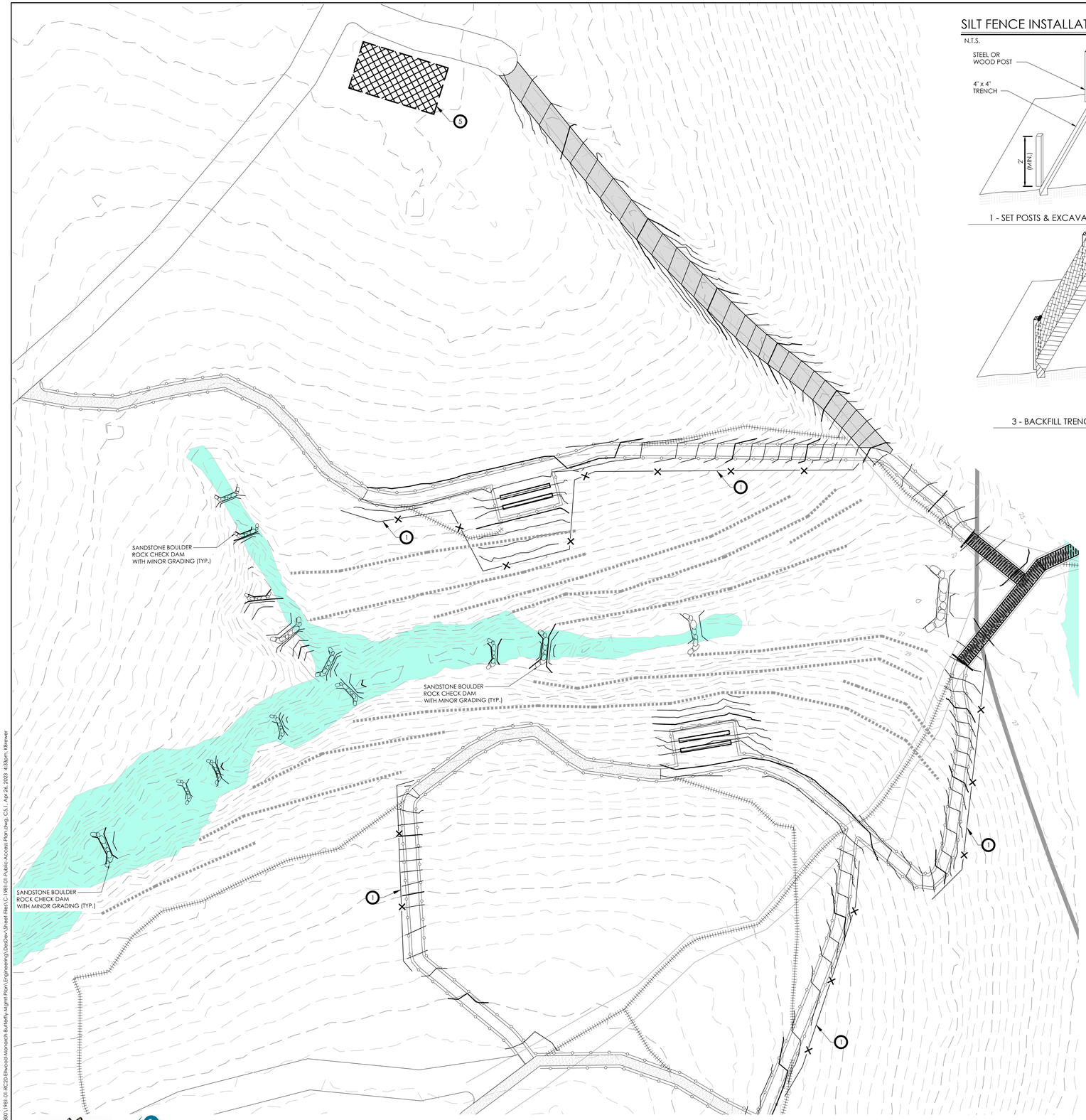
CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

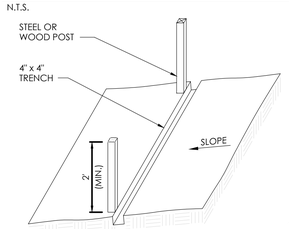
EROSION CONTROL PLAN

C5.0

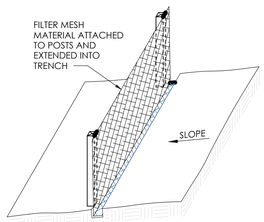


SILT FENCE INSTALLATION

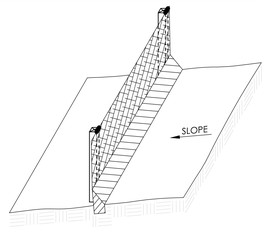
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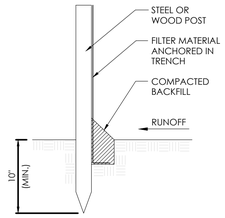
1 - SET POSTS & EXCAVATE TRENCH



2 - INSTALL FILTER FABRIC



3 - BACKFILL TRENCH



4 - CROSS SECTION OF
INSTALLED FILTER FABRIC

SILT FENCE

CONSTRUCTION SPECIFICATIONS:

- THE HEIGHT OF A SILT FENCE SHALL NOT EXCEED 36 INCHES (0.9 M). STORAGE HEIGHT AND PONDING HEIGHT SHALL NEVER EXCEED 18 INCHES (0.5 M).
- THE FENCE LINE SHALL FOLLOW THE CONTOUR AS CLOSELY AS POSSIBLE. IF POSSIBLE, THE FILTER FABRIC SHALL BE CUT FROM A CONTINUOUS ROLL TO AVOID THE USE OF JOINTS.
- JOINTS, WHEN NECESSARY, SHALL BE SPLICED ONLY AT A SUPPORT POST, WITH A MINIMUM 6 INCH (0.2 M) OVERLAP AND BOTH ENDS SECURELY FASTENED TO THE POST.
- POSTS SHALL BE SPACED A MAXIMUM OF 10 FEET (3.1 M) APART AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES (0.3M)). WHEN EXTRA-STRENGTH FABRIC IS USED WITHOUT THE WIRE SUPPORT FENCE, POST SPACING SHALL NOT EXCEED 6 FEET (1.8 M).
- TURN THE ENDS OF THE FENCE UPHILL.
- A TRENCH SHALL BE EXCAVATED APPROXIMATELY 4 INCHES (101 MM) WIDE AND 6 INCHES (0.2 M) DEEP ALONG THE LINE OF POSTS AND UP-SLOPE FROM THE BARRIER.
- WHEN STANDARD-STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UP-SLOPE SIDE OF THE POSTS USING HEAVY DUTY WIRE STAPLES AT LEAST 1 INCH (25.4 MM) LONG, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 2 INCHES (51MM) ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
- WHEN EXTRA-STRENGTH FILTER FABRIC AND CLOSER POST SPACING ARE USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH A CASE, THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POSTS.
- THE TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE TOE OF THE FILTER FABRIC.
- SILT FENCES PLACED AT THE TOE OF A SLOPE SHALL BE SET AT LEAST 6 FEET (1.8 M) FROM THE TOE IN ORDER TO INCREASE PONDING VOLUME.
- SILT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED AND ANY SEDIMENT STORED BEHIND THE SILT FENCE HAS BEEN REMOVED.

INSPECTION AND MAINTENANCE:

- SILT FENCES AND FILTER BARRIERS SHALL BE INSPECTED WEEKLY AFTER EACH SIGNIFICANT STORM (1 INCH (25.4 MM) IN 24 HOURS). ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
- SEDIMENT SHOULD BE REMOVED WHEN IT REACHES ½ HEIGHT OF THE FENCE OR 9 INCHES (0.3 M) MAXIMUM.
- THE REMOVED SEDIMENT SHALL CONFORM WITH THE EXISTING GRADE AND BE VEGETATED OR OTHERWISE STABILIZED.

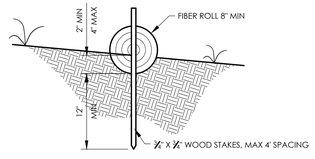
SILT FENCE CONSTRUCTION DETAIL

SCALE: N.T.S.

STORMWATER POLLUTION PREVENTION BMPs

	BMP*	NAME	SYMBOL
1	SE-1	SILT FENCE	
2	SE-7	STREET SWEEPING & VACUUMING	
3	SE-10	STORM DRAIN INLET PROTECTION	
4	TC-1	STABILIZED CONSTRUCTION ENTRANCE	
5	WM-1	MATERIAL DELIVERY & STORAGE AREA CONSTRUCTION STAGING AREA	
6	WM-8	CONCRETE WASTE MANAGEMENT	
7	SE-5	FIBER ROLL	

* REFERS TO BMP DESIGNATION GIVEN IN THE CASQA STORMWATER BEST MANAGEMENT PRACTICE CONSTRUCTION HANDBOOK. SEE HANDBOOK FOR BMP DETAILS AND IMPLEMENTATION STRATEGIES.



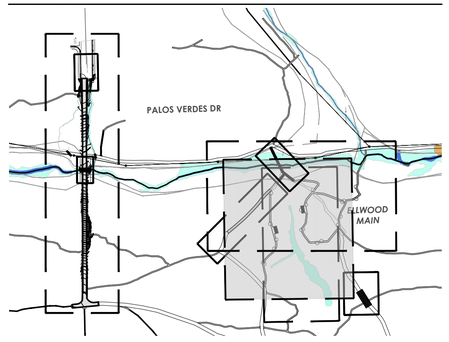
FIBER ROLL INSTALLATION

SCALE: N.T.S.

GENERAL NOTES

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3. GRAVEL BAGS SHOWN IN THE CURB AND GUTTER FLOW LINES SHALL BE ORIENTED TO TEMPORARILY SLOW AND DAM THE FLOWING STORM WATER IN THE GUTTERS TO HELP FILTER OUT ANY SEDIMENTS. THESE GRAVEL BAGS SHALL BE SPACED AT 50' O/C OR CLOSER AS CONDITIONS WARRANT.
4. STREETS SHALL BE CLEANED AS NEEDED BY MEANS OF MOBILE STREET SWEEPERS.

KEY MAP:



0 20 40 30 feet

SCALE: 1"=20'

CITY OF GOLETA Coastal Conservancy

APRIL 26, 2023

GOLETA MONARCH BUTTERFLY GROVE

EROSION CONTROL PLAN

C5.1

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Appendix F

Biological Resources Assessment Report

Appendix F



Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan Implementation – Phase 1

Biological Resources Assessment

prepared for

City of Goleta
130 Cremona Drive
Goleta, California 93117
Contact: George Thomson
Via email: gthomson@cityofgoleta.org

prepared by

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

February 2023

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

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Executive Summary

This report documents the findings of a Biological Resources Assessment conducted by Rincon Consultants, Inc. for City of Goleta's Ellwood Mesa Monarch Butterfly Habitat Management Plan Implementation – Phase 1 (project). The Ellwood Mesa Monarch Butterfly Habitat Management Plan was approved by the City Council in 2019. The project is located on seven City-owned parcels (Assessor Parcel Numbers 079-210-024, 079-210-050, 079-210-051, 079-210-069, 079-395-015, 079-442-023, 079-445-001) within the Ellwood Mesa Open Space and Sperling Preserve, entirely within the Coastal Zone. This Biological Resources Assessment documents the biological resources that occur, or have the potential to occur, based on results of field visits and a desktop review, and provides an assessment of potential impacts to those resources from proposed activities associated with the project site. This report also includes recommended avoidance and minimization measures for protection of sensitive resources occurring in and adjacent to the project site.

The project is the Phase 1 implementation of the Monarch Butterfly Habitat Management Plan through the restoration at four of the eight aggregation sites at Ellwood Mesa, which is one of the most important sites for monarch butterflies in California. The project includes improvements to wildlife habitat, reduction of wildfire risk, invasive plant management, trail maintenance and improvements, signage, drainage improvements, and various other stewardship actions. Specifically, the project involves habitat enhancements (site preparation, removal of downed and dead eucalyptus trees, eucalyptus tree replacement, nectar and native vegetation plantings, temporary irrigation, sourced plant materials, and seed storage and propagation) and public access and trail improvements (viewing areas repair and enhancement, trail improvements, signage program, emergency/maintenance road repairs, footbridge replacement, open space accessories, and culvert and drainage repairs).

This report describes biological resources within the entire Monarch Butterfly Habitat Management Plan Coverage Area and the project site plus a 100-foot buffer (the study area). Impact analysis, however, is limited to the project site, which is where the activities that the City of Goleta is proposing at this time will occur over the next 1 to 2 years. The Monarch Butterfly Habitat Management Plan Implementation – Phase 2 will address additional activities that will be analyzed separately.

The study area consists primarily of large eucalyptus groves that provide habitat to overwintering populations of Monarch butterflies, raptors, nesting birds, and other wildlife. Ten unnamed ephemeral drainages and two coastal wetlands are present within the study area that are potentially subject to United States Army Corps of Engineers, California Coastal Commission, California Department of Fish and Wildlife, Regional Water Quality Control Board, the City jurisdiction. Devereux Creek bisects the project site in a generally west to east trajectory, is associated with the arroyo willow riparian corridor, and is part of an Environmentally Sensitive Habitat Area.

These jurisdictional waters along with the eucalyptus grove support habitat that is key for monarch butterflies and other wildlife movement; however, the project is not located within an *Essential Connectivity Area*, as determined by the California Essential Habitat Connectivity Project. Ellwood is part of the Goleta Coast Important Bird Area, considered to be globally important due to its location on the Pacific Flyway.

Fourteen vegetation communities and four land cover types are present within the study area, of which some are considered Environmentally Sensitive Habitat Areas per the City of Goleta Genera Plan/Coastal Land Use Plan and California Coastal Act. The vegetation communities and land cover types support a variety of special-status plant and animal species such as Santa Barbara honeysuckle (*Lonicera subspicata*, California Rare Plant Rank 1B.2 and Santa Barbara Botanic Garden Rare Plant), California overwintering population of monarch butterflies (*Danaus plexippus* pop. 1), Cooper's hawk (*Accipiter cooperii*), and white-tailed kite (*Elanus leucurus*), which are known to occur within the project site. Six special-status plant species and seven special-status animal species have a moderate to high potential to occur or are present within the study area. Mature native trees are also present within the study area.

Incorporation of recommended mitigation measures from the Ellwood Monarch Butterfly Habitat Management Plan Initial Study – Mitigated Negative Declaration (IS/MND; State Clearinghouse [SCH] No. 2019011059), policies from various programs in the Monarch Butterfly Habitat Management Plan, and Environmental Protection Practices proposed in this Biological Resources Assessment would minimize impacts to special-status species, sensitive vegetation communities and Environmentally Sensitive Habitat Areas, jurisdictional waters, native trees, and wildlife movement.

Habitat Types within Study Area

Vegetation Community/Land Cover Type	Total Acres	ESHA Acres
Vegetation Community		
Alkali Heath Marsh	0.99	0.99
Arroyo Willow Thickets	1.52	1.52
Coast Live Oak Woodland and Forest	1.14	1.14
Coyote Brush Scrub	14.06	2.51
Creeping Wildrye Turfs	0.64	0.64
Eucalyptus Grove	65.32	65.32
Hardstem Bulrush Marshes	0.19	0.19
Ice Plant Mats	1.98	-
Iris-Leaf Rush Seeps	0.11	0.11
Lemonade Berry Scrub	0.06	0.06
Perennial Rye Grass Fields	0.09	0.09
Purple Needle Grass Grassland	7.28	7.28
Upland Mustards	2.73	0.19
Wild Oats and Annual Brome Grasslands	22.51	2.98
Land Cover Type		
Bare Ground	3.93	1.5
Developed/Ornamental	17.57	0.36
Native Landscaping/Restoration	0.54	0.54
Undifferentiated Ornamental Shrubland	0.69	0.22
Total	**141.37**	**85.64**

1 Introduction

Rincon Consultants, Inc. has prepared this Biological Resources Assessment (BRA) on behalf of the City of Goleta (City), for the Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan (MBHMP) Implementation – Phase 1 (herein referred to as the project) in the City, Santa Barbara County, California. The purpose of the BRA is to support the issuance of a Coastal Development Permit (CDP) by the California Coastal Commission (CCC), a Development Plan by the City, and a Lake and Streambed Alteration Agreement (LSAA) by the California Fish and Wildlife Department (CDFW). The BRA documents the existing conditions and evaluates the potential for impacts to special status species and sensitive habitats pursuant to the CCC) guidance and consistent with the City's General Plan/Coastal Land Use Plan (GP/CLUP; City 2006). An Initial Study – Mitigated Negative Declaration (IS/MND; State Clearinghouse [SCH] No. 2019011059) for the MBHMP (Rincon 2019a) was approved by the City on March 25, 2019 and is provided in Appendix G. The MBHMP project was determined not to have a significant effect on the environment with the adoption of a mitigation monitoring and reporting program (MMRP) for the conditions of project approval necessary to mitigate or avoid significant effects. This BRA incorporates by reference the mitigation measures (MMs) from the IS/MND for the MBHMP.

1.1 Project Location

Regionally, the project 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). The approximate center of the project is located at latitude 34.423235 and longitude -119.8890608 (WGS84). The Pacific Ocean is less than 200 feet to the south from the southeastern corner of the project and the Santa Ynez Mountains are approximately 3.5 miles to the north (Figure 1). The project is in the Santa Ynez – Sulphur Mountains subsection of the Southern California Coast (USFS 2014), an ecological sub-unit that extends from the mouth of the Santa Ynez River 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 form relatively steep hillsides vegetated by with chaparral and scrub vegetation types, drained by incised streams. The project is on the coastal plain between the southern foot of the mountains and the Pacific Ocean.

Locally, the project is in the City in Santa Barbara County, California, 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). The project is located within the Ellwood Mesa Open Space (Ellwood Mesa) within a portion of the overall MBHMP area (Figure 2). The entire open space is in the Coastal Zone. The MBHMP Phase I project area includes 60 acres containing four aggregation sites (Ellwood Main, Ellwood West, Ellwood Ironbark, and Ellwood North) with the highest number of overwintering populations historically, within the overall MBHMP area.

1.2 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.

1.3 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.

Two types of activities will occur in Phase 1:

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.

1.3.1 Project Activities: 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 CalPoly.

Native trees will also be planted to provide wind protection including Western sycamores (*Platanus racemose*), 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. Vernal pools will … Plan Set X, Appendix F, provides details for planting.

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

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.

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, dated XX, sheets L3.0-L3.7 for details.

Plant Protection

Signage and temporary construction fencing per Public Access and Signage Plan (Plan Sheet xx) will be placed around the native gardens to inform people to stay out of the restoration area to minimize trampling of native plants.

Irrigation

A temporary irrigation system will be installed to irrigate areas where replacement trees and native vegetation are planted to promote establishment. (Size) lines will be installed within the existing trail system. Size lines will extend on top of ground to the planted trees and gardens. A total of X will be installed underground permanently, and x will be temporarily. Temporary lines will be removed X.

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, dated XX, sheets L2.0-L2.8 for additional detail.

Use of Pesticides

No pesticides will be used.

1.3.2 Project Activities: 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 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, dated XX, 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.

Approximately 5CY of cut and of fill will be required to replace the 72” CMP culvert. 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, dated XX, sheets C2.0-C2.4 for additional detail.

Footbridge Replacement

In xxx, citizens placed wooden planks in Devereux Creek as a crossing 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. No cut or fill will be required to replace the existing footbridge over Devereux Creek. See the Public Access Plans developed by RRM Design Group, dated XX, 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. See the Grading Plans developed by RRM Design Group, dated XX, sheets C2.0-C2.4 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, dated XX, 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, dated XX, sheets L1.0-L1.10 for additional detail.

Water will be stored at the site in a temporary aboveground water tank as illustrated on Plan Set XX. 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, dated XX, sheets L1.0-L1.10 for additional detail.

Erosion Control

Erosion control mitigation measures will be implemented during any/all grading activities. See Plan Set XXX

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, dated XX, 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. The access route will not be improved or marked with signage, to avoid unnecessary biological or visual impacts. Plan Set XX shows the temporary trail closures to public access during enhancement activities and the alternative trails that will be open to public access.

Access Plan

1.3.3 Environmental Protection Practices

Environmental protection practices or environmental commitments under Section 5 are incorporated herein into the project description based on existing regulations and policies in the City's GP/CLUP. The project proponents will implement these environmental commitments as part of the project construction activities. In other words, these commitments will be satisfied even if not separately imposed by the permitting agencies. If permitting agencies impose additional measures

or modifications, those will also be adhered to as part of the permit. These measures will be implemented prior to and during habitat enhancement and public access improvement activities with a potential to impact special status species, native trees, and jurisdictional waters.

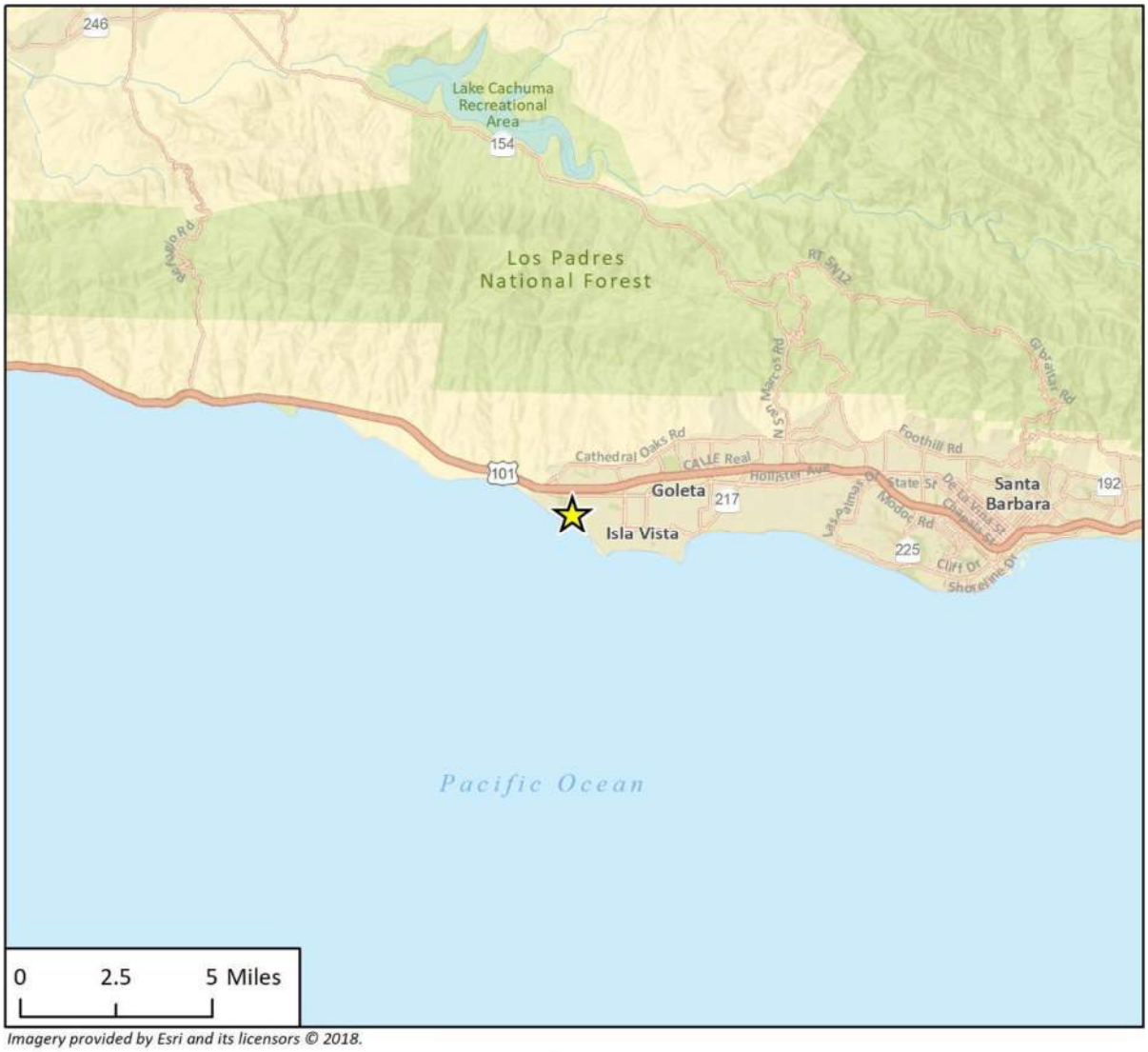
In addition to the measures included in the IS/MND, the following environmental protection practices are incorporated into the project description:

- **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.
- **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.
- **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.
- **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.
- **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.

- **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 was developed considering the elements within the CCC *Suggestions for Resource Management Plans* (CCC 2012).

Figure 1 Regional Location Map



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MBHMP Location

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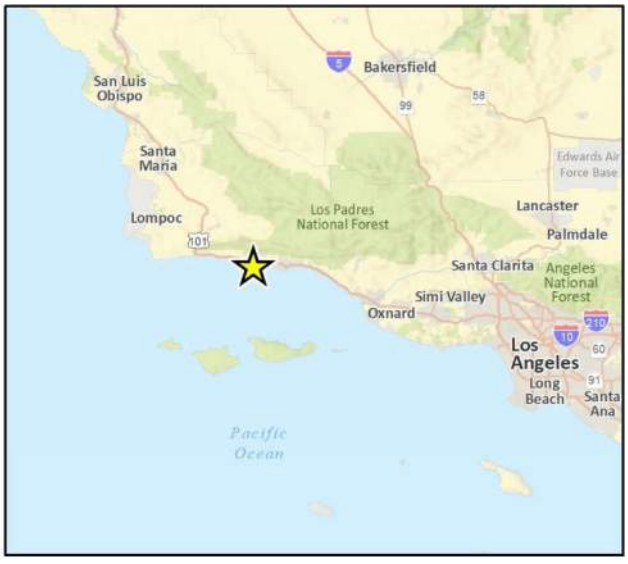
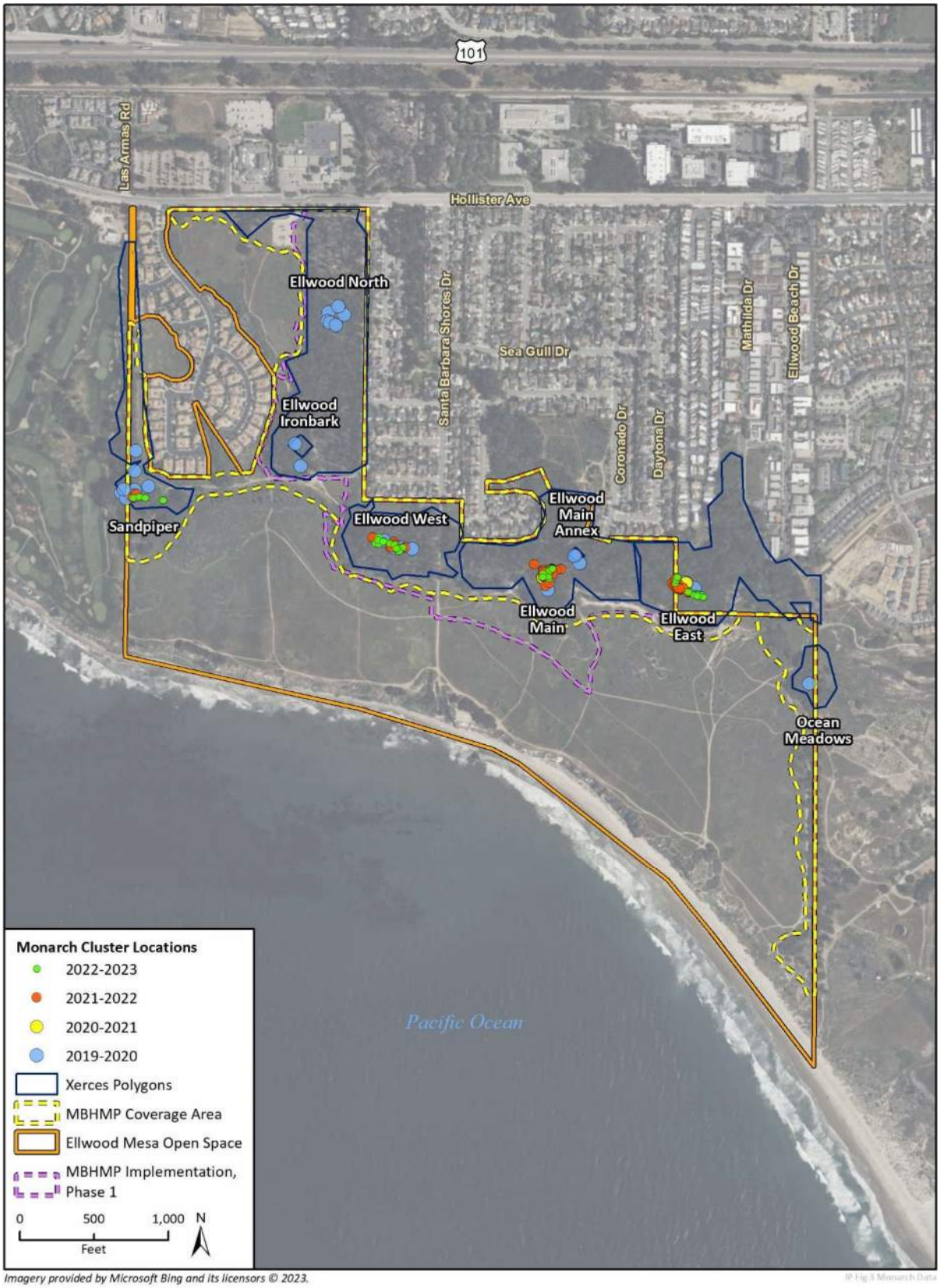


Figure 2 Project Location



Figure 3 Monarch Butterfly Aggregation Sites



2 Methodology

2.1 Regulatory Overview

Regulated or sensitive resources studied and analyzed herein include special status plant and animal species, nesting birds and raptors, sensitive plant communities and habitats, jurisdictional waters and wetlands, wildlife movement, and locally protected resources such as protected trees and Environmentally Sensitive Habitat Areas (ESHA). Regulatory authority over biological resources is shared by Federal, State, and local entities. Primary authority for regulation of general biological resources lies within the land use control and planning authority of local jurisdictions, in this instance, the City. Ellwood Mesa is located entirely within the Coastal Zone, under the jurisdiction of the CCC. The CCC has not yet certified a Local Coastal Program (LCP) for the City. Thus, the proposed project is subject to the CCC's coastal development permit jurisdiction, and the standard of review for this project is the Chapter Three policies of the California Coastal Act (CCA).

2.1.1 Definition of Special Status Species

For the purposes of this report, special status species include:

- Species listed as threatened or endangered under the Federal Endangered Species Act (ESA); species that are under review may be included if there is a reasonable expectation of listing within the life of the project
- Species listed as candidate, threatened, or endangered under the California Endangered Species Act (CESA)
- Species designated as Fully Protected, Species of Special Concern, or Watch List by the CDFW
- Plants occurring on lists 1 and 2 of the California Native Plant Society (CNPS) California Rare Plant Rank system (CRPR) and/or with a global or state rarity ranking of 1 to 3 by NatureServe
- Species designated as locally important by the City or otherwise protected through ordinance or local policy.
- Chapter Three policies of the CCA species that are and/or especially valuable and are easily disturbed and degraded by certain human activities and development.

2.1.2 Environmental Statutes

For the purpose of this report, potential impacts to biological resources were analyzed based on the following statutes (Appendix A):

- California Environmental Quality Act (CEQA) including the City's Environmental Thresholds and Guidelines Manual
- ESA
- CESA
- Federal Clean Water Act (CWA)
- California Fish and Game Code (CFGC)
- Migratory Bird Treaty Act (MBTA)
- Bald and Golden Eagle Protection Act

- Porter-Cologne Water Quality Control Act
- CCA
- City General Plan/Coastal Land Use Plan (Goleta GP/CLUP)
- Ellwood-Devereux Coast Open Space and Habitat Management Plan
- City of Goleta Creek and Watershed Management Plan

2.1.3 CEQA

The IS/MND (SCH) No. 2019011059 for the MBHMP (Rincon 2019a) was approved by the City on March 25, 2019 and is provided in Appendix G. The MBHMP project was determined not to have a significant effect on the environment with the adoption of a mitigation monitoring and reporting program (MMRP) for the conditions of project approval necessary to mitigate or avoid significant effects. This BRA incorporates by reference the Biological Resources mitigation measures from the IS/MND for the MBHMP. As such, the project is not anticipated to have a significant effect on the environment.

Nonetheless, the CEQA Guidelines Appendix G Initial Study Checklist and the City's Environmental Thresholds and Guidelines Manual (City 2002) were followed in this BRA as they are a useful and defined process for the evaluation and grouping of resource impacts. These guidelines aid in facilitating detailed discussion of impacts that may occur with this project, detailed analysis and species information, and sufficient project-level information. Literature Review

Rincon conducted a literature review to obtain baseline information about biological resources with potential to occur within the project site and in the surrounding area. The literature review included information from standard biological reference materials and regionally applicable regulatory guidance documents including, but not limited to, the following: Mammals of North America (Bowers et al. 2004); A Field Guide to the Mammals of North American North of Mexico (Burt and Grossenheider 1980); A Field Guide to Western Reptiles and Amphibians (Stebbins 2003); Birds of Santa Barbara County (Lehman 2022), Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986); Santa Barbara Breeding Bird Study (SBAS 2023); iNaturalist Observations (iNaturalist 2023); eBird Online Database (eBird 2023); The Jepson Manual: Vascular Plants of California, Second Edition, Thoroughly Revised and Expanded (Baldwin et al. 2012); The Manual of California Vegetation, Second Edition (MCV2; Sawyer et al. 2009); Rare Plants of Santa Barbara (Center for Plant Conservation 2007), UCSB Natural History Collection (UCSB 2023), Monarch Butterfly Overwintering Sites, Santa Barbara County, Santa Barbara (Meade et al 2017), City Creek and Watershed Management Plan (City2021), Goleta Slough Ecosystem Management Plan (Goleta Slough Management Committee 1997 and 2015), and the Goleta GP/CLUP (City2006). In addition, projects within the vicinity including the MBHMP (Rincon 2019a), UCSB Long Range Development Plan (UCSB 2016), and the San Jose Creek Multi-Use Path Project (Rincon 2019b) were also reviewed. This report is prepared to be consistent with the CCC *Guidelines for Biological Surveys and Biological Survey Reports for Proposed Development Projects* (CCC 2016) and *Suggestions for Preparing a Wetland Delineation Report for the California Coastal Commission* (City 2011), and the City's Environmental Thresholds and Guidelines Manual Appendix A Biological Resources/Technical Background (City 2002)

Other sources of information reviewed include aerial photographs, topographic maps, geologic maps, climatic data, and project plans. Rincon also conducted queries of relevant scientific databases which provide information about occurrences of sensitive biological resources: the CDFW Biogeographic Information and Observation System (CDFW 2023a); the California Natural Diversity

Data Base (CNDDB) (CDFW 2023b); the United States Fish and Wildlife Service (USFWS) Critical Habitat Portal (USFWS 2023a) and Information, Planning, and Conservation System Query (USFWS 2023b); United States National Wild and Scenic Rivers Program Map (United States National Wild and Scenic Rivers System 2023); National Wetlands Inventory (NWI) (USFWS 2023c); the United States Department of Agriculture, Natural Resource Conservation Service (USDA NRCS) Web Soil Survey (USDA NRCS 2023), and the CNPS Online Inventory of Rare and Endangered Plants of California (CNPS 2023).

Rincon compiled a complete list of special status species previously documented within a 10-mile radius of the project from the CNDDB query and additional sources. Then an analysis to determine which of these special status species have the potential to occur within the project was conducted. The habitat requirements for each special status species were assessed and compared to the type and quality of habitats observed on-site during the reconnaissance survey. Conclusions regarding which special status species have the potential to occur were based not only on background research and literature review previously mentioned, but also on the data collected in the field during the site survey. Several regionally occurring special status species were eliminated due to lack of suitable habitat within the project, range in elevation, and/or geographic distribution. A table summarizing the results of the special status species assessment is provided in Appendix D.

2.2 Field Surveys

Field surveys were conducted within the MBHMP Coverage Area plus a 100-foot survey buffer (together comprising the Study Area) to obtain information regarding special status plants and animals, sensitive vegetation communities, and other resources that are regulated by federal, state and local agencies. The methods for each survey type are presented in Section 2.3.1 to Section 2.3.4 below. The dates and personnel for each survey are also presented in Table 1. Note that three native plant surveys were conducted for Ellwood North, Ellwood Main, and Ellwood Ironbark/Ellwood West for the purposes of informating restoration/enhancement activities. These surveys are referenced in Table 1 below but not discussed further or depicted graphically in this BRA as native plant locations are discussed generally, however any rare plants detected incidentally during theses surveys is discussed and mapped in the BRA. In addition, note that during all surveys, biologists were directed to document any incidentally observed signs of special-status species.

Table 1 Field Surveys Summary

Date	Personnel	Time	Weather Conditions	Survey Type
08/17/2021	J. Love	0930-1400	Clear, 0% cloud cover, wind 2-5 miles per hour (mph), temperature 68-70°F	Native Plant Survey (Ellwood North)
09/29/2021	J. Love, Y. Huo	0930-1400	Clear, 0% cloud cover, wind 5-9 miles per hour (mph), temperature 66-72°F	Native Plant Survey and Vegetation Community Mapping (Ellwood Main)
10/5/2021	R. Murray, Y. Huo	0930-1400	Clear, 25% cloud cover, wind 5-13 mph, temperature 69-76°F	Jurisdictional Delineation
12/10/2021	R. Murray, K. Bonsall	0715-0830	Clear, 0% cloud cover, wind 0 mph, temperature 43-52°F	Jurisdictional Delineation
2/4/2022	R. Murray, C. Welch	0930-1400	Clear, 0% cloud cover, wind 0-15 mph, temperature 54-68°F	Jurisdictional Delineation

Date	Personnel	Time	Weather Conditions	Survey Type
2/7/2022	R. Murray, C. Welch	0930-1400	Clear, 0% cloud cover, wind 0-7 mph, temperature 57-76°F	Jurisdictional Delineation
2/8/2022	K. Bonsall, J. Love, Y. Huo	0930-1400	Clear, 0% cloud cover, wind 1-5mph, temperature 63-76°F	Reconnaissance Survey
3/2/2022	C.Clark, K. Bonsall	0930-1400	Clear, 0% cloud cover, wind 5-7mph, temperature 61-72°F	Arborist Tree Survey
3/8/2022	C.Clark, K. Bonsall	0930-1400	Clear, 0% cloud cover, wind 8-12mph, temperature 56-62°F	Arborist Tree Survey
3/21/2022	R. Murray, M. Pechter	0930-1400	Clear, 0% cloud cover, wind 5-20mph, temperature 62-77°F	Jurisdictional Delineation
3/29/22	C. Clark	0930-1400	Clear, 0% cloud cover, wind 5-20mph, temperature 65-75°F	Native Plant Survey (Ellwood Ironbark and Ellwood West)

Additionally, protocol overwintering Monarch surveys were conducted by Rincon staff every two weeks from December 2021 to March 2023. The City's Overwintering Monarch Butterfly Survey Report 2021-2022 provides data and a summary of observations during the 2021-2022 survey season as well as from years past and is included in Appendix F. A similar report will be prepared for the 2022-2023 survey season in April 2023.

2.2.1 Field Reconnaissance Survey

Rincon Biologists Julie Love, Yuling Huo, and Kendra Bonsall conducted a reconnaissance survey/vegetation mapping of the Study Area on September 29, 2021 and February 8, 2022 (Table 1). The surveys were conducted to document the existing conditions and general biological context of the Study Area and to evaluate the potential presence of sensitive biological resources, including special status plant and wildlife species, sensitive plant communities, and habitat for raptors and nesting birds protected by federal and state laws. The potential use of Ellwood Mesa habitat by other wildlife was also assessed. Weather conditions during both surveys were typical for the time of year, with temperatures ranging between 63-76 degrees Fahrenheit and with winds approximately 1 to 10 miles per hour. The February 2022 survey was specifically timed to coincide with the beginning of blooming season for plants. The survey consisted of walking the extent of the Study Area (where feasible, minus areas with dense poison oak and private property), documenting general site conditions, mapping vegetation communities and land cover types, and recording the plants and animals observed. A compendia of plants and animals observed are provided in Appendix C. For areas that were inaccessible within the Study Area and are not private property, the biologist visually inspected those areas with binoculars. Wildlife species were identified by direct visual observation, vocalization, or by sign (e.g., tracks, scat, burrows).

Plant species nomenclature and taxonomy followed *The Jepson Manual: Vascular Plants of California, Second Edition* (Baldwin et al. 2012). The vegetation classification used for this analysis is based on *A Manual of California Vegetation, Second Edition* (MCV2, Sawyer et al. 2009), which establishes systematic classifications and definitions of vegetation communities. Updates to the MCV2 provided in the online database (CNPS 2023) were taken into account. Each vegetation mapping unit was analyzed for characteristics to define the applicable vegetation community, such as dominant or co-dominant plant species and community membership rules. For those vegetated areas that could not be classified per MCV2, descriptive vegetation community names were used

(e.g., ornamental). Additionally, land covers were characterized in areas that lacked vegetation (e.g., disturbed). Refer to Appendix B for photographs that depict current site conditions.

Wildlife identification and nomenclature followed standard reference texts, including *Sibley Birds West: Field Guide to Birds of Western North America* (Sibley 2016), *Field Guide to Western Reptiles and Amphibians* (Stebbins 2003), and *Mammals of North America* (Bowers et al. 2004). The habitat requirements for each regionally occurring sensitive and special status species were assessed and compared to the type and quality of the habitats observed within the Study Area during the field surveys. Several special status species were eliminated from consideration as having potential to occur on site due to lack of suitable habitat, lack of suitable soils/substrate, and/or knowledge of regional distribution.

2.2.2 Native Tree Survey

On March 2 and 8, 2022, Rincon's International Society of Arboriculture (ISA) Certified Arborist Casey Clark (#WE-12031A) and biologist Kendra Bonsall surveyed for protected native trees, which are those with at least one trunk with a diameter at breast height (DBH) of 3 inches or more, and that contained any portion of their dripline within the survey area. Tree locations were recorded using a Geode global positioning system (GPS) device capable of submeter accuracy as close to the base of the trunk as possible. All surveyed trees were assigned a unique identification number but were not tagged. In instances where dense thickets of trees were encountered (e.g., willow thickets) a polygon was taken around the perimeter of the canopy. Relationships among the trees (i.e., multiple trunks arising from the same root, mature clones of a no longer present parent tree) were not determined, as only above ground portions of the trees were examined. For each tree, DBH was measured at 4.5 feet above natural grade using a tree caliper or Biltmore stick, or slightly higher or lower where a limb or swelling interfered; if the trunk split at or below 4.5 feet, the tree was considered a multi-trunk tree. Data collected included the following information for each tree:

- Scientific and common name
- DBH and visually estimated height/canopy
- Health assessment and structural condition ratings (see Section 4.5) by visual tree assessment, which does not include any above (aerial access via climbing or bucket truck) or below ground inspections
- Determination of tree status including ESHA, California native tree, introduced, heritage, or historical designations
- Geographic locations using a Trimble® GeoXT global positioning system (GPS) capable of sub-meter accuracy
- Geographic location of trunk and Tree Protection Zone (TPZ) (canopy and/or root zone) in relation to the proposed multi-use path location

2.2.3 Jurisdictional Delineation

A jurisdictional delineation survey was conducted within the central portion of the study area on October 5, 2021 by Rincon Senior Biologist Robin Murray and Associate Biologist Yuling Huo and on December 10, 2021 by Robin Murray and Rincon Biologist Kendra Bonsall. On February 4 and 7, 2022, Robin Murray and Rincon Biologist Carolyn Welch surveyed the remainder of the study area. Additional investigation was conducted by Robin Murray on May 31 and November 2, 2022.

Surveys were conducted on foot for potential wetlands and non-wetland aquatic resources that might exhibit an ordinary high-water mark (OHWM) and/or bed and bank that might constitute waters of the United States (U.S.), CDFW-jurisdictional streambeds, waters of the State, and/or coastal wetlands. During the field delineation, general site characteristics were noted and vegetation present on site was documented. Current federal and state policies, methods, and guidelines were used to identify and delineate potential jurisdictional areas, as described below in detail. Data collection points in the study area were focused on areas containing a potential waterway and were chosen as best representation of the conditions at the study area. Detailed methodology is provided in the Jurisdictional Delineation Report prepared by Rincon (Rincon 2023; Appendix I). The CCA coastal wetland definition relies on the same three parameters considered by the USACE's delineation method but requires only a single parameter to be present (i.e., hydric soils, hydrophytic vegetation, or wetland hydrology would qualify an area as wetland, rather than requiring all three).

3 Existing Conditions

This section summarizes the results of the surveys and provides analysis of the data collected in the field. Brief discussions regarding the general environmental setting, soils, vegetation and land cover types, and plant and wildlife species, are presented below. Representative photographs of the Study Area are provided in Appendix B, and complete lists of all plant and wildlife species observed within the Study Area are presented in Appendix C.

3.1 Physical Characteristics

The Study Area is located entirely within the Ellwood Mesa, on gentle slopes and terraces immediately north of the Ellwood bluffs. The eucalyptus grove is the dominant vegetative feature of Ellwood Mesa, historically utilized for oil development, wood lots, and ranching (City of Goleta et al 2006; Campbell Geo 2010). Over the years Ellwood has transformed into a local recreational area. Existing trails meander throughout the entire open space, within the eucalyptus grove, undeveloped open spaces, and through the Devereux Creek riparian corridor. These trails are compacted soils and highly disturbed from public use (e.g., hikers and cyclists).

Land uses within the vicinity of the Study Area include Hollister Avenue to the north, Sandpiper golf course to the west, UCSB to the east, and existing trails entering and exiting Ellwood Mesa and residential developments abutting the northeast corner of the open space. Ellwood Elementary School is approximately 100 feet from the open space boundary, north and across Hollister Avenue.

The regional climate is Mediterranean, influenced by proximity to the ocean with hot, dry summers and mild winters. According to the Natural Resources Conservation Service's National Water and Climate Center data records between 1941 and 2000, average annual temperatures in Goleta ranged between 49- and 69-degrees Fahrenheit, with the warmest temperatures occurring between August and September and the coldest temperatures occurring between January and February. Goleta receives an average rainfall of approximately 17.37 inches, with the most rain occurring between January and March (USDA, NRCS 2000).

Elevations on-site range from 12 to 115 feet above mean sea level (amsl) and the topography of the Study Area is primarily flat.

3.1.1 Hydrology

The study area is located within the eastern portion of the Jalama Creek-Frontal Santa Barbara Channel Hydrologic Unit Code (HUC) watershed (HUC-10 No. 1806001301) (USGS 2023b). The Jalama Creek-Frontal Santa Barbara Channel watershed and adjacent San Pedro Creek-Frontal Santa Barbara Channel (HUC-10 No. 1806001302) compose the Santa Barbara Coastal watershed (HUC_8 No. 18060013). Within the Jalama Creek-Frontal Santa Barbara Channel watershed, the Study Area is contained entirely in the Devereux Creek watershed as described in the City's Creek and Watershed Management Plan (CWMP, City 2020) shown in Figure 4 below.

The CWMP identifies Devereux Creek as a seasonal/intermittent system composed of a network of small tributaries which direct flows into Devereux Creek and then into Devereux Slough and the Pacific Ocean. The Devereux Creek Watershed Area is approximately 3.5 square miles and

composed of 46 percent open space, the remaining percentage being designated for residential, street, or golf course use.

The National Hydrography Dataset (NHD) identifies Devereux Creek as both an ephemeral stream and an intermittent stream in the Study Area (USGS 2023) (Figure 5). The intermittent stream is herein referred to as Devereux Creek. Devereux Creek is hydrologically connected to Devereux Slough, and during heavy precipitation events, also connected to the Pacific Ocean. Hydrology within Devereux Creek is supplied primarily by storm flows and urban golf course runoff from upstream (west of the Study Area), as well as sheet flow from the adjacent uplands in the Study Area. Devereux Creek exits the eastern boundary of the Study Area and flows into Devereux Slough, which connects to the Pacific Ocean. NWI identifies Devereux Creek as an intermittent riverine system with freshwater forested/shrub wetlands, and also maps freshwater emergent wetland in the Study Area (USFWS 2023) (Figure 5). Figure 5 below depicts NHD and NWI data within and adjacent to the study area.

3.1.2 Soils

Information about the soil types present within the Study Area was obtained from the NRCS Online Web Soil Survey (USDA NRCS 2023) and the Santa Barbara Area Soil Survey (USDA NRCS 1958). Based on data from the soil survey, the Study Area includes nine soil map units, as described below (Figure 6). One soil type (Camarillo fine sandy loam, fine substratum) is included on the National Hydric Soils List (USDA, NRCS 2023b).

Camarillo fine sandy loam, fine substratum

Camarillo fine sandy loam, fine substratum, consists of very deep, somewhat poorly drained soils located on relatively flat floodplains from 10 to 100 feet amsl. A typical soil profile is composed of alluvium derived from sedimentary rocks and extends from the surface to 80 inches in depth. Camarillo series soils are frequently used in agriculture. The Camarillo fine sandy loam, fine substratum, is a hydric soil (USDA, NRCS 2023b).

Concepcion fine sandy loam, 0 to 2 percent slopes

Concepcion fine sandy loam, 0 to 2 percent slopes, consists of deep, moderately well drained soils located on relatively flat terraces between 40 to 200 feet amsl within one to two miles of the Pacific Ocean. A typical soil profile is composed of weakly consolidated stratified alluvium or wind-deposited sandy material to a depth of 64 inches. Concepcion series soils are often used for grazing, agriculture, and urban development. The Concepcion fine sandy loam, 0 to 2 percent slopes, is not a hydric soil (USDA, NRCS 2023b).

Concepcion fine sandy loam, 2 to 9 percent slopes

Concepcion fine sandy loam, 2 to 9 percent slopes, eroded, consists of deep, moderately well drained soils located on gentle slopes between 40 to 200 feet amsl within one to two miles of the Pacific Ocean. A typical soil profile is composed of weakly consolidated stratified alluvium or wind-deposited sandy material to a depth of 64 inches. Concepcion series soils are often used for grazing, agriculture, and urban development. The Concepcion fine sandy loam, 2 to 9 percent slopes, eroded, is not a hydric soil (USDA, NRCS 2023b).

Figure 4 Watershed Map

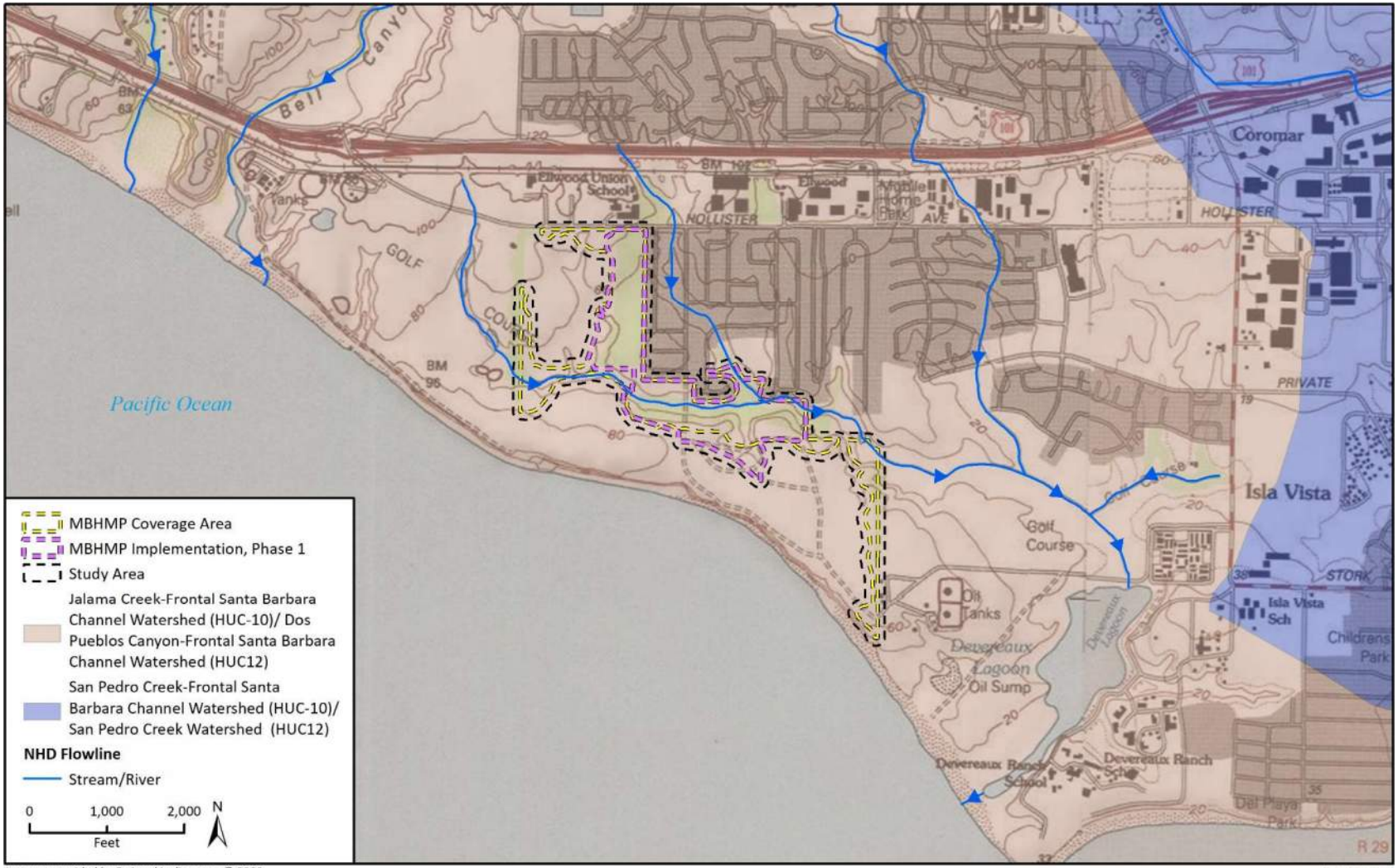


Figure 5 NHD and NWI Resources Map



Imagery provided by Microsoft Bing and its licensors © 2023.
Additional data provided by USGS and USFWS, 2021.

Figure 6 Soils



Concepcion fine sandy loam, 15 to 30 percent slopes, eroded

Concepcion fine sandy loam, 15 to 30 percent slopes, eroded, consists of deep, moderately well drained soils located on slopes between 40 to 200 feet amsl within one to two miles of the Pacific Ocean. A typical soil profile is composed of weakly consolidated stratified alluvium or wind-deposited sandy material to a depth of 64 inches. Concepcion series soils are often used for grazing, agriculture, and urban development. The Concepcion fine sandy loam, 15 to 30 percent slopes, eroded, is not a hydric soil (USDA, NRCS 2023b).

Diablo clay, 2 to 9 percent slopes

Diablo clay, 2 to 9 percent slopes, consists of well drained soils with slow permeability located on gently sloped uplands between 25 to 3,000 feet amsl. A typical soil profile is composed of residuum weathered from shale, sandstone, and consolidated sediments with minor areas of tuffaceous material to a depth of 60 inches. Diablo series soils may be used for grazing or agriculture. Diablo clay, 2 to 9 percent slopes, is not a hydric soil (USDA, NRCS 2023b).

Diablo clay, 9 to 15 percent slopes, warm MAAT

Diablo clay, 9 to 15 percent slopes, warm MAAT, consists of well drained soils with slow permeability located on hilly uplands between 25 to 3,000 feet amsl. A typical soil profile is composed of residuum weathered from shale, sandstone, and consolidated sediments with minor areas of tuffaceous material to a depth of 60 inches. Diablo series soils may be used for grazing or agriculture. Diablo clay, 2 to 9 percent slopes, is not a hydric soil (USDA, NRCS 2023b).

Milpitas-Positas fine sandy loams, 2 to 9 percent slopes

Milpitas-Positas fine sandy loams, 2 to 9 percent slopes, consists of Milpitas series soils and Positas series soils. Milpitas series soils are moderately well drained soils with medium runoff and very slow permeability located on gently sloped old terraces between 30 to 500 feet amsl. A typical soil profile is moderately acidic to slightly alkaline and is composed of alluvium derived largely from sandstone to a depth of 68 inches. Milpitas series soils may support native herbaceous, scrub, and oak savannah communities, and may be used for pasture, agriculture, or urban development.

Positas series soils are moderately well drained soils located on stream terraces and terrace side slopes between 200 to 1,600 feet amsl. A typical soil profile is composed of alluvial material from mixed rock sources to a depth of 64 inches. Positas series soils support annual herbaceous and oak savannah communities and may be used as rangeland and agriculture. Milpitas-Positas fine sandy loams, 2 to 9 percent slopes, is not a hydric soil (USDA, NRCS 2023b).

Milpitas-Positas fine sandy loam, 9 to 15 percent slopes, eroded

Milpitas-Positas fine sandy loam, 9 to 15 percent slopes, eroded, consists of Milpitas series soils and Positas series soils. Milpitas series soils are moderately well drained soils with medium runoff and very slow permeability located on moderately sloped old terraces between 30 to 500 feet amsl. A typical soil profile is moderately acidic to slightly alkaline and is composed of alluvium derived largely from sandstone to a depth of 68 inches. Milpitas series soils support native herbaceous, scrub, and oak savannah communities, and may be used for pasture, agriculture, or urban development.

Positas series soils are moderately well drained soils located on stream terraces and terrace side slopes between 200 to 1,600 feet amsl. A typical soil profile is composed of alluvial material from

mixed rock sources to a depth of 64 inches. Positas series soils support annual herbaceous and oak savannah communities and may be used as rangeland and agriculture. Milpitas-Positas fine sandy loam, 9 to 15 percent slopes, eroded, is not a hydric soil (USDA, NRCS 2023b).

Xerorthents, cut and fill areas

Xerorthents, cut and fill areas, consists of man-modified material, either soils rearranged in a cut and fill or as tailings heaps. Xerorthents, cut and fill areas, is not a hydric soil (USDA, NRCS 2023b).

3.2 Vegetation and Land Cover

Fourteen vegetation communities and four land cover types occur within the Study Area and are described below and shown in Table 2 and Figure 7. A list of all plant species observed during the field surveys is provided in Appendix B.

Each vegetation community/land cover type is partially or entirely considered ESHA per the CCA and Goleta GP/CLUP Conservation Element (CE) definitions. Some vegetation communities/land cover types are considered ESHA as defined by the GP/CLUP, while some do not meet ESHA definitions but do contain 2006 City-mapped ESHA per the Goleta GP/CLUP CE Figure 4.1. Total acreage of each vegetation community/land cover type is provided in Table 2, as well as ESHA acreage within each vegetation community/land cover type (including those that are mapped by the City). ESHA within each vegetation community/land cover type is discussed in detail in Section 4.2.2.

Table 2 Summary of Vegetation Community and Land Cover Types in the Study Area

Vegetation Community	Total Acres	ESHA Acres	CDFW Sensitive Natural Community Rank (Yes/No)[1]	Notes
Vegetation Community				
Alkali Heath Marsh	0.99	0.99	G4S3; Yes	Considered riparian and/or wetland ESHA per GP/CLUP and contains CCA coastal wetland ESHA
Arroyo Willow Thickets	1.52	1.52	G4S4; Yes (Arroyo willow association)	Considered riparian and/or wetland ESHA per GP/CLUP and contains CCA coastal wetland ESHA
Coast Live Oak Woodland and Forest	1.14	1.14	G5S4; No	Considered woodland ESHA per GP/CLUP
Coyote Brush Scrub	14.06	2.51	G5S5; No	Contains 2006 City-mapped coastal bluff scrub/coastal sage scrub ESHA in three locations as well as creeks/riparian ESHA
Creeping Wildrye Turfs	0.64	0.64	G3G3; Yes	Considered native grassland ESHA per GP/CLUP
Eucalyptus Grove	65.32	65.32	GNA SNA; No	Considered monarch butterfly ESHA per GP/CLUP and contains CCA coastal wetland ESHA
Hardstem Bulrush Marshes	0.19	0.19	GNR S3S4: Yes	Considered wetland ESHA per GP/CLUP and CCA coastal wetland ESHA

Ice Plant Mats	1.98	-	GNA SNA; No	
Iris-Leaf Rush Seeps	0.11	0.11	G2?S2?; Yes	Considered riparian ESHA per GP/CLUP and CCA coastal wetland ESHA
Lemonade Berry Scrub	0.06	0.06	G3S3; Yes	Considered coastal bluff scrub ESHA per GP/CLUP
Perennial Rye Grass Fields	0.09	0.09	GNA SNA; No	Contains 2006 City-mapped ESHA
Purple Needle Grass Grassland	7.28	7.28	G3G4 S3S4; Yes	Considered native grassland ESHA per GP/CLUP
Upland Mustards	2.73	0.19	GNA SNA; No	Contains 2006 City-mapped ESHA
Wild Oats and Annual Brome Grasslands	22.51	2.98	GNA SNA; No	Contains 2006 City-mapped ESHA
Land Cover Type				
Bare Ground	3.93	1.5	N/A	Contains 2006 City-mapped ESHA
Developed/Ornamental	17.57	0.36	N/A	Contains 2006 City-mapped ESHA
Native Landscaping/Restoration	0.54	0.54	N/A	Considered ESHA per GP/CLUP where it supports special status plant species (Santa Barbara honeysuckle) in one location. Other locations contain 2006 City-mapped ESHA
Undifferentiated Ornamental Shrubland	0.69	0.22	N/A	Contains 2006 City-mapped ESHA
Total	**141.37**	**85.64**		

Figure 7a Vegetation Communities and Land Cover Types



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Fig X Vegetation_11x17

Figure 7b Vegetation Communities and Land Cover Types



3.2.1 Vegetation Communities

Alkali Heath Marsh (*Frankenia salina* Herbaceous Alliance)

Alkali heath marsh (*Frankenia salina* Herbaceous Alliance) is typically located in coastal salt marshes, brackish marshes, alkali meadows, and alkali playas with soils that are saline and composed of sandy to clayey alluvium. Elevations range between sea level and 300 meters. This community is characterized by an open to continuous herbaceous canopy. Alkali heath (*Frankenia salina*) has over 30% relative cover in the herbaceous layer and may be codominant with other herbs and subshrubs such as salt grass (*Distichlis spicata*). This alliance is ranked G4S3 and is considered a CDFW sensitive natural community (CDFW 2022a).

This community is located in the eastern corner of the Study Area, where Devereux Creek exits the Study Area. The thick herbaceous layer is dominated by alkali heath, Italian rye grass (*Festuca perennis*), and creeping wildrye (*Elymus triticoides*). Several dirt footpaths cross the alkali heath marsh. This community is considered City riparian and wetland ESHA due to the presence of hydrophytic vegetation under the GP/CLUP Policy CE 3 and is mapped as ESHA in GP/CLUP Figure 4-1. This community also contains CCA coastal wetland ESHA. The Study Area contains 0.99 acres of this alliance.

Arroyo Willow Thickets (*Salix lasiolepis* Shrubland Alliance)

Arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance) typically occurs along stream banks and benches, slope seeps, and stringers along drainages from sea level to 2,170 meters in elevation. This alliance is characterized by an open to continuous shrub layer and a variable herbaceous layer. The community is dominated by arroyo willow (*Salix lasiolepis*) with over 50% relative cover in the tree or shrub layer and co-dominant species including Fremont cottonwood (*Populus fremontii*), giant reed (*Arundo donax*), and mulefat (*Baccharis salicifolia*). This alliance is ranked G4S4 and the arroyo willow association of this alliance is considered a CDFW sensitive natural community (CDFW 2022a).

Arroyo willow thickets are present along Devereux Creek in the western portion of the Study Area. The tree and shrub layers are dominated by arroyo willow. Other tree species present include coast live oak (*Quercus agrifolia*) and California sycamore (*Platanus racemosa*). The diverse shrub layer includes mulefat, coyote brush (*Baccharis pilularis*), and giant wild rye (*Elymus condensatus*). The herbaceous layer consists of species including ripgut brome (*Bromus diandrus*), common spikerush (*Eleocharis macrostachya*), Parish's spike rush (*Eleocharis parishii*), and cutleaf geranium (*Geranium dissctum*). This community contains several large open patches dominated by common spikerush and Parish's spike rush, with few to no shrubs or trees. This community is considered a City riparian and wetland ESHA due to the presence of hydrophytic vegetation under the GP/CLUP Policy CE 3 and is mapped as ESHA in GP/CLUP Figure 4-1. This community also contains CCA coastal wetland ESHA. The Study Area contains 1.52 acres of this alliance.

Coast Live Oak Woodland and Forest (*Quercus agrifolia* Forest & Woodland Alliance)

Coast live oak woodland and forest (*Quercus agrifolia* Woodland Alliance) is typically found on canyon bottoms, slopes, and flats between sea level and 1,200 meters in elevation. Soils are typically deep and sandy or loamy with high organic matter. This vegetation community is characterized by a tree layer that ranges from continuous to open and sparse shrub and herbaceous

layers. Coast live oak contributes to at least 60% relative cover in the tree layer (Sawyer et al. 2009). This vegetation community is ranked G5S4 and is not considered a CDFW sensitive natural community (CDFW 2022a).

This community is located in the central and eastern portions of the Study Area. Coast live oak is dominant in the tree canopy, and shrub species present include coyote brush, arroyo willow, and giant wild rye. The dense herbaceous layer is dominated by ripgut brome and black mustard (*Brassica nigra*). The Study Area contains 1.14 acres of this alliance. This community meets the definition of native oak woodland ESHA per GP/CLUP Policy CE 9.

Coyote Brush Scrub (*Baccharis pilularis* Shrubland Alliance)

Coyote brush scrub (*Baccharis pilularis* Shrubland Alliance) may occur on coastal bluffs, terraces, stabilized dunes of coastal bars, spits along the coastline, river mouths, stream sides, open exposed slopes, ridges, and gaps in forest stands. Soils are variable, ranging from sandy to relatively heavy clay, between sea level and 1,500 meters in elevation. The shrub and herbaceous layers are variable. Coyote brush is dominant with over 50% absolute or relative cover in the shrub canopy. California coffeeberry (*Frangula californica*) or coast silk tassel (*Garrya elliptica*) may be codominant in the shrub layer. This alliance is ranked G5S5 and is not considered a CDFW sensitive natural community per the Sensitive Natural Communities list (CDFW 2022a) but CDFW considers coyote brush scrub sensitive in Goleta (CDFW 2021). This community meets the definition of coastal bluff[1] scrub terrestrial ESHA under Goleta GP/LCP CE Policies 1.2.c, cy 5.1, and 5.3.

Coyote brush scrub is found in several patches throughout the Study Area. Coyote brush is dominant along with giant wild rye and California sagebrush (*Artemisia californica*). Other species present in this community include mulefat, toyon (*Heteromeles arbutifolia*), ripgut brome, creeping wildrye, creeping wildrye, Italian rye grass, and emergent coast live oaks.

This community is only mapped in the following three locations within the Study Area as terrestrial ESHA under GP/CLUP Policy CE 5 per CE Figure 4-1 using the Holland Classification:

1. Southern coastal bluff scrub – in the southernmost portion of the study area closest to the beach

2. Ventura coastal sage scrub – west of Coronado Drive

3. Ventura coastal sage scrub - east of the Bluffs neighborhood near Kestrel Lane.

Outside these areas upland coyote brush scrub has not historically nor is currently mapped as ESHA on Ellwood Mesa since it lacks the compositional and structural characteristics of coastal bluff scrub and coastal sage scrub described by Holland. Special-status species have not been detected in this community and no mobile species has a life cycle dependent on this community. The CWMP (page 73) describes coyote brush as a "community [that] often forms monocultures thereby lacking the diversity of similar habitats, such as coastal sage scrub". These areas only considered ESHA where they overlap with other City-mapped ESHA per CE Figure 4-1.

The Study Area contains 14.06 acres of this community, of which 2.51 acres are considered ESHA consistent with CE Figure 4-1.

[1] *Policy CE 5.3a For purposes of this policy, coastal bluff scrub is defined as scrub habitat occurring on exposed coastal bluffs. Example species in bluff scrub habitat include Brewer's saltbush (Atriplex lentiformis), lemonade berry (Rhus integrifolia), seashore blight (Suaeda californica), seacliff buckwheat (Eriogonum parvifolium), California sagebrush (Artemisia californica), and coyote bush (Baccharis pilularis).*

Creeping Wildrye Turfs (*Elymus triticoides* Herbaceous Alliance)

Creeping wildrye turfs (*Elymus triticoides* Herbaceous Alliance [*Leymus triticoides* Herbaceous Alliance]) are typically found on poorly drained floodplains, playas, drainage and valley bottoms, or marsh margins with mesic flat to sloping topography between sea level and 3,000 meters. Soils are generally alkaline or saline clays and loams. creeping wildrye contributes at least 50% relative cover in the herbaceous layer, and the herbaceous layer is open to continuous. Creeping wildrye turfs are ranked G3S3 and are considered a CDFW sensitive natural community (CDFW 2022a).

Several small patches of creeping wildrye turfs are present near the center of the Study Area. Creeping wildrye is overwhelmingly dominant in the dense, turf-forming herbaceous layer. The tree and shrub layers are absent. The Study Area contains 0.64 acres of this alliance. This community meets the definition of native grassland terrestrial ESHA under GP/CLUP Policy CE 5.2.

Eucalyptus Grove (*Eucalyptus globulus* Semi-Natural Alliance)

Eucalyptus Grove (*Eucalyptus globulus* Semi-Natural Alliance) is found planted as trees, groves, and windbreaks, as well as in settings where it has become naturalized on uplands or bottomlands and adjacent to stream courses, lakes, or levees from sea level to 1,900 meters in elevation. Eucalyptus species consist of over 80% cover within the tree layer. The understory of this community is generally poorly developed or composed of low-growing forbs and non-native grasses due to the excessive shade and possibly toxic properties produced by the eucalyptus leaf litter. This vegetation community is ranked GNA SNA and is not considered a CDFW sensitive natural community (CDFW 2022a).

This community is found throughout the Study Area and is crossed by dirt footpaths. Within the Study Area, this alliance is dominated by blue gum eucalyptus (*Eucalyptus globulus*), which forms a closed canopy. Other trees and shrubs present in the understory include arroyo willow, shamel ash (*Fraxinus uhdei*) golden wattle (*Acacia longifolia*) and myoporum (*Myoporum laetum*). The herbaceous layer is sparse, and primarily consists of weedy non-native species such as black mustard, ripgut brome, and upright veldt grass (*Ehrharta erecta*). Vines present include poison oak (*Toxicodendron diversilobum*) and cape ivy (*Delairea odorata*). The Study Area contains 65.32 acres of this alliance. This community is part of the Ellwood Complex which is designated monarch butterfly ESHA per the GP/CLUP Policy CE 4 and mapped in GP/CLUP Figure 4-1. This community provides key elements for monarch autumnal and winter aggregation and is a location where monarchs have historically been present. This community also contains CCA coastal wetland ESHA in some areas.

Hardstem Bulrush Marshes (*Schoenoplectus acutus* Herbaceous Alliance)

Hardstem bulrush marshes (*Schoenoplectus acutus* Herbaceous Alliance) typically occur in brackish to freshwater marshes, including along stream shores, bars, channels of river mouth estuaries, ponds and lakes, sloughs, swamps, and roadside ditches. Soils are poorly aerated with a high organic content between sea level and 2,500 meters in elevation. This alliance is characterized by an intermittent to continuous herbaceous layer. Hardstem bulrush (*Schoenoplectus acutus*) has over 50% relative cover in the herbaceous layer and at least 10% absolute cover. This community is ranked GNR S3S4 and is considered a CDFW sensitive natural community (CDFW 2022a).

This community is located in the eastern corner of the Study Area where Devereux Creek exits the Study Area. Hardstem bulrush is the dominant species. Other species present at low cover include curly dock (*Rumex crispus*), wild radish (*Raphanus sativus*), and bristly oxtongue (*Helminthotheca*

echioides). The Study Area contains 0.19 acres of this alliance. This community is considered City wetland ESHA due to the presence of hydrophytic vegetation under GP/CLUP Policy CE 3 and is mapped as ESHA in GP/CLUP Figure 4-1. This community is also entirely within CCA coastal wetland ESHA.

Ice Plant Mats (*Carpobrotus* spp. Herbaceous Semi-Natural Alliance)

Ice plant mats (*Carpobrotus* spp. Herbaceous Semi-Natural Alliance) typically occurs on bluffs, disturbed, land, and sand dunes near the coastline between sea level and 10 meters in elevation. This alliance is characterized by an intermittent to continuous herbaceous layer. Iceplants (*Carpobrotus* spp.) are dominant with over 50% relative cover. This community is ranked GNA SNA and is not considered a CDFW sensitive natural community (CDFW 2022a).

Ice plant mats are present in several areas of the Study Area, including at the top of the seaside bluffs in the southeastern part of the Study Area. Ice plant (*Carpobrotus edulis*) is dominant in the dense herbaceous layer, along with ripgut brome, black mustard, slender oats (*Avena barbata*), and wild oats (*Avena fatua*). Scattered shrubs are present including deerweed (*Acmispon glaber*), pampas grass (*Cortaderia selloana*), and seacliff buckwheat (*Eriogonum parvifolium*). This community is not considered ESHA per the GP/CLUP but does contain City-mapped ESHA per GP/CLUP Figure 4-1 in some areas. The Study Area contains 1.98 acres of this alliance.

Iris-Leaf Rush Seeps (*Juncus phaeocephalus* Provisional Herbaceous Alliance)

Iris-leaf rush seeps (*Juncus phaeocephalus* Provisional Herbaceous Alliance) typically occurs on seeps, mainly on metamorphic, serpentine, and volcanic substrates between sea level and 1,600 meters in elevation. This alliance is characterized by an intermittent to continuous herbaceous cover. Pointed rush (*Juncus oxymeris*), irisleaf rush (*Juncus xiphioides*) or another iris-leaved rush, such as brown headed rush (*Juncus phaeocephalus*) is dominant. This alliance is ranked G2?S2? and is considered a CDFW sensitive natural community (CDFW 2022a).

This community is present in a small depression along the eastern boundary of the Study Area. Brown headed rush is dominant in the closed herbaceous layer. Other species present include common spikerush and common rush (*Juncus patens*). The Study Area contains 0.11 acres of this alliance. This community is considered City wetland ESHA due to the presence of hydrophytic vegetation under GP/CLUP Policy CE 3 and is mapped as ESHA in GP/CLUP Figure 4-1. This community is also entirely within CCA coastal wetland ESHA.

Lemonade Berry Scrub (*Rhus integrifolia* Shrubland Alliance)

Lemonade berry scrub (*Rhus integrifolia* Shrubland Alliance) generally occurs on gentle to abrupt slopes and coastal bluffs of variable aspect with loam and clay soils between 5-750 meters in elevation. This community is characterized by an open to continuous two-tiered shrub canopy and an open herbaceous layer. Lemonade berry (*Rhus integrifolia*) has over 50% relative cover in the shrub canopy or is co-dominant along with other coastal scrub species, with over 30% relative cover in the shrub canopy. This community is ranked G3S3 and is considered a CDFW sensitive natural community (CDFW 2022a).

One lemonade berry patch is located near the southeastern extent of the Study Area. Lemonade berry is the only species in the closed shrub canopy, and the herbaceous layer is sparse. The Study

Area contains 0.06 acres of this alliance. This community meets the definition of coastal bluff scrub terrestrial ESHA under GP/CLUP Policy 5.3 and is mapped as ESHA in GP/CLUP Figure 4-1.

Perennial Rye Grass Fields (*Festuca perennis* Herbaceous Semi-Natural Alliance)

Perennial rye grass fields (*Festuca perennis* Herbaceous Semi-Natural Alliance [*Lolium perenne* Herbaceous Semi-Natural Alliance) typically occur on lowlands with periodic flooding, disked fields, and uplands including serpentine substrates between sea level and 1,325 meters in elevation. This alliance is characterized by an intermittent to continuous herbaceous layer. Italian rye grass has at least 50% relative cover in the herbaceous layer. This community is ranked GNA SNA and is not considered a CDFW sensitive natural community (2022a).

This community is located in the southeastern corner of the Study Area. Italian rye grass is dominant in the dense herbaceous layer. Other species present include creeping wildrye, California burclover (*Medicago polymorpha*), and curly dock. The Study Area contains 0.09 acres of this alliance.

Purple Needle Grass Grassland (*Stipa* pulchra Herbaceous Alliance)

Purple needle grass grassland (*Stipa pulchra* Herbaceous Alliance [*Nassella pulchra* Herbaceous Alliance)] may occur on all topographic locations with deep soils with high clay content, or loamy, sandy, or silty soils derived from mudstone, sandstone, or serpentine substrates. Elevations range between sea level and 1,700 meters in elevation. This community is characterized by an open to continuous herbaceous layer. Needle grass (*Stipa* sp.) is characteristically present with at least 2% absolute cover or at least 10% relative cover in the herbaceous layer. This alliance is ranked G3G4 S3S4 and is considered a CDFW sensitive natural community (CDFW 2022a).

GP/CLUP policy CE 5.2 defines native grasslands where native grassland species comprise 10 percent or more of the total relative plant cover. Patches of purple needle grass grassland are present throughout grasslands in the Study Area, and the eastern portion of the Study Area contains a large amount of this community. Purple needlegrass (*Stipa pulchra*) is dominant along with ripgut brome, slender oats, and wild oats. Scattered emergent coyote brush, coast live oak, and olive trees (*Olea europaea*) are present. Several dirt footpaths cross this community. The Study Area contains 7.28 acres of this alliance. This community meets the definition of native grassland terrestrial ESHA under GP/CLUP Policy CE 5.2 and is mapped as ESHA in GP/CLUP Figure 4-1.

Upland Mustards (*Brassica nigra* Herbaceous Semi-Natural Alliance)

Upland mustards (*Brassica nigra* Herbaceous Semi-Natural Alliance) are typically found in fallow fields, grasslands, roadsides, levee slopes, disturbed coastal scrub, riparian areas, cleared roadsides, and waste places between sea level and 2,800 meters in elevation. This vegetation community is characterized by an open to continuous herbaceous layer. Black mustard, summer mustard, wild radish, or other mustards occur with non-native plants at over 80% cover in the herbaceous layer. This vegetation community is ranked GNA SNA and is not considered a CDFW sensitive natural community or ESHA (CDFW 2022a).

Patches of upland mustards are found in the north, western, and central portions of the Study Area. Black mustard is the dominant species, and other herbaceous plants present include summer mustards, wild radish, ripgut brome, slender oats, and wild oats. This community is not considered ESHA per the GP/CLUP but does contain City-mapped ESHA per GP/CLUP Figure 4-1 in some areas. The Study Area contains 2.73 acres of this alliance, of which 0.19-acre is considered ESHA.

Wild Oats and Annual Brome Grasslands (*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance)

Wild oats and annual brome grasslands (*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance) are found in all topographic settings in foothills, waste places, rangelands, and openings in woodlands between sea level and 2,200 meters in elevation. This alliance is characterized by an open to continuous herbaceous layer. Wild oats or annual bromes (*Bromus* spp.) are dominant or co-dominant with other non-native species in the herbaceous layer. Emergent trees and shrubs may be present at low cover. This vegetation community is ranked GNA SNA and is not considered a CDFW sensitive natural community (CDFW 2022a).

Wild oats and annual brome grasslands are located throughout the Study Area. Ripgut brome, slender oats, and wild oats are dominant in the herbaceous layer. Other widely present herbaceous species include black mustard, wild radish, blue-eyed grass (*Sisyrinchium bellum*), and summer mustard (*Hirschfeldia incana*). Emergent coyote brush, California sagebrush, and coast live oak are present at low cover. This community is not considered ESHA per the GP/CLUP but does contain CCA coastal wetland ESHA and City-mapped ESHA per GP/CLUP Figure 4-1 in some areas. The Study Area contains 22.51 acres of this alliance, of which 2.98 acres is considered ESHA.

3.2.2 Land Cover Types

Bare Ground

This land cover type consists of paved and unpaved roads and footpaths, including the parking lot off Hollister Avenue and numerous dirt paths. Little to no vegetation is present in this land cover type. Since these areas are composed entirely of exposed soils and do not support any vegetation, these areas do no provide suitable cover or foraging opportunities for wildlife. This land cover type contains City-mapped ESHA per GP/CLUP Figure 4-1 in some areas. The Study Area contains 3.93 acres of this land cover type, of which 1.5 acres contains City-mapped ESHA.

Developed/Ornamental

This land cover type consists of paved roads, sidewalks, parking areas, buildings and yards, and includes portions of Sandpiper Golf Course. Vegetated areas in this land cover type are regularly maintained by people and do not constitute a natural vegetation community as described in MCV2 (Sawyer et al. 2009, CNPS 2021a). Ornamental land cover is present around the houses surrounding much of the Study Area to the north. This land cover type contains City-mapped ESHA per GP/CLUP Figure 4-1 in some areas. The Study Area contains 17.57 acres of this land cover type, of which 0.36-acre contains City-mapped ESHA.

Native Landscaping/Restoration

This land cover type consists of areas with native plants that have been installed, either as part of landscaping or as restoration work. These areas are regularly maintained and do not constitute a natural vegetation community as described in MCV2 (Sawyer et al. 2009, CNPS 2021a). Native landscaping/restoration areas are present in the central portion of the Study Area, adjacent to homes. This land cover type contains a wide array of plants, including coast live oak, valley oak (*Quercus lobata*), giant wild rye, California sunflower (*Encelia californica*), lemonade berry, and deergrass (*Muhlenbergia rigens*).

This land cover type occurs in three areas within the Study Area. One of these areas is small patch just east of Newport Drive that contains Santa Barbara honeysuckle (*Lonicera subspicata*, CRPR 1B.2, SBBG Rare Plant) and functions as native habitat. This patch meets the definition of habitat for special status plant species ESHA under GP/CLUP Policy CE 8.1. The remaining two are not considered ESHA, except where they overlap with other City-mapped ESHA. One of these is a long swath just east of the residences on Kestrel Lane that overlaps in some areas with City-mapped native grassland ESHA, although Rincon did not map any native grasslands within this area. The other is a small patch just south of the cul-de-sac at the end of Newport Drive that overlaps with City-mapped monarch ESHA. These two areas are isolated, are not likely to function as native habitat, and are not known to support special-status species. The Study Area contains 0.54-acre of this land cover type, of which 0.10-acre is considered ESHA and 0.44-acre contains City-mapped ESHA.

Undifferentiated Ornamental Shrubland

This land cover type consists of areas landscaped with primarily non-native plants. These areas are regularly maintained by people and do not constitute a vegetation community as described in MCV2 (Sawyer et al. 2009, CNPS 2021a). Undifferentiated ornamental shrubland is present near the houses near the center of the Study Area. A diverse selection of plants are found in this land cover type, including acacias (*Acacia* spp.), Mexican fan palm (*Washingtonia robusta*), bougainvillea (*Bougainvillea spectabilis*), mission cactus (*Opuntia ficus-indica),* and iceplant. This land cover type contains City-mapped ESHA per GP/CLUP Figure 4-1 in some areas.The Study Area contains 0.69 acres of this land cover type, of which 0.22-acre contains City-mapped ESHA.

3.3 General Wildlife

Wildlife species observed within the Study Area during surveys for this report were predominantly common avian species. Wildlife species observed during the reconnaissance-level field survey include red-tailed hawk (*Buteo jamaicensis*), western scrub jay (*Aphelocoma californica*), California towhee (*Melozone crissalis*), American kestrel (*Falco sparverius*), Anna's hummingbird (*Calypte anna*), western bluebird (*Sialia mexicana*), western fence lizard (*Sceloporus occidentalis*), and California ground squirrel (*Otospermophilus beecheyii*), among other common species. A complete list of species observed can be found in Appendix C.

The vegetation communities within the Survey Area including oak woodlands, eucalyptus groves, arroyo willow thickets, and non-native grasslands, provide habitat to common wildlife species including for those that were not observed, but are likely to occur.

In general, oak woodlands are known to provide suitable food, shading, and nesting sources for both common and special-status species. Oak acorn production provides food for a variety of native wildlife such as acorn woodpecker (*Melanerpes formicivorus*) and western gray squirrel (*Sciurus griseus*). The attraction of herbivores to the oak woodlands in turn attracts predators, such as Cooper's hawks (*Accipiter cooperii*) and white-tailed kites (*Elanus leucurus*).

Within woodlands, dead and decaying trees of all species and/or their downed limbs provide areas for small mammals, amphibians, and reptiles to seek cover and food, such as insects or fungi. In addition, dead tree snags provide perching opportunities for raptors. The wide spreading and sturdy branches of tree canopies provide shading opportunities for wildlife traversing across the terrain. Tree branches also provide important nesting opportunities for many bird species, including cavity nesting birds such as acorn woodpecker, oak titmouse (*Baeolophus inornatus*), ash-throated

flycatcher (*Myiarchus cinerascens*), Nuttall's woodpecker (*Dryobates nuttallii*), Downy woodpecker (*Dryobates pubescens*), and house wren (*Troglodytes aedon*).

Arroyo willow thickets typically provide habitat for foraging, breeding, and/or cover for a variety of common wildlife species, including amphibians, such as the Pacific chorus frog (*Pseudacris regilla*); reptiles, such as the western fence lizard (*Sceloporus occidentalis*); and mammals, such as raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), woodrat (*Neotoma* sp.), rabbits (*Sylvilagus* sp.), and shrews (*Sorex* spp.). Some of the more visible species typically present in this community include migratory and resident bird species, such as Bewick's wren (*Troglodytes bewickii*), warbling vireo (*Vireo gilvus*), Wilson's warbler (*Wilsonia pusilla*), black phoebe (*Sayornis nigricans*), goldfinches (*Spinus* sp.), hummingbirds, and black-headed grosbeak (*Pheucticus melanocephalus*).

Non-native annual grasslands may provide habitat for burrowing species such as California ground squirrel (*Spermophilus beecheyi*), California vole (*Microtus californicus*), and Botta's pocket gopher (*Thomomys bottae*). A variety of bird species hunt or forage in this community for these burrowing species, including raptors such as the red-tailed hawk and white tailed kites. Depending on the height of the vegetation, some unmaintained non-native grasslands can provide suitable cover for other small mammals and reptiles.

4 Sensitive Biological Resources

Local, state, and federal agencies regulate special status species and other sensitive biological resources and require an assessment of their presence or potential presence to be conducted on-site prior to the approval of proposed development on a property. This section discusses sensitive biological resources observed in the Study Area and evaluates the potential for the Study Area to support additional sensitive biological resources.

Assessments for the potential occurrence of special status species are based upon known ranges, habitat preferences for the species, species database records, species occurrence records from other sites in the vicinity of the survey area, previous reports of Ellwood Mesa, and the results of 2021 and 2022 surveys of the Study Area. The results are summarized in Appendix D. The potential for each special status species to occur in the Study Area was evaluated according to the following criteria:

- **Not Expected.** 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), and species would have been identifiable on-site if present (e.g., oak trees). Protocol surveys (if conducted) did not detect species.
- **Low Potential.** Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site. Protocol surveys (if conducted) did not detect 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.** Species is observed on the site or has been recorded (e.g., CNDDB, other reports) on the site recently (within the last 5 years).

Plant or animal taxa may have “special status” due to declining populations, vulnerability to habitat change, or because they have restricted ranges. Some are listed as threatened or endangered by the USFWS or by the CDFW and are protected by the ESA and CESA. Others have been identified as sensitive or as special status species by the USFWS, the CDFW, or by private conservation organizations, including the CNPS. Unlisted special status species do not have formal state or federal status.

For the purpose of this BRA, 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 ESA; those listed or candidates for listing as Rare, Threatened, or Endangered by the CDFW under the CESA or Native Plant Protection Act; those recognized as Species of Special Concern (SSC) by the CDFW; and plants occurring on lists 1 and 2 of the CNPS California Rare Plant Rank (CRPR) system, per the following definitions:

- **CRPR 1A** = Plants presumed extinct in California

- **CRPR 1B.1** = Rare or endangered in California and elsewhere; seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)
- **CRPR 1B.2** = Rare or endangered in California and elsewhere; fairly endangered in California (20-80% occurrences threatened)
- **CRPR 1B.3** = Rare or endangered in California and elsewhere, not very endangered in California (<20% of occurrences threatened or no current threats known)
- **CRPR 2** = Rare, threatened or endangered in California, but more common elsewhere
- **CRPR 3** = Need more information (Review List)
- **CRPR 4** = Limited Distribution (Watch List)

Plants on lists 3 and 4 of the CRPR system are not considered special-status species per GP/CLUP Policy CE 8.1 or the Guidelines for Biological Surveys and Biological Survey Reports for Proposed Development Projects (CCC 2016) but are included in Appendix D for reference since they are tracked by CNDDB.

In addition, special status species are those that are ranked globally (G) and subnationally (S) 1 through 3 based on NatureServe's Heritage Methodology methodologies:

- **G1 or S1** - Critically Imperiled Globally or State-wide
- **G2 or S2** - Imperiled Globally or State-wide
- **G3 or S3** - Vulnerable to extirpation or extinction Globally or State-wide

Plant communities are also considered special status biological resources if they have limited distributions, have high value for sensitive wildlife, contain special status species, or are particularly susceptible to disturbance. The CDFW ranks special status communities as "threatened" or "very threatened" and keeps records of their occurrences in the CNDDB. Additionally, the current Sensitive Natural Communities List (CDFW 2022a) was referenced to determine the current sensitivity status of the vegetation alliances found within the Study Area. The list provides the current G and S rank for each community, and indicates whether CDFW considers the community to be sensitive (CDFW 2018a).

Plant communities/land cover types may also be considered ESHA per City GP/CLUP Policy CE 1.1, which incorporates the same ESHA language as the CCA (§ 30107.5) to include areas where plant or animals or habitat are rare or especially valuable and that can be easily disturbed/degraded.

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 and wildlife listed by the City may be considered locally sensitive.

4.1 Special Status Species

Based on the database and literature review, 43 special status plant species and 39 special status animal species have been recorded in the vicinity of the study area (Appendix D). Known occurrences within 10 miles of the project from CNDDB and within a 9-quad search from CNPS were considered in this analysis. Of these, six special-status plant species and eight special-status wildlife species were evaluated as having a moderate to high potential to occur or are present. The CCA

requires discussion of sensitive species that are present or likely to be present. As such, species with a low potential to occur are not discussed in the section below but are listed in Appendix D.

4.1.1 Special Status Plant Species

Based on the database and literature review and field reconnaissance survey, six special-status plant species have a moderate to high potential to occur or are present (Table 3). Two special-status plant species, Santa Barbara honeysuckle (CRPR 1B.2, SBBG Rare Plant) and Plummer's baccharis (*Baccharis plummerae* ssp. *plummerae*, G3T3/S3, CRPR 4.3), were previously identified in existing biological surveys for this site and are shown on Figure 4-1 of the Goleta GP/CLUP CE as well as observed on-site during the 2021 and 2022 surveys. In addition, four other special status plant species were determined to have a moderate to high potential to occur within the Study Area due to presence of suitable habitats including arroyo willow thicket, coast live oak woodland and forest, coyote brush scrub, lemonade berry scrub, purple needle grass grasslands and wild oat and annual brome grasslands.

Table 3 Special-Status Plant Species with Moderate to High Potential to Occur or are Present within Study Area

Species	G-Rank/S-Rank CRPR Other	Moderate	High	Present
Brewer's calandrinia (*Calandrinia breweri*)	G4/S4, 4.2, SBBG	X		
Catalina mariposa lily (*Calochortus catalinae*)	G3G4/S3S, 4.2	X		
Coulter's saltbush (*Atriplex coulteri*)	G3/S1S2, 1B.2	X		
Plummer's baccharis *(Baccharis plummerae ssp. plummerae)*	G3T3/S3, 4.3			X
Santa Barbara honeysuckle (*Lonicera subspicata)*	G5T2?/S2?, 1B.1, SBBG			X
Southern tarplant (*Centromadia parryi* ssp. *australis*)	G3T2/S2, 1B.1, SBBG		X	

Notes:

[1]G-Rank/S-Rank = Global/state rarity ranking based on NatureServe

CRPR = CNPS California Rare Plant Rank

SBBG = Santa Barbara Botanic Garden Rare Plant

[2]Southern tarplant is documented as being present at the south end of the housing tract, as a restoration element in conjunction with development of The Bluffs project but is not naturally occurring (Storrer Environmental Services 2020). Rincon's 2021 and 2022 field surveys did not detect southern tarplant in these areas but did detect common tarplant (*Deinandra fasiculata*); however the surveys did not occur during the species blooming period as they were not focused rare plant surveys.

The remaining 37 special status plant species have a low potential or are not expected to occur based on habitat requirements and site conditions and do not warrant further discussion. Precluding factors include disturbance history of the site and lack of suitable soils, site elevations, hydrologic conditions, or vegetation communities.

4.1.2 Special Status Wildlife Species

Based on the results of the database and literature review and field reconnaissance survey and presence of suitable habitat, nine special-status wildlife species warrant further discussion in this section, including seven that were evaluated as having a moderate to high potential to occur or are present (Table 4) and two species which have a low potential to occur. During the reconnaissance surveys, three special status animal species were observed within the Study Area including California overwintering population of monarch butterflies and Copper's hawk in the eucalyptus groves and white-tailed kite foraging in the grasslands. No USFWS designated critical habitat is present within or directly adjacent to the study area.

Table 4 Special Status Wildlife Species with Potential to Occur Within the Study Area

Species	Status[1]	Low	Moderate	High	Present
California horned lark (*Eremophila alpestris actia*)	WL		X		
California red-legged frog (*Rana draytonii*)	FT, SSC	X			
Cooper's hawk (*Accipiter cooperii*)	WL				X
Grasshopper sparrow (*Ammodramus savannarum*)	SSC			X	
Monarch butterfly - California overwintering population	SA				X
Northern Bryant's woodrat (*Neotoma bryanti intermedia*)	SSC	X			
Northern California legless lizard (*Anniella pulchra*)	SSC			X	
Western red bat (*Lasiurus blossevillii*)	SSC		X		
White-tailed kite (*Elanus leucurus*)	FP				X

[1]Notes:

FT = Federally Threatened FC = Federal Candidate FD = Federal Delisted FP= Fully Protected SE = State Endangered SD = State Delisted SSC = CDFW Species of Special Concern WL= Watch List SA= State Special Animal

The remaining 31 special status species identified in the literature/database review have a low potential to occur or are not expected based on the criteria presented above. This includes some bird, amphibian, reptile, and mammal species previously documented near the Study Area but are likely to be only transient through the area during limited foraging or migratory movements, and for which no suitable nesting or roosting habitat is present. The species that can be reasonably anticipated to occur were determined based on the published ranges of the species, and the type, extent, and condition of terrestrial native or non-native (e.g., eucalyptus grove) nesting/roosting and foraging habitat available in the study area.

Monarch Butterfly – California Overwintering Population

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. Overwintering roosting sites are predominately in dense eucalyptus groves to provide cover from wind and storms, 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 Study Area provide

significant habitat value to the monarch butterfly population (City 2019). Monarchs typically arrive in the Study Area in October and depart between late February and April, depending on conditions. Warmer temperatures lead to earlier departures. The Ellwood Mesa eucalyptus groves were planted in 1872 and contained roughly 150,000 blue gum trees by 1876. Monarchs were recorded overwintering at Ellwood Mesa as early as the 1960s. The site contains topographic features that support the microclimates needed for monarch overwintering (cold air sinks) and historically had dense canopies with multi-tiered wind protection and cathedral openings for sunning. Overwintering monarch aggregations in Ellwood Mesa have numbered in the hundreds of thousands during some years. Drought conditions from 2012 to 2016, however, led to massive tree die off and the quality of habitat diminished greatly, causing monarch overwintering populations to decrease drastically. The 2021-2022 survey year showed an increase in monarch counts, with a total of 15,055 monarchs throughout Ellwood Mesa on December 15, 2021; however these numbers are still well below historic counts (Appendix F). In November 2022, biologists conducting protocol overwintering monarch surveys observed an increased number of aggregating monarchs since 2016 (12,387 butterflies); however after the first winter storm with heavy rain and high winds, the count in December 2022 dropped to 1,911 butterflies. This illustrates that monarchs are continuing to overwinter at historic aggregation sites which no longer provide adequate habitat and protection.

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). In 2014, monarchs were petitioned to be listed under the federal ESA. In December 2020, the USFWS found that listing was warranted but precluded by other listing actions on its National Priority List. The monarch is currently scheduled to be federally listed in 2024. Monarch butterfly aggregation sites located in Ellwood Mesa, including historic aggregation sites that are no longer used, are also designated as ESHA in the Goleta GP/CLUP Policy CE 4.1 through 4.5.

California Red-Legged Frog

The California red-legged frog (CRLF) is a federally threatened and state SSC. The species is found in stagnant or slow moving water with depths greater than two feet and surrounded by dense shrubs, or emergent riparian vegetation, such as arroyo willow, cattails, and bulrushes. However, CRLF use a variety of habitat types, including various aquatic, riparian, and upland habitats. The species requires 11-20 weeks of permanent water for larval development and must have access to estivation habitat. The breeding period for CRLF is typically November through April. Additionally, at any time of the year, adult CRLF may move long distances from breeding sites, including through actively cultivated agricultural fields, in search of suitable habitat. The majority of extant localities are isolated and fragmented remnants of larger historical populations occur along the coast from Mendocino County to Baja California and throughout the Central Valley and Sierra Nevada foothills. CRLF movements are variable, and dispersing individuals can travel over land between breeding sites up to 1.7 miles (Bulgar 2003). Movements often occur along riparian corridors; however drier upland sites are also utilized during the rainy season. Additionally, the Primary Constituent Elements (PCEs, termed Physical and Biological Features under current regulations) for CRLF defined in the Revised Designation of Critical Habitat for the CRLF; Final Rule published on March 17, 2010; states PCEs for CRLF include must have two (or more) suitable breeding locations, a permanent water source, and associated uplands surrounding these water bodies up to 300 feet from the water's edge. Additionally, all of these features must occur within 1.25 miles of one another and be connected by barrier-free dispersal habitat that is at least 300 feet in width.

The species has been documented in the CNDDB in Bells Canyon and Tecolote Creek, approximately one mile west of the Study Area. Within the Study Area, the lack of mature riparian vegetation and presence of developed trails and human activities and pets within Ellwood Mesa Open Space limits the potential for CRLF. The portion of Devereux Creek within the Study Area may provide marginally suitable aquatic habitat, consisting of intermittent sources of standing freshwater which may be occasionally present during the winter months during an above average rainfall season. However, the lack of continually ponded water would likely preclude CRLF from establishing breeding habitat.

The Study Area does not provide the critical habitat PCEs for this species and does not provide suitable breeding habitat, such as permanent water sources which contribute to resident populations of CRLF. No observations of the species or potential breeding habitats within Devereux Creek were observed during the reconnaissance survey in February 2022. Devereux Creek provides potentially suitable transitory habitat for CRLF, but suitable breeding pools are not present in the reach within the Study Area. Based on review of aerial imagery and NWI, no ponds or permanent sources of water are visible within 300 feet of the site. Therefore, the species has a low to moderate (depending on cumulative seasonal precipitation) potential to occur transitorily within the Study Area during suitable climatic conditions.

Northern California Legless Lizard

The northern California legless lizard is CDFW SSC that is typically found in coastal dune, valley-foothill chaparral, and coastal scrub vegetation communities, and areas with sandy or loose organic soils or high amounts of leaf litter. The species is fossorial, and eats primarily larval insects, beetles, termites, and spiders (California Herps 2023). Soil moisture is an essential component of their habitat requirements. The species ranges from northern Contra Costa County south to Ventura County, and in scattered locations in the San Joaquin Valley and on the desert side of the Tehachapi Mountains and part of the San Gabriel Mountain (Nafis 2019).

Numerous historic CNDDB occurrences of the species have been documented within 10 miles of the Study Area; one recent (2018) record was documented northeast of El Capitan Beach. No citizen database records have been recorded within the City (iNaturalist 2023). Suitable sandy soils with high moisture content are present throughout much of the Study Area; therefore, the species has a moderate potential to occur. The species would not be expected to occur within the eucalyptus groves due to the dense root network, which is not suitable for fossorial reptiles.

Western Red Bat

Western red bat is a CDFW SSC that is locally common in California. This species is found in a variety of habitats such as grasslands, woodlands, and agriculture land (Zeiner et al. 1990). This species typically roosts in trees (particularly foliage) and occasionally in shrubs, primarily within edge habitats adjacent to streams, orchards, and sometimes urban areas. In California, breeding appears highly associated with wide riparian strips of intact stands of cottonwood and sycamore (Pierson et. Al 2006), and often with major/perennial creeks.

A CNDDB occurrence of a single individual of the species has been documented from acoustic surveys in 2017 approximately 0.6 miles east of the Study Area in a eucalyptus tree in Devereux Slough. Somewhat suitable roosting and foraging habitat in eucalyptus, cottonwoods or sycamores associated with Devereux Creek is present in the Study Area, however the woodland is dominated by eucalyptus trees which are not known to support roosting red bats. Devereux Creek is also an intermittent system that only holds water some months of the year during heavy rain events and

increased runoff. No sign of bat species (guano) were observed during the reconnaissance survey. Therefore, the species has a moderate potential to occur within the Study Area.

Grasshopper Sparrow, California Horned Lark

The grasshopper sparrow is a CDFW SSC. This small songbird is resident of open grasslands with patchy bare ground and prefers large tracts of habitat rather than fragmented. In California, presence of native grasses is less important than absence of trees. Nests are often found on the ground at the base of a grass clump protected by overhanging grasses and sedges. They display loose colonial breeding patterns, but do not form flocks during migration. Their diet is not well known but includes grasses, forb seeds, and insects, depending on the season, locality, and availability (Birds of the World 2023). Grasshopper sparrows are susceptible to grassland fragmentation due to agriculture and urban development.

Somewhat suitable open grassland habitat occurs within the Study Area. Predominantly non-native annual grasslands in the northwestern portion of the Study Area provide marginally suitable habitat as it is surrounded by eucalyptus woodlands and residential and urban development. More suitable non-native annual and native purple needlegrass grasslands are present in the southern portion of the Study Area on the coastal bluffs, however it is fragmented by shrubs and trails. A small population has been documented on More Mesa, approximately five miles east of the Study Area. Adults and fledglings (in 2015) have been documented in Ellwood Mesa between 1991 and 2019 and the area is considered to support probable or definite breeders (eBird 2023, Lehman 2020, SBAS 2023). The species has a high potential to occur within the Study Area.

California horned lark is CDFW Watch List species. The species is a ground-dwelling bird common in open, sparsely vegetated areas such as grasslands, deserts, and agricultural areas. They congregate in moderately sized flocks, feeding mostly on insects and other small invertebrates. The species is a ground-nester, building a small grass-lined cup in slight depressions in the open. They are year-round residents in much of California, breeding in open areas throughout their range (Zeiner et al 1990).

A historic (2003) CNDDB occurrence of the species was documented within 0.25 miles of the Study Area in Devereux Slough. Citizen database records show individuals in and adjacent to Ellwood Mesa, but documentation of breeding (eBird 2023, Lehman 2020, SBAS 2023). Grassland habitat for foraging is present within the Study Area; therefore, the species has a moderate potential to occur.

White Tailed Kite and Cooper's Hawk

The white-tailed kite (*Elanus leucurus*) is a CDFW fully protected species. A yearlong resident in coastal and valley lowlands, the species inhabits a wide range of habitats, mostly in cismontane California. The species prefers trees with dense canopies for cover. Their diet consists mostly of voles and other small, diurnal mammals, but the species occasionally feeds on birds, insects, reptiles, and amphibians. Typical foraging habitat is undisturbed, open grasslands, meadows, farmlands and emergent wetlands. Nesting is typically near top of dense oak, willow, or other tree stands, located near foraging areas and typically forages within a 0.5 mile radius from the nest site when breeding (CDFW 2014). This species preferentially selects herbaceous lowlands with a range of woodland structure, and high density of voles, and substantial groves of dense, broad-leafed deciduous trees for nesting and roosting.

The species occurs as a year-round resident at Ellwood Mesa (City 2006, Storrer 2011). White-tailed kites have been recorded nesting in the eucalyptus trees in and surrounding the Study Area as

recently as 2019 (City 2006, eBird 2023, SBAS 2023). A kite was observed foraging over the wild oat and annual brome grasslands during the reconnaissance surveys in February 2022.

The Cooper's hawk (*Accipiter cooperii*) is a CDFW watch list (WL) species. The species typically inhabits woodlands and forest edges but can also be found in urban parks and neighborhoods where trees are present. Nests are constructed 25- 50 feet high in a variety of tree species, including pines, oaks, beeches, and spruces. Nests are made of sticks and are often lined with bark flakes and green twigs. Cooper's hawks are aerial predators that feed primarily on medium-sized birds, such as mourning dove (*Zenaida macroura*), American robin (*Turdus migratorius*), California quail (*Callipepla californica*), and European starling (*Sturnus vulgaris*). In addition to preying on adult birds, Cooper's hawks will also occasionally rob nests and hunt rabbits, rodents, and bats (Birds of the World 2023). Cooper's hawks are reported to nest in Ellwood Mesa's oak woodlands and eucalyptus groves as recently as 2021 (City 2006, eBird 2023, SBAS 2023) and were observed during the reconnaissance survey.

Northern Bryant's Woodrat

The northern Bryant's woodrat is a CDFW SSC that occurs in scrub habitats of southern California from San Luis Obispo County to San Diego County. The species prefers live oak, chamise, and buckwheat and typically builds houses against rock crevice, base of cactus, or lower branches of trees. The species was formerly named the San Diego desert woodrat (*Neotoma fuscipes*) which was split into the northern dusky-footed woodrat and the southern big-eared woodrat (*Neotoma macrotis*) (Matocq 2002). Northern Bryant's woodrat and big-eared woodrat can live in fairly close proximity, however Bryant's prefers arid, xeric sites often containing *Opuntia* sp. Cactus (Alvarez-Casteneda, et al. 1999) while big-eared typically occur in drainages and chaparral habitat (Haynie, et al. 2007). Nests are somewhat distinctive, with big-eared woodrats building well-developed, large nest stacks typically 2 to 3 feet or more in height (Matocq, et al. 2004); while Bryant's nests are indifferent groupings of sticks 1 to 2 feet high (Alvarez-Casteneda, et al. 1999).

Somewhat suitable habitat is present in the Study Area for midden construction including eucalyptus groves and oak woodland habitat along drainages, however this habitat is more suited for the common big-eared woodrat. No obvious woodrat middens were observed during the reconnaissance survey, although middens have been observed by local resident accounts. CNDDB occurrence has been documented along San Pedro Creek within the San Ynez Mountains approximately 5 miles northeast of Study Area. No citizen database records occur within the City (iNaturalist 2023). Therefore, the northern Bryant's woodrat has a low potential to occur within the Study Area.

4.1.3 Other Protected Species

Nesting Birds and Raptors

The Study Area contains suitable habitat to support regulated nesting birds (e.g. Anna's hummingbird, hooded oriole, and California towhee) and raptors (e.g. turkey vulture, great horned owl, and red-tailed hawk), protected under the CFGC Section 3503 and the MBTA (16 United States Code §§ 703–712). Potential nesting locations for raptors were observed throughout the Study Area, with the most suitable locations being mature native and non-native trees (e.g., eucalyptus, sycamore, arroyo willow, cottonwood, coast live oak) and shrubs in the coyote bush scrub and native landscaping vegetation communities. Several inactive historic nests were observed in the eucalyptus trees within the Study Area during the reconnaissance survey. Turkey vulture roosts have

been documented in the eucalyptus groves on Ellwood Mesa as depicted on Figure 4-1 of the Goleta GP/CLUP CE (City 2006, eBird 2023); however, no turkey vultures were observed within the Study Area during the reconnaissance survey. There are 47 avian species documented as breeding within or directly adjacent to Ellwood Mesa (SBAS 2023).

4.1.4 Critical Habitats

No designated critical habitat for threatened or endangered species occurs in the study 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 Study Area (USFWS 2023a). Snowy plovers are discussed under Appendix F but critical habitat is not discussed further.

4.2 Sensitive Plant Communities and ESHA

4.2.1 Sensitive Plant Communities

The following seven vegetation alliances observed within the Study Area are considered CDFW sensitive natural communities and are considered City and CCA ESHA: alkali heath marsh (G4/S3), arroyo willow thickets (G4/S4), hardstem bulrush marshes (GNR/S3S4), iris-leaf rush seeps (G2?S2?), creeping wildrye turfs (G3/S3), lemonade berry scrub (G3/S3),and purple needle grass grasslands (G3G4/S3S4).

The remaining three vegetation alliances within the Study Area are not considered CDFW sensitive natural communities. Coast live oak woodland and forest (G5/S4) is considered City and CCA ESHA. Eucalyptus grove (GNA/SNA) is considered City and CCA ESHA in Ellwood because it contains the Ellwood Mesa Complex and key elements for monarch overwintering. Coyote brush scrub (G5/S5) is not typically considered City and CCA ESHA except where it overlaps with City-mapped coastal bluff scrub and coastal sage scrub ESHA, as described in Section 3.2.1

All sensitive communities are considered CCA ESHA under Policy CE 1.1. Further discussion of sensitive communities is in the context of ESHA beginning under Section 4.2.2. For a discussion of CDFW sensitivity as it pertains to CEQA, refer to Attachment F.

4.2.2 ESHA

This section includes a discussion of City and CCA ESHA designation and protection policy. The GP/CLUP CE is consistent with and expands on the CCA definition of ESHA. A consistency discussion is included under Section 5.2.

Policy CE 1 Environmentally Sensitive Habitat Area Designations and Policy

In the City ESHAs are defined under Policy CE 1.1 (in italics). Section a. incorporates the same ESHA language as the CCA (§ 30107.5) to include areas where plant or animals or habitat are rare or especially valuable and that can be easily disturbed/degraded.

CE 1.1 Definition of Environmentally Sensitive Habitat Areas. [GP/CLUP]. ESHAs shall include, but are not limited to, any areas that through professional biological evaluation are determined to meet the following criteria:

a. 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 that could be easily disturbed or degraded by human activities and developments;

b. any area that includes habitat for species and plant communities recognized as threatened or endangered by the state or federal governments; plant communities recognized by the State of California (in the Terrestrial Natural Communities Inventory) as restricted in distribution and very threatened; and those habitat types of limited distribution recognized to be of particular habitat value, including wetlands, riparian vegetation, eucalyptus groves associated with monarch butterfly roosts, oak woodlands, and savannas; and

c. any area that has been previously designated as an ESHA by a by the [CCC]*, the* [CDFW], *City of Goleta, or other agency with jurisdiction over the designated area.*

Section b. expands upon the CCA to include CDFW sensitive communities, critical habitat (e.g., snowy plover) as well as specific habitats that may not be on the CDFW sensitive communities list. Section c. is relevant to the study area since ESHA had previously been designated by the City and the CCC incorporating the mapping from the Draft Ellwood-Devereux Coast Open Space and Habitat Management Plan (City 2004). While the GP/CLUP EIR and CE mapping is cited as 2006, the information included in the 2006 map is taken directly from the 2004 Draft Ellwood-Devereux Coast Open Space and Habitat Management Plan.

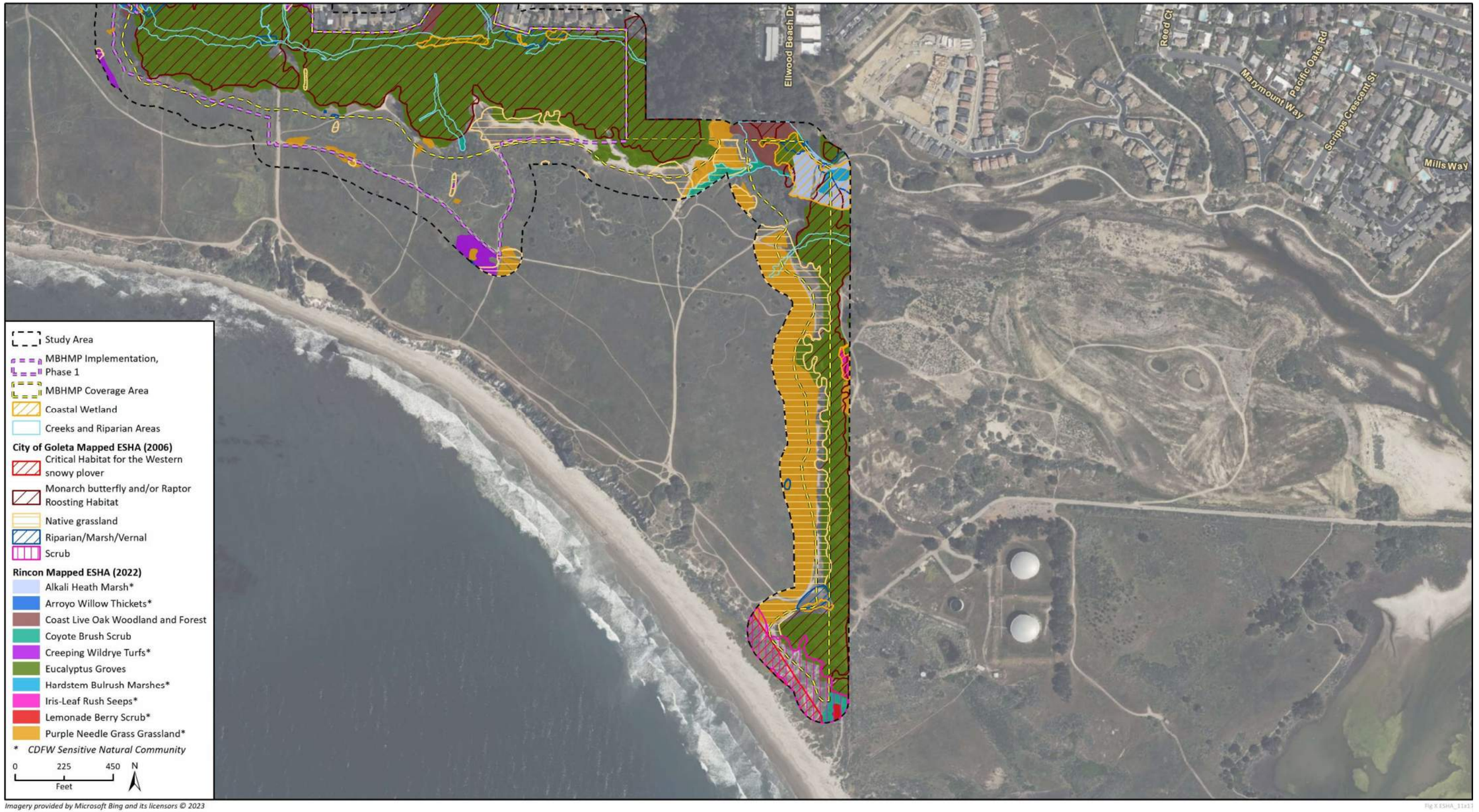
Much of the Study Area is designated ESHA in the Ellwood Mesa Open Space, including oak woodland, riparian habitat, vernal pools, wetlands, native grasslands, coastal bluff scrub, and monarch butterfly habitat areas. Policy CE 1.2 describes these habitats, which are mapped in GP/CLUP CE Figure 4-1. The GP/CLUP Figure 4-1 mapped ESHA in the Study Area in 2004 prior to the current practice of alliance-based mapping under the MCV2 and generally follows an abbreviated version of the 1986 Holland Classification. Since 2004 changes in the study area include the development of The Bluffs in the eastern portion of the study area, death of numerous trees in the eucalyptus grove, and unofficial expansion of trails on the southern edge of the main eucalyptus grove.

While the City and Rincon-mapped boundaries differ slightly as shown in Figure 8, no reduction in the GP/CLUP CE Figure 4-1 ESHA mapping are proposed. Consistent with Policy CE 1.5, once ESHA is designated it can only be removed though a GP/CLUP amendment. However, per Policy CE 1.3, any area not designated on the GP/CLUP Figure 4-1 that meets the requirements of Policy CE 1.1 and 1.2 ESHA criteria are granted the same protections. Therefore, the areas considered ESHA in this report include the GP/CLUP CE Figure 4-1 mapping and the additional 2022 Rincon-mapped habitat. Policy CE 1.6, 1.7, 1.9, and 1.10 define ESHA uses, development standards, on-site and off-site mitigation, setbacks/buffers, and management.

Figure 8a ESHA Mapping Comparison



Figure 8b ESHA Mapping Comparison



Policy CE 2: Protection of Creeks and Riparian Areas

Policy CE 2 defines and restricts activities than can occur in Streamside Protection Areas. Policy CE 2.1 designates creeks shown in Figure 4-1 as ESHA and CE 2.2 establishes a 100-foot Stream Protection Area (SPA) (Appendix A). However, similar to the ESHA provision, Policy CE 2.3.e allows the proposed project uses to occur within an SPA. Policy CE 2.6.d generally prohibits the planting of nonnative species in riparian areas, non-natives species are allowed to occur where they provide critical habitat for monarch butterflies, raptors, or other protected animals.

Policy CE 3: Protection of Wetlands

CE 3.1 defines wetlands using one parameter consistent with CCA Section 30121 (Appendix A). The policy protects wetlands including designating all wetlands/vernal pools as ESHA and prohibiting the modification through filling, diking or dredging of wetlands and establishing a 100-foot wetland buffer. Under policy CE 3.4 the buffer can be reduced to no less than 50 feet, but certain uses (e.g., resource dependent, restoration) within the coastal zone are allowed in the buffer provided the use/activity least damaging alternative and mitigation measures are provided. As further discussed in Section 4.3 above, Devereux Creek with associated riparian corridor, unnamed drainages, and two coastal wetlands occur within the Study Area and are protected under these local policies. A buffer reduction is not required since the project for a resource dependent activity (low impact public use) and restoration and enhancement that are allowed uses under all CE 3 policies.

CE.3.8 protects vernal pools on Ellwood Mesa and Santa Barbara Shores Park and requires trails on these two properties shall be sited and constructed in a manner that avoids impacts to vernal pool hydrology and that will allow restoration by removing several informal trail segments that bisect vernal pool habitats.

Policy CE 4: Protection of Monarch Butterfly Habitat Areas

Policy CE 4 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 Ellwood Complex in the Study Area. Policy CE 4.4 restricts development in monarch butterfly ESHA and 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. Policy CE 4.6 prohibits any construction grading, or other development within 200 feet of the active roost between October 1 and March 1.

Policy CE 5: Protection of Other Terrestrial Habitat Areas

Policy CE 5.1 designates native grasslands, coastal bluff scrub, coastal sage-scrub, and chaparral as ESHA (Appendix A).

Native Grasslands

Under CE 5.2 native grasslands are generally defined as areas where the native grassland species comprise 10 percent or more of the total relative plant cover. Policy 5.2 includes development restrictions and 10-foot native restoration buffer around native grasslands.

Coastal Bluff Scrub, Coastal Sage Scrub, and Chaparral

Under CE 5.3, coastal bluff scrub is defined as scrub habitat occurring on exposed coastal bluffs. Coastal sage scrub is defined as drought-tolerant Mediterranean habitat including California sagebrush, coyote bush, and California encelia. Scrub habitat must have the compositional and structural characteristics described in Holland 1986 or other classification system recognized by CDFW. Policy CE 5.3 includes development restrictions and a 25-foot native restoration buffer around this ESHA.

Policy CE 8: Protection of Special-Status Species

Policy CE 8.1 designates requisite habitats for individual occurrences of special-status plants and animals, including candidate species for listing under the state and federal ESA, California SSC, CNPS List 1B plants, and other species protected under provisions of the CFGC as ESHAs. These habitats include, but are not limited to, the following:

a. Special-status plant species such as Santa Barbara honeysuckle (Lonicera subspicata var. subspicata), southern tarplant (Centromadia parryi ssp. australis) and blackflowered figwort (Scrophularia atrata).
b. Nesting and roosting areas for various species of raptors such as Cooper's hawks (Accipiter cooperii), red-tailed hawks (Buteo jamaicensis), white-tailed kites (Elanus leucurus), and turkey vultures (Cathartes aura).

Based on the presence of Santa Barbara honeysuckle, the native landscaping/restoration land cover type just east of Newport Drive is considered ESHA. All raptor nesting or roosting trees and woodlands and monarch butterfly habitat remain designated as ESHA.

Policy CE 9: Protection of Native Woodlands

Policy CE 9.3 designates native oak woodlands or savannas as ESHAs.

4.3 Jurisdictional Waters and Wetlands

Based on the JD, the study area contains areas potentially subject to USACE, CDFW, RWQCB, and CCC/City jurisdictions. Potentially jurisdictional features include Devereux Creek, seven unnamed drainages tributary to Devereux Creek, one unnamed drainage tributary to Devereux Slough, and two coastal wetlands. These features are described in detail below. Representative photographs and sample point methodology are included in Appendix I. Below is a summary of jurisdictional features based on the Jurisdictional Delineation Report (Appendix I; Rincon 2023).

4.3.1 Field Results

Devereux Creek

Devereux Creek enters the study area from the west and flows eastward across the study area (Figure 9a to Figure 9d). As it exits the study area, Devereux Creek flows into Devereux Slough, which is a seasonally flooded tidal lagoon periodically connected to the Pacific Ocean. Devereux Creek is an intermittent system maintained by groundwater, storm flows, and urban runoff from surrounding neighborhoods and the Sandpiper Golf Course, which is adjacent to the western boundary of the study area. The drainage characteristics of Devereux Creek, including channel

dimensions, vegetation type, and hydrology, change as the creek flows through the study area, as described below.

Western

Between the western (upstream) boundary of the study area and the confluence of Devereux Creek and Unnamed Drainage 1c (Figure 9a), Devereux Creek is generally flat and characterized by a single active channel which flows eastward through eucalyptus groves and arroyo willow thickets. No surface water was present in the channel in this area during the delineation. The bed of the channel is approximately 6 feet wide, and the top of bank ranges from 35 to 100 feet wide and 5 to 10 feet in height. Where Devereux Creek crosses the eucalyptus groves, the channel is generally unvegetated due to the dense leaf litter, and the fine sandy loam soils are compacted (Photograph 1). In the arroyo willow thickets, more vegetation is present, including arroyo willow and coyote brush. The channel is well defined and broad floodplains are not present. The OHWM is defined by the presence of break in slope and change in vegetation cover, and largely coincides with the width of channel bottom from toe of slope to toe of slope.

Along the active channel in the western part of the study area, no primary wetland hydrology indicators were observed. Secondary wetland hydrology indicators were occasionally present on the sloped banks near the OHWM, including riverine drift deposits and water marks. However, wetland hydrology indicators were not consistently present in the abundance needed to indicate the presence of wetland hydrology.

Central

The central portion of Devereux Creek begins at the confluence of Unnamed Drainage 1c with Devereux Creek (Figure 9b) and extends eastward to the point where Devereux Creek exits the study area for the first time (Figure 9c). The characteristics of Devereux Creek change at the confluence of Drainage 1c (described below) and Devereux Creek. The creek continues to flow eastward across a flat plain vegetated with arroyo willow thickets, then further into dense eucalyptus groves. In this central portion of the study area, the creekbed of Devereux Creek is relatively flat and characterized by a single active channel, which varies between approximately 3 to 10 feet in width. Surface water was present in portions of the creek, with water depth between 3 to 6 inches. The floodplain along much of this section of the creek is approximately 25 feet in total width. These floodplains are characterized by saturated soils and a dominance of hydrophytic vegetation, including arroyo willows, soft chess, Parish's spike rush, and common rush. The top of bank ranges from approximately one to 10 feet high and 30 to 115 feet wide in this area. As Devereux Creek flows east into dense eucalyptus groves, the herbaceous layer is sparse. As it continues east, the eucalyptus canopy becomes more open with a more developed herbaceous layer, including the hydrophytic species basin saltbush (*Atriplex prostrata*), brown sedge (*Carex subfusca*), cocklebur (*Xanthium strumarium*), and curly dock. Five sample points (Sample Points 1-5) were assessed to determine hydrology and presence of other wetland characteristics, as described below.

While much of the topography of Devereux Creek is natural, several small portions of the creek have been manipulated by human activity. Grouted rip rap boulders are present along Devereux Creek near the center of the study area, extending the width of the banks. South of Santa Barbara Shores Drive, east of the confluence of Unnamed Drainage 3 and west of the confluence of Unnamed Drainage 4, an unpaved road crosses Devereux Creek with a 5-foot wide corrugated pipe culvert. Further downstream, an approximately 250-foot long section of the creek has been modified into a

trapezoidal concrete channel. This portion of the channel has a steeper gradient than upstream, and is lined with concrete-grouted rip-rap. Other than these two anthropogenically manipulated areas, the creek is not confined or deeply incised.

Eastern

The creek characteristics change as Devereux Creek re-enters the study area and approaches the far eastern boundary of the study area, where it flows into upper Devereux Slough (Figure 9d) . The creek cuts a narrow, shallowly incised channel approximately 5 feet wide and 2 feet deep through a dense alkali heath herbaceous layer. The OHWM is defined by the presence of break in slope, change in vegetation cover, and drift debris accumulation, and largely coincides with the width of channel bottom from toe of slope to toe of slope. A broad floodplain defined by topography and presence of hydrophytic vegetation is present, extending approximately 150 to 250 feet across.

Based on the presence of hydrophytic vegetation and other hydrology indicators, two sample points (Sample Points 6 and 7) were assessed near the outlet of Devereux Creek into upper Devereux Slough. A total of seven sampling points were assessed along Devereux Creek to determine hydrology and presence of other wetland characteristics.

Unnamed Drainage 1

An unnamed ephemeral drainage (herein described as Unnamed Drainage 1) intersects with the northwest corner of the study area (Figure 9e to Figure 9f) in three areas, referenced as segments 1a, 1b, and 1c. Flows are conveyed from Unnamed Drainages 1a and 1b southward and outside the study area as non-jurisdictional overland flow before converging into Unnamed Drainage 1c outside the study area. Unnamed Drainage 1c then flows south approximately 830 feet to converge with Devereux Creek.

Unnamed Drainage 1a

Unnamed Drainage 1a flows southward through a 2-foot-diameter pipe culvert which crosses under Hollister Avenue and outlets into a natural bottomed drainage. The natural portion of the drainage channel has sloping to steep banks composed of natural soil and is approximately 2 to 5 feet high; the drainage is approximately 5 to 12 feet wide in this area. Although the channel is incised, it is not confined. Unnamed Drainage 1a does not exhibit indicators of an OHWM. The natural portion of the drainage is dominated by upland vegetation and is located within the eucalyptus groves vegetation community. Dominant plant species in the channel include garden nasturtium (*Tropaeolum majus*) and upright veldt grass, while the canopy is dominated by blue gum eucalyptus. No hydrophytic vegetation is present and the drainage appears to receive flows during rain events and primarily from urban runoff. Based on these factors, Unnamed Drainage 1a was determined to be ephemeral.

As Unnamed Drainage 1a flows south, the banks flatten and become indistinct, with water either infiltrating the soil or transitioning to sheet flow with no hydrologic indicators or evidence of ordinary flow. During heavy rain events, water travels from Unnamed Drainage 1b as overland sheet flow outside the study area and south into Unnamed Drainage 1c.

Unnamed Drainage 1b

Unnamed Drainage 1b flows southward through the study area to the east of Unnamed Drainage 1a (Figure 9e). Like Unnamed Drainage 1a, Unnamed Drainage 1b enters the study area as a 2-foot-wide pipe culvert which crosses under Hollister Avenue and outlets into a natural bottomed

drainage. The natural portion of the drainage is characterized by a top of bank which ranges between 7 and 30 feet wide and 2 to 20 feet tall. The channel is incised and is not confined. A collection of un-grouted rip rap is present along the banks in the natural portion of the drainage just south of Hollister Avenue. No surface water was present in Unnamed Drainage 2 during the time of the field surveys. Unnamed Drainage 1b does not exhibit indicators of an OHWM. The drainage appears to receive flows during rain events and from urban runoff and was determined to be ephemeral. The natural portion of the drainage is unvegetated and dominated fallen eucalyptus leaves. Herbaceous vegetation includes upland species such as upright veldt grass and smilo grass (*Stipa miliacea* var. *miliacea*). It is located within the eucalyptus groves vegetation community and blue gum eucalyptus forms a closed canopy over the drainage. No hydrophytic vegetation is present.

After exiting the southern boundary of the study area, Unnamed Drainage 1b transitions into non-jurisdictional sheet flow. Similar to Unnamed Drainage 1a, the banks flatten and water either infiltrates the soil or transitions to sheet flow with no hydrologic indicators or evidence of ordinary flow. During heavy rain events, water travels as overland sheet flow outside the study area and south into Unnamed Drainage 1c.

Unnamed Drainage 1c

Unnamed Drainage 1c flows southward through northwestern portion of the study area (Figure 9f). Outside the study area, Unnamed Drainages 1a and 1b contribute overland flow to this drainage. The upstream part of the drainage is characterized by a system of deeply incised branching channels which have highly disturbed, flat unvegetated bottoms. An OHWM was delineated based on the presence of a break in the bank slope and change in vegetation cover. These erosional channels range between 5 and 10 feet deep and 15 to 45 feet wide, and appear to have developed through rill and gully erosion. Several dirt footpaths cross the channels under the canopy of the eucalyptus groves, resulting in highly compacted and unvegetated channel bottoms in the northern portion of the drainage. In some areas, the channels are characterized by coyote brush scrub and arroyo willow thickets, including a patch of common spikerush.

The channels combine into a single drainage which flows southward through the eucalyptus groves, characterized by banks which range between 35 to 65 feet in width and 2 to 6 feet in height. The channel is generally unvegetated due to the dense layer of dead eucalyptus leaves. At the southern end of Unnamed Drainage 1c, the drainage crosses a dirt footpath and intersects with Devereux Creek. No surface water was present in Unnamed Drainage 1c during the assessment. The drainage appears to receive flows during rain events and from urban runoff and based on the factors described above, was determined to be ephemeral.

Unnamed Drainage 2

Unnamed Drainage 2 flows southeastward from The Bluffs residential neighborhood into Devereux Creek in the western portion of the study area (Figure 9a). The drainage has very shallow sloping banks which are approximately 10 to 20 feet wide and one foot deep. The channel bottom contains an OHWM defined by a break in slope. Unnamed Drainage 2 flows through arroyo willow thickets and eucalyptus groves before crossing a dirt footpath and entering Devereux Creek. No surface water was present in Unnamed Drainage 2 during the field surveys. The drainage appears to receive flows during rain events and from urban runoff, including from a one-foot-wide pipe culvert outlet which conveys runoff from the residential neighborhood.

In the absence of urban runoff, this drainage would likely be ephemeral due to the topography and lack of natural water sources. However, the regular supply of urban runoff from the culvert outlet has contributed to the development of an intermittent feature.

Unnamed Drainage 3

Unnamed Drainage 3 is located in the central portion of the study area and flows southward from the gutter on the western side of Santa Barbara Shores Drive and the residential neighborhood at the northern boundary of the study area. This drainage flows south through the coyote brush scrub and eucalyptus groves communities, crosses under a dirt trail through an 18-inch corrugated pipe culvert, exits the culvert, and continues south to connect to Devereux Creek (Figure 9b). The drainage consists of a weakly defined, shallow two-foot-wide unvegetated channel with a substrate of dense leaf litter. The drainage Unnamed Drainage 3 does not exhibit indicators of an OHWM. No surface water was present in Unnamed Drainage 3. The drainage appears to receive flows during rain events and from urban runoff and is ephemeral.

Unnamed Drainage 4

Unnamed Drainage 4 is located in the central portion of the study area, just east of Unnamed Drainage 3 (Figure 9**Error! Reference source not found.**b). This drainage flows southward from the gutter on the eastern side of Santa Barbara Shores Drive and the residential neighborhood at the northern boundary of the study area into Devereux Creek. Unnamed Drainage 4 is characterized by a shallow but clearly defined one-foot-wide channel with banks that extend to 5 to 18 feet wide. Within the northern portion of the channel, vegetation consists of wild oats. As it flows south, the drainage passes through a small patch of coyote brush, then enters the eucalyptus grove. Within the northern portion of the eucalyptus grove, the drainage has a dense herbaceous layer of iceplant (*Carpobrotus chilensis*); as the drainage continues south, the herbaceous layer becomes sparse, with a dense layer of leaf litter. The drainage then crosses a dirt trail and converges with Devereux Creek. The drainage contained evidence of flow, including channel incision, scouring, and drift deposits. The drainage appears to receive flows during rain events and from urban runoff. No surface water was present in Unnamed Drainage 4.

Unnamed Drainage 5

Unnamed Drainage 5 travels through the Ellwood Main monarch aggregation site located in the central portion of the study area (Figure 9c). The drainage consists of a branched channel that converges and flows in a northerly direction, and then transitions into a wide swale without evidence of bed, bank, or ordinary flow. During heavy rain events, water travels as overland sheet flow approximately 130 feet north into Devereux Creek.

Within the southern, upstream extent of Unnamed Drainage 5, vegetation consists of dense coyote brush. As it flows north, vegetation transitions to an overstory of eucalyptus. The drainage is unvegetated beneath the eucalyptus grove canopy, with a dense layer of leaf litter. The banks of Unnamed Drainage 5 range from approximately 15 to 40 feet from bank to bank. Banks are steeply incised and eroded in the southern, upstream extent. Large pieces of concrete rubble were observed within this portion of the drainage. As it flows north the channel widens and bank slopes become more gentle, eventually broadening to a wide swale. Unnamed Drainage 5 does not exhibit indicators of an OHWM and no surface water was present during the field survey. Unnamed Drainage 5 appears to receive flows during rain events and is ephemeral.

Unnamed Drainage 6

Unnamed Drainage 6 is located within the Coronado Butterfly Preserve in the central portion of the study area, north of Devereux Creek (Figure 9c). This drainage flows southeast through eucalyptus groves into Devereux Creek. Unnamed Drainage 6 is characterized by a shallow channel bottom defined by a three-foot-wide OHWM with banks that extend between 10 to 20 feet wide. The drainage is mostly unvegetated beneath the eucalyptus grove canopy, with a dense layer of leaf litter. Occasional patches of smilo grass are present. Human influences on the drainage include a wooden foot bridge and a series of un-grouted rip-rap check dams. The drainage did not contain surface water during the field survey and appears to receive flows during rain events and from urban runoff. The channel is unvegetated and contains a dense layer of leaf litter.

Unnamed Drainage 7

Unnamed Drainage 7 consists of a deeply incised erosional ravine that conveys flows eastward into Devereux Creek, in the northeastern corner of the study area (Figure 9d). This drainage has steep, highly eroded banks which range between 5 and 25 feet deep and 20 to 65 feet wide. The OHWM ranges from two to eight feet wide, and was clearly defined by scour marks. Vegetation consists of a sparse layer of coyote brush. The drainage appears to receive flows only during rain events and was determined to be ephemeral. No surface water was present in Unnamed Drainage 7 during the field survey. The drainage converges with Devereux Creek approximately 300 feet north of its transition to upper Devereux Slough.

Unnamed Drainage 8

Unnamed Drainage 8 consists of a single channel that conveys flows eastward into upper Devereux Slough in the northeastern corner of the study area (Figure 9d). The drainage originates in the purple needle grass grassland community as a shallow erosional feature with banks between 10 to 30 feet wide and a depth of approximately one foot. Unnamed Drainage 8 then crosses a dirt trail and continues eastward into the adjacent eucalyptus groves. In the eucalyptus groves, the drainage transitions to a wide, flat channel with banks approximately 15 to 35 feet in width and 2 to 5 feet in depth. The OHWM is approximately 8 feet wide and was discernable from a break in bank slope and drift deposits. The entire drainage is characterized by a combination of bare ground, leaf litter, and sparse upland vegetation consisting of ripgut brome, slender oats, and wild oats. No hydrophytic vegetation is present. No surface water was present during the field survey, and the drainage appears to receive flows only during rain events. Based on these factors, the drainage was determined to be ephemeral.

Coastal Wetland 1

Coastal Wetland 1 is located along the eastern boundary of the study area, south of Devereux Creek within a relatively flat coastal terrace (Figure 8g). The feature consists of a shallow depression approximately 160 feet in length and 50 feet in width, is generally defined by the topography and limits of the iris-leaf rush seeps vegetation community (Photograph 38). The feature is mapped as a seasonally flooded emergent freshwater wetland by NWI and appears to receive water from rainfall and overland surface flows from seasonal pools in the North Campus Open Space to the southeast. Ponded water and tadpoles were observed within this feature on February 7, 2022. According to weather records, the most recent rainfall events were 41 days prior on December 28, 2021, which contributed approximately 0.5 inch of rain, and 20 days prior on January 18, 2022, which contributed 0.06 inch.

Coastal Wetland 2

Coastal Wetland 2 is located in the southeast corner of the study area, approximately 300 feet north of the Pacific Ocean (Figure 9g). The feature consists of a shallow depression approximately 150 feet in length and 30 feet in width, which is generally defined by the topography and limits of the perennial rye grass fields vegetation community. The feature is mapped as a seasonally flooded emergent freshwater wetland by NWI. The feature appears to receive water from rainfall and overland surface flows from the north. A metal gate extends across Coastal Wetland 2. Surface water was not observed within this feature on February 7, 2022.

Non-Jurisdictional Features

Sample Points 11 and 12 were collected to evaluate the presence of wetland indicators within two areas mapped by NWI as freshwater emergent freshwater wetlands. These features are situated south of the MBHMP Coverage Area and blue gum eucalyptus groves, but within the study area (Figure 5). These features did not contain evidence of water flow, hydrophytic vegetation, hydric soils, or wetland hydrology.

4.3.2 Discussion

Eleven potentially jurisdictional features are present within the study area, consisting of Devereux Creek, Unnamed Drainages 1-8, and Coastal Wetlands 1 and 2. Detailed discussion of jurisdictional determination for each feature is provided in Appendix I, and a brief summary is provided in Table 5 below.

Table 5 USACE, RWQCB, CCC/City, and CDFW Jurisdiction within the Study Area

	USACE Jurisdiction		RWQCB Jurisdiction		CCC/City Jurisdiction	CDFW Jurisdiction
Feature	Non-Wetland Waters of the U.S. (acres/ linear feet)	Wetland Waters of the U.S. (acres/ linear feet)	Non-Wetland Waters of the State (acres/ linear feet)	Wetland Waters of the State (acres/ linear feet)	Coastal Wetland (acres/ linear feet)	Streambed and Associated Riparian Habitat (acres/ linear feet)
Devereux Creek	0.88/3,634	0.76/1,010	6.34/4,635	0.76/1,010	1.96/1,387	6.53/4,635
Unnamed Drainage 1a	0/0	0/0	0.02/170	0/0	0/0	0.02/170
Unnamed Drainage 1b	0/0	0/0	0.24/456	0/0	0/0	0.24/456
Unnamed Drainage 1c	0.5/975	0/0	1.42/1,066	0/0	0/0	1.42/1,066
Unnamed Drainage 2	0.02/90	0/0	0.21/205	0/0	0/0	0.21/205
Unnamed Drainage 3	0/0	0/0	0.01/394	0/0	0/0	0.01/394
Unnamed Drainage 4	0.01/308	0/0	0.08/308	0/0	0/0	0.08/308
Unnamed Drainage 5	0/0	0/0	0.2/374	0/0	0/0	0.2/374

Unnamed Drainage 6	0.05/688	0/0	0.18/688	0/0	0/0	0.18/688
Unnamed Drainage 7	0.04/455	0/0	0.31/396	0/0	0/0	0.31/396
Unnamed Drainage 8	0.05/247	0/0	0.24/446	0/0	0/0	0.24/446
Coastal Wetland 1	0/0	0/0	0/0	0.11/155	0.11/155	0/0
Coastal Wetland 2	0/0	0/0	0.09/144	0/0	0.09/144	0/0
Total	1.55/6,397	0.76/1,010	9.34/9,281	0.87/1,165	2.16/1,685	9.44/9,138

Figure 9a Jurisdictional Delineation

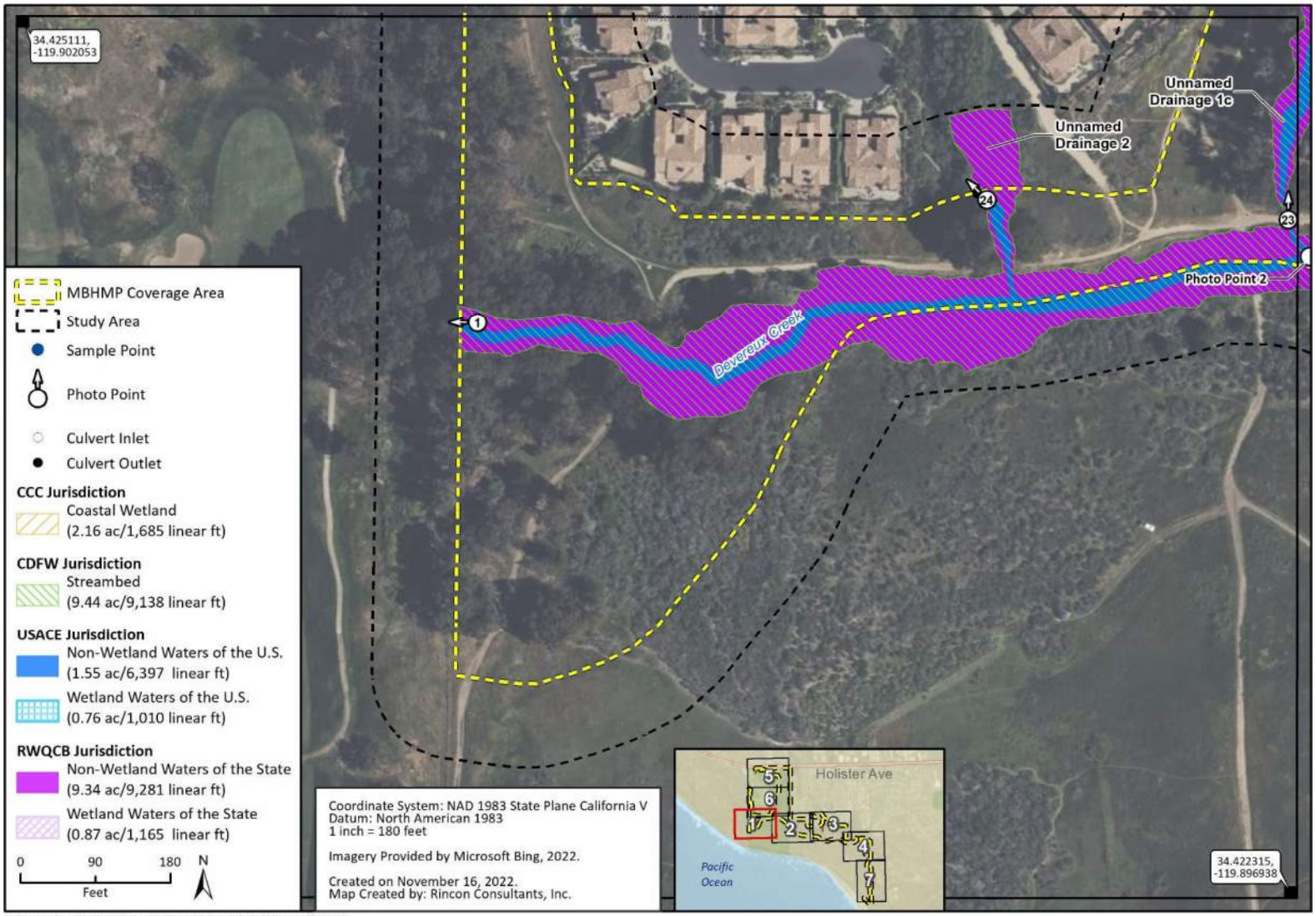


Figure 9b Jurisdictional Delineation

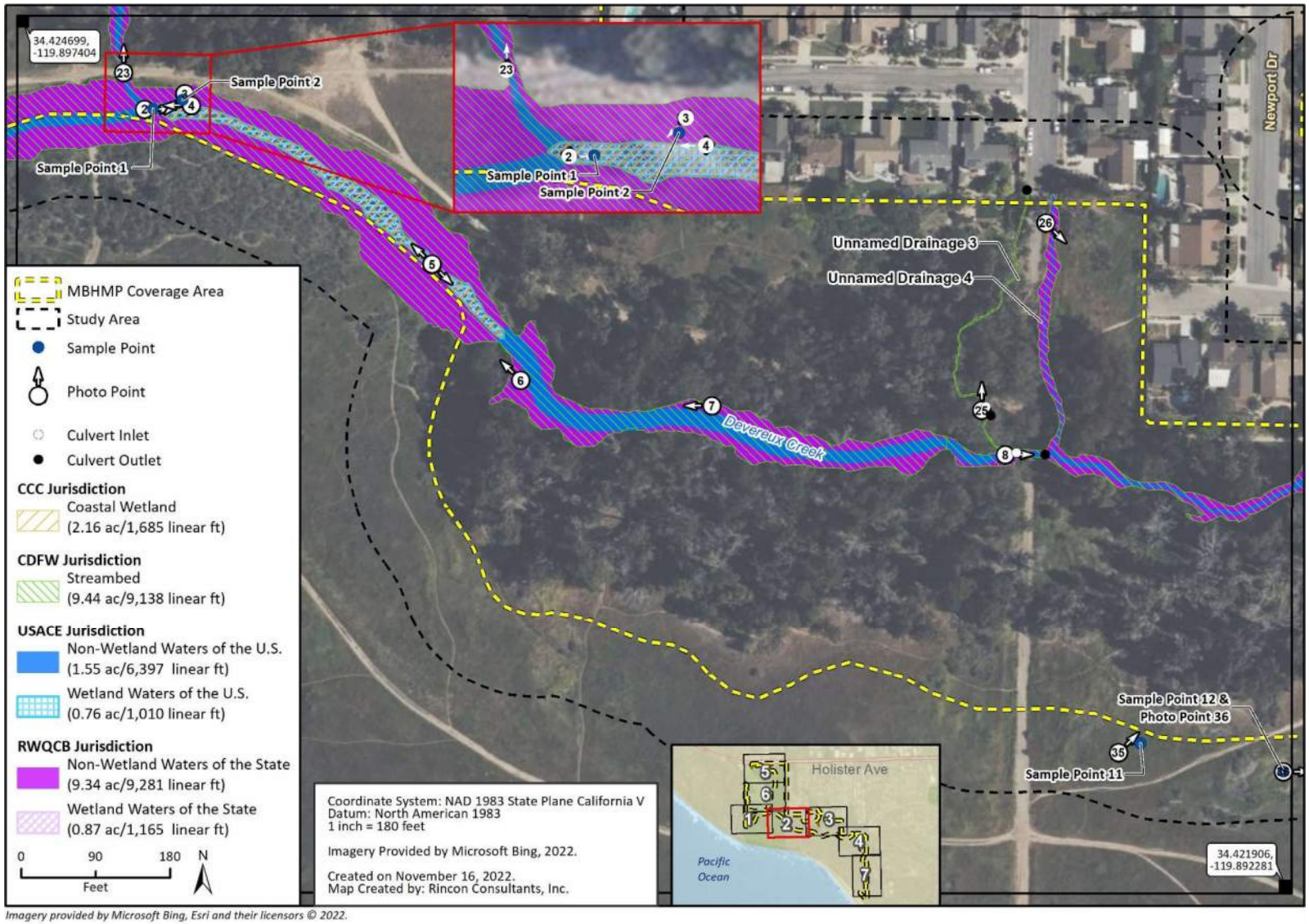


Figure 9c Jurisdictional Delineation

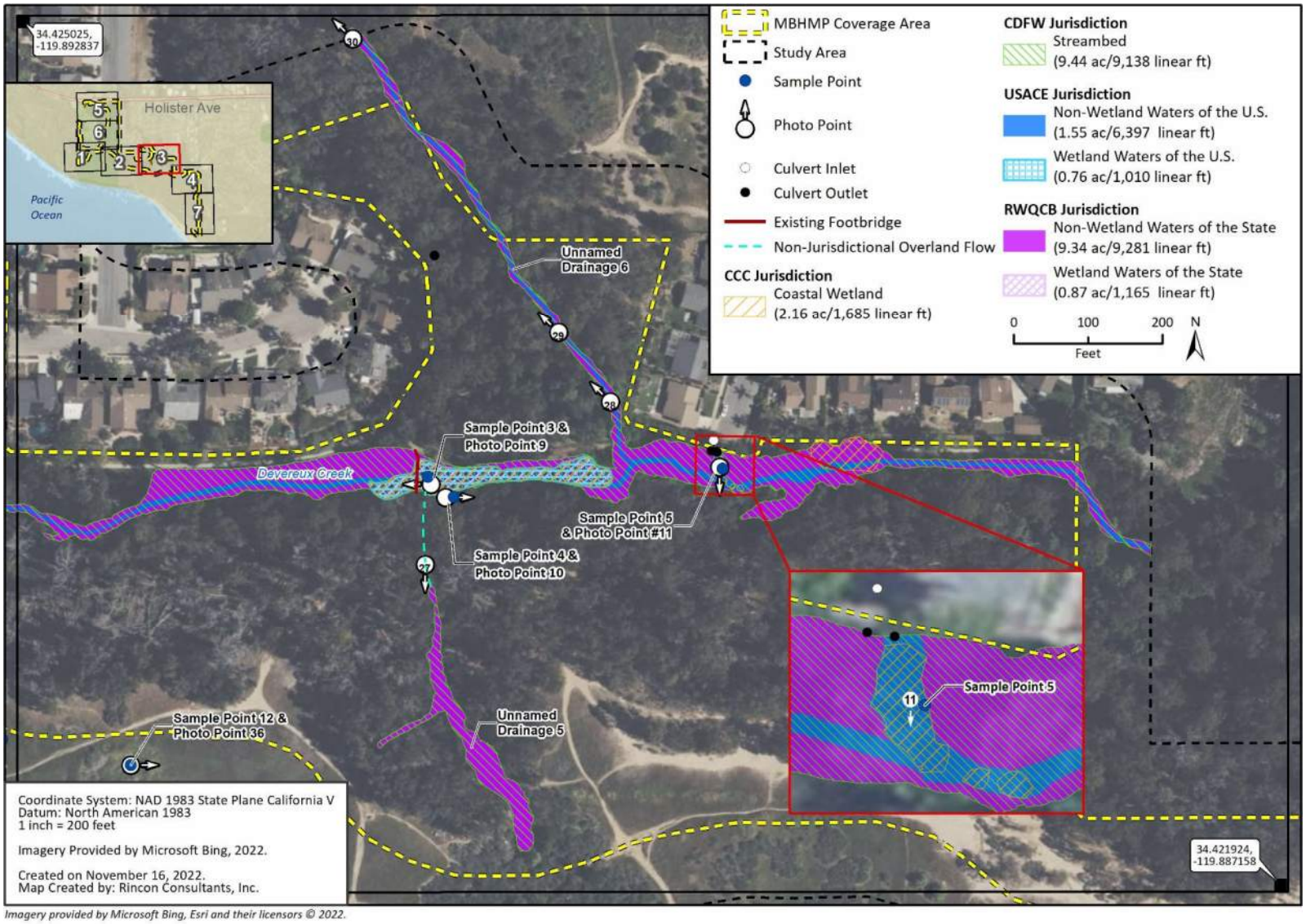


Figure 9d Jurisdictional Delineation

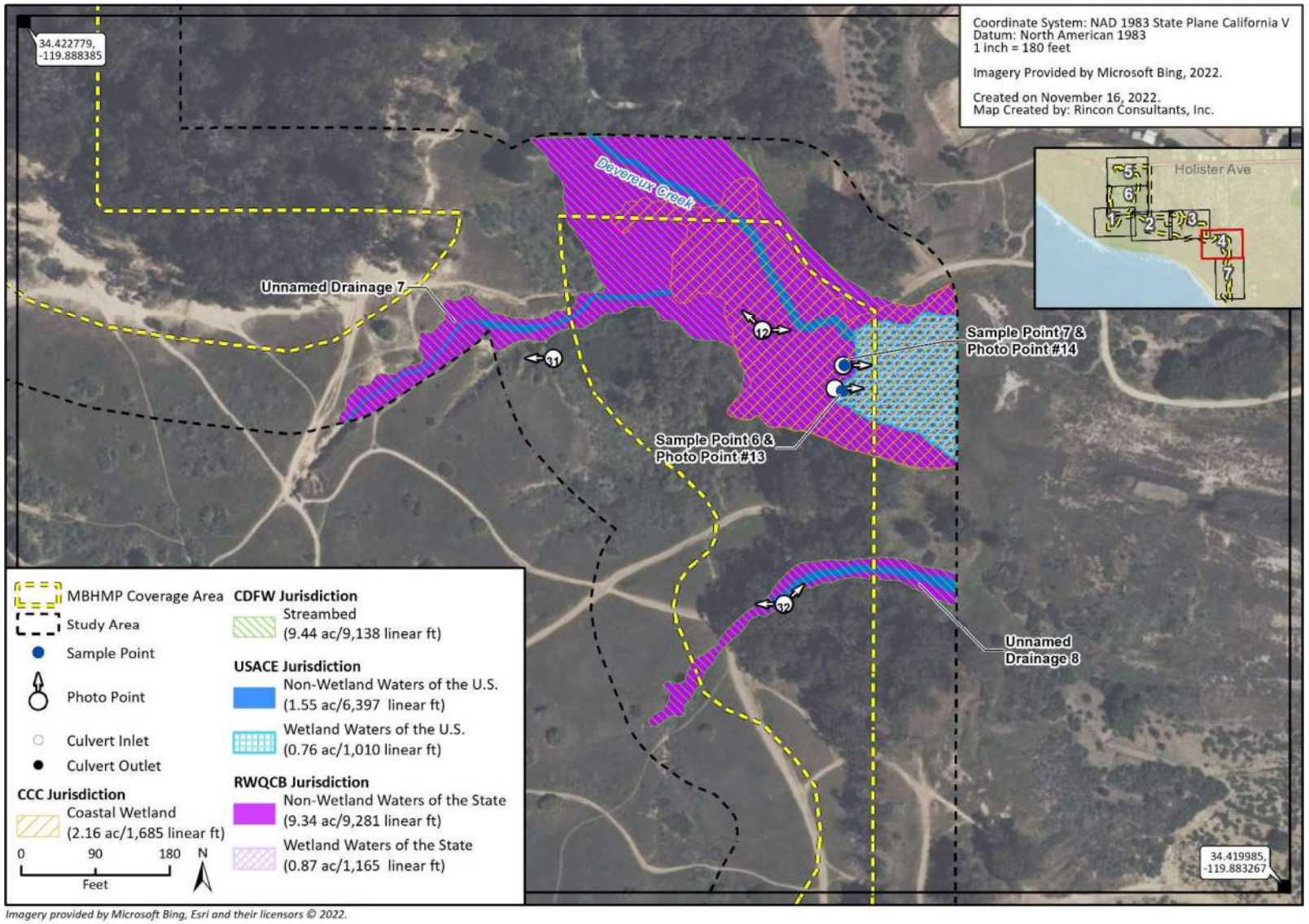


Figure 9e Jurisdictional Delineation

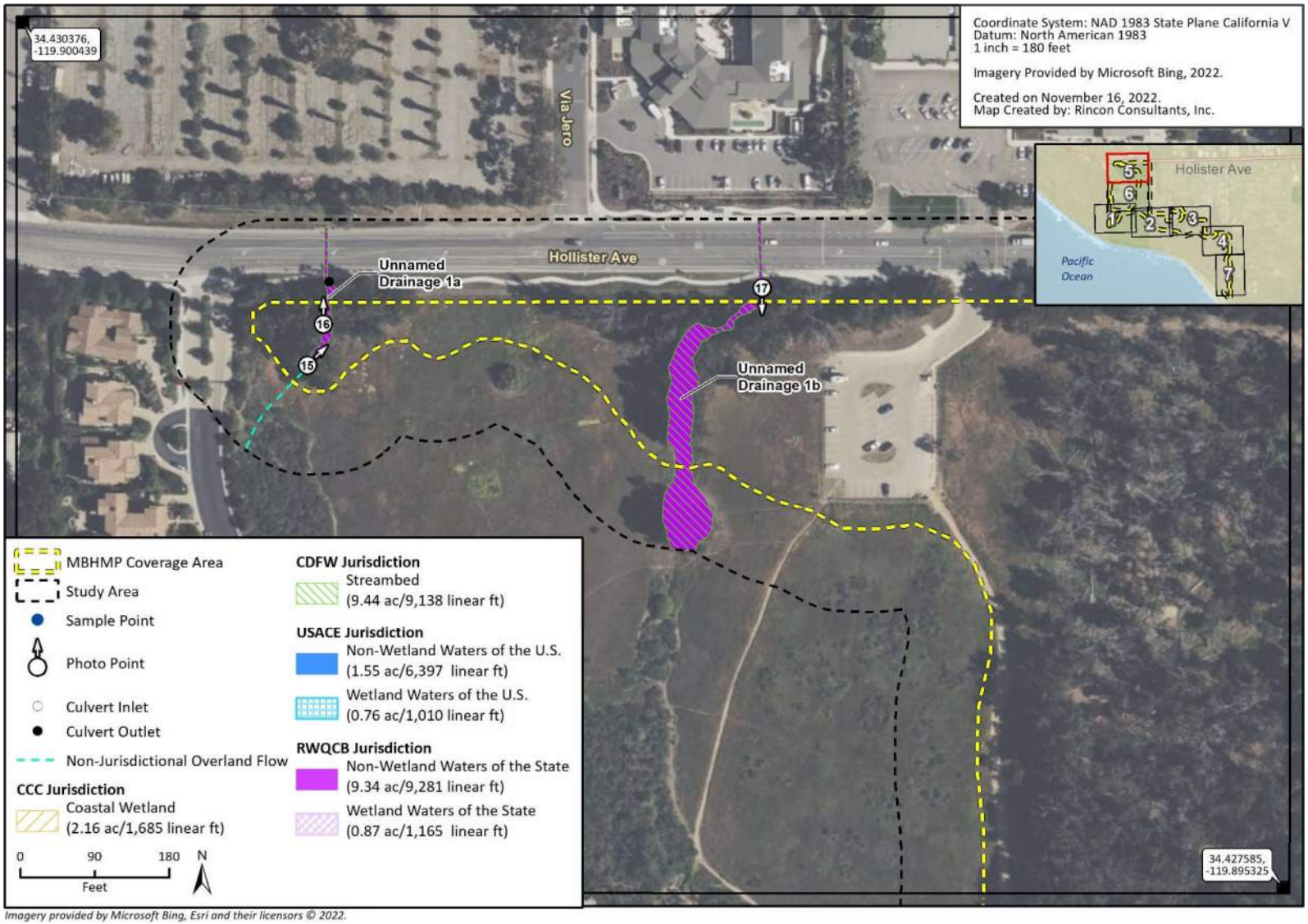


Figure 9f Jurisdictional Delineation

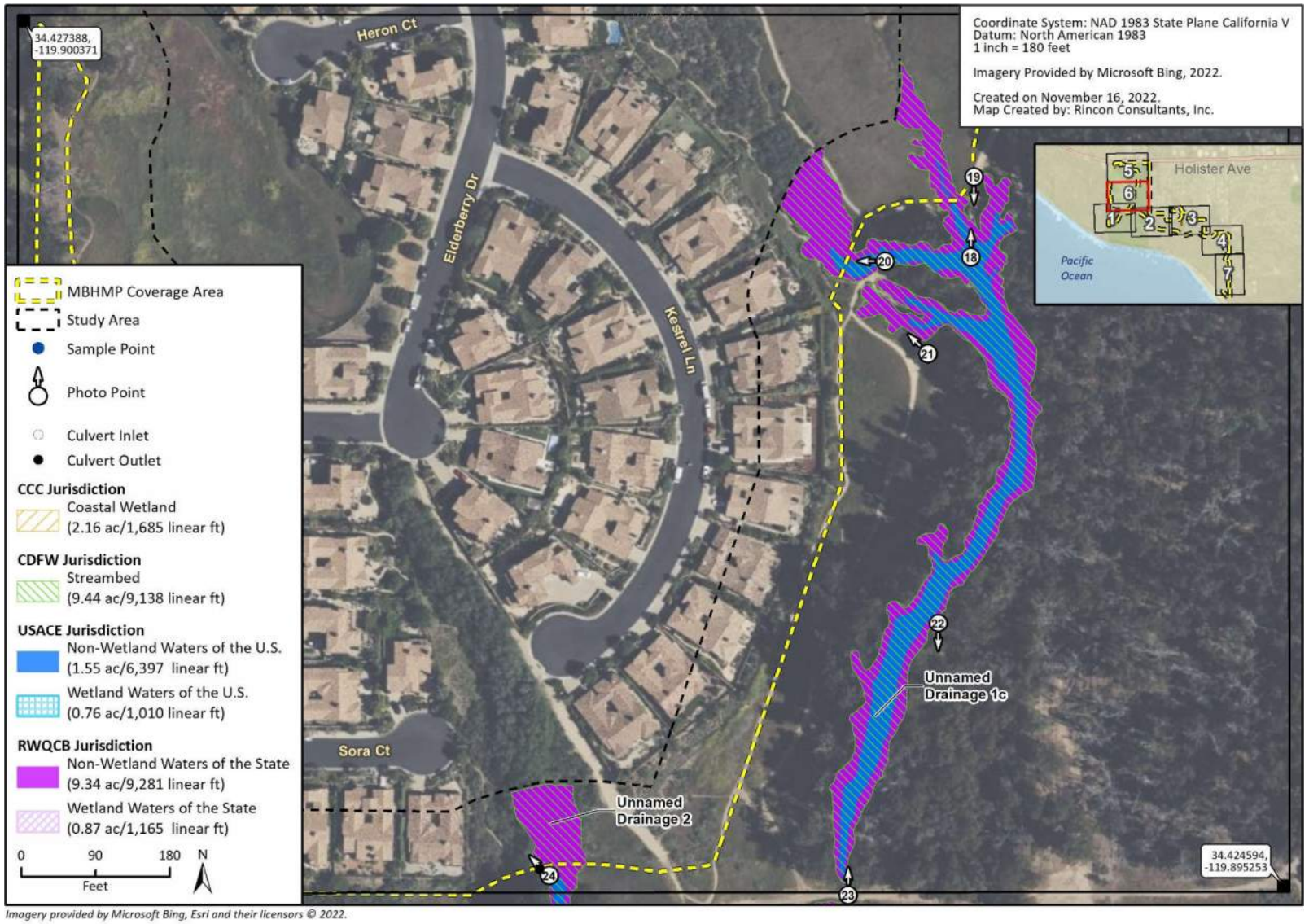
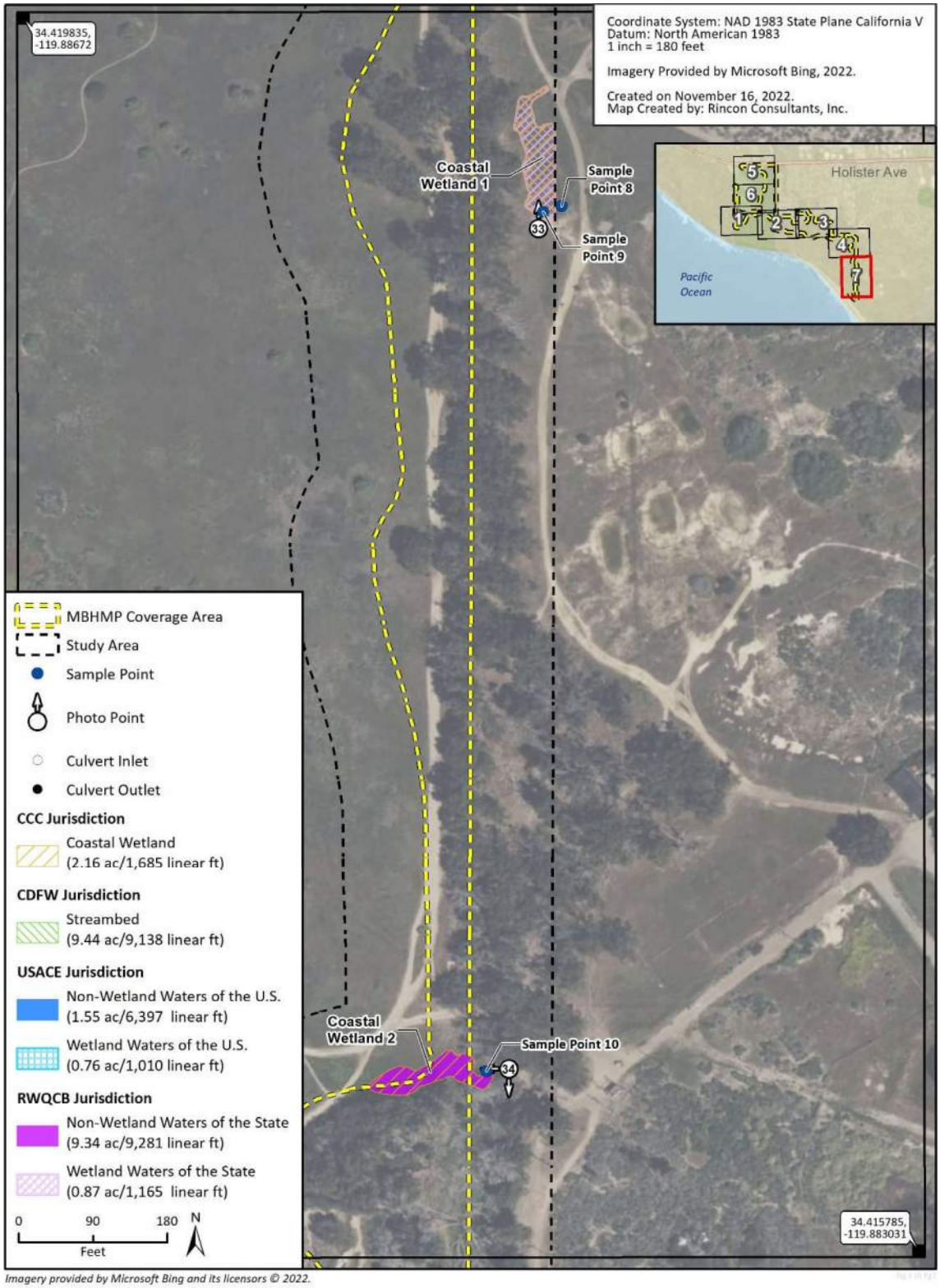


Figure 9g Jurisdictional Delineation



4.4 Wildlife Movement

Wildlife movement corridors, or habitat linkages, are generally defined 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 and denning areas, or they may be regional in nature. Some habitat linkages may serve as migration corridors, wherein animals periodically move away from an area and then subsequently return. Others may be important as dispersal corridors for young animals. A group of habitat linkages in an area can form a wildlife corridor network.

The habitats in the link do not necessarily need to be the same as the habitats that are being linked. Rather, the link merely needs to contain sufficient cover and forage to allow temporary inhabitation by ground-dwelling species. Typically, habitat linkages are contiguous strips of natural areas, though dense plantings of landscape vegetation can be used by certain disturbance-tolerant species. Depending upon the species using a corridor, specific physical resources (e.g., rock outcroppings, vernal pools, or oak trees) may need to be in the habitat link at certain intervals to allow slower-moving species to traverse the link. For highly mobile or aerial species, habitat linkages may be discontinuous patches of suitable resources spaced sufficiently close together to permit travel along a route in a short period of time.

Wildlife movement corridors can be both large- and small-scale. Overall, the Study Area is surrounded by developed land uses and the Pacific Ocean. At the regional/landscape-level scale, the Study Area is not included within any mapped landscape models, such as an Essential Connectivity Area (ECA) or Natural Landscape block in the California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California (Spencer et al. 2010). ECAs are regions in which land conservation and management actions should be prioritized to maintain and enhance ecological connectivity. ECAs are mapped based on coarse ecological condition indicators, rather than the needs of particular species and thus serve the majority of species in each region. No mapped wildlife movement corridors are present within the study area.

However, the undeveloped condition and natural vegetation within the Study Area allow for local movement of wildlife. Small-scale habitat corridors are present within the Study Area and include Devereux Creek and the eucalyptus grove. These small-scale corridors provide wildlife movement locally and are important in linking non-contiguous or fragmented wildlife habitats.

Wildlife corridor camera and tracking studies conducted as part of the City's Water Management Plan documented the following mammal species within Ellwood Mesa Open Space: bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), coyote, raccoon and multiple resident species, including opossum, striped skunk, California ground squirrel, rabbits, rodents, and domestic cats. As previously mentioned, Devereux Creek provides connectivity from the Santa Ynez Mountains to habitat areas south of the City, including the Devereux Slough (City Water Management Plan 2021).

Although bird flyways are not traditionally considered wildlife movement corridors, Devereux Slough, located southeast of the Study 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 2006). Ellwood Mesa Open Space, including the Devereux Creek riparian corridor within the Study 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.

The mosaic and expanse of open space and resources attract many species of birds to utilize the variety habitats for feeding, cover, resting, nesting, and perching. The main tree groves are dominated by eucalyptus, surrounded by open space grasslands, and interspersed with thickets of arroyo willow and scrub habitat. The groves of eucalyptus provide many wooded resources (e.g., downed logs, woody debris, cavity nesting, seed caching opportunities) for a variety of bird species (City Water Management Plan 2021).

4.5 Resources Protected by Local Policies and Ordinances

The project is in the City within the coastal zone. The Goleta GP/CLUP CE contains policies, to protect, preserve, and enhance biological and natural resources. Locally protected resources within the Study Area include ESHAs and ESHA buffers and Streamside Protection Areas which are discussed in Section 4.2.2, and mature native trees which are discussed below.

Policy CE 9: Protection of Native Woodlands

Within the City, there is currently no tree protection ordinance in place. Protection of trees within the City is regulated by Policy CE 9, the Goleta Municipal Code (GMC) Appendix A Grading Ordinance Guidelines for Native Oak Tree Removal, and the Draft *State of the Goleta Urban Forest Report: An Urban Resource Assessment for the City of Goleta* (herein referred to as the Goleta Urban Forest Report; City 2009).

CE 9.1 Definition of Protected Trees.

This policy requires development be sited and designed to preserve native trees including oaks (*Quercus* spp.), California black walnut (*Juglans californica*), California sycamore, cottonwood (*Populus* spp.), willows (*Salix* spp.) and other native trees that are otherwise not protected in ESHAs.

CE 9.2 and 9.4 Tree Protection Plan and Standards

New development applications require an arborist report including an inventory and tree protection plan. A size threshold for mature native trees and tree protection standards are not defined because the Tree Protection Ordinance (contemplated under CE-IA-4) has not yet been established. While the GMC Appendix A Grading Ordinance Guidelines for Native Oak Tree Removal does not apply to the coastal zone and urban boundaries, it provides for protection of live oaks with at least one trunk that is 8 inches or greater in diameter at breast height (DBH). As such, this protection size will be referenced for the purposes of this report and protected trees are defined herein as any native tree with at least one trunk with a DBH of 8 inches or greater. Tree protection zones are defined herein as the area within the tree's dripline.

A total of 274 trees of 12 species were documented during the native tree survey. Of the 274 trees, 138 have at least one trunk that is 8 inches in DBH or greater and therefore are considered City protected trees. Table 6 lists the total number of each species and the total number of protected trees in the survey area. A summary of all 274 trees inventoried is provided in Appendix E and tree locations are provided in Figure 10a through Figure 10j.

Table 6 Native Tree Species within the Survey Area

Species	Number of Native Trees (DBH of one trunk >3")	Number of Protected Trees (DBH of one trunk >8")
Arroyo willow (*Salix lasiolepis*)	2	2
Black cottonwood (*Populus trichocarpa*)	1	0
Blue elderberry (*Sambucus nigra* ssp. *caerulea*)	5	2
Box elder (*Acer negundo*)	1	1
Catalina cherry (*Prunus ilicifolia* ssp. *lyonii*)	3	0
Coast live oak (*Quercus agrifolia*)	232	120
Fremont cottonwood (*Populus fremontii*)	2	0
Tanoak (*Notholithocarpus densiflorus*)	3	0
Unknown native[1]	1	0
Valley oak (*Quercus lobata*)	1	0
Western sycamore (*Platanus racemosa*)	2	2
Willow (*Salix* spp.)	18	10
Total	**274**	**138**

[1]Denudate and unidentifiable during time of survey

The protected native trees are located primarily within the eucalyptus groves and coast live oak woodland and forest vegetation communities and within/adjacent to jurisdictional features such as Devereux Creek.

CE 9.5 Mitigation of Impacts to Native Trees.

Specifically, Policy CE 9.5 states that removal of mature native trees or encroachment into the protected zone that could threaten the continued viability of the tree(s) should, at a minimum, be mitigated by planting of replacement trees on site. Specific mitigation measures and ratios are not defined because the Tree Protection Ordinance has not yet been established.

Figure 10a Native Tree Locations

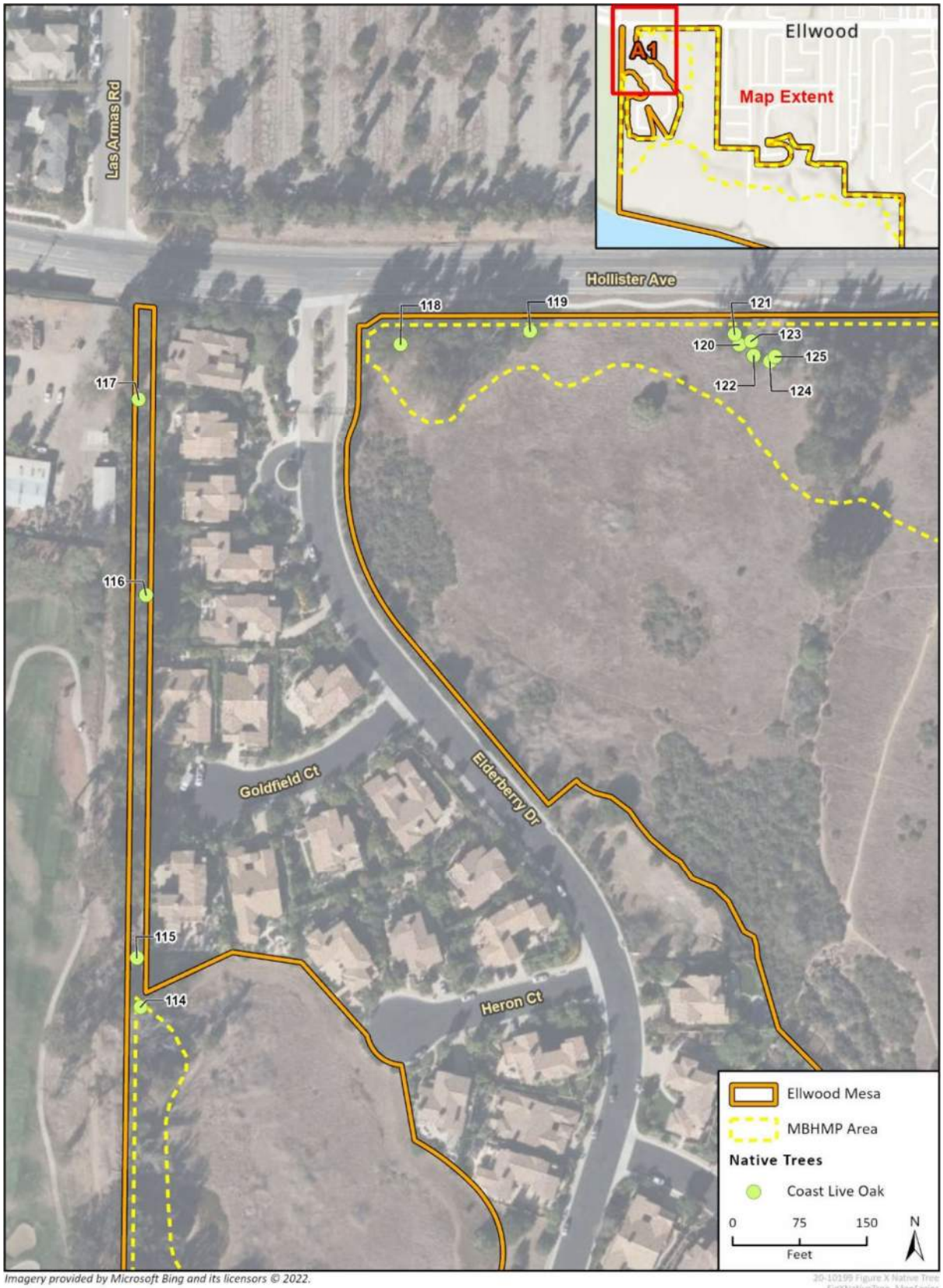


Figure 10b Native Tree Locations



Figure 10c Native Tree Locations

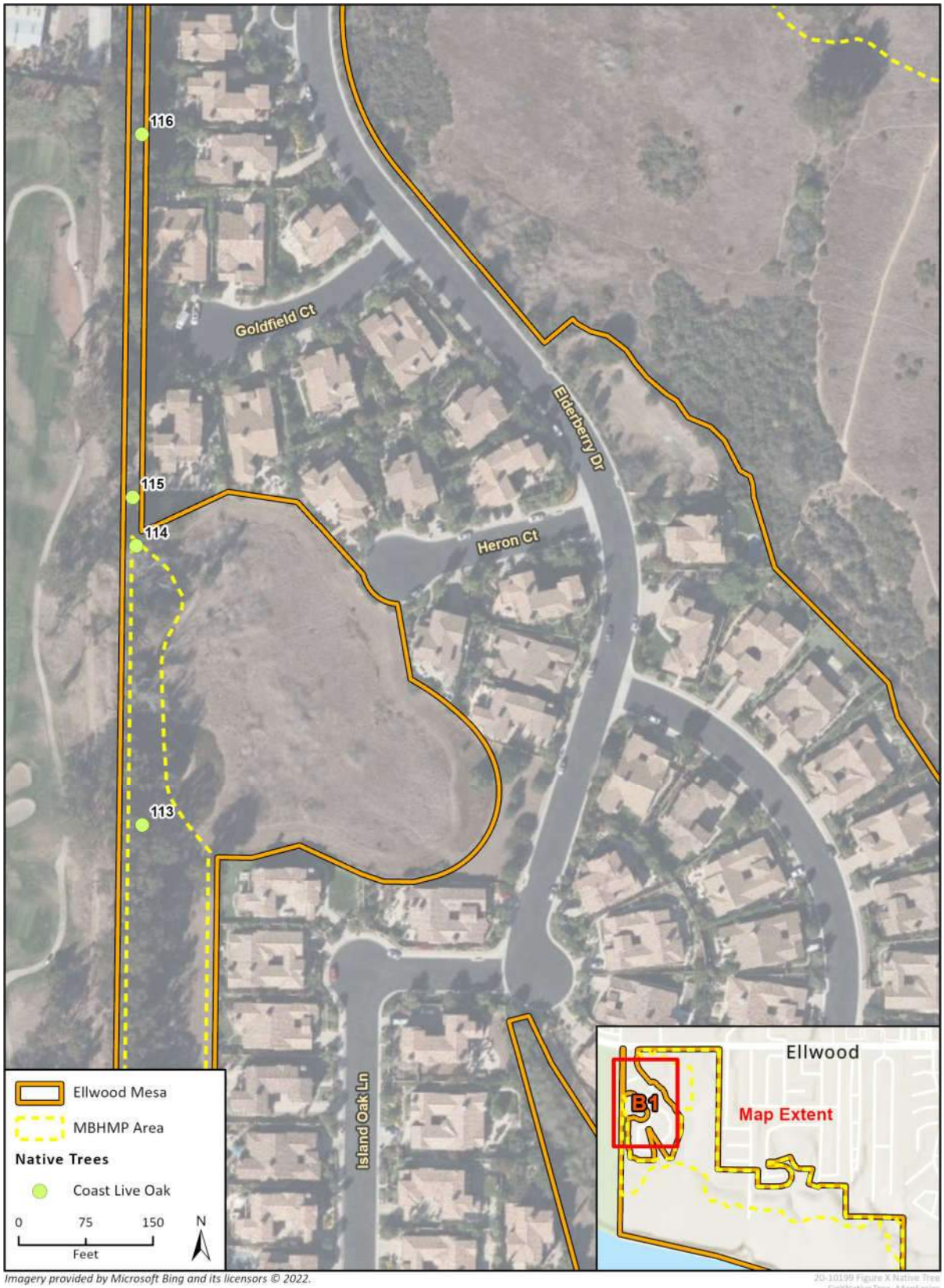


Figure 10d Native Tree Locations



Figure 10e Native Tree Locations

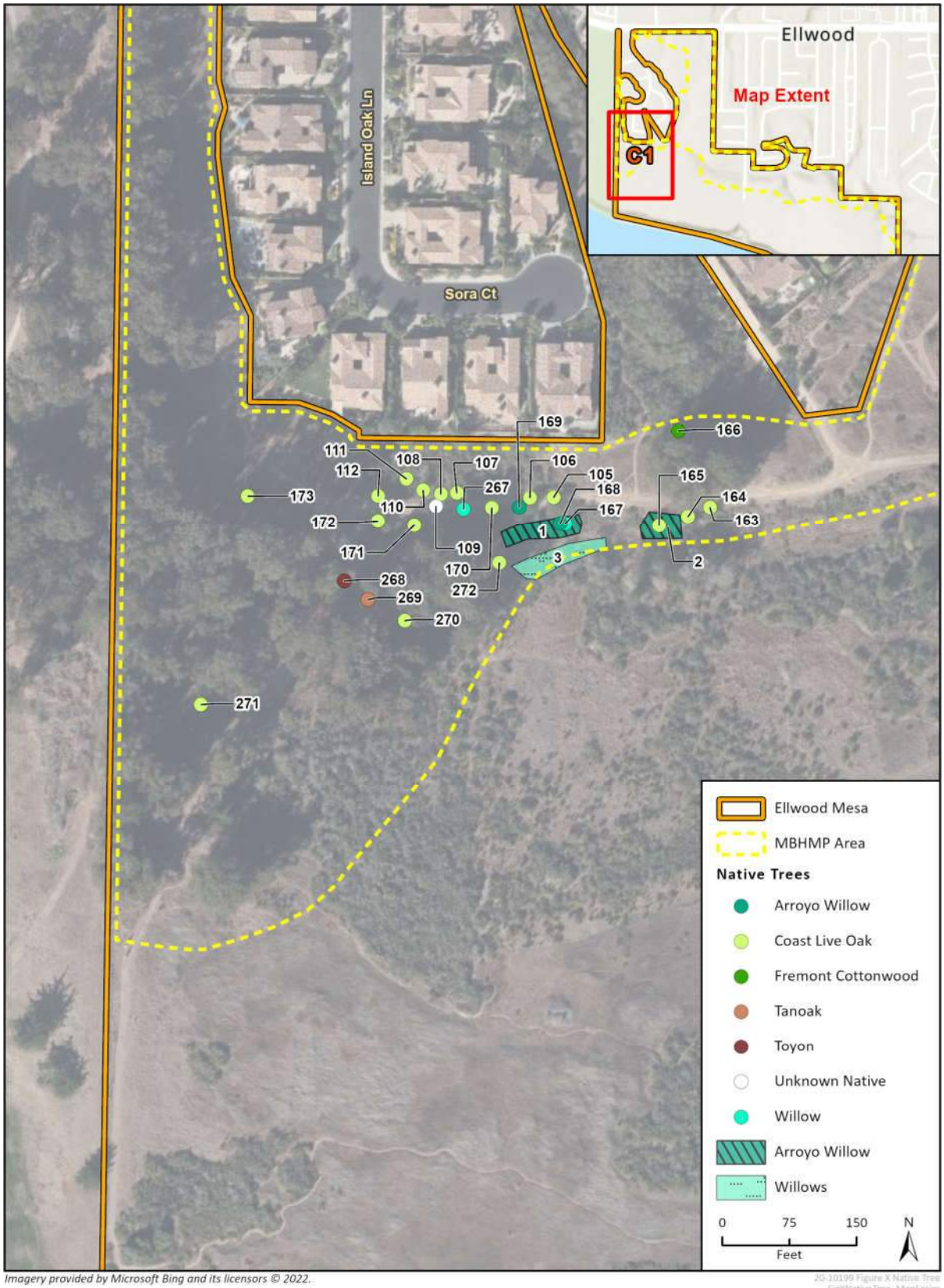


Figure 10f Native Tree Locations

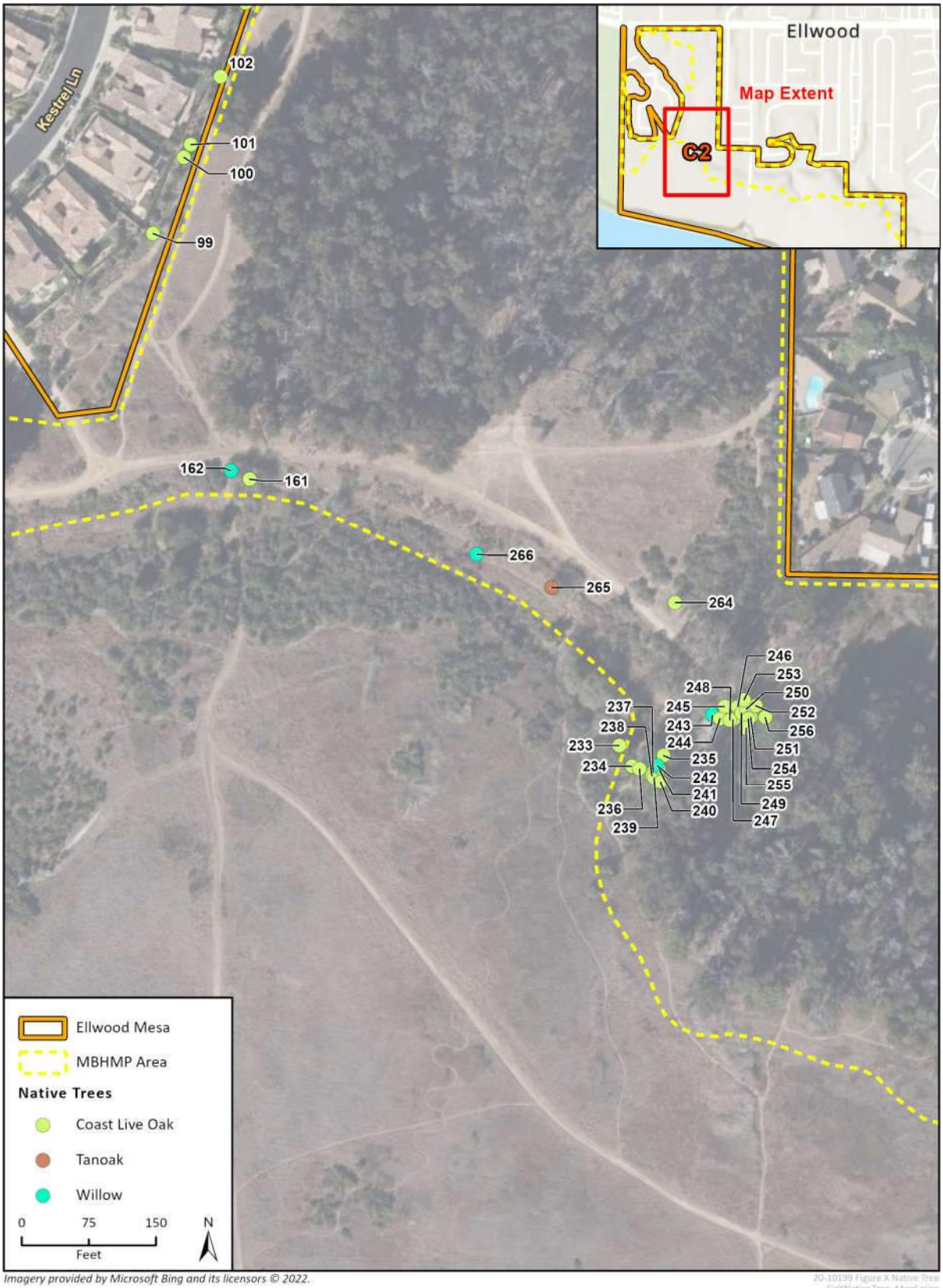


Figure 10g Native Tree Locations

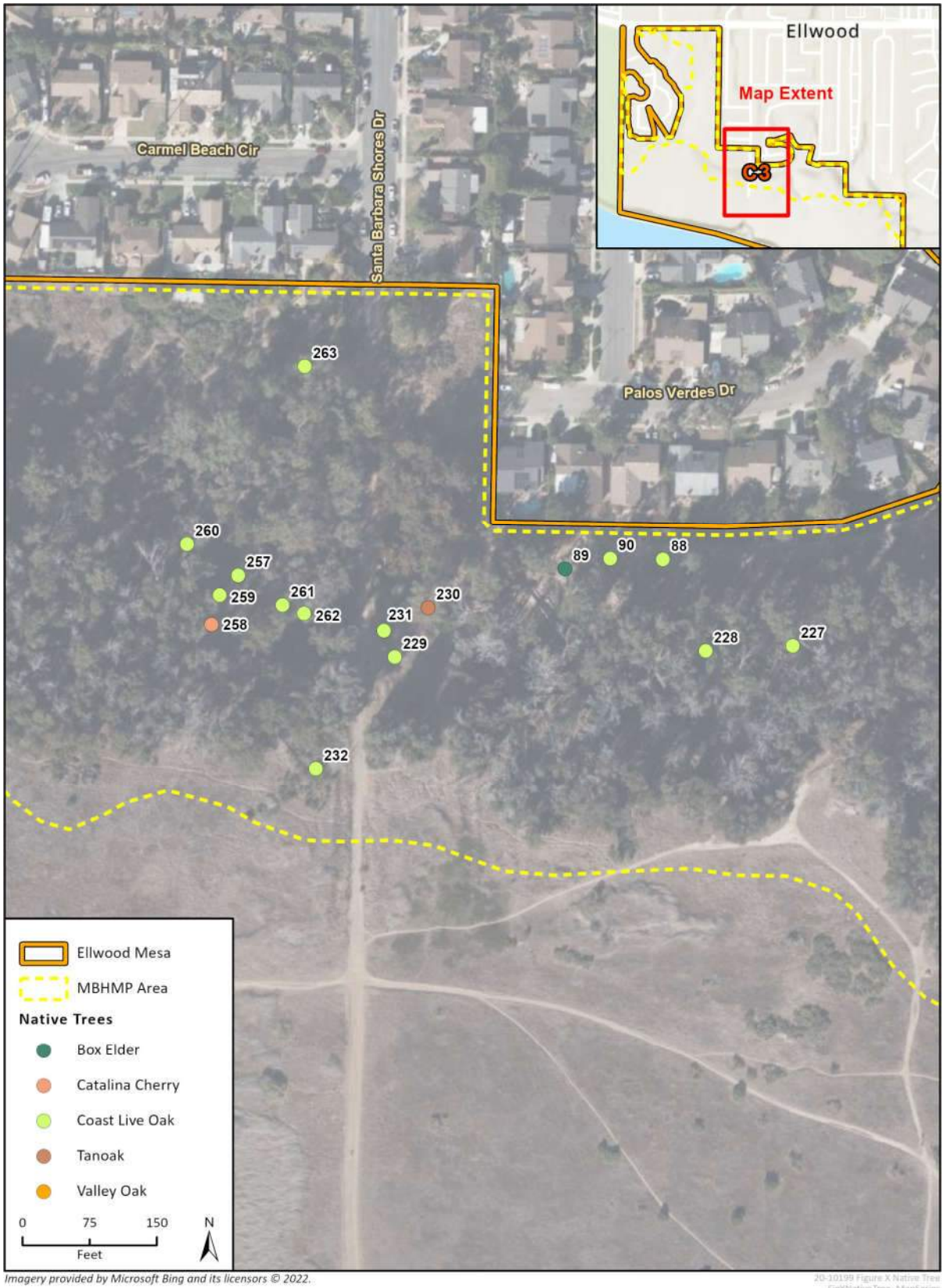


Figure 10h Native Tree Locations

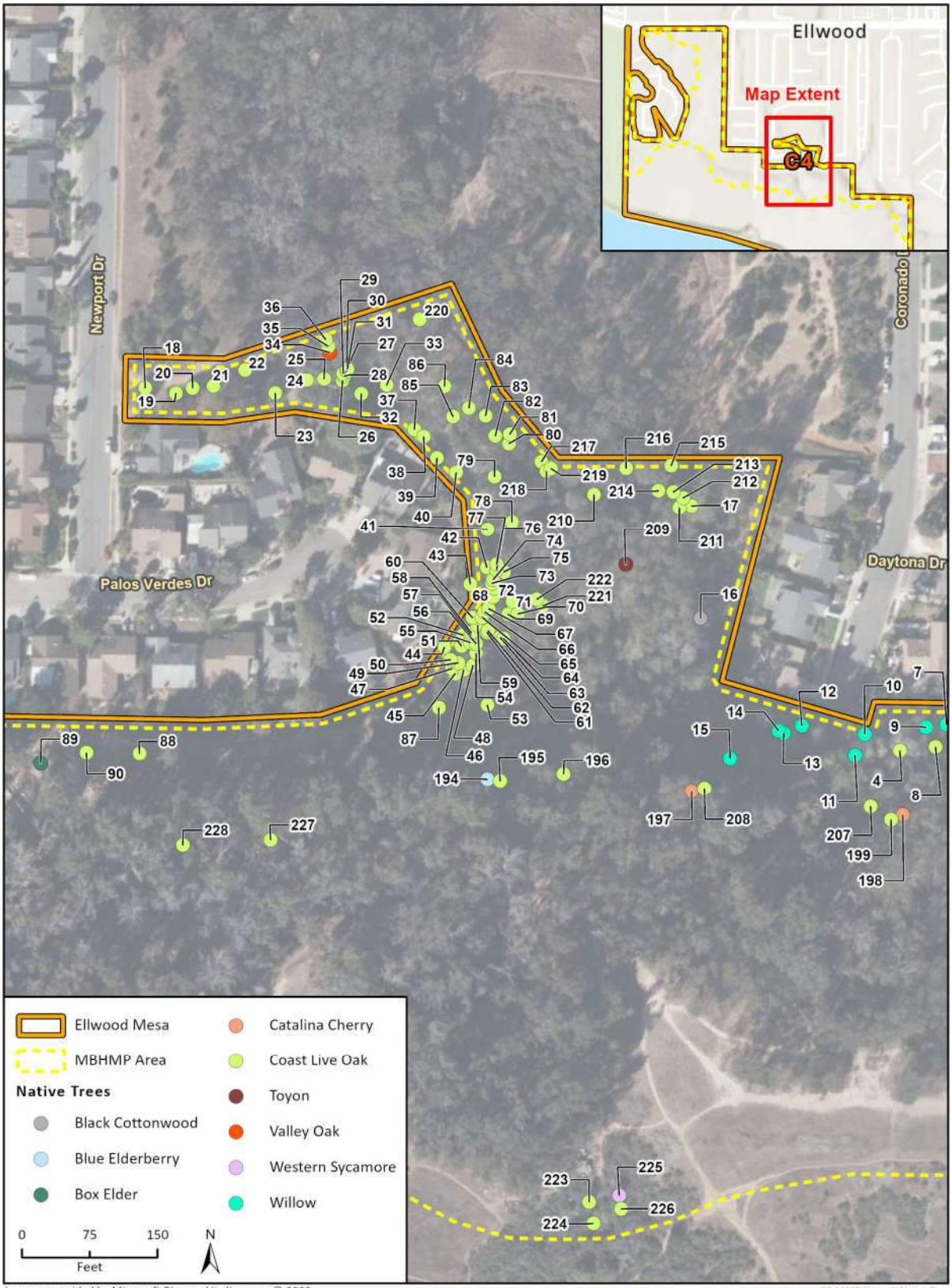


Figure 10i Native Tree Locations

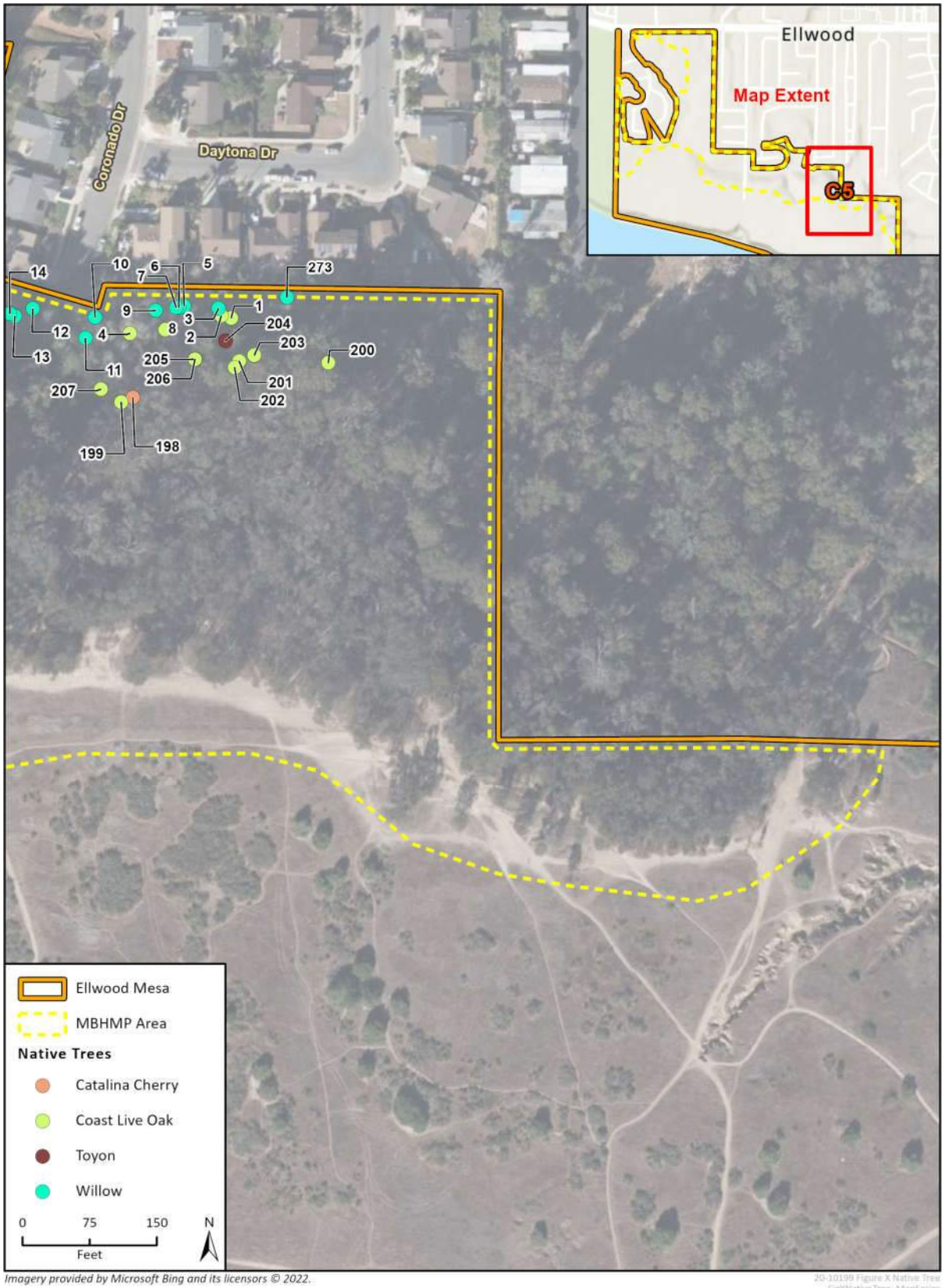
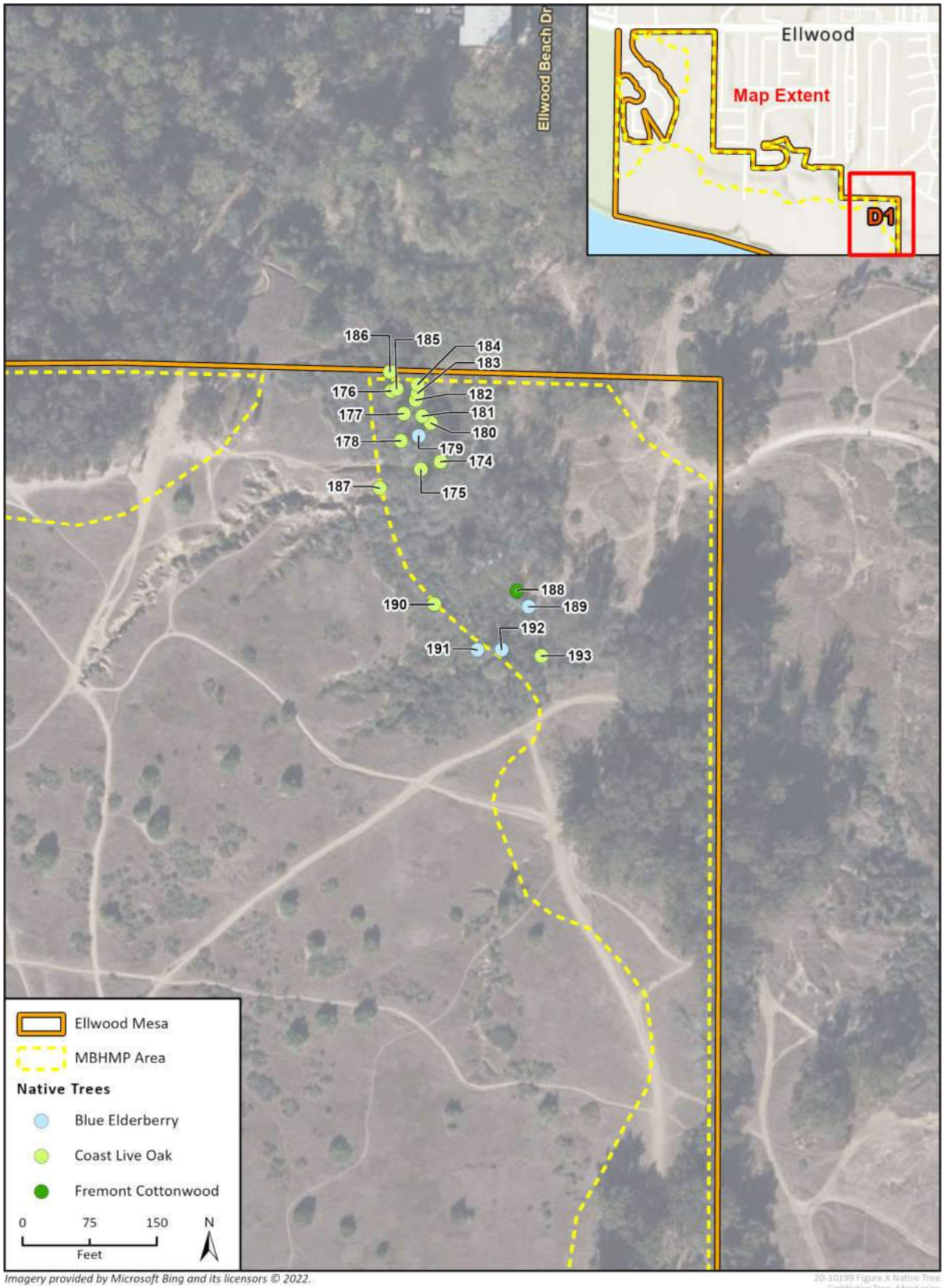


Figure 10j Native Tree Locations



City Community Wildfire Protection Plan

Ellwood Mesa is also covered under the City's Community Wildlife Protection Plan (CWPP). The CWPP provides guidance for butterfly aggregation areas adjacent to structures and outlines approved actions to be taken within 100 feet of structures to reduce the ignitability of those structures. In butterfly aggregation areas within 100 feet 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. For defensible space safety fuel reduction zones have been established and discussed in Table 7 based on Defensible Space PRC-4291 and Firefighter Safety guidelines. Figure 11 shows the treatment areas as individual zones.

Table 7 CWPP Prescription Guidance for Butterfly Aggregation Areas Adjacent to Structures

Location (Fuel Type)	Primary Defense Zone (A)*** (0-30 feet)	Fuel Reduction Zone (B)*** (30-100 feet)
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, 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.

Figure 11 Fuel Reduction Zones



4.6 Habitat Conservation Plans

No adopted Habitat Conservation Plan or Natural Community Conservation Plan is in effect within the study area. However, the Ellwood Mesa/Sperling Preservation Monarch Butterfly Habitat Management Plan is in effect within the study area. This plan provides 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 (City 2019).

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5 Impact Analysis

The criteria used to evaluate potential project-related impacts to biological resources and consistency with resource protection policies are presented in Section 2.1.2. This section discusses potential impacts to biological resources that may occur from implementation of the proposed project and suggests appropriate avoidance and minimization measures that would reduce effects, ensure consistency with state and local policy, and result in the least damaging alternative. This BRA incorporates by reference the mitigation measures from the IS/MND MMRP for the MBHMP. In addition, the project will comply with the six Special Conditions from the NOI for CDP No. 4-18-1223. As discussed under Section 1.3 (Project Description), environmental protection practices are also included in this section, including measures to ensure consistency with other statutes (e.g., MBTA and City GP/CLUP). Environmental protection practices are hereby incorporated into the project description.

5.1 Special-Status Species

Rare plant and animal species and their habitats are protected under the CCA Chapter 3 and City CE policies. In some cases, the CCC or City may require avoidance measures for species protection that are comparable to other agencies, also factor in more holistic ecological considerations beyond the single species. This is sometimes a different approach than other agencies take under their respective laws, leading to different requirements. These may include larger exclusion zones for marine mammals or nesting bird protection, or larger habitat buffers.

5.1.1 Special Status Plant Species

As summarized in Section 4.1.1, six special status plant species have potential to occur within the Study Area. Based on the results of the field survey, Santa Barbara honeysuckle and Plummer's baccharis were the only special status plant species present within the Study Area. Of the remaining four, Southern tarplant (*Centromadia parryi* ssp. *australis*) has a high potential to occur while Coulter's saltbush (*Atriplex coulteri),* Brewer's calandrinia (*Calandrinia breweri*), and Catalina mariposa lily (*Calochortus catalinae*) have a moderate potential to occur in the project footprint. An additional 37 special status plant species have a low potential or are not expected to occur (Appendix D).

Should any individuals of these species or any other special status plant species be present in the project footprint, direct impacts through injury or mortality to individuals during construction is possible. This could occur during the use of construction equipment and ground disturbance required for enhancement and civil improvement activities. Accidental fuel spills during construction could also lead to contamination of soils and habitat degradation. Indirect impacts could result from habitat modifications by the introduction of invasive plants from construction equipment. Potential direct and indirect effects special status plants would be reduced by implementation of IS/MND Mitigation Measure (MM) BIO-1 – General Housekeeping, BIO-2 – Qualified Biological Monitor, BIO-3 – Biological Resources Awareness Training, and BIO-4 – Special-Status Plants; NOI for CDP No. 4-18-1223 Special Condition #3 – Construction Responsibilities, which includes work area delineation, best management practices (BMPs) to prevent spills and contain sediment, and ESHA avoidance; the MBHMP Administrative Program – Community Wildfire Protection Program; and the following MBHMP Natural Resources Avoidance Programs as further discussed in Section 5.2: Integrated Pest

Management Program, Invasive Plant Management Program, Habitat Enhancement and Restoration Program, and Ecosystem-wide Management Coordination Program. These measures and programs will ensure that special status plants are identified, avoided during construction activities, and protected from indirect impacts such as pesticides in the short term and restored/further protected through habitat enhancement in the long term. No additional measures are recommended.

5.1.2 Special Status Wildlife Species

California overwintering population of monarch butterflies (*Danaus plexippus* pop. 1), Cooper's hawk (*Accipiter cooperii*), and white-tailed kite (*Elanus leucurus*) are present within the Study Area. There is a high potential for northern California legless lizard, grasshopper sparrow, and California horned lark a moderate potential for western red bat and low potential for CRLF and northern Bryant's woodrat to be present within the Study Area.

Should special status species be encountered during the proposed project there could be direct impacts through injury or mortality to individuals that are present during the use of construction equipment and ground disturbance required for enhancement and civil improvement activities. These activities could cause direct strikes to wildlife. Indirect impacts could result from noise and dust from construction equipment; as well as habitat modifications by the introduction of invasive plants from construction equipment or contamination of soils and habitat degradation from accidental fuel spills resulting in loss of cover and foraging opportunities. Impacts to aquatic resources, such as Devereux Creek, could negatively impact aquatic and semi-aquatic species.

Monarch Butterflies. Overwintering monarch butterflies may be impacted in the short-term by direct impacts to or disturbance of suitable habitat during the overwintering season.

Potential direct and indirect impacts would be reduced during construction (short term) through adherence to the IS/MND MM BIO-1 – General Housekeeping, BIO-2 – Qualified Biological Monitor, BIO-3 – Biological Resource Awareness Training, BIO-8 – Native Habitats, and BIO 9 – Riparian/Wetland Areas; and the NOI for CDP No. 4-18-1223 Special Condition #2 – Sensitive Species Surveys and Condition #3 – Construction Responsibilities. Unless authorized by a qualified biologist, potentially invasive activities to monarch butterflies will be conducted during April 1 to September 30 of each year outside of overwintering season, per the Monarch Butterfly Management Program. In addition, the Chemical Application Control Plan would place restrictions on chemical applications in the Coverage Area. Impacts would be reduced operationally (long term) though BIO-7 – Tree Replacement; as well as the MBHMP Community Wildfire Protection Program and the following MBHMP Natural Resources Management Programs, as further discussed in Section 5.2: Monarch Butterfly Management Program, Tree Management Program, Biological Monitoring Program, Habitat Enhancement and Restoration Program, Wildlife Management Program, and Ecosystem-wide Management Coordination Program. The project involves restoration and habitat enhancement, including eucalyptus and native tree and native understory planting, that will improve the habitat for monarchs in the long term. In addition, the project description includes environmental protection practices such as daily construction monitoring, pre-construction bat surveys, woodrat midden avoidance, white-tailed kite buffer avoidance, and coastal wetland avoidance/restoration.

Raptors and Nesting Birds. Raptors and nesting birds (including special status species such as the grasshopper sparrow, California horned lark, Cooper's hawk, and white-tailed kite), may be directly impacted if individuals and/or active nests are present in the work area through direct mortality or

physical impacts to active nests. Nesting birds may be indirectly impacted from noise and human presence that causes nest abandonment or predation or disturbance to foraging individuals.

White-tailed kites are fully protected species that could be indirectly impacted by construction disturbance within its 0.5-mile foraging range during breeding season.

Potential direct and indirect impacts would be reduced during construction (short term) through adherence to the IS/MND MM BIO-1 – General Housekeeping, BIO-2 – Qualified Biological Monitor, BIO-3 – Biological Resource Awareness Training, BIO-6 – Nesting Bird Survey, BIO-8 – Native Habitats, and BIO 9 – Riparian/Wetland Areas; the NOI for CDP No. 4-18-1223 Special Condition #2 – Sensitive Species Surveys and Condition #3 – Construction Responsibilities; as well as environmental protection practices including daily monitoring and white-tailed kite avoidance. John Storrer Environmental Services will prepare a Nesting Bird Management Plan in compliance with NOI CDP No. 4-18-1223 Special Condition #2, prior to the start of construction. In addition, the MBHMP Chemical Application Control Plan would place restrictions on chemical applications in the Coverage Area. Impacts would be reduced operationally (long term) though IS/MND BIO-7 – Tree Replacement; as well as the MBHMP Community Wildfire Protection Program and the following Natural Resources Management Programs: Monarch Butterfly Management Program, Tree Management Program, Biological Monitoring Program, Habitat Enhancement and Restoration Program, Wildlife Management Program, and Ecosystem-wide Management Coordination Program. The project involves restoration and habitat enhancement, including eucalyptus and native tree and native understory planting, that will improve the habitat for raptors and nesting birds in the long term.

Northern California legless lizard. Northern California legless lizard may be directly impacted in the short-term by direct mortality from heavy equipment and ground disturbance of leaf litter/cover.

Potential direct and indirect impacts would be reduced during construction (short term) through adherence to the IS/MND MM BIO-1 – General Housekeeping, BIO-2 – Qualified Biological Monitor, BIO-3 – Biological Resource Awareness Training, BIO-8 – Native Habitats, and BIO 9 – Riparian/Wetland Areas; the NOI for CDP No. 4-18-1223 Special Condition #2 – Sensitive Species Surveys and Condition #3 – Construction Responsibilities; and the environmental protection practices including daily monitoring. In addition, the MBHMP Chemical Application Control Plan would place restrictions on chemical applications in the Coverage Area. Impacts would be reduced operationally (long term) though the MBHMP Community Wildfire Protection Program and the following Natural Resources Management Programs: Biological Monitoring Program, Habitat Enhancement and Restoration Program, Wildlife Management Program, and Ecosystem-wide Management Coordination Program. The project involves restoration and habitat enhancement, including native understory planting, that will improve the habitat for legless lizard and other reptiles in the long term.

California Red-Legged Frog. CRLF may be directly impacted in the short-term by ground disturbance and operation of heavy equipment within or adjacent to riparian and wetland vegetation.

Potential direct and indirect impacts would be reduced during construction (short term) through adherence to the IS/MND MM BIO-1 – General Housekeeping, BIO-2 – Qualified Biological Monitor, BIO-3 – Biological Resource Awareness Training, BIO-5 – California Red-Legged Frog, BIO-8 – Native Habitats, and BIO 9 – Riparian/Wetland Areas; the NOI for CDP No. 4-18-1223 Special Condition #2 – Sensitive Species Surveys and Condition #3 – Construction Responsibilities; and environmental protection practices including daily monitoring. In addition, the MBHMP Chemical Application Control Plan would place restrictions on chemical applications in the Coverage Area. Impacts would

be reduced operationally (long term) though the MBHMP Community Wildfire Protection Program and the following Natural Resources Management Programs: Biological Monitoring Program, Habitat Enhancement and Restoration Program, Wildlife Management Program, and Ecosystem-wide Management Coordination Program. The project involves restoration and habitat enhancement, including eucalyptus and native tree and native understory planting, that will improve the habitat for CRLF and other amphibians in the long term.

Western Red Bat. Roosting western red bats may be directly or indirectly impacted by ground disturbance and operation of heavy equipment in or adjacent to roost sites.

Potential direct and indirect impacts would be reduced during construction (short term) through adherence to the IS/MND MM BIO-1 – General Housekeeping, BIO-2 – Qualified Biological Monitor, BIO-3 – Biological Resource Awareness Training, BIO-8 – Native Habitats, and BIO 9 – Riparian/Wetland Areas; the NOI for CDP No. 4-18-1223 Special Condition #2 – Sensitive Species Surveys and Condition #3 – Construction Responsibilities; and environmental protection practices including daily monitoring and pre-construction bat surveys. In addition, the MBHMP Chemical Application Control Plan would place restrictions on chemical applications in the Coverage Area. Impacts would be reduced operationally (long term) though the MBHMP Community Wildfire Protection Program and the following Natural Resources Management Programs: Monarch Butterfly Management Program, Tree Management Program, Biological Monitoring Program, Habitat Enhancement and Restoration Program, Wildlife Management Program, and Ecosystem-wide Management Coordination Program. The project involves restoration and habitat enhancement, including eucalyptus and native tree and native understory planting, that will improve the habitat for western red bat and other bat species in the long term.

Woodrats. The common big-eared woodrat has a potential to occur in the study area and may be directly or indirectly impacted by ground disturbance and operation of heavy equipment through midden disturbance.

Potential direct and indirect impacts would be reduced during construction (short term) through adherence to the IS/MND MM BIO-1 – General Housekeeping, BIO-2 – Qualified Biological Monitor, BIO-3 – Biological Resource Awareness Training, BIO-8 – Native Habitats, and BIO 9 – Riparian/Wetland Areas; the NOI for CDP No. 4-18-1223 Special Condition #2 – Sensitive Species Surveys and Condition #3 – Construction Responsibilities; and environmental protection practices including daily monitoring and woodrat midden avoidance. In addition, the MBHMP Chemical Application Control Plan would place restrictions on chemical applications in the Coverage Area. Impacts would be reduced operationally (long term) though the MBHMP Community Wildfire Protection Program and the following Natural Resources Management Programs: Monarch Butterfly Management Program, Tree Management Program, Biological Monitoring Program, Habitat Enhancement and Restoration Program, Wildlife Management Program, and Ecosystem-wide Management Coordination Program. The project involves restoration and habitat enhancement, including eucalyptus and native tree and native understory planting, that will improve the habitat for woodrats in the long term.

No additional measures are recommended.

5.2 Sensitive Plant Communities and ESHA

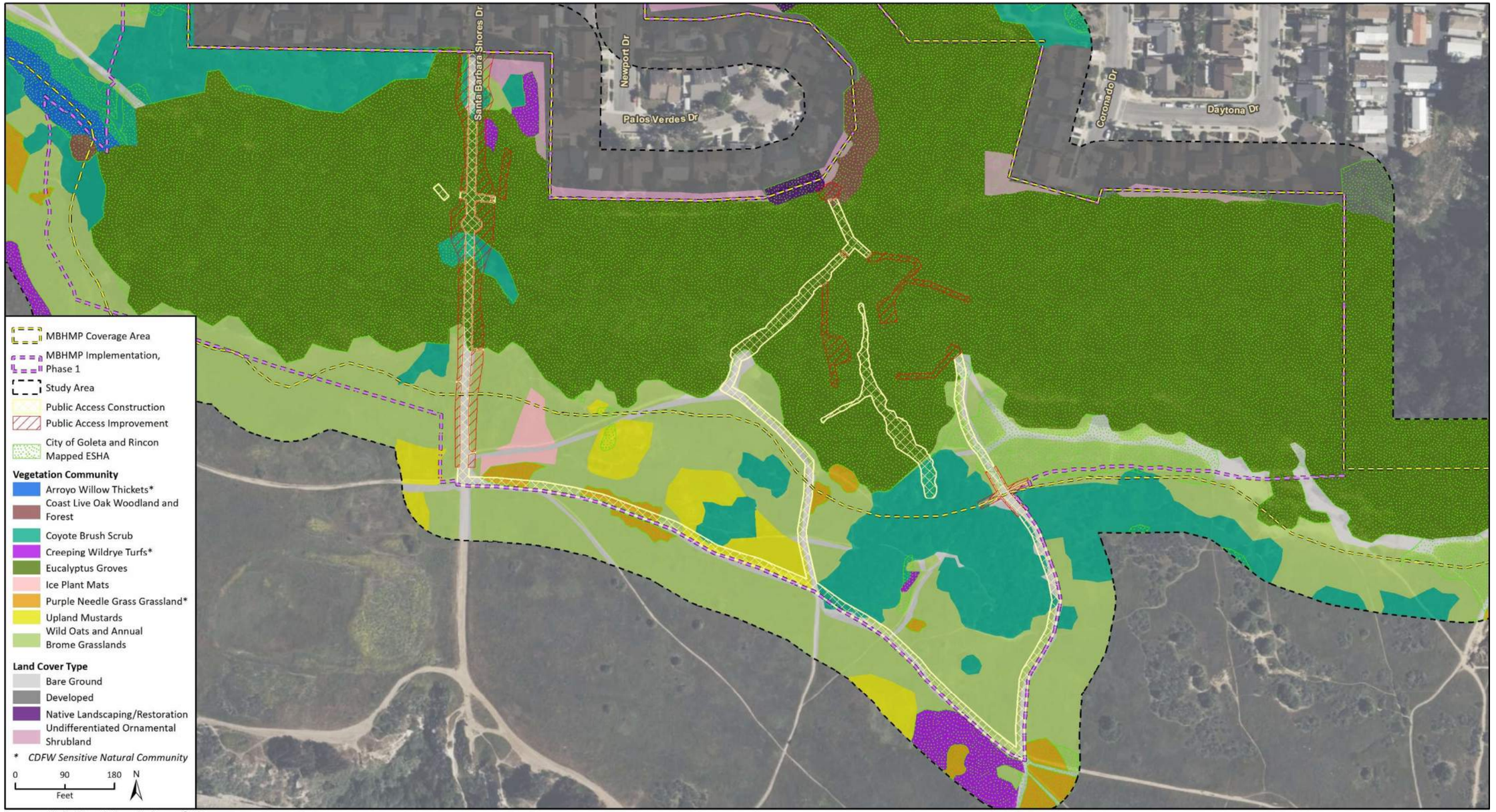
The City's ESHA Policy is provided under Section 4.2. This section provides an analysis of consistency with those policies and Chapter 3 of the CCA where applicable. Public access improvement impacts to ESHA are mapped under Figure 12 and summarized in Table 8 below.

Table 8 Vegetation and ESHA Impacts

Vegetation Community/Land Cover	Public Access Improvement Vegetation Impacts (Acres)[1]	Public Access Construction (Temporary) Vegetation Impacts (Acres)[2]	Public Access Improvement ESHA Impacts (Acres) [1]	Public Access Construction (Temporary) ESHA Impact (Acres) [2]
Vegetation Community				
Alkali Heath Marsh	-	-	-	-
Arroyo Willow Thickets	-	-	-	-
Coast Live Oak Woodland and Forest	0.02	<0.01	0.02	<0.01
Coyote Brush Scrub	0.12	0.12	0.08	0.06
Creeping Wildrye Turfs	<0.01	-	<0.01	-
Eucalyptus Grove	0.51	0.51	0.51	0.51
Hardstem Bulrush Marshes	-	-	-	-
Ice Plant Mats	-	<0.01	-	-
Iris-Leaf Rush Seeps	-	-	-	-
Lemonade Berry Scrub	-	-	-	-
Perennial Rye Grass Fields	-	-	-	-
Purple Needle Grass Grassland	-	0.06	-	0.06
Upland Mustards	-	0.09	-	-
Wild Oats and Annual Brome Grasslands	0.13	0.30	0.02	0.02
Land Cover Type				
Bare Ground	0.04	0.52	<0.01	0.06
Developed/ Ornamental	0.01	<0.01	<0.01	-
Native Landscaping/ Restoration	<0.01	-	<0.01	-
Undifferentiated Ornamental Shrubland	0.01	-	<0.01	-
Total	**0.84**	**1.60**	**0.63**	**0.70**

[1]Public access improvements are allowable uses under the CCA. Under the definitions provided by the CCC, structural public access improvements (i.e. viewing area repair and improvement, culvert replacements, pedestrian bridge replacement, emergency/maintenance road renovation, and trail repair) are considered a permanent impact, whereas construction of these improvements is considered a temporary impact. Public access improvements will only affect the vegetation/land cover/ESHA understory and would not result in tree removal. Habitat reestablishment is considered a temporary impact and would not result in tree removal except in Ellwood Ironbark, where approximately 17 ironbark trees will be selectively removed to create a gap in canopy cover and create roosting monarch butterfly habitat.

Figure 8Figure 12 Impacts to Vegetation and ESHA



Potential direct and indirect impacts to sensitive plant communities and terrestrial ESHA during construction (short term) would be reduced through adherence to the IS/MND MM BIO-8 and BIO 9 and operationally (long term) though BIO-7 and BIO-9; the NOI for CDP No. 4-18-1223 Special Condition #3 – Construction Responsibilities; as well as the following plans, as discussed in Section 5.2: Tree Management Program, Habitat Enhancement and Restoration Program, and Wildlife Management Program. The project involves restoration and habitat enhancement, including native tree and native understory planting and invasive plant removal; these activities are not anticipated to be considered impacts to ESHA as they are restoring native vegetation communities and improving habitat for special status plants and wildlife. Additional compensatory mitigation is not anticipated to be required.

Given the protection afforded to ESHA under the GP/LP under numerous CE ESHA policies, consistency analysis is included in this section. A discussion of riparian and wetland policy consistency is included in the section, but for impacts to coastal wetlands refer to Section 5.3 below.

Policy CE 1: Environmentally Sensitive Habitat Area Designations and Policy

Policies CE 1.1-1.3 and 1.5: ESHA Designation and Mapping

Consistent. As discussed under Section 4.2, ESHA has been designated and mapped consistent with Policies CE 1.1, 1.2, and 1.3 to the extent of current and previously designated ESHA. No map correction specified under CE 1.5 is required or proposed.

CE 1.4, 1.6, and 1.8: Protection of ESHAs and ESHA Buffers

Consistent. The project is for public access and associated management programs are a resource dependent use that is considered allowed use in ESHA under Policy CE 1.6.c. The Trail Management Program includes placement of boardwalks, signage and exclusionary ropes, and other measures to avoid impacts to ESHA under CE 1.6.d.

The design and siting selected when combined with environmental protection practices would have the fewest impacts to ESHA. All impacts will be mitigated through the CEQA analysis or offset though environmental protection practices. The design requires the least amount of fuel modification and alteration of natural landforms as possible.

An ESHA buffer under CE 1.8 is not required since the project use is allowed to be located within ESHA.

CE 1.7: Mitigation of Impacts to ESHA

Consistent. The MBHMP Habitat Enhancement and Restoration, Wildlife Habitat Management, Adaptive Management, and Tree Management Programs will enhance ESHA on site. These programs will be monitored as required under coastal development and agency permits and reports submitted to regulating agencies for a minimum of five years as required under Policy CE 1.7 and IS/MND MM BIO-7 (Tree Replacement). However, the management directive of these programs are proposed to be implemented for the life of the operation of the project and amended through the MBHMP Review, Update, and Amendment Program. Specifics of these Programs will be finalized with City, CCC, and agency comments prior to the issuance of permits from these agencies**.**

CE 1.9: Standards Applicable to Development Projects

Consistent. No night lighting, or non-native species planting is proposed. The design preserves existing wildlife corridors and habitat networks and are of sufficient width to protect habitat and dispersal zones for small mammals, amphibians, reptiles, and birds. With adherence to the Natural Resource Program, development would minimize grading, alteration of natural landforms and physical features, and vegetation clearance in order to reduce or avoid soil erosion, creek siltation, increased runoff, and reduced infiltration of stormwater and prevent net increases in baseline flows for any receiving water body.

CE 1.10: Management of ESHAs.

Consistent. Construction impacts would be avoided though adherence to the CEQA mitigation measures, the NOI for CDP No. 4-18-1223 Special Conditions, and environmental protection practices. Specific to the development standards above, the following plans proposed as part of MBHMP operation would maintain the ESHA ecological functions:

- Integrated Pest Management Program would limit the use of insecticides, herbicides, artificial fertilizers, or other toxic chemical substances consistent with CE 1.10.a and 1.10.b.
- Community Wildfire Protection Program was adopted in 2012 and through the implementation of the Tree Management Program would ensure weed abatement and brush clearance would be the minimum needed for fire safety under 1.10.d.
- Invasive Plant Management Program would remove invasive vegetation (except with habitat value) consistent with CE 1.10.f.
- Adherence to City and State stormwater requirements would ensure any grading during the rainy season would be conducted consistent with CE 1.10.j.

Policy CE 2: Protection of Creeks and Riparian Areas

CE 2.1: Designation of Protected Creeks

Consistent. Riparian ESHA is mapped on site and includes Devereux Creek, shown as a “Creek” (blue line stream) in CE Figure 4-1.

CE 2.2 and CE 2.3: Streamside Protection Areas and Allowable Uses and Activities

Consistent. Similar to policy CE 1.6 above, public access improvements and habitat reestablishment are allowed in the SPA since it includes low-impact facilities for public access, restoration and enhancement, nature education/research, low-impact interpretive and public access signage, and is a Public Works projects identified in the Capital Improvement Plan. As discussed under CE 1.6 the project is the least environmentally damaging alternative feasible.

CE 2.5: Maintenance of Creeks as Natural Drainage System

Consistent. The proposed project footbridge has been designed to avoid the natural drainage course, minimize vegetation removal, and avoid concrete in the channel or alteration of the creek.

CE 2.6: Restoration of Degraded Creeks

Consistent. With implementation of the Wildlife Habitat Management, Habitat Enhancement and Restoration, and Invasive Plant Management Coordination Programs the project would result in restoration of native riparian vegetation, removal of exotic plant species, and creek rehabilitation. 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 2.6.d.

Policy CE 3: Protection of Wetlands.

CE 3.1-3.3: Definition of Wetlands, Designation of Wetland ESHA, and Site-Specific Wetland Delineations

Consistent. All wetlands in the Study Area have been delineated under the CE 3.1 definition and mapped as ESHA.

CE 3.4: Protection of Wetlands in the Coastal Zone

Consistent. The project use is a resource dependent activity and associated fill is an allowed use in wetlands (section d), is the least damaging alternative (section a,), involves the minimum amount of fill necessary (section b), and mitigation/environmental protection practices would minimize adverse effects (section c). A wetland buffer is not required since the project (low impact public access and restoration of wetlands) is an allowed use.

CE 3.6 Mitigation of Wetland Fill

Consistent. Net loss of wetlands are not proposed and compensatory mitigation (i.e., 2:1 offsets) is not required. Proposed habitat management activities would not require significant placement of fill or permanent removal of vegetation in wetland areas, though trimming, mowing, and non-native invasive plant removal activities may occur for restoration purposes. With implementation of the MBHMP Wildlife Habitat Management, Habitat Enhancement and Restoration, and Invasive Plant Management Coordination Programs the project would result in restoration and enhancement of wetlands. The project will implement the proposed environmental protection practice of restoration of 0.9-acre coastal wetland at a 3:1 ratio for public access improvements and at a 1:1 ratio for public access improvement construction and habitat reestablishment.

CE 3.8 Vernal Pool Protection

Consistent. The project avoids vernal pools and would not impact their hydrology.

Policy CE 4: Protection of Monarch Butterfly Habitat Areas

CE 4.1-4.3: Definition of Habitat Area, Designation of Monarch Butterfly ESHAs, and Site-Specific Studies and Unmapped Monarch ESHAs.

Consistent. Current and historical butterfly habitat and roosts have been recently mapped and identified as ESHA and continue to be mapped under the Biological Monitoring Program of the MBHMP. All suitable habitat in the Study Area have been surveyed according to City and current Xerces protocol.

CE 4.4 Protection of Monarch Butterfly ESHAs, CE 4.5 Buffers Adjacent to Monarch Butterfly ESHAs.

Consistent. The project is an allowed use in monarch butterfly ESHA and has been sited to avoid impacts to aggregation sites and potential habitat. A buffer from sites is not required since the project is an allowed use. The only monarch butterfly ESHA vegetation removal proposed includes minor pruning of trees and removal of dead trees and debris for public safety. Removed trees would be replaced with the objective of monarch butterfly habitat restoration and enhancement.

CE 4.6 Standards Applicable to New Development Adjacent to Monarch ESHAs.

Consistent. The Monarch Butterfly Management Program serves as a Monarch Butterfly Habitat Protection Plan. Unless authorized by a qualified biologist, Action 10-4.1 of the Monarch Butterfly Management Program restricts construction to outside the overwintering period (April 1 to September 30). For any work outside the 200-foot buffer from an active roost October 1 and March 1, the buffer would be fenced. In addition, the Biological Monitoring Program includes maintaining butterfly counts, assessing ecosystem health using spectral imaging, and creating monitoring reports.

Policy CE 5: Protection of Other Terrestrial Habitat Areas

CE 5.2: Protection of Native Grasslands.

Consistent. As discussed above, all areas previously designated by the City (2006) and currently (2022) mapped as native grassland (10 percent cover or high-density small patches) are mapped as ESHA. Public access improvements are the least damaging alternative and impact 0.06-acre of native grasslands. The trail repair will occur within existing trails and would not destroy, isolate, interrupt, or cause a break in continuous habitat that would disrupt associated animal movement patterns and seed dispersal, or increase vulnerability to weed invasions. Native grasses will be entirely avoided per IS/MND MM BIO-1 through BIO-4, BIO-8; as well as environmental protection practices for daily construction monitoring.

CE 5.3 Protection of Costal Bluff Scrub, Coastal Sage Scrub, and Chaparral ESHA

Consistent. As discussed above under Section 4.2, areas mapped previously as coastal bluff scrub and coastal sage scrub remain designated AS ESHA (City 2006). The project avoids these areas.

Policy CE 8: Protection of Special-Status Species

CE 8.1: ESHA Designation

Consistent. Native landscaping where Santa Barbara honeysuckle is present is mapped as ESHA. Raptor nesting and roosting areas remain mapped as ESHA.

Policy CE 9: Protection of Native Woodlands

CE 9.3: Native Oak Woodlands or Savannas

Consistent. Native oak woodlands are mapped as ESHA within the Study Area and tree trimming, weed abatement, and brush clearance under the MBHMP Tree Management Program will be the minimum (least damaging) required to achieve fire safety. Impacts to native oak woodlands would be addressed through creation and enhancement of ESHA under the Habitat Enhancement and Restoration Program.

5.3 Jurisdictional Waters and Wetlands

The CCC 2012 *Suggestions for Wetland Delineation Reports to the California Coastal Commission* states that "long-term "temporary impacts" that result in the removal or death of vegetation should be distinguished from short-term "temporary impacts" that are sufficiently brief or benign that the vegetation can reasonably be expected to recover in less than one year. For the purposes of this report, the public access improvements are assumed to be permanent impacts, while the construction of public access improvements are assumed to be temporary impacts. Habitat enhancement activities are not anticipated to be considered impacts as they are restoring native vegetation communities and improving habitat for sensitive plant and wildlife species.

The project will result in the following permanent and temporary impacts to jurisdictional features shown in Table 9 and Figure 13.

Table 9 Temporary and Permanent Impacts to Jurisdictional Waters and Streambeds

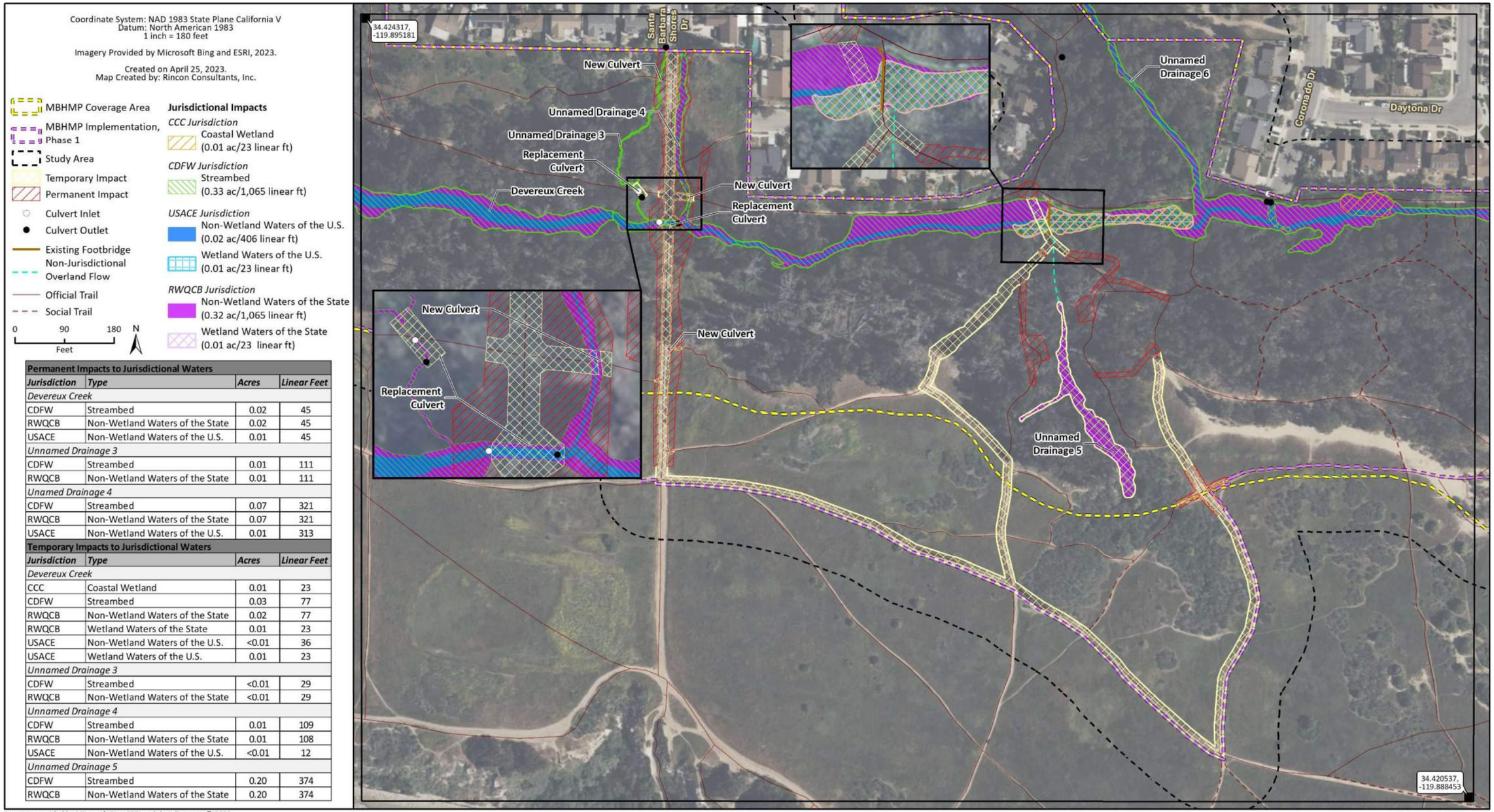
Impact Type	Agency	Length of Impact (feet)	Area of Impact (acres)
Temporary Impact	CCC Coastal Wetland	23	0.01
	CDFW Streambed and Riparian Habitat	588	0.24
	RWQCB Non-Wetland Waters of the State	588	0.23
	RWQCB Wetland Waters of the State	23	0.01
	USACE Non-Wetland Waters of the U.S.	48	<0.01
	USACE Wetland Waters of the U.S.	23	0.01
	Total[1]	**588**	**0.24**
	Temporary Impact Restoration (1:1)[2]	**588**	**0.24**
Permanent Impact	CDFW Streambed and Riparian Habitat	477	0.09
	RWQCB Non-Wetland Waters of the State	477	0.09
	USACE Non-Wetland Waters of the U.S.	358	0.01
	Total[1]	**477**	**0.09**
	Permanent Impact Restoration (3:1)	**477**	**0.28**

[1]Totals are equivalent to CDFW streambed and riparian habitat

[2]Temporary impacts associated with Unnamed Drainage 5 are due to the restoration and enhancement of this feature. Restoration of unnamed Drainage 5 will be included as mitigation for permanent impacts.

Note: Exact acreages were calculated using GIS. Small discrepancies within the table are due to rounding.

Figure 13 Permanent and Temporary Impacts to Jurisdictional Areas



Permanent Impacts to Jurisdictional Waters			
Jurisdiction	*Type*	*Acres*	*Linear Feet*
Devereux Creek			
CDFW	Streambed	0.02	45
RWQCB	Non-Wetland Waters of the State	0.02	45
USACE	Non-Wetland Waters of the U.S.	0.01	45
Unnamed Drainage 3			
CDFW	Streambed	0.01	111
RWQCB	Non-Wetland Waters of the State	0.01	111
Unamed Drainage 4			
CDFW	Streambed	0.07	321
RWQCB	Non-Wetland Waters of the State	0.07	321
USACE	Non-Wetland Waters of the U.S.	0.01	313
Temporary Impacts to Jurisdictional Waters			
Jurisdiction	*Type*	*Acres*	*Linear Feet*
Devereux Creek			
CCC	Coastal Wetland	0.01	23
CDFW	Streambed	0.03	77
RWQCB	Non-Wetland Waters of the State	0.02	77
RWQCB	Wetland Waters of the State	0.01	23
USACE	Non-Wetland Waters of the U.S.	<0.01	36
USACE	Wetland Waters of the U.S.	0.01	23
Unnamed Drainage 3			
CDFW	Streambed	<0.01	29
RWQCB	Non-Wetland Waters of the State	<0.01	29
Unnamed Drainage 4			
CDFW	Streambed	0.01	109
RWQCB	Non-Wetland Waters of the State	0.01	108
USACE	Non-Wetland Waters of the U.S.	<0.01	12
Unnamed Drainage 5			
CDFW	Streambed	0.20	374
RWQCB	Non-Wetland Waters of the State	0.20	374

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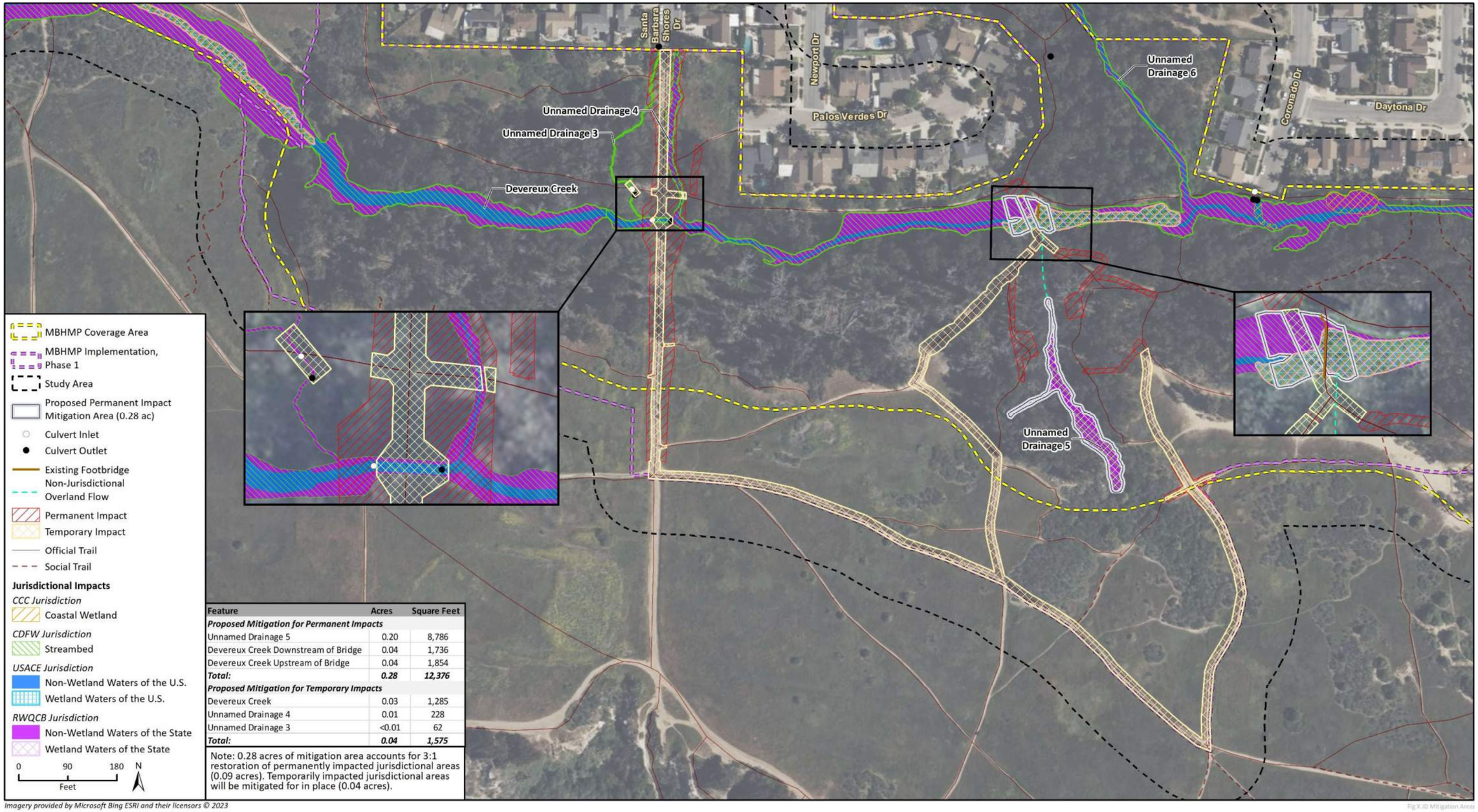
Fig X ID Impacts_11x17Landscape

Potential direct and indirect impacts to potentially jurisdictional waters during construction (short term) would be reduced through adherence to the IS/MND MM BIO-8 – Native Habitats and BIO 9 – Riparian/Wetland Areas and the NOI for CDP No. 4-18-1223 Special Condition #3. Impacts would be reduced operationally (long term) though BIO-7 – Tree Replacement and BIO-9; as well as the following MBHMP Natural Resources Management Programs, as discussed in Section 5.2: Tree Management Program, Habitat Enhancement and Restoration Program, and Wildlife Management Program. The MBHMP Implementation – Phase 1 Mitigation and Monitoring Plan (Appendix J) describes the habitat restoration details and success criteria proposed to mitigate the temporary and permanent impacts to jurisdictional features that are associated with project activities.

The project will avoid staging/stockpiling within riparian habitats/wetlands/vernal pools, avoid impacts to jurisdiction waters to the maximum extent practicable, and obtain required regulatory permits for any vegetation trimming/removal or ground disturbing activities in potentially jurisdictional waters. The project involves restoration and habitat enhancement, including native tree and native understory planting and invasive plant removal, that will restore the Devereux Creek riparian corridor and its tributaries.

Public access improvements would permanently impact 0.09-acre of jurisdictional waters (including 0.09-acre of coastal wetland) and public access improvement construction would temporarily impact 0.04-acre of jurisdictional waters (including 0.01-acre of coastal wetland). These activities are the least damaging alternative. Restoration and habitat enhancement activities within Unnamed Drainage 5 will temporarily impact 0.20-acre of jurisdictional waters but improve the habitat quality within the impacted area, resulting in a net benefit to Ellwood Mesa. A total of 0.32 acres of riparian habitat will be restored per the environmental protection practice of jurisdictional waters and coastal wetland avoidance/restoration proposed in the Project Description, including restoration activities associated with Unnamed Drainage 5. Restoration would expand the extent and functional capacity of the riparian corridor and stream banks by increasing native species diversity and abundance along otherwise non-native species-dominated waterways. Restoration of permanently impacted areas will occur immediately upstream and downstream of the proposed pedestrian pathway located along Devereaux Creek between Santa Barbara Shores Drive and Coronado Drive, and along unnamed drainage 5 as displayed in Figure 14. Temporary impacts to be restored in place will occur along Devereaux Creek and along unnamed drainages 3 and 4 as shown in Figure 14 Habitat Restoration and Mitigation AreasFigure 14. This approach as permitted by the agencies would fulfill IS/MND MM BIO-9.

Figure 14 Habitat Restoration and Mitigation Areas



Feature	Acres	Square Feet
Proposed Mitigation for Permanent Impacts		
Unnamed Drainage 5	0.20	8,786
Devereux Creek Downstream of Bridge	0.04	1,736
Devereux Creek Upstream of Bridge	0.04	1,854
Total:	***0.28***	***12,376***
Proposed Mitigation for Temporary Impacts		
Devereux Creek	0.03	1,285
Unnamed Drainage 4	0.01	228
Unnamed Drainage 3	<0.01	62
Total:	***0.04***	***1,575***

Note: 0.28 acres of mitigation area accounts for 3:1 restoration of permanently impacted jurisdictional areas (0.09 acres). Temporarily impacted jurisdictional areas will be mitigated for in place (0.04 acres).

5.4 Wildlife Movement

As discussed above under Section 5.2, the project design preserves existing wildlife corridors and habitat networks and is of sufficient width to protect habitat and dispersal zones for small mammals, amphibians, reptiles, and birds.

5.5 Local Policies and Ordinances

ESHA and SPA policies are discussed above under Section 5.2. The following is a discussion of project consistency with GP/CLUP CE policies protecting resources that are not designated as ESHA.

Policy CE 8: Protection of Special-Status Species

CE 8.4: Buffer Areas for Raptor Species

Consistent. As discussed above under Section 5.1.2, project effects on raptor nesting would be addressed though adherence to the MBHMP Wildlife Habitat Management Program including Action 11-1.3, the environmental protection practice for white-tailed kite avoidance, IS/MND BIO-6, and the NOI for CDP No. 4-18-1223 Special Conditions #2 and #3. A minimum construction buffer of 500 feet would be established around active raptor nests consistent with IS/MND BIO-6 and the NOI for CDP No. 4-18-1223 Special Conditions #2. In terms of the 100-foot historical and active roost development buffer, the project development (access improvements and habitat management) is a resource dependent activity that is a compatible use within the buffer and impacts would be mitigated under the project. A 100-foot buffer is not required for the project from current and historical roosts with adherence to the construction measures discussed above.

Policy CE 9: Protection of Native Woodlands

CE 9.1, 9.2, and 9.4: Tree Protection Plan and Standards

Consistent. Based on Policy CE 9.1, 9.2, and 9.4, impacts (including removal, fragmentation of habitat, removal of understory, disruption of canopy, and alteration of drainage patterns) to mature native trees will be avoided or minimized to the extent feasible through the implementation of the environmental protection practice for native tree avoidance. Policy CE 9 does not include specific tree protection standards; as such, the tree protection measures include industry protection standards (measures to be implemented prior to, during, and after construction including methods of avoiding injury, damage treatment and inspections, activities permitted/prohibited within TPZs, and monitoring requirements for work within TPZs). Native tree removal is not anticipated to be required for the project.

CE 9.5: Mitigation of Impacts to Native Trees

Consistent. No native trees are proposed to be removed. Encroachment into the TPZ will be the least damaging alternative and will be minimized through the environmental protection practice for native tree avoidance. The project is not anticipated to threaten the continued viability of any native trees.

Limitations, Assumptions, and Use Reliance

This Biological Resources Assessment has been performed in accordance with professionally accepted biological investigation practices conducted at this time and in this geographic area. The biological investigation is limited by the scope of work performed. Reconnaissance biological surveys for certain taxa may have been conducted as part of this assessment but were not performed during a particular blooming period, nesting period, or particular portion of the season when positive identification would be expected if present, and therefore, cannot be considered definitive. The biological surveys are limited also by the environmental conditions present at the time of the surveys. In addition, general biological (or protocol) surveys do not guarantee that the organisms are not present and will not be discovered in the future within the site. In particular, mobile wildlife species could occupy the site on a transient basis, or re-establish populations in the future. Our field studies were based on current industry practices, which change over time and may not be applicable in the future. No other guarantees or warranties, expressed or implied, are provided. The findings and opinions conveyed in this report are based on findings derived from site reconnaissance, jurisdictional areas, review of CNDDB RareFind5, and specified historical and literature sources. Standard data sources relied upon during the completion of this report, such as the CNDDB, may vary with regard to accuracy and completeness. In particular, the CNDDB is compiled from research and observations reported to CDFW that may or may not have been the result of comprehensive or site-specific field surveys. Although Rincon believes the data sources are reasonably reliable, Rincon cannot and does not guarantee the authenticity or reliability of the data sources it has used. Additionally, pursuant to our contract, the data sources reviewed included only those that are practically reviewable without the need for extraordinary research and analysis.

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Appendix A

Regulatory Setting

Regulatory Setting

The following is a brief summary of the regulatory context under which biological resources are managed at the federal, state, and local levels. A number of federal and state statutes provide a regulatory structure that guides the protection of biological resources. Agencies with the responsibility for protection of biological resources within the project site include:

- U.S. Army Corps of Engineers (wetlands and other waters of the United States);
- U.S. Fish and Wildlife Service (federally listed species and migratory birds);
- National Marine Fisheries Service (marine animals and anadromous fishes);
- Central Coast Regional Water Quality Control Board (waters of the State);
- California Department Fish and Wildlife (riparian areas, streambeds, and lakes; state-listed species; nesting birds, marine resources);
- City of Goleta General Plan/Coastal Land Use Plan

United States Army Corps of Engineers

The United States Army Corps of Engineers (USACE) is responsible for administering several federal programs related to ensuring the quality and navigability of the nation's waters.

Clean Water Act Section 404

Congress enacted the Clean Water Act (CWA) "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Section 404 of the CWA authorizes the Secretary of the Army, acting through the USACE, to issue permits regulating the discharge of dredged or fill materials into the "navigable waters at specified disposal sites."

Section 502 of the CWA further defines "navigable waters" as "waters of the United States, including the territorial seas." "Waters of the United States" are broadly defined at 33 CFR Part 328.3 to include navigable waters, perennial and intermittent streams, lakes, rivers, ponds, as well as wetlands, marshes, and wet meadows. In recent years the USACE and US Environmental Protection Agency (USEPA) have undertaken several efforts to modernize their regulations defining "waters of the United States" (e.g., the 2015 Clean Water Rule and 2020 Navigable Waters Protection Rule), but these efforts have been frustrated by legal challenges which have invalidated the updated regulations. Thus, the agencies' longstanding definition of "waters of the United States," which dates from 1986, remains in effect albeit with supplemental guidance interpreting applicable court decisions as described below.

Waters of the U.S.

In summary, USACE and USEPA regulations define "waters of the United States" as follows:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;

3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

    i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or

    ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

    iii. Which are used or could be used for industrial purpose by industries in interstate commerce;

4. All impoundments of waters otherwise defined as waters of the United States;
5. Tributaries of waters identified in paragraphs (a)(1)-(4) of this section;
6. The territorial sea;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in items 1-6 above.

Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with the USEPA.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA are not waters of the United States.

The lateral limits of USACE jurisdiction in non-tidal waters is defined by the "ordinary high-water mark" (OHWM) unless adjacent wetlands are present. The OHWM is a line on the shore or edge of a channel established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed upon the bank, shelving, changes in the character of soil, destruction of vegetation, or the presence of debris (33 CFR 328.3(e)). As such, waters are recognized in the field by the presence of a defined watercourse with appropriate physical and topographic features. If wetlands occur within, or adjacent to, waters of the United States, the lateral limits of USACE jurisdiction extend beyond the OHWM to the outer edge of the wetlands (33 CFR 328.4 (c)). The upstream limit of jurisdiction in the absence of adjacent wetlands is the point beyond which the OHWM is no longer perceptible (33 CFR 328.4; see also 51 FR 41217).

Wetlands

The USACE defines wetlands as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3). The USACE’s delineation procedures identify wetlands in the field based on indicators of three wetland parameters: hydrophytic vegetation, hydric soils, and wetland hydrology. The following is a discussion of each of these parameters.

Hydrophytic Vegetation

Hydrophytic vegetation dominates areas where frequency and duration of inundation or soil saturation exerts a controlling influence on the plant species present. Plant species are assigned

wetland indicator status according to the probability of their occurring in wetlands. More than fifty percent of the dominant plant species must have a wetland indicator status to meet the hydrophytic vegetation criterion. The USACE published the National Wetland Plant List (USACE 2018), which separates vascular plants into the following four basic categories based on plant species frequency of occurrence in wetlands:

- **Obligate Wetland (OBL).** Almost always occur in wetlands
- **Facultative Wetland (FACW).** Usually occur in wetlands, but occasionally found in non-wetlands
- **Facultative (FAC).** Occur in wetlands or non-wetlands
- **Facultative Upland (FACU).** Usually occur in non-wetlands, but may occur in wetlands
- **Obligate Upland (UPL).** Almost never occur in wetlands

The USACE considers OBL, FACW and FAC species to be indicators of wetlands. An area is considered to have hydrophytic vegetation when greater than 50 percent of the dominant species in each vegetative stratum (tree, shrub, and herb) fall within these categories. Any species not appearing on the United States Fish and Wildlife Service's list is assumed to be an upland species, almost never occurring in wetlands. In addition, an area needs to contain at least 5% vegetative cover to be considered as a vegetated wetland.

Hydric Soils

Hydric soils are saturated or inundated for a sufficient duration during the growing season to develop anaerobic or reducing conditions that favor the growth and regeneration of hydrophytic vegetation. Field indicators of wetland soils include observations of ponding, inundation, saturation, dark (low chroma) soil colors, bright mottles (concentrations of oxidized minerals such as iron), gleying (indicates reducing conditions by a blue-grey color), or accumulation of organic material. Additional supporting information includes documentation of soil as hydric or reference to wet conditions in the local soils survey, both of which must be verified in the field.

Wetland Hydrology

Wetland hydrology is inundation or soil saturation with a frequency and duration long enough to cause the development of hydric soils and plant communities dominated by hydrophytic vegetation. If direct observation of wetland hydrology is not possible (as in seasonal wetlands), or records of wetland hydrology are not available (such as stream gauges), assessment of wetland hydrology is frequently supported by field indicators, such as water marks, drift lines, sediment deposits, or drainage patterns in wetlands.

Applicable Case Law and Agency Guidance

The USACE's regulations defining "waters of the United States" have been subject to legal interpretation, and two influential Supreme Court decisions have narrowed the definition to exclude certain classes of waters that bear an insufficient connection to navigable waters. In *Solid Waste Agency of Northern Cook County v. Army Corps of Engineers* (2001), the United States Supreme Court stated that the USACE's CWA jurisdiction does not extend to ponds that "are not adjacent to open water." In reaching its decision, the Court concluded that the "Migratory Bird Rule," which served as the basis for the USACE's asserted jurisdiction, was not supported by the CWA. The Migratory Bird Rule extended CWA jurisdiction to intrastate waters "which are or would be used as habitat by birds protected by Migratory Bird Treaties or which are or would be used as habitat by

other migratory birds which cross state lines…" The Court was concerned that application of the Migratory Bird Rule resulted in "reading the term 'navigable waters' out of the statute. Highlighting the language of the CWA to determine the statute's jurisdictional reach, the Court stated, "the term 'navigable' has at least the import of showing us what Congress had in mind as its authority for enacting the CWA: its traditional jurisdiction over waters that were or had been navigable in fact or which could reasonably be so made." This decision stands for the proposition that non-navigable isolated, intrastate waters are not waters of the United States and thus are not jurisdictional under the CWA.

In 2006 the United States Supreme Court decided *Rapanos v. United States* and *Carabell v. United States* (collectively "Rapanos"), which were consolidated cases determining the extent of CWA jurisdiction over waters that carry only an infrequent surface flow. The court issued no majority opinion in Rapanos. Instead, the justices authored five separate opinions including the "plurality" opinion, authored by Justice Scalia (joined by three other justices), and a concurring opinion by Justice Kennedy. To guide implementation of the decision, the USACE and USEPA issued a joint guidance memorandum ("Rapanos Guidance Memorandum") in 2008 stating that "regulatory jurisdiction under the CWA exists over a water body if either the plurality's or Justice Kennedy's standard is satisfied."

According to the plurality opinion in Rapanos, "the waters of the United States include only relatively permanent, standing or flowing bodies of water" and do not include "ordinarily dry channels through which water occasionally or intermittently flows." In addition, while all wetlands that meet the USACE definition are considered adjacent wetlands, only those adjacent wetlands that have a continuous surface connection because they directly abut the tributary (e.g., they are not separated by uplands, a berm, dike, or similar feature) are considered jurisdictional under the plurality standard.

Under Justice Kennedy's opinion, "the USACE's jurisdiction over wetlands depends upon the existence of a significant nexus between the wetlands in question and navigable waters in the traditional sense. Wetlands possess the requisite nexus, and thus come within the statutory phrase 'navigable waters,' if the wetlands, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable.' When, in contrast, wetlands' effects on water quality are speculative or insubstantial, they fall outside the zone fairly encompassed by the statutory term 'navigable waters.'" Justice Kennedy identified "pollutant trapping, flood control, and runoff storage" as some of the critical functions wetlands can perform relative to other waters. He concluded that, given wetlands' ecological role, "mere adjacency" to a non-navigable tributary was insufficient to establish CWA jurisdiction, and that "a more specific inquiry, based on the significant nexus standard, is therefore necessary."

Interpreting these decisions, and according to the Rapanos Guidance Memorandum, the USACE and USEPA will assert jurisdiction over the following waters:

- Traditional navigable waters;
- Wetlands adjacent to traditional navigable waters;
- Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); and,
- Wetlands that directly abut such tributaries.

The USACE and USEPA will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water:

- Non-navigable tributaries that are not relatively permanent;
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent; and,
- Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

Where a significant nexus analysis is required, the USACE and USEPA will apply the significant nexus standard as follows:

- A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters; and,
- Significant nexus includes consideration of hydrologic and ecologic factors.

The USACE and USEPA generally will not assert jurisdiction over the following features:

- Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow); and,
- Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

Rivers and Harbors Act Section 10

Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the USACE for the construction of any structure in or over any navigable water of the United States. Structures or work outside the limits defined for navigable waters of the United States require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, re-channelization, or any other modification of a navigable water of the United States, and applies to all structures and work. It further includes, without limitation, any wharf, dolphin, weir, boom breakwater, jetty, groin, bank protection (e.g., riprap, revetment, bulkhead), mooring structures such as pilings, aerial or subaqueous power transmission lines, intake or outfall pipes, permanently moored floating vessel, tunnel, artificial canal, boat ramp, aids to navigation, and any other permanent, or semi-permanent obstacle or obstruction. It is important to note that Section 10 applies only to navigable waters, and thus does not apply to work in non-navigable wetlands or tributaries. In some cases, Section 10 authorization is issued by the USACE concurrently with CWA Section 404 authorization, such as when certain Nationwide Permits are used.

Regional Water Quality Control Board

The State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs) have jurisdiction over “waters of the State,” which are defined as any surface water or groundwater, including saline waters, within the boundaries of the state (California Water Code sec. 13050(e)). These agencies also have responsibilities for administering portions of the CWA.

Clean Water Act Section 401

Section 401 of the CWA requires an applicant requesting a federal license or permit for an activity that may result in any discharge into navigable waters (such as a Section 404 Permit) to provide state certification that the proposed activity will not violate state and federal water quality standards. In California, CWA Section 401 Water Quality Certification (Section 401 Certification) is issued by the RWQCBs and by the SWRCB for multi-region projects. The process begins when an applicant submits an application to the RWQCB and informs the USACE (or the applicable agency from which a license or permit was requested) that an application has been submitted. The USACE will then determine a "reasonable period of time" for the RWQCB to act on the application; this is typically 60 days for routine projects and longer for complex projects but may not exceed one year. When the period has elapsed, if the RWQCB has not either issued or denied the application for Section 401 Certification, the USACE may determine that Certification has been waived and issue the requested permit. If a Section 401 Certification is issued it may include binding conditions, imposed either through the Certification itself or through the requested federal license or permit.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is the principal law governing water quality regulation in California. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act applies to surface waters, wetlands, and ground water and to both point and nonpoint sources of pollution. Pursuant to the Porter-Cologne Act (California Water Code section 13000 et seq.), the policy of the State is as follows:

- The quality of all the waters of the State shall be protected
- All activities and factors affecting the quality of water shall be regulated to attain the highest water quality within reason
- The State must be prepared to exercise its full power and jurisdiction to protect the quality of water in the State from degradation

The Porter-Cologne Act established nine RWQCBs (based on watershed boundaries) and the SWRCB, which are charged with implementing its provisions and which have primary responsibility for protecting water quality in California. The SWRCB provides program guidance and oversight, allocates funds, and reviews RWQCB decisions. In addition, the SWRCB allocates rights to the use of surface water. The RWQCBs have primary responsibility for individual permitting, inspection, and enforcement actions within each of nine hydrologic regions. The SWRCB and RWQCBs have numerous nonpoint source related responsibilities, including monitoring and assessment, planning, financial assistance, and management.

Section 13260 of the Porter-Cologne Act requires any person discharging or proposing to discharge waste that could affect the quality of waters of the State to file a Report of Waste Discharge with the appropriate RWQCB. The RWQCB may then authorize the discharge, subject to conditions, by issuing Waste Discharge Requirements (WDRs). While this requirement was historically applied primarily to outfalls and similar point source discharges, the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*, effective May 2020, make it clear that the agency will apply the Porter-Cologne Act's requirements to discharges of dredge and fill material as well. The *Procedures* state that they are to be used in issuing CWA Section 401 Certifications and WDRs, and largely mirror the existing review requirements for CWA

Section 404 Permits and Section 401 Certifications, incorporating most elements of the USEPA's *Section 404(b)(1) Guidelines*. Following issuance of the *Procedures*, the SWRCB produced a consolidated application form for dredge/fill discharges that can be used to obtain a CWA Section 401 Water Quality Certification, WDRs, or both.

Non-Wetland Waters of the State

The SWRCB and RWQCBs have not established regulations for field determinations of waters of the state except for wetlands currently. In many cases the RWQCBs interpret the limits of waters of the State to be bounded by the OHWM unless isolated conditions or ephemeral waters are present. However, in the absence of statewide guidance each RWQCB may interpret jurisdictional boundaries within their region and the SWRCB has encouraged applicants to confirm jurisdictional limits with their RWQCB before submitting applications. As determined by the RWQCB, waters of the State may include riparian areas or other locations outside the OHWM, leading to a larger jurisdictional area over a given water body compared to the USACE.

Wetland Waters of the State

Procedures for defining wetland waters of the State pursuant to the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* went into effect May 28, 2020. The SWRCB defines an area as wetland if, under normal circumstances:

(i) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both;

(ii) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and

(iii) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.

The SWRCB's *Implementation Guidance for the Wetland Definition and Procedures for Discharges of Dredge and Fill Material to Waters of the State* (2020), states that waters of the U.S. and waters of the State should be delineated using the standard USACE delineation procedures, taking into consideration that the methods shall be modified only to allow for the fact that a lack of vegetation does not preclude an area from meeting the definition of a wetland.

United States Fish and Wildlife Service

The United States Fish and Wildlife Service (USFWS) implements several laws protecting the Nation's fish and wildlife resources, including the Endangered Species Act (ESA; 16 United States Code [USC] Sections 153 et seq.), the Migratory Bird Treaty Act (MBTA; 16 USC Sections 703-711) and the Bald and Golden Eagle Protection Act (16 USC Section 668).

Endangered Species Act

The USFWS and National Marine Fisheries Service (NMFS) share responsibility for implementing the ESA. Generally, the USFWS implements the ESA for terrestrial and freshwater species, while the NMFS implements the ESA for marine and anadromous species. Projects that would result in "take" of any threatened or endangered animal species, or a threatened or endangered plant species if occurring on federal land, are required to obtain permits from the USFWS or NMFS through either Section 7 (interagency consultation with a federal nexus) or Section 10 (Habitat Conservation Plan)

of the ESA, depending on the involvement by the federal government in funding, authorizing, or carrying out the project. The permitting process is used to determine if a project would jeopardize the continued existence of a listed species and what measures would be required to avoid jeopardizing the species. “Take” under federal definition means to harass, harm (which includes habitat modification), pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Proposed or candidate species do not have the full protection of the ESA; however, the USFWS and NMFS advise project applicants that they could be elevated to listed status at any time.

Migratory Bird Treaty Act

The MBTA of 1918 implements four international conservation treaties that the U.S. entered into with Canada in 1916, Mexico in 1936, Japan in 1972, and Russia in 1976. It is intended to ensure the sustainability of populations of all protected migratory bird species. The law has been amended with the signing of each treaty, as well as when any of the treaties were amended, such as with Mexico in 1976 and Canada in 1995. The MBTA prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the USFWS.

The list of migratory bird species protected by the law, in regulations at 50 CFR Part 10.13, is primarily based on bird families and species included in the four international treaties. A migratory bird species is included on the list if it meets one or more of the following criteria:

1. It occurs in the United States or U.S. territories as the result of natural biological or ecological processes and is currently, or was previously listed as, a species or part of a family protected by one of the four international treaties or their amendments.

2. Revised taxonomy results in it being newly split from a species that was previously on the list, and the new species occurs in the United States or U.S. territories as the result of natural biological or ecological processes.

3. New evidence exists for its natural occurrence in the United States or U.S. territories resulting from natural distributional changes and the species occurs in a protected family.

In 2004, the Migratory Bird Treaty Reform Act limited the scope of the MBTA by stating the MBTA applies only to migratory bird species that are native to the United States or U.S. territories, and that a native migratory bird species is one that is present as a result of natural biological or ecological processes. The MBTRA requires the USFWS to publish a list of all nonnative, human-introduced bird species to which the MBTA does not apply, and an updated list was published in 2020. The 2020 update identifies species belonging to biological families referred to in treaties the MBTA implements but are not protected because their presence in the United States or U.S. territories is solely the result of intentional or unintentional human-assisted introductions.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act prohibits anyone, without a permit issued by the USFWS, from "taking" bald or golden eagles, including their parts (including feathers), nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any

golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

"Disturb" means “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

California Department of Fish and Wildlife

The California Department of Fish and Wildlife (CDFW) derives its authority from the Fish and Game Code of California and administers several State laws protecting fish and wildlife resources and the habitats upon which they depend.

California Endangered Species Act

The California Endangered Species Act (CESA) (Fish and Game Code Section 2050 et. seq.) prohibits take of state listed threatened or endangered. Take under CESA is defined as “Hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill” (Fish and Game Code sec. 86). This definition does not prohibit indirect harm by way of habitat modification, except where such harm is the proximate cause of death of a listed species. Where incidental take would occur during construction or other lawful activities, CESA allows the CDFW to issue an Incidental Take Permit upon finding, among other requirements, that impacts to the species have been minimized and fully mitigated. Unlike the federal ESA, CESA’s protections extend to candidate species during the period (typically one year) while the California Fish and Game Commission decides whether the species warrants CESA listing.

Native Plant Protection Act

The CDFW also has authority to administer the Native Plant Protection Act (NPPA) (Fish and Game Code Section 1900 et seq.). The NPPA requires the CDFW to establish criteria for determining if a species, subspecies, or variety of native plant is endangered or rare, and prohibits the take of listed plant species. Effective in 2015, CDFW promulgated regulations (14 CCR 786.9) under the authority of the NPPA, establishing that the CESA’s permitting procedures would be applied to plants listed under the NPPA as "Rare." With this change, there is little practical difference for the regulated public between plants listed under CESA and those listed under the NPPA.

Fully Protected Species Laws

The CDFW enforces Sections 3511, 4700, 5050, and 5515 of the Fish and Game Code, which prohibit take of species designated as Fully Protected. The CDFW is not allowed to issue an Incidental Take Permit for Fully Protected species; therefore, impacts to these species must be avoided. The exception is situations where a Natural Community Conservation Plan (NCCP) is in place that authorizes take of the fully protected species.

Avian Protection Laws

California Fish and Game Code sections 3503, 3503.5, and 3513 describe unlawful take, possession, or destruction of native birds, nests, and eggs. Section 3503.5 of the Code protects all birds-of-prey and their eggs and nests against take, possession, or destruction of nests or eggs. Section 3513 makes it a state-level offense to take any bird in violation of the federal Migratory Bird Treaty Act.

Protection of Lakes and Streambeds

California Fish and Game Code section 1602 states that it is unlawful for any person to "substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake" without first notifying the California Department of Fish and Wildlife (CDFW) of that activity. Thereafter, if CDFW determines and informs the entity that the activity will not substantially adversely affect any existing fish or wildlife resources, the entity may commence the activity. If, however, CDFG determines that the activity may substantially adversely affect an existing fish or wildlife resource, the entity may be required to obtain from CDFW a Streambed Alteration Agreement (SAA), which will include reasonable measures necessary to protect the affected resource(s), before the entity may conduct the activity described in the notification. Upon receiving a complete Notification of Lake/Streambed Alteration, CDFW has 60 days to present the entity with a Draft SAA. Upon review of the Draft SAA by the applicant, any problematic terms are negotiated with CDFW and a final SAA is executed.

The CDFW has not defined the term “stream” for the purposes of implementing its regulatory program under Section 1602, and the agency has not promulgated regulations directing how jurisdictional streambeds may be identified, or how their limits should be delineated. However, four relevant sources of information offer insight as to the appropriate limits of CDFW jurisdiction as discussed below.

- **The plain language of Section 1602 of CFGC** establishes the following general concepts:
  - References “river,” “stream,” and “lake”
  - References “natural flow”
  - References “bed,” “bank,” and “channel”
- **Applicable court decisions**, in particular *Rutherford v. State of California* (188 Cal App. 3d 1276 (1987), which interpreted Section 1602’s use of “stream” to be as defined in common law. The Court indicated that a “stream” is commonly understood to:
  - Have a source and a terminus
  - Have banks and a channel
  - Convey flow at least periodically, but need not flow continuously and may at times appear outwardly dry
  - Represent the depression between the banks worn by the regular and usual flow of the water
  - Include the area between the opposing banks measured from the foot of the banks from the top of the water at its ordinary stage, including intervening sand bars
  - Include the land that is covered by the water in its ordinary low stage
  - Include lands below the OHWM

- **CDFW regulations** defining "stream" for other purposes, including sport fishing (14 CCR 1.72) and streambed alterations associated with cannabis production (14 CCR 722(c)(21)), which indicate that a stream:
  - Flows at least periodically or intermittently
  - Flows through a bed or channel having banks
  - Supports fish or aquatic life
  - Can be dry for a period of time
  - Includes watercourses where surface or subsurface flow supports or has supported riparian vegetation
- **Guidance documents**, *including A Field Guide to Lake and Streambed Alteration Agreements* (CDFG 1994) and *Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-Scale Solar Power Plants* (Brady and Vyverberg 2013), which suggest the following:
  - A stream may flow perennially or episodically
  - A stream is defined by the course in which water currently flows, or has flowed during the historic hydrologic course regime (approximately the last 200 years)
  - Width of a stream course can reasonably be identified by physical or biological indicators
  - A stream may have one or more channels (single thread vs. compound form)
  - Features such as braided channels, low-flow channels, active channels, banks associated with secondary channels, floodplains, islands, and stream-associated vegetation, are interconnected parts of the watercourse
  - Canals, aqueducts, irrigation ditches, and other means of water conveyance can be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife
  - Biologic components of a stream may include aquatic and riparian vegetation, all aquatic animals including fish, amphibians, reptiles, invertebrates, and terrestrial species which derive benefits from the stream system
  - The lateral extent of a stream can be measured in different ways depending on the particular situation and the type of fish or wildlife resource at risk

The tenets listed above, among others, are applied to establish the boundaries of streambeds in various environments. Importance of each factor may be weighted based on site-specific considerations and the applicability of the indicators to the streambed at hand.

California Coastal Commission

The California Coastal Act (CCA) places a high priority on the protection of biological and natural resources. Strict limits are placed on development in ESHA areas. The CCA (§ 30107.5) defines Environmentally Sensitive Habitat Area as: "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." Very limited types of development are allowed in ESHA areas and then only where there is no feasible less environmentally damaging alternative. and feasible mitigation measures have been adopted. In general, only land uses that are dependent on the habitat resources are allowable within ESHA areas.

Section 30121 of the CCA identifies wetlands, which often qualify as Environmentally Sensitive Habitat Areas, as "lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens." Under the CCA's definition of wetlands (California Code of Regulations Section 13577(b)), a wetland need only display one of the parameters typically used to define wetland areas, in contrast to the U.S. Army Corps of Engineers, which uses a three-parameter definition under its federal authorities. The diking, filling or dredging of wetlands is generally permitted for specific purposes listed in CCA Section 30233, regardless of whether the wetland also meets the definition of Environmentally Sensitive Habitat Areas.

Local Jurisdiction

City of Goleta General Plan/Coastal Land Use Plan

This plan governs land use and physical development within the geographic area of the incorporated City of Goleta limits. As of January 1, 2006, this area included 5,075 acres, or approximately 7.9 square miles. The Goleta General Plan/Coastal Land Use Plan, which is required by California law, is the most important policy document that guides future physical changes and public decision making within a community. California law places the general plan atop the hierarchy of land use planning regulations; by analogy, it has been described as a "constitution" for decision making by a city for its future physical development and change. General plans are required to be comprehensive, long-range, and internally consistent. Every general plan must address seven specific topics, or elements: land use, housing, conservation, open space, transportation, safety, and noise. While state law establishes specific requirements for the contents of the plan, within that legal framework each community has latitude to design its own future. State law allows flexibility in how elements are organized and the additional topics that may be included. All elements have the same legal status, and no element, goal, or policy can supersede any other. The Goleta General Plan/Coastal Land Use Plan is the primary means for guiding future change in Goleta as it faces difficult choices on a daily basis about growth, housing, environmental protection, neighborhood compatibility and preservation, and transportation. The plan provides a guide for making these choices by relating day-to-day decisions to the goals, objectives, and policies of this document. The plan has four major purposes:

- To provide a unified and coherent framework and vision for the future of the community.
- To provide a basis for future decisions by the City on implementing ordinances such as zoning and subdivision codes, individual development project applications, and public investments in infrastructure and services, so as to achieve consistency with the framework.
- To inform the public of the City's policies and provide a means to invite public participation in the City's decision-making processes.
- To guide private landowners, developers, and other public agencies in formulating projects and designs that will be consistent with Goleta's policies.

Specifically, the General Plan Conservation Element Policy 1.1, which incorporates the same ESHA language as the CCA (§ 30107.5), defines ESHA as follows:

> *ESHAs shall include, but are not limited to, any areas that through professional biological evaluation are determined to meet the following criteria under*

d. 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 that could be easily disturbed or degraded by human activities and developments;

e. any area that includes habitat for species and plant communities recognized as threatened or endangered by the state or federal governments; plant communities recognized by the State of California (in the Terrestrial Natural Communities Inventory) as restricted in distribution and very threatened; and those habitat types of limited distribution recognized to be of particular habitat value, including wetlands, riparian vegetation, eucalyptus groves associated with monarch butterfly roosts, oak woodlands, and savannas; and

f. any area that has been previously designated as an ESHA by a by the California Coastal Commission, the California Department of Fish and Game, City of Goleta, or other agency with jurisdiction over the designated area.

Policy CE 1.6, 1.7, 1.9, and 1.10 defines ESHA uses, development standards, and mitigation as follows:

CE 1.6 Protection of ESHAs. [GP/CLUP] ESHAs shall be protected against significant disruption of habitat values, and only uses or development dependent on and compatible with maintaining such resources shall be allowed within ESHAs or their buffers. The following shall apply:

a. No development, except as otherwise allowed by this element, shall be allowed within ESHAs and/or ESHA buffers.
b. A setback or buffer separating all permitted development from an adjacent ESHA shall be required and shall have a minimum width as set forth in subsequent policies of this element. The purpose of such setbacks shall be to prevent any degradation of the ecological functions provided by the habitat area.
c. Public accessways and trails are considered resource-dependent uses and may be located within or adjacent to ESHAs. These uses shall be sited to avoid or minimize impacts on the resource to the maximum extent feasible. Measures— such as signage, placement of boardwalks, and limited fencing or other barriers—shall be implemented as necessary to protect ESHAs. […]

CE 1.7 Mitigation of Impacts to EHSAs. [GP/CLUP] New development shall be sited and designed to avoid impacts to ESHAs. If there is no feasible alternative that can eliminate all impacts, then the alternative that would result in the fewest or least significant impacts shall be selected. Any impacts that cannot be avoided shall be fully mitigated, with priority given to onsite mitigation. Offsite mitigation measures shall only be approved when it is not feasible to fully mitigate impacts on site. If impacts to onsite ESHAs occur in the Coastal Zone, any offsite mitigation area shall also be located within the Coastal Zone. All mitigation sites shall be monitored for a minimum period of 5 years […].

CE 1.9 Standards Applicable to Development Projects. [GP/CLUP] The following standards shall apply to consideration of developments within or adjacent to ESHAs:

a. Site designs shall preserve wildlife corridors or habitat networks. Corridors shall be of sufficient width to protect habitat and dispersal zones for small mammals, amphibians, reptiles, and birds.

b. [..]

c. Site plans and landscaping shall be designed to protect ESHAs. Landscaping, screening, or vegetated buffers shall retain, salvage, and/or reestablish vegetation that supports wildlife

habitat whenever feasible. Development within or adjacent to wildlife habitat networks shall incorporate design techniques that protect, support, and enhance wildlife habitat values. Planting of nonnative, invasive species shall not be allowed in ESHAs and buffer areas adjacent to ESHAs.

d. *All new development shall be sited and designed so as to minimize grading, alteration of natural landforms and physical features, and vegetation clearance in order to reduce or avoid soil erosion, creek siltation, increased runoff, and reduced infiltration of stormwater and to prevent net increases in baseline flows for any receiving water body*.

e. Light and glare from new development shall be controlled and directed away from wildlife habitats. Exterior night lighting shall be minimized, restricted to low intensity fixtures, shielded, and directed away from ESHAs.

f. All new development should minimize potentially significant noise impacts on special-status species in adjacent ESHAs.

g. All new development shall be sited and designed to minimize the need for fuel modification, or weed abatement, for fire safety in order to preserve native and/or nonnative supporting habitats. Development shall use fire resistant materials and incorporate alternative measures, such as firewalls and landscaping techniques, that will reduce or avoid fuel modification activities.

h. The timing of grading and construction activities shall be controlled to minimize potential disruption of wildlife during critical time periods such as nesting or breeding seasons.

i. Grading, earthmoving, and vegetation clearance adjacent to an ESHA shall be prohibited during the rainy season, generally from November 1 to March 31, except as follows: 1) where erosion control measures such as sediment basins, silt fencing, sandbagging, or installation of geofabrics have been incorporated into the project and approved in advance by the City; […]

CE 1.10 Management of ESHAs. [GP/CLUP] The following standards shall apply to the ongoing management of ESHAs:

a. The use of insecticides, herbicides, artificial fertilizers, or other toxic chemical substances that have the potential to degrade ESHAs shall be prohibited within and adjacent to such areas, except where necessary to protect or enhance the ESHA itself.
b. The use of insecticides, herbicides, or other toxic substances by City employees and contractors in construction and maintenance of City facilities and open space lands shall be minimized.
c. […]
d. Weed abatement and brush-clearing activities for fire safety purposes shall be the minimum that is necessary to accomplish the intended purpose. Techniques shall be limited to mowing and other low-impact methods such as hand crews for brushing, tarping, and hot water/foam for weed control. Disking shall be prohibited.
e. […]
f. Removal of nonnative invasive plant species within ESHAs may be allowed and encouraged, unless the nonnatives contribute to habitat values

[…]

Policy CE 3 protects wetlands/vernal pools in the coastal zone as follows:

CE 3.4: Protection of Wetlands in the Coastal Zone. [CP] The biological productivity and the quality of wetlands shall be protected and, where feasible, restored in accordance with the federal and state regulations and policies that apply to wetlands within the Coastal Zone. Only uses permitted by the regulating agencies shall be allowed within wetlands. The filling, diking, or dredging of open coastal waters, wetlands, estuaries, and lakes is prohibited unless it can be demonstrated that: a. There is no feasible, environmentally less damaging alternative to wetland fill. b. The extent of the fill is the least amount necessary to allow development of the permitted use. c. Mitigation measures have been provided to minimize adverse environmental effects. d. The purposes of the fill are limited to: incidental public services, such as burying cables or pipes; restoration of wetlands; and nature study, education, or similar resource-dependent activities. A wetland buffer of a sufficient size to ensure the biological integrity and preservation of the wetland shall be required. Generally the required buffer shall be 100 feet, but in no case shall wetland buffers be less than 50 feet. The buffer size should take into consideration the type and size of the development, the sensitivity of the wetland resources to detrimental edge effects of the development to the resources, natural features such as topography, the functions and values of the wetland, and the need for upland transitional habitat. A 100-foot minimum buffer area shall not be reduced when it serves the functions and values of slowing and absorbing flood waters for flood and erosion control, sediment filtration, water purification, and ground water recharge. The buffer area shall serve as transitional habitat with native vegetation and shall provide physical barriers to human intrusion

CE.3.8 Vernal Pool Protection. [GP/CLUP] Vernal pools, an especially rare wetland habitat on the south coast of Santa Barbara County, shall be preserved and protected. Vernal pools in Goleta, which are generally small in area and only a few inches deep, are found at scattered locations on the City owned Ellwood Mesa and Santa Barbara Shores Park. These appear to be naturally formed and exhibit little or no evidence of altered hydrology. Trails on these two properties shall be sited and constructed in a manner that avoids impacts to vernal pool hydrology and that will allow restoration by removing several informal trail segments that bisect vernal pool habitats. […]

Policy CE 5 protects native grasslands, coastal bluff scrub, coastal sage-scrub, and chaparral as follows:

CE 5.2: Protection of Native Grasslands. In addition to the provisions of Policy CE 1, the following standards shall apply:

a. For purposes of this policy, existing native grasslands are defined as an area where native grassland species comprise 10 percent or more of the total relative plant cover. Native grasslands that are dominated by perennial bunch grasses tend to be patchy. Where a high density of separate small patches occurs in an area, the whole area shall be delineated as native grasslands.

b. To the maximum extent feasible, development shall avoid impacts to native grasslands that would destroy, isolate, interrupt, or cause a break in continuous habitat that would (1) disrupt associated animal movement patterns and seed dispersal, or (2) increase vulnerability to weed invasions.

c. Removal or disturbance to a patch of native grasses less than 0.25 acre that is clearly isolated and is not part of a significant native grassland or an integral component of a larger ecosystem may be allowed. Removal or disturbance to restoration areas shall not be allowed.

d. Impacts to protected native grasslands shall be minimized by providing at least a 10-foot buffer that is restored with native species around the perimeter of the delineated native grassland area.

e. Removal of nonnative and invasive exotic species shall be allowed; revegetation shall be with plants or seeds collected within the same watershed whenever feasible.

CE 5.3: Protection of Costal Bluff Scrub, Coastal Sage Scrub, and Chaparral ESHA. [GP/CLUP] In addition to the provisions of Policy CE 1, the following standards shall apply:

a. For purposes of this policy, coastal bluff scrub is defined as scrub habitat occurring on exposed coastal bluffs. Example species in bluff scrub habitat include Brewer's saltbush (Atriplex lentiformis), lemonade berry (Rhus integrifolia), seashore blight (Suaeda californica), seacliff buckwheat (Eriogonum parvifolium), California sagebrush (Artemisia californica), and coyote bush [brush] (Baccharis pilularis).

Coastal sage scrub is defined as a drought-tolerant, Mediterranean habitat characterized by soft-leaved, shallow-rooted subshrubs such as California sagebrush (Artemisia californica), coyote bush [brush] (Baccharis pilularis), and California encelia (Encelia californica). It is found at lower elevations in both coastal and interior areas where moist maritime air penetrates inland. […]The area must have both the compositional and structural characteristics of coastal bluff scrub, coastal sage scrub, or chaparral habitat as described in Preliminary Descriptions of Terrestrial Natural Communities of California (Holland 1986) or other classification system recognized by the [CDFW].

b. To the maximum extent feasible, development shall avoid impacts to coastal bluff scrub, coastal sage scrub, or chaparral habitat that is part of a wildlife movement corridor and the impact would preclude animal movement or isolate ESHAs previously connected by the corridor such as (1) disrupting associated bird and animal movement patterns and seed dispersal, and/or (2) increasing erosion and sedimentation impacts to nearby creeks or drainages.

c. Impacts to coastal bluff scrub, coastal sage scrub, and chaparral ESHAs shall be minimized by providing at least a 25-foot buffer restored with native species around the perimeter of the ESHA, unless the activity is allowed under other CE subpolicies and mitigation is applied per CE 1.7. d. Removal of nonnative and invasive exotic species shall be allowed; revegetation shall be with plants or seeds collected within the same watershed whenever feasible.

Policy CE 8 protects special-status species, including their habitats, as follows:

CE 8.1 ESHA Designation. [GP/CLUP] Requisite habitats for individual occurrences of special-status plants and animals, including candidate species for listing under the state and federal endangered species acts, California [SSC], [CNPS] *List 1B plants, and other species protected under provisions of the [CFGC] shall be preserved and protected, and their occurrences, including habitat requirements, shall be designated as ESHAs.* […]

CE 8.2 Protection of Habitat Areas. [GP/CLUP] All development shall be located, designed, constructed, and managed to avoid disturbance of adverse impacts to special-status species and their habitats, including spawning, nesting, rearing, roosting, foraging, and other elements of the required habitats.

CE 8.4 Buffer Areas for Raptor Species. [GP/CLUP] Development shall be designed to provide a 100-foot buffer around active and historical nest sites for protected species of raptors

> *when feasible. In existing developed areas, the width of the buffer may be reduced to correspond to the actual width of the buffer for adjacent development. If* […] *an active raptor nest site exists on the subject property, whenever feasible no vegetation clearing, grading, construction, or other development activity shall be allowed within a 300-foot radius of the nest site during the nesting and fledging season.*

Coastal Wetlands

The CCC coastal wetlands are determined in accordance with the CCA, which defines coastal wetlands as generally extending seaward to the state's outer limit of jurisdiction (i.e., three nautical miles from the MHTL) and inland generally 1,000 yards from the MHTL (CCC 2011). The CCA contains specific policies aimed at preserving biological resources, such as wetlands, riparian habitat, and marine habitat.

Potential coastal wetland features are evaluated for the presence of one of the three USACE wetland indicators (California Code of Regulations [CCR] Title 14). The one-parameter definition as follows:

> Wetland shall be defined as land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deep-water habitats. (14 CCR Section 13577).

City Wetlands

Pursuant to General Plan Conservation Element sub policy CE 3.1, Definition of Wetlands, the City defines wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology) and directly cites the CCC definitions contained in 14 CCR 13577(b). Boundaries of City wetlands were delineated as coterminous with CCC coastal wetlands.

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Appendix B

Site Photographs



Photograph 1. View of the eucalyptus grove at the central portion of the Study Area (aspect: south, February 9, 2022).



Photograph 2. View of dead and down trees in the eucalyptus grove at the central portion of the Study Area (aspect: west, February 9, 2022).



Photograph 3. View of bareground outside of the eucalyptus grove at the northwestern portion of the Study Area (aspect: northwest, February 9, 2022).



Photograph 4. View of existing trails outside of the eucalyptus grove at the eastern portion of the Study Area (aspect: northwest, February 9, 2022).



Photograph 5. View of coyote brush scrub (seen on the right side of the photograph) and wild oats and annual brome grasslands (seen on the left side of the photograph) at the eastern portion of the Study Area (aspect: northwest, February 9, 2022).



Photograph 6. View of wild oats and annual brome grasslands at the northwestern portion of the Study Area (aspect: east, February 9, 2022).



Photograph 7. View of creeping wildrye turfs at the central portion of the Study Area (aspect: east, February 9, 2022).



Photograph 8. View of purple needle grass grassland at the southern portion of the Study Area (aspect: southwest, February 9, 2022).



Photograph 9. View of dead and down trees in the intermittent drainage (Devereux Creek) within the eucalyptus grove at the central portion of the Study Area (aspect: west, February 4, 2022).



Photograph 10. View of vegetated bottom of Unnamed Drainage 1c with patches of coyote brush scrub

and arroyo willow thickets at the southwestern portion of the Study Area (aspect: north, February 4, 2022).



Photograph 11. View of a Coastal Wetland 1 (aspect: north, February 7, 2022).



Photograph 12. View of arroyo willow thickets (left side of the photopgraph) adjacent to an existing trail

at the eastern portion of the Study Area. Note wild oats and annual brome grasslands at the right side of the photograph (aspect: northwest, February 9, 2022).



Photograph 13. View of an existing trail at the northeastern edge of the Study Area. Note the eucalyptus grove to the left of the photograph and the ornamental vegetation, adjcaent to residential developments, to the right of the photograph (aspect: west, February 9, 2022).



Photograph 14. View of the parking lot at the northern portion of the Study Area. Note the eucalyptus grove in the background (aspect: west, February 9, 2022).

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Appendix C

Floral and Faunal Compendium

Plant Species Observed in Study Area (March 2020, September 2021, and February 2022)

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced Status	Wetland Indicator Status	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping / Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferenti ated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Trees																			
Acacia spp.	acacia	Invasive Introduced	UPL						X								X		
Acer negundo	box elder	Native	FACW						X										
Ailanthus altissima	tree of heaven	Invasive Introduced	FACU				X												
Corymbia sp.	flowering gum	Introduced	-														X		
Cupressus sp.	cypress tree	-	UPL			X			X										
Eucalyptus camaldulensis	red gum	Introduced	FAC						X								X		
Eucalyptus cladocalyx	sugar gum	Introduced	UPL						X										
Eucalyptus globulus	blue gum	Introduced	UPL			X	X		X										X
Eucalyptus sideroxylon	red ironbark	Introduced	UPL						X										
Fraxinus sp.	ash	Introduced	-						X										
Fraxinus uhdei	shamel ash	Introduced	UPL			X			X										
Juniperus communis	common juniper	Native	FACU						X										
Olea europaea	olive tree	Invasive Introduced	UPL						X							X			X
Pinus sp.	pine tree	-	-			X			X										
Prunus ilicifolia ssp. *lyonii*	Catalina cherry	Native	UPL						X										
Platanus racemosa	western sycamore	Native	FAC		X		X										X		
Phoenix canariensis	canary palm	Invasive Introduced	UPL						X										
Populus balsamifera ssp. *trichocarpa*	Black cottonwood	Native	FAC		X														
Populus fremontii	Fremont cottonwood	Native	FAC		X		X												
Quercus agrifolia	coast live oak	Native	UPL		X	X	X		X					X					X
Quercus lobata	valley oak	Native	FACU											X					
Salix lasiolepis	arroyo willow	Native	FACW		X	X			X										
Schinus terebinthifolius	Brazilian pepper	Introduced	FAC						X										
Washingtonia robusta	Mexican fan palm	Invasive Introduced	FACW						X								X		
Shrubs																			

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced Status	Wetland Indicator Status	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping / Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Acacia longifolia	golden wattle	Introduced	UPL						X										
Acmispon glaber	deerweed	Native	UPL								X								
Artemisia californica	California sagebrush	Native	UPL		X		X		X		X								X
Atriplex lentiformis	quailbush	Native	FACU											X*					
Agave sp.	Ornamental agave	Introduced	UPL														X		
Baccharis pilularis	coyote brush	Native	UPL		X	X	X*		X							X	X	X	X
Baccharis plummerae ssp. *plummerae*	Plummer's baccharis	Native (CRPR 4.3)	UPL						X										
Baccharis salicifolia	mulefat	Native	FAC		X														
Bougainvillea spectabilis	bougainvillea	Introduced	UPL														X		
Caesalpinia gilliesii	bird of paradise	Introduced	UPL														X		
Ceanothus sp.	ornamental ceanothus	-	UPL											-					
Cortaderia selloana	pampas grass	Invasive Introduced	FACU								X								
Crassula ovata	jade plant	Introduced	UPL						X										
Diplacus aurantiacus	sticky monkeyflower	Native	FACU						X										
Elymus condensatus	giant wild rye	Native	UPL		X	X	X		X					X	X				
Encelia californica	California sunflower	Native	UPL		X									X					
Eriogonum grande	island buckwheat	Native	UPL											X					
Eriogonum parvifolium	seacliff buckwheat	Native	UPL								X			X					
Hazardia squarrosa	sawtooth goldenbush	Native	UPL						X										
Hedera helix	English ivy	Invasive Introduced	FACU						X								X		
Heteromeles arbutifolia	toyon	Native	UPL		X		X		X								X		X
Lonicera subspicata var. *subspicata*	Santa Barbara honeysuckle	Native (CRPR 1B.2)	UPL						X					X					
Opuntia ficus-indica	mission cactus	Introduced	UPL														X		

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced Status	Wetland Indicator Status	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping / Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Myoporum laetum	myoporum	Invasive Introduced	FACU						X										
Nerium oleander	oleander	Introduced	UPL														X		
Phyllostachys bambusoides	Japanese timber bamboo	Introduced	UPL														X		
Pittosporum sp.	pittosporum	Introduced	-						X										
Polygala myrtifolia	myrtle leaf milkwort	Introduced	UPL																X
Pyracantha coccinea	scarlet firethorn	Introduced	UPL														X		
Pyracantha sp.	Pyracantha	Introduced	-						X										
Ribes speciosum	fuchsia flowered gooseberry	Native	UPL						X										
Rosa californica	California rose	Native	FAC											X					
Rhus integrifolia	lemonade berry	Native	UPL				X		X				X	X					X
Rubus armeniacus	Himalayan blackberry	Introduced	FAC						X										
Rubus ursinus	California blackberry	Native	FAC		X		X		X										
Ruscus aculeatus	Butcher's broom	Introduced	UPL																X
Salvia mellifera	black sage	Native	UPL											X					
Sambucus nigra ssp. *caerulea*	blue elderberry	Native	FACU						X										
Tecoma capensis	cape honeysuckle	Introduced	UPL														X		
Yucca sp.	ornamental yucca	Introduced	UPL						X								X		
Herbs																			
Agapanthus sp.	lily of the Nile	Introduced	-						X										X
Ambrosia psilostachya	western ragweed	Native	FACU		X				X		X								X
Araujia sericifera	bladder vine	Introduced	UPL																X
Artemisia douglasiana	mugwort	Native	FAC		X		X												
Asparagus asparagoides	African asparagus fern	Invasive Introduced	UPL				X		X										
Atriplex prostrata	basin saltbush	Introduced	FACW						X										

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced Status	Wetland Indicator Status	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping / Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Atriplex semibaccata	Australian saltbush	Invasive Introduced	FAC		X														X
Avena barbata	slender oat	Invasive Introduced	UPL				X		X		X					X		X	X
Avena fatua	common wild oats	Invasive Introduced	UPL				X				X					X		X	X
Brassica nigra	black mustard	Invasive Introduced	UPL	X	X	X	X		X	X						X		X*	X
Brassica rapa	field mustard	Invasive Introduced	FACU								X								
Bromus sitchensis var. *carinatus*	California brome	Native	UPL						X										X
Bromus diandrus	ripgut brome	Invasive Introduced	UPL	X	X		X		X		X				X	X		X	X
Bromus hordeaceus	soft chess	Invasive Introduced	FACU		X		X								X			X	X
Bolboschoenus maritimus	alkali bulrush	Native	UPL						X										
Campsis radicans	trumpet creeper	Introduced	FACU														X		
Calystegia macrostegia	coast morning glory	Native	UPL				X		X					X					X
Carduus pycnocephalus	Italian thistle	Invasive Introduced	UPL				X												X
Carex sp.	sedge	-	-																X
Carex subfusca	brown sedge	Native	FAC	X	X														X
Carpobrotus edulis	ice plant	Invasive Introduced	UPL						X		X						X		X
Claytonia parviflora	miner's lettuce	Native	FACU						X										
Clematis pauciflora	hill clematis	Native	UPL						X										
Cressa truxillensis	alkali weed	Native	FACW														X		
Cynodon dactylon	Bermuda grass	Invasive Introduced	FACU						X										
Cyperus eragrostis	umbrella sedge	Native	FACW	X					X										
Datura wrightii	jimsonweed	Native	UPL						X										
Delairea odorata	cape ivy	Invasive Introduced	FAC						X										
Dipterostemon capitatum	blue dicks	Native	FACU						X										
Distichlis spicata	salt grass	Native	FAC	X	X														

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced Status	Wetland Indicator Status	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping / Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferenti ated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Echinochloa crus-galli	barnyard grass	Introduced	UPL						X										
Ehrharta erecta	upright veldt grass	Invasive Introduced	UPL						X										
Eleocharis macrostachya	common spikerush	Native	UPL	X	X				X			X							
Eleocharis parishii	Parish's spike rush	Native	FACW		X														
Elymus triticoides	creeping wildrye	Native	UPL	X			X	X	X										X
Erodium botrys	big heron bill	Introduced	FACU				X		X										X
Erodium cicutarium	red stemmed filaree	Invasive Introduced	UPL				X									X			X
Festuca perennis	Italian rye grass	Invasive Introduced	FAC	X			X									X			X
Foeniculum vulgare	sweet fennel	Invasive Introduced	UPL		X		X				X							X	X
Frankenia salina	alkali heath	Native	FACW	X	X				X	X									
Galium sp.	bedstraw	-	-						X										
Geranium dissectum	cutleaf geranium	Invasive Introduced	UPL		X				X										
Geranium mole	crane's bill geranium	Introduced	UPL				X									X			X
Hedera canariensis	Algerian ivy	Invasive Introduced	UPL						X								X		
Helminthotheca echioides	bristly ox-tongue	Invasive Introduced	FAC	X	X		X								X				X
Hirschfeldia incana	summer mustard	Invasive Introduced	UPL								X								X
Hordeum murinum	foxtail barley	Invasive Introduced	FACU				X												X
Ipomoea indica	ornamental morning glory	Introduced	OBL														X		
Isocoma menziesii	Menzies' goldenbush	Native	FAC				X						X						X
Juncus bufonius	common toad rush	Native	FACW						X										
Juncus patens	common rush	Native	FACW	X	X				X			X							X
Juncus phaeocephalus	brown headed rush	Native	FACW		X							X							
Juncus sp.	rush	Native	-						X										
Malephora crocea	Coppery mesembryanthemum	Invasive Introduced	FACU						X										

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced Status	Wetland Indicator Status	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping / Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Malvella leprosa	alkali mallow	Native	FACU						X										
Medicago polymorpha	California burclover	Invasive Introduced	FACU		X										X				X
Muhlenbergia rigens	deergrass	Native	FAC											X					
Narcissus papyraceus	paperwhite	Introduced	FACU																X
Narcissus sp.	daffodil	Introduced	-																X
Nasturtium officinale	watercress	Native	OBL																
Oxalis pes-caprae	sourgrass	Invasive Introduced	UPL		X		X		X	X					X				X
Pennisetum clandestinum	kikuyu grass	Invasive Introduced	UPL						X										
Pentagramma triangularis ssp. *triangularis*	gold back fern	Native	UPL						X										
Phalaris aquatica	harding grass	Invasive Introduced	FACU						X										X
Plantago lanceolata	English plantain	Invasive Introduced	FAC		X		X		X						X			X	X
Pseudognaphalium bioletti	two-color rabbit-tobacco	Native	UPL								X								
Pseudognaphalium californicum	ladies' tobacco	Native	UPL						X										
Pteridium aquilinum var. *pubescens*	western bracken fern	Native	FACU						X										
Raphanus sativus	wild radish	Invasive Introduced	UPL	X	X				X	X									X
Rudbeckia hirta var. *pulcherrima*	black eyed susan	Introduced	FACU														X		
Rumex crispus	curly dock	Invasive Introduced	FAC	X	X		X			X					X			X	X
Salicornia pacifica	pickleweed	Native	OBL	X															
Salsola tragus	Russian thistle	Invasive Introduced	FACU				X												
Salvia leucophylla	purple sage	Native	UPL						X										
Sanicula sp.	sanicle	-	-						X										X
Schoenoplectus acutus var. *occidentalis*	tule	Native	OBL	X						X									
Scrophularia californica	California bee plant	Native	FAC											X					

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced Status	Wetland Indicator Status	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping / Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Silybum marianum	milk thistle	Invasive Introduced	UPL																X
Sisyrinchium bellum	blue-eyed grass	Native	FACW						X							X			X
Solanum xanti	purple nightshade	Native	UPL														X		X
Solidago californica	California goldenrod	Native	UPL						X										
Sonchus asper	spiny sowthistle	Introduced	FAC						X										X
Sonchus asper ssp. *asper*	sowthistle	Introduced	FAC		X				X										X
Sonchus oleaceus	common sow thistle	Introduced	UPL		X				X										X
Stellaria media	chickweed	Introduced	FACU												X				
Stipa miliacea var. *miliacea*	smilo grass	Invasive Introduced	UPL			X			X										X
Stipa pulchra	purple needle grass	Native	UPL													X			X
Tetragonia tegragoniodes	New Zealand spinach	Introduced	UPL						X										
Toxicodendron diversilobum	poison oak	Native	FACU			X			X										
Tragopogon porrifolius	purple salsify	Introduced	UPL																X
Triteleia crocea	goldenstar	Native	UPL						X										
Tropaeolum majus	garden nasturtium	Introduced	UPL				X		X										X
Typha sp.	cattails	-	-		X														
Verbena lasiostachys	verbena	Native	FAC				X									X			X
Vicia sp.	common vetch	-	-																X
Vicia sativa ssp. *sativa*	spring vetch	Introduced	FACU	X	X		X		X	X						X			X
Vinca major	periwinkle	Invasive Introduced	UPL						X										
Xanthium strumarium	cocklebur	Native	FAC						X										
Poaceae	Unidentifiable annual non-native grasses	Introduced	UPL		X	X	X		X	X	X	X	X	X		X	X	X	X

Sources:

[1] CDFW 2023d, Jepson Flora Project 2022, and Cal-IPC 2022

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Wildlife Species Observed Within the Study Area on February 9, 2022

Scientific Name	Common Name	Status	Native or introduced
Invertebrates			
Danaus plexippus pop. 1	monarch – California overwintering population	ESA Candidate	Native
Bombus vosnesenskii	yellow faced bumblebee	-	Native
Amphibians			
Pseudacris cadaverina	California tree frog	-	Native
Reptiles			
Sceloporus occidentalis	western fence lizard	-	Native
Birds			
Aphelocoma californica	California scrub jay	-	Native
Baeolophus inornatus	oak titmouse	-	Native
Branta canadensis	Canada goose	-	Native
Buteo jamaicensis	red-tailed hawk	-	Native
Buteo lineatus	red-shouldered hawk	-	Native
Calypte anna	Anna's hummingbird	-	Native
Chamaea fasciata	wrentit	-	Native
Corvus brachyrhynchos	American crow	-	Native
Dryobates pubescens	downy woodpecker	-	Native
Elanus leucurus	white-tailed kite	FP	Native
Falco sparverius	American kestrel	-	Native
Haemorhous mexicanus	house finch	-	Native
Junco hyemalis	dark-eyed junco	-	Native
Larus occidentalis	western gull	-	Native
Melanerpes formicivorus	acorn woodpecker	-	Native
Melozone crissalis	California towhee	-	Native
Melospiza melodia	song sparrow	-	Native
Mimus polyglottos	northern mockingbird	-	Native
Pipilo maculatus	spotted towhee	-	Native
Psaltriparus minimus	bushtit	-	Native
Sayornis nigricans	black phoebe	-	Native
Sayornis saya	Say's phoebe	-	Native
Setophaga townsendi	Townsend's warbler	-	Native
Sialia mexicana	western bluebird	-	Native
Streptopelia decaocto	Eurasian-collared dove	-	Native
Sturnus vulgaris	European starling	-	Introduced
Thryomanes bewickii	Bewick's wren	-	Native
Toxostoma redivivum	California thrasher	-	Native
Tyrannus vociferans	Cassin's kingbird	-	Native
Zonotrichia atricapilla	golden-crowned sparrow	-	Native

Scientific Name	Common Name	Status	Native or introduced
Mammals			
Otospermophilus beecheyi	California ground squirrel	-	Native
Sciurus niger	Fox squirrel	-	Introduced
Sylvilagus audubonii	desert cottontail rabbit	-	Native

FP= State Fully Protected ESA = Endangered Species Act

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Appendix D

Special Status Species Evaluation Tables

Special Status Plant Species in the Regional Vicinity of the Project Site

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CRPR Other	Habitat Requirements	Potential to Occur	Rationale
Plants				
Abronia maritima red sand-verbena	None/None G4/S3? 4.2 SBBG Rare Plant	Perennial herb. Coastal dunes. Dune plant. Elevations: 0-330ft. (0-100m.) Blooms Feb-Nov.	Low	Suitable coastal dune habitat not present in Study Area.
Amsinckia douglasiana Douglas' fiddleneck	None/None G4/S4 4.2	Annual herb. Cismontane woodland, valley and foothill grassland. Dry. Elevations: 0-6400ft. (0-1950m.) Blooms Mar-May.	Low	Suitable valley and foothill grassland present in Study Area. No CNDDB occurrences within 10 mile radius of the Study Area.
Anomobryum julaceum slender silver moss	None/None G5?/S2 4.2	Moss. Broadleafed upland forest, lower montane coniferous forest, north coast coniferous forest. Moss which grows on damp rocks and soil; acidic substrates. Usually seen on roadcuts. Elevations: 330-3280ft. (100-1000m.)	Not Expected	Suitable broadleafed upland forests present, however suitable elevations not present in Study Area.
Arctostaphylos refugioensis Refugio manzanita	None/None G3/S3 1B.2 SBBG Rare Plant	Perennial evergreen shrub. Chaparral. On sandstone. Elevations: 900-2690ft. (274-820m.) Blooms (May)Dec-Mar.	Not Expected	Suitable elevations not present in Study Area.
Arenaria paludicola marsh Sandwort	FE/SCE G1/S1 1B.1	Marshes and swamps. Openings, Sandy. Elevations: 10-560ft. (3-170m). Blooms May-Aug.	Not Expected	Potentially suitable marsh and swamp habitat is present in Study Area; however, this species has a highly limited distribution in California and is not currently known to occur in Santa Barbara County. No CNDDB occurrences have been recorded within 10 mile radius of the Study Area .
Atriplex coulteri Coulter's saltbush	None/None G3/S1S2 1B.2	Perennial herb. Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland. Alkaline (sometimes), clay (sometimes). Elevations: 10-1510ft. (3-460m.) Blooms Mar-Oct.	Moderate	Three CNDDB occurrences recorded within 10 miles of Study Area, the most recent recorded in 2003, approximately 1.8 miles east of the Study Area at UCSB. Suitable grassland habitat is present in Study Area, however the perennial species was not observed during survey.

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CRPR Other	Habitat Requirements	Potential to Occur	Rationale
Atriplex serenana var. *davidsonii* Davidson's saltscale	None/None G5T1/S1 1B.2 SBBG Rare Plant	Annual herb. Coastal bluff scrub, coastal scrub. Alkaline. Elevations: 35-655ft. (10-200m.) Blooms Apr-Oct.	Low	Suitable coastal scrub and bluff scrub is located in Study Area and two CNDDB occurrences within 10 miles of the Study Area. However, the occurrences are historical (1947, 1948).
Baccharis plummerae ssp. *plummerae* Plummer's baccharis	None/None G3T3/S3 4.3	Perennial deciduous shrub. Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub. Rocky. Elevations: 15-1395ft. (5-425m.) Blooms May-Oct.	Present	Suitable coastal scrub habitat present in Study Area; and the species was observed onsite during survey.
Calandrinia breweri Brewer's calandrinia	None/None G4/S4 4.2 SBBG Rare Plant	Annual herb. Chaparral, coastal scrub. Burned areas, disturbed areas, loam (sometimes), sandy (sometimes). Elevations: 35-4005ft. (10-1220m.) Blooms (Jan)Mar-Jun.	Moderate	Suitable coastal scrub habitat is present in Study Area. However, no CNDDB occurrences are recorded within 10 miles of the Study Area .
Calochortus catalinae Catalina mariposa lily	None/None G3G4/S3S4 4.2	Perennial bulbiferous herb. Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. In heavy soils, open slopes, openings in brush. Elevations: 50-2295ft. (15-700m.) Blooms (Feb)Mar-Jun.	Moderate	Suitable coastal scrub and grassland present in Study Area. However, no CNDDB occurrences are recorded within a 10-mile radius of the Study Area.
Calochortus fimbriatus late-flowered mariposa-lily	None/None G3/S3 1B.3 SBBG Rare Plant	Perennial bulbiferous herb. Chaparral, cismontane woodland, riparian woodland. Serpentinite (sometimes). Elevations: 900-6250ft. (275-1905m.) Blooms Jun-Aug.	Not Expected	Suitable coast live oak woodland present, however suitable elevations not present in Study Area.
Centromadia parryi ssp. *australis* southern tarplant	None/None G3T2/S2 1B.1 SBBG Rare Plant	Annual herb. Marshes and swamps, valley and foothill grassland, vernal pools. Often in disturbed sites near the coast at marsh edges; also in alkaline soils sometimes with saltgrass. Sometimes on vernal pool margins. Elevations: 0-1575ft. (0-480m.) Blooms May-Nov.	High	14 CNDDB occurrences recorded within 10 miles of Study Area, the most recent record from 2003, approximately 0.2 miles east of the Study Area. Suitable grassland and coastal wetland habitat present in Study Area.
Chorizanthe palmeri Palmer's spineflower	None/None G4/S4 4.2	Annual herb. Chaparral, cismontane woodland, valley and foothill grassland. Rocky, serpentinite. Elevations: 180-3100ft. (55-945m.) Blooms Apr-Aug.	Not Expected	Suitable serpentinite sites and rocky areas and suitable elevations not present in Study Area.

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CRPR Other	Habitat Requirements	Potential to Occur	Rationale
Cordylanthus maritimus ssp. *maritimus* salt marsh bird's-beak	FE/SCE G4?T1?S1 1B.2	Coastal dunes, Marshes and swamps. Limited to the higher zones of salt marsh habitat. 0-10 m. Blooms May-Oct(Nov).	Not Expected	No suitable coastal dune and salt marsh habitat present in Study Area. No CNDDB occurrences are recorded within a 10-mile radius of the Study Area.
Cordylanthus rigidus ssp. *littoralis* seaside bird's-beak	None/SCE G5T2/S2 1B.1 SBBG Rare Plant	Annual herb (hemiparasitic). Chaparral, cismontane woodland, closed-cone coniferous forest, coastal dunes, coastal scrub. Disturbed areas (often), sandy. Elevations: 0-1690ft. (0-515m.) Blooms Apr-Oct.	Low	Suitable coastal scrub, coast live oak woodland, and disturbed habitats are present in Study Area, however no CNDDB occurrences are recorded within a 10-mile radius of the Study Area.
Deinandra paniculata paniculate tarplant	None/None G4/S4 4.2	Annual herb. Coastal scrub, valley and foothill grassland, vernal pools. Usually in vernally mesic sites. Sometimes in vernal pools or on mima mounds near them. Elevations: 80-3085ft. (25-940m.) Blooms (Mar)Apr-Nov.	Low	Suitable grassland, coastal scrub, and coastal wetland habitat are present in Study Area. However, no CNDDB occurrences are recorded within 10 miles of the Study Area.
Delphinium umbraculorum umbrella larkspur	None/None G3/S3 1B.3 SBBG Rare Plant	Perennial herb. Chaparral, cismontane woodland. Mesic sites. Elevations: 1310-5250ft. (400-1600m.) Blooms Apr-Jun.	Not Expected	Suitable coast live oak woodland and mesic habitats are present, however suitable elevations are not present in Study Area.
Erigeron sanctarum saints' daisy	None/None G3/S3 4.2 SBBG Rare Plant	Perennial rhizomatous herb. Chaparral, cismontane woodland, coastal scrub. Elevations: 245-1150ft. (75-350m.) Blooms Mar-Jul.	Not Expected	Suitable coastal scrub and coast live oak woodland habitats present, however suitable elevations are not present in Study Area and the perennial species was not observed during survey.
Eriogonum elegans elegant wild buckwheat	None/None G4G5/S4S5 4.3	Annual herb. Cismontane woodland, valley and foothill grassland. Usually in sandy or gravelly substrates; often in washes, sometimes roadsides. Elevations: 655-5005ft. (200-1525m.) Blooms May-Nov.	Not Expected	Suitable coast live oak woodland and grassland habitats are present in the Study Area, however suitable elevations are not present in Study Area.
Fritillaria ojaiensis Ojai fritillary	None/None G3/S3 1B.2 SBBG Rare Plant	Perennial bulbiferous herb. Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest. Rocky sites. Sometimes on serpentine; sometimes along roadsides. Elevations: 740-3275ft. (225-998m.) Blooms Feb-May.	Not Expected	Suitable coast live oak woodland is present in the Study Area, however suitable elevations not present in Study Area.

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CRPR Other	Habitat Requirements	Potential to Occur	Rationale
Galium cliftonsmithii Santa Barbara bedstraw	None/None G4/S4 4.3	Perennial herb. Cismontane woodland. Light shade, coastal canyons, dry banks. Elevations: 655-4005ft. (200-1220m.) Blooms May-Jul.	Not Expected	Suitable coast live oak woodland is present in the Study Area, however suitable elevations not present in Study Area.
Horkelia cuneata var. *puberula* mesa horkelia	None/None G4T1/S1 1B.1 SBBG Rare Plant	Perennial herb. Chaparral, cismontane woodland, coastal scrub. Sandy or gravelly sites. Elevations: 230-2660ft. (70-810m.) Blooms Feb-Jul(Sep).	Not Expected	Suitable coast live oak woodland and coastal scrub habitats are present, however suitable elevations are not present in Study Area. This perennial species was not observed during survey.
Juglans californica Southern California black walnut	None/None G4/S4 4.2 SBBG Rare Plant	Perennial deciduous tree. Chaparral, cismontane woodland, coastal scrub, riparian woodland. Slopes, canyons, alluvial habitats. Elevations: 165-2955ft. (50-900m.) Blooms Mar-Aug.	Not Expected	Suitable coast live oak woodland, coastal scrub, and riparian woodland habitats are present in the Study Area. Suitable slopes, canyon, or alluvial habitat not present and suitable elevations not present in Study Area. Perennial tree not observed during survey.
Juncus acutus ssp. *leopoldii* southwestern spiny rush	None/None G5T5/S4 4.2 SBBG Rare Plant	Perennial rhizomatous herb. Coastal dunes, marshes and swamps, meadows and seeps. Moist saline places. Elevations: 10-2955ft. (3-900m.) Blooms (Mar)May-Jun.	Low	Suitable mesic habitats are present in Study Area, but this perennial herb was not observed during the survey.
Juncus luciensis Santa Lucia dwarf rush	None/None G3/S3 1B.2 SBBG Rare Plant	Annual herb. Chaparral, great basin scrub, lower montane coniferous forest, meadows and seeps, vernal pools. Vernal pools, ephemeral drainages, wet meadow habitats and streamsides. Elevations: 985-6695ft. (300-2040m.) Blooms Apr-Jul.	Not Expected	Suitable coastal wetland and mesic habitats present in the Study Area, however suitable elevations not present in Study Area. The only two CNDDB occurrences recorded within 10 miles of the Study Area are from 1956 and are located in the Santa Ynez Mountains at least 5.5 miles to the north.
Lasthenia conjugens Contra Costa goldfields	FE/None G1/S1 1B.1 SBBG Rare Plant	Annual herb. Cismontane woodland, playas, valley and foothill grassland, vernal pools. Vernal pools, swales, low depressions, in open grassy areas. Elevations: 0-1540ft. (0-470m.) Blooms Mar-Jun.	Low	Suitable coastal wetland/low depression habitats present in Study Area. However, only one record exists within the county of Santa Barbara, a historical (1973) CNDDB

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CRPR Other	Habitat Requirements	Potential to Occur	Rationale
				occurrence recorded 0.35 mile from the Study Area which is considered extirpated.
Lasthenia glabrata ssp. coulteri Coulter's goldfields	None/None G4T2/S2 1B.1 SBBG Rare Plant	Annual herb. Marshes and swamps, playas, vernal pools. Usually found on alkaline soils in playas, sinks, and grasslands. 1-. Elevations: 5-4005ft. (1-1220m.) Blooms Feb-Jun.	Low	Suitable coastal wetland and mesic habitats present in Study Area. However, only one historical (1982) CNDDB occurrence recorded 1.35 miles from the Study Area.
Layia heterotricha pale-yellow layia	None/None G2/S2 1B.1 SBBG Rare Plant	Annual herb. Cismontane woodland, coastal scrub, pinyon and juniper woodland, valley and foothill grassland. Alkaline or clay soils; open areas. Elevations: 985-5595ft. (300-1705m.) Blooms Mar-Jun.	Not Expected	Suitable coast live oak woodland, coastal scrub, and grassland habitats present, however suitable elevations not present in Study Area.
Lepechinia fragrans fragrant pitcher sage	None/None G3/S3 4.2 SBBG Rare Plant	Perennial shrub. Chaparral. Elevations: 65-4300ft. (20-1310m.) Blooms Mar-Oct.	Not Expected	Suitable chaparral habitat not present in Study Area.
Lonicera subspicata var. *subspicata* Santa Barbara honeysuckle	None/None G5T2?/S2? 1B.2 SBBG Rare Plant	Perennial evergreen shrub. Chaparral, cismontane woodland, coastal scrub. Elevations: 35-3280ft. (10-1000m.) Blooms (Feb)May-Aug(Dec).	Present	CNDDB occurrence recorded in Study Area and in the Goleta GP/LCP Conservation Element Figure 4-1. Species observed at Ellwood Main during 2021 site visit.
Malacothrix saxatilis var. *saxatilis* cliff malacothrix	None/None G5T4/S4 4.2	Perennial rhizomatous herb. Coastal bluff scrub. Coastal scrub. Elevations: 10-655ft. (3-200m.) Blooms Mar-Sep.	Not Expected	Suitable coastal scrub habitat present in Study Area. However, no CNDDB occurrences recorded within 10 miles of the Study Area and perennial species not observed during survey.
Monardella hypoleuca ssp. *hypoleuca* white-veined monardella	None/None G4T3/S3 1B.3	Perennial herb. Chaparral, cismontane woodland. Dry slopes. Elevations: 165-5005ft. (50-1525m.) Blooms (Apr)May-Aug(Sep-Dec).	Low	Marginally suitable coast live oak woodland present n Study Area. This perennial herb was not observed during survey.

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CRPR Other	Habitat Requirements	Potential to Occur	Rationale
Nasturtium gambelii Gambel's water cress	FE/SCT G1/S1 1B.1 SBBG Rare Plant	Perennial rhizomatous herb. Marshes and swamps. Freshwater and brackish marshes at the margins of lakes and along streams, in or just above the water level. Elevations: 15-1085ft. (5-330m.) Blooms Apr-Oct.	Not Expected	Freshwater wetlands are present in Study Area, but do not provide the perennial water supply the species requires. This species has a highly limited distribution with only one extant population known to occur in Santa Barbara County. The only CNDDB occurrences recorded within 10 mile radius of the Study Area is from 1886 and is considered extirpated.
Pleuridium mexicanum Mexican earthmoss	None/None G5/S1 2B.1	Moss. Chaparral. Sandstone. Elevations: 1445-1445ft. (440-440m.)	Not Expected	Suitable elevations not present in Study Area.
Polygala cornuta var. *fishiae* Fish's milkwort	None/None G5T4/S4 4.3 SBBG Rare Plant	Perennial deciduous shrub. Chaparral, cismontane woodland, riparian woodland. Scree slopes, brushy ridges, and along creeks; often with oaks. Elevations: 330-3280ft. (100-1000m.) Blooms May-Aug.	Not Expected	Suitable coast live oak woodland and riparian woodlands present, however suitable elevations not present in Study Area. This perennial shrub species was not observed during survey.
Quercus dumosa Nuttall's scrub oak	None/None G3/S3 1B.1 SBBG Rare Plant	Perennial evergreen shrub. Chaparral, closed-cone coniferous forest, coastal scrub. Generally on sandy soils near the coast; sometimes on clay loam. Elevations: 50-1310ft. (15-400m.) Blooms Feb-Apr(May-Aug).	Low	Suitable coastal scrub habitat present in Study Area, however perennial shrub species not observed during survey.
Ribes amarum var. *hoffmannii* Hoffmann's bitter gooseberry	None/None G4?T3/S3 3	Perennial deciduous shrub. Chaparral, riparian woodland. Elevations: 15-3905ft. (5-1190m.) Blooms Mar-Apr.	Low	Riparian woodland habitat present in Study Area, however perennial shrub not observed during survey.
Scrophularia atrata black-flowered figwort	None/None G2?/S2? 1B.2	Perennial herb. Chaparral, closed-cone coniferous forest, coastal dunes, coastal scrub, riparian scrub. Sand, diatomaceous shales, and soils derived from other parent material; around swales and in sand dunes. Elevations: 35-1640ft. (10-500m.) Blooms Mar-Jul.	Low	Suitable coastal scrub and riparian habitats and sandy soils present in Study Area, however perennial species not observed during survey. The most recent CNDDB occurrence located within 10 miles of the Study Area is from 1971.

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CRPR Other	Habitat Requirements	Potential to Occur	Rationale
Senecio aphanactis chaparral ragwort	None/None G3/S2 2B.2 SBBG Rare Plant	Annual herb. Chaparral, cismontane woodland, coastal scrub. Drying alkaline flats. Elevations: 50-2625ft. (15-800m.) Blooms Jan-Apr(May).	Low	Suitable coast live oak woodland and coastal scrub present in Study Area. No CNDDB occurrences have been recorded within 10 miles of the Study Area.
Senecio astephanus San Gabriel ragwort	None/None G3/S3 4.3 SBBG Rare Plant	Perennial herb. Chaparral, coastal bluff scrub. Rocky slopes. Elevations: 1310-4920ft. (400-1500m.) Blooms May-Jul.	Not Expected	Suitable rocky slopes are not present in Study Area. Study area is outside expected elevation range.
Suaeda esteroa estuary seablite	None/None G3/S2 1B.2 SBBG Rare Plant	Perennial herb. Marshes and swamps. Coastal salt marshes in clay, silt, and sand substrates. Elevations: 0-15ft. (0-5m.) Blooms (Jan-May)Jul-Oct.	Not Expected	Suitable coastal salt marsh habitat not present in Study Area. The only CNDDB occurrence located within 10 miles of the Study Area is from 1971.
Thelypteris puberula var. *sonorensis* Sonoran maiden fern	None/None G5T3/S2 2B.2 SBBG Rare Plant	Perennial rhizomatous herb. Meadows and seeps. Along streams, seepage areas. Elevations: 165-2000ft. (50-610m.) Blooms Jan-Sep.	Low	Marginally suitable mesic habitat present in Study Area. 4 CNDDB occurrences reported within 10 miles of the Study Area, including most recently from 2015 (however, this occurrence occurs in the Santa Ynez mountains).
Thermopsis macrophylla Santa Ynez false lupine	None/SCR G1/S1 1B.3 SBBG Rare Plant	Perennial rhizomatous herb. Chaparral. In open areas such as fuel breaks, after burns; on sandstone. Elevations: 1395-4595ft. (425-1400m.) Blooms Apr-Jun.	Not Expected	Suitable chaparral habitat and sandstone substrate not present in Study Area. Study Area is outside of expected elevation range.

Status (Federal/State)

FE = Federal Endangered
FT = Federal Threatened
FPE = Federal Proposed Endangered
FPT = Federal Proposed Threatened
FD = Federal Delisted
FC = Federal Candidate
SE = State Endangered
ST = State Threatened
SCE = State Candidate Endangered
SCT = State Candidate Threatened
SR = State Rare
SD = State Delisted

CRPR (CNPS California Rare Plant Rank)

1A = Presumed extirpated in California, and rare or extinct elsewhere
1B = Rare, Threatened, or Endangered in California and elsewhere
2A = Presumed extirpated in California, but common elsewhere
2B= Rare, Threatened, or Endangered in California, but more common elsewhere
3 = Need more information (Review List)
4 = Limited Distribution (Watch List)

CRPR Threat Code Extension

.1 = Seriously endangered in California (>80% of occurrences threatened/high degree and immediacy of threat)
.2 = Moderately threatened in California (20-80% of occurrences threatened/moderate degree and immediacy of threat)
.3 = Not very endangered in California (<20% of occurrences threatened/low degree and immediacy of threat)

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CRPR Other	Habitat Requirements	Potential to Occur	Rationale

SSC = CDFW Species of Special Concern
FP = CDFW Fully Protected
WL = CDFW Watch List

Other Statuses

G1 or S1 Critically Imperiled Globally or Subnationally (state)
G2 or S2 Imperiled Globally or Subnationally (state)
G3 or S3 Vulnerable to extirpation or extinction Globally or Subnationally (state)

Special Status Animal Species in the Regional Vicinity of the Project Site

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CDFW	Habitat Requirements	Potential to Occur	Rationale
Invertebrates				
Branchinecta lynchi vernal pool fairy shrimp	FT/None G3/S3	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	Low	Marginally suitable depression habitat present in Study Area within Coastal Wetland 1; however, no CNDDB occurrences within 10 miles of the Study Area have been documented. Vernal pool habitat has been documented to occur on Ellwood Mesa (USFWS 1998; City 2006). No vernal pools were observed within the Study Area, though shallow depressions classified as coastal wetlands are present and may provide marginally suitable habitat for vernal pool fairy shrimp. It is unclear whether these depressions contain water long enough to support the development of vernal pool fairy shrimp, and investigation of the depressions did not detect fairy shrimp cysts.
Danaus plexippus pop. 1 monarch - California overwintering population	FC/None 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	Overwintering population and winter roost sites are present throughout Study Area in eucalyptus groves.
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.	Not Expected	Although the species is documented as present in the Goleta GP/LCP Conservation Element Figure 4-1 on Devereaux Beach, no suitable sand dune habitat is present within the Study Area required for the species.
Fish				
Eucyclogobius newberryi tidewater goby	FE/None G3/S3	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego	Not Expected	Suitable brackish water, shallow lagoons, or lower

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		County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.		stream mouth not present in Study Area.
Amphibians				
Rana boylii *foothill yellow-legged frog*	None/SE G3/S3 SSC	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis.	Not Expected	Suitable shallow streams with rocky substrate not present in Study Area. Only records within 10 miles of Study Area are considered extirpated.
Rana draytonii California red-legged frog	FT/None G2G3/S2S3 SSC	Lowlands and 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.	Low to Moderate	17 CNDDB occurrences recorded withing 10 miles of Study Area, including one in 2010 approximately 0.5-mile northwest in Tecolote Creek and most recently in 2017 approximately 3.5 miles north of Study Area within Bell Canyon. Suitable emergent riparian vegetation habitat near permanent sources of deep water are not present in Study Area. Low potential to occur transiently near Devereux Creek and coastal wetlands within Study Area; not observed during survey.
Taricha torosa Coast Range newt	None/None G4/S4 SSC	Coastal drainages from Mendocino County to San Diego County. Lives in terrestrial habitats and will migrate over 1 km to breed in ponds, reservoirs and slow moving streams.	Low	Suitable terrestrial habitat present in Study Area. Aquatic habitat suitable for egg laying and larval development is not present. 7 historic CNDDB occurrences within 10 miles, the closest (2011) recorded approximately 1.3 miles north of Study Area in Ellwood Canyon. Study Area does not contain suitable breeding habitat long enough for the species' aquatic life cycle, however suitable terrestrial habitat (moist areas under woody debris and animal burrows) is present. As such, the species has a low potential

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CDFW	Habitat Requirements	Potential to Occur	Rationale
				to occur within the Study Area.
Reptiles				
Anniella pulchra Northern California legless lizard	None/None G3/S3 SSC	Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential. They prefer soils with a high moisture content.	Moderate	15 CNDDB occurrences within 10 miles of the Study Area. The nearest occurrence, documented in 1995 is on More Mesa, approximately 5 miles east of the Study Area. Suitable sandy or loamy soils with sparse vegetation and high moisture content present near Devereux Creek in Study Area.
Emys marmorata western pond turtle	None/None G3G4/S3 SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 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.	Not Expected	14 CNDDB occurrences within 10 miles of the Study Area, with one historic (2007) occurrence within a tributary to Devereux Slough, approximately 0.3 mile east of the Study Area. However, suitable streams with aquatic vegetation and basking sites are not present in Study Area and species was not observed during the survey.
Phrynosoma blainvillii coast horned lizard	None/None G3G4/S3S4 SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Low	Marginally suitable habitat present in Study Area within scrub communities. 4 CNDDB occurrences within 10 miles of Study Area, the most recent recording from 2010 in the Santa Ynez Mountains. Species not observed during survey.
Salvadora hexalepis virgultea coast patch-nosed snake	None/None G5T4/S2S3 SSC	Brushy or shrubby vegetation in coastal Southern California. Require small mammal burrows for refuge and overwintering sites.	Low	Somewhat suitable coyote brush scrub habitat with small mammal burrows present in Study Area. 3 historic CNDDB occurrences within 10 miles of Study Area, most recently (1978) in the Santa Ynez Mountains. Species not observed during survey. No citizen database records south of the Santa Ynez

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CDFW	Habitat Requirements	Potential to Occur	Rationale
				Mountains (iNaturalist 2022).
Birds				
Accipiter cooperii Cooper's hawk	None/None G5/S4 WL	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 has been documented in Study Area within the Goleta GP/LCP Conservation Element Figure 4-1. .
Agelaius tricolor tricolored blackbird	None/ST G1G2/S1S2 SSC	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	Not Expected	3 CNDDB occurrences within 10 miles of the Study Area, approximately 3 miles east of the Study Area in 2014. However, suitable open freshwater marsh habitat not present in Study Area and species/colony not observed during survey.
Aimophila ruficeps canescens southern California rufous-crowned sparrow	None/None G5T3/S3 WL	Resident in Southern California coastal sage scrub and sparse mixed chaparral. Frequents relatively steep, often rocky hillsides with grass and forb patches.	Low	Marginally suitable coastal scrub habitat is present, but the Study Area lacks steep rocky hillsides. Most recent documented occurrence was from 1992, approximately one mile north of the Study Area.
Ammodramus savannarum grasshopper sparrow	None/None G5/S3 SSC	Dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs and scattered shrubs. Loosely colonial when nesting.	Low	2 CNDDB occurrences within 10 miles of the Study Area, approximately 5 miles east of the Study Area in 2007 and 2008. Suitable dense grassland hill slope habitat is present within Study Area.
Aquila chrysaetos golden eagle	None/None G5/S3 FP WL	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Not Expected	1 CNDDB occurrence, approximately 7 miles north of the Study Area. However, the occurrence is historical (1974) and suitable rolling foothill, mountain, juniper flat, or desert habitat not present in Study Area.
Artemisiospiza belli belli Bell's sage sparrow	None/None G5T2T3/S3 WL	Nests in chaparral dominated by fairly dense stands of chamise. Found in coastal sage scrub in south of range. Nest located on the ground beneath a shrub or in a shrub 6-18 inches above	Not Expected	Suitable chaparral habitat for nesting not present in Study Area. 1 CNDDB occurrence within 10 miles of the Study Area. However, the occurrence is historical

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CDFW	Habitat Requirements	Potential to Occur	Rationale
		ground. Territories about 50 yds apart.		(1994) and located within the Santa Ynez Mountains.
Athene cunicularia burrowing owl	None/None G4/S3 SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Low	Species extirpated from breeding in coastal California and would only be present September to February as an overwintering migrant (Shuford 2008). 1 historic CNDDB occurrence (2001) recorded 0.2-mile east of Study Area in Devereux Slough. Suitable dry grassland and coastal scrub with low vegetation and small mammal burrows present in Study Area. Species not observed during survey. The species has a low potential to occur as a winter migrant.
Brachyramphus marmoratus marbled murrelet	FT/SE G3/S2	Feeds near-shore; nests inland along coast from Eureka to Oregon border and from Half Moon Bay to Santa Cruz. Nests in old-growth redwood-dominated forests, up to six miles inland, often in Douglas-fir.	Not Expected	The Study Area is outside the current range of the species.
Buteo regalis ferruginous hawk	None/None G4/S3S4 WL	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats. Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	Low	1 historic (1992) CNDDB occurrence approximately 1.3 miles west of the Study Area. Suitable grassland habitat present in Study Area for foraging habitat; however, the Study Area is not within the breeding range of the species. The City is located outside the breeding range of the species (CDFW 2014, Lehman 2020). Citizen database records show no breeding and limited individual sightings within the City (eBird 2022, SBAS 2022). Therefore, the species has a low potential to occur as a winter transient in the Study Area.
Charadrius nivosus nivosus	FT/None G3T3/S2 SSC	Sandy beaches, salt pond levees and shores of large alkali lakes.	Low	Suitable nesting (beaches) and foraging (beaches, tide flats, river mouths, and

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CDFW	Habitat Requirements	Potential to Occur	Rationale
western snowy plover		Needs sandy, gravelly or friable soils for nesting.		lagoons, typically in shallow (1-2 cm deep) waters not present in Study Area (Birds of the World 2022). Species not observed during survey in Study Area. Species is present in USFWS critical habitat is present within Coal Oil Point Reserve near the mouth of Devereux Slough, approximately 0.3 miles southeast of the Study Area. The species forage up and down the beach for several hundred meters for invertebrates in the tidal margin (Lafferty, K.D. 2000). Due to the proximity to Devereux Beach, the species has a low potential to occur as transients flying overhead through the Study Area.

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CDFW	Habitat Requirements	Potential to Occur	Rationale
Elanus leucurus white-tailed kite	None/None G5/S3S4 FP	Rolling foothills and valley margins with scattered oaks and 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	Suitable grasslands and dense-topped trees and streams present in Study Area. Species has been documented nesting in eucalyptus trees within Study Area in CNDDB and observed during survey. Several nests have been previously documented at Ellwood Mesa in eucalyptus groves.
Empidonax traillii extimus southwestern willow flycatcher	FE/SE G5T2/S1	Riparian woodlands in Southern California.	Low	Somewhat suitable arroyo willow thicket (greater than 0.25-acre [USFWS 2022]) nesting habitat patch occurs within the Study Area in the western portion of Devereux Creek; however it lacks suitable density, is surrounded by recreational disturbance such as humans and pets, is associated with an intermittent system that lacked surface water during the field surveys. No CNDDB occurrences reported within 10 miles of Study Area and species not observed during survey. Species has been documented with large populations along the Santa Ynez River more than 10-miles north of the Study Area (USFWS 2013). No citizen database records within the City. SWFL are not anticipated to breed but have a very low potential to occur as transients within the Study Area.
Eremophila alpestris actia California horned lark	None/None G5T4Q/S4 WL	Coastal regions, chiefly from Sonoma County to San Diego County. Also main part of San Joaquin Valley and east to foothills. Short-grass prairie, "bald" hills, mountain meadows,	Low	1 CNDDB occurrence approximately 0.25 miles east of the Study Area in 2003. Moderately suitable open coastal plain habitat present in within grasslands

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CDFW	Habitat Requirements	Potential to Occur	Rationale
		open coastal plains, fallow grain fields, alkali flats.		in Study Area. Species not observed during survey.
Falco mexicanus prairie falcon	None/None G5/S4 WL	Inhabits dry, open terrain, either level or hilly. Breeding sites located on cliffs. Forages far afield, even to marshlands and ocean shores.	Not Expected	No documented CNDDB occurrences within 10 miles of the Study Area. Cliff habitat not present for breeding within the Study Area. Species not observed during survey and may occur transiently in Study Area.
Passerculus sandwichensis beldingi Belding's savannah sparrow	None/SE G5T3/S3	Inhabits coastal salt marshes, from Santa Barbara south through San Diego County. Nests in Salicornia on and about margins of tidal flats.	Low	Alkali heath marsh within the eastern portion of the Study Area provides limited suitable non-breeding habitat for the species as it contains some pickleweed but is non-tidal. This habitat is degraded by crossing footpaths and is disturbed by recreational activities and pets. A historic 1982 CNDDB occurrence has been documented in Devereux Slough (pickleweed dominated coast salt marsh) approximately 1 mile east of the Study Area. Species not observed during survey. Species has a low potential to forage within the Study Area.
Pelecanus occidentalis californicus California brown pelican	FD/SD G4T3T4/S3 FP	Colonial nester on coastal islands just outside the surf line. Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators. Roosts communally.	Not Expected	Suitable ocean foraging habitat present adjacent to Study Area; however, no suitable nesting habitat within Study Area. CNDDB occurrence documented along Devereux Beach adjacent to Study Area. Species not observed during survey.
Phalacrocorax auritus double-crested cormorant	None/None G5/S4 WL	Colonial nester on coastal cliffs, offshore islands, and along lake margins in the interior of the state. Nests along coast on sequestered islets, usually on ground with sloping surface, or in tall trees along lake margins.	Not Expected	No suitable nesting habitat, cliff or islets, or foraging habitat present within the Study Area. Species not observed during survey. CNDDB occurrence documented approximately

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CDFW	Habitat Requirements	Potential to Occur	Rationale
				6 miles east of the Study Area in the Goleta Slough.
Rallus obsoletus levipes light-footed Ridgway's rail	FE/SE G3T1T2/S1 FP	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.	Not Expected	Suitable salt marsh and tidal slough habitat not present in Study Area. Pickleweed and cordgrass necessary for nesting not present in Study Area. Only documented occurrence within 10 miles of the Study Area dates from 1974 and is considered extirpated.
Riparia riparia bank swallow	None/ST G5/S2	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	Not Expected	Suitable vertical banks and cliffs for nesting not present in Study Area.
Sternula antillarum browni California least tern	FE/SE G4T2T3Q/S2 FP	Nests along the coast from San Francisco Bay south to northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, land fills, or paved areas.	Low	Suitable sand beaches and ocean foraging habitat present adjacent to, but not within the Study Area. CNDDB occurrence documented on Coal Oil Point, approximately 0.10 mile east. Species not observed during survey; and may occur transiently in Study Area. Species has low potential to occur transiently through the Study Area.

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CDFW	Habitat Requirements	Potential to Occur	Rationale
Vireo bellii pusillus least Bell's vireo	FE/SE G5T2/S2	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, mesquite.	Not Expected	Somewhat suitable arroyo willow thicket nesting habitat occurs within the Study Area in the western portion of Devereux Creek, however it lacks suitable density, is surrounded by recreational/residential disturbance such as humans and pets, and is associated with an intermittent system that lacked surface water during the field surveys. One historic (1980) CNDDB record within 10 miles of the Study Area are in the vicinity of the Santa Ynez River, approximately 8 miles north of the Study Area. No citizen database records or breeding within the City (eBird 2022, iNaturalist 2022, SBAS 2022). Brown-headed cowbird which paratizes LBVI nests has been documented to breed within Ellwood Mesa (SBAS 2022). Species not observed during survey. Species not anticipated to breed and have a very low potential to occur as transients within the Study Area.
Mammals				
Antrozous pallidus pallid bat	None/None G4/S3 SSC	Found in a variety of habitats including deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts in crevices of rock outcrops, caves, mine tunnels, buildings, bridges, and hollows of live and dead trees which must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Low	Species is highly associated with oak woodlands and savannahs in lower elevation California (Bolster 1998). Somewhat suitable foraging habitat (coast live oak woodland) is present in limited quantities within the Study Area, however it is surrounded by eucalyptus woodlands and residential development and is frequently disturbed by human recreational and bird/raptor activity. Suitable open, dry, and rocky habitat for roosting

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CDFW	Habitat Requirements	Potential to Occur	Rationale
				not present, and suitable crevices (tree hollows) limited in Study Area. One occurrence documented acoustically in 2017 approximately 0.6 mile east of Study Area.
Corynorhinus townsendii Townsend's big-eared bat	None/None G4/S2 SSC	Occurs throughout California in a wide variety of habitats. Most common in mesic sites, typically coniferous or deciduous forests. Roosts in the open, hanging from walls; ceilings in caves, lava tubes, bridges, and buildings. This species is extremely sensitive to human disturbance.	Not Expected	Somewhat suitable foraging habitat (coast live oak woodland) is present in limited quantities within the Study Area (Bolster 1998). 2 CNDDB occurrences documented within 10 miles of the Study Area, Dos Pueblos Canyon and Monte Vista School. However, suitable coniferous/deciduous forest and cave habitat for roosting away from human disturbance not present in Study Area.
Eumops perotis californicus western mastiff bat	None/None G4G5T4/S3S4 SSC	Occurs in open, semi-arid to arid habitats, including coniferous and deciduous woodlands, coastal scrub, grasslands, and chaparral. Roosts in crevices in cliff faces and caves, and buildings. Roosts typically occur high above ground.	Not Expected	Suitable foraging habitat (grassland and oak woodland) is present within the Study Area. 3 CNDDB occurrences within 10 miles of the Study Area, More Mesa (2008) and White Rock Recreation Area (1998). However, suitable cliff and cave habitat and significant rock features for roosting not present in Study Area.

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Lasiurus blossevillii western red bat	None/None G4/S3 SSC	Roosts in trees in forests and woodlands of varying elevations. Forages in grasslands, shrublands, open woodlands and forests, and agriculture. Typically found in riparian habitats, does not occur in deserts.	Moderate	3 CNDDB occurrences within 10 miles of the Study Area, including one occurrence in 2017 approximately 0.6 miles east of the Study Area. Somewhat suitable roosting and foraging habitat (trees, grasslands and shrublands and riparian habitat) present in Study Area. Species and/or sign (guano) not observed during survey.
*Neotoma bryanti intermedia (*formerly *Neotoma lepida intermedia*) northern Bryant's woodrat (formerly San Diego desert woodrat)	None/None G5T3T4/S3S4 SSC	Occurs in scrub habitats of southern California from San Luis Obispo County to San Diego County. In coastal scrub habitat, prefers live oak, chamise, and buckwheat. Houses typically built against rock crevice, base of cactus, or lower branches of trees.	Low	Habitats present in Study Area for midden construction (eucalyptus groves and oak woodland along drainages) more suited for big-eared woodrat. No sign of the species including middens were observed during the reconnaissance survey. CNDDB occurrence has been documented along San Pedro Creek within the San Ynez Mountains approximately 5 miles northeast of Study Area. No citizen database records within the City (iNaturalist 2022). Therefore, this species has a low potential to occur within the Study Area.
Taxidea taxus American badger	None/None G5/S3 SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Low	Moderately suitable habitat (friable soils and grassland habitat) present within Study Area. 1 CNDDB occurrence within 10 miles of the Study Area. However, the occurrence was historical (1922). Study Area is not expected to provide sufficient prey base for species, but may occur transiently. No suitable burrows observed during the survey. Additionally, a suitable prey base including California ground squirrel

Scientific Name Common Name	Status Fed/State ESA G-Rank/S-Rank CDFW	Habitat Requirements	Potential to Occur	Rationale
				(*Otospermophilus beecheyi*) is also present. However, the size of Ellwood when combined with NCOS is less than one square mile and under the territory size for an individual. Therefore, this species has a low potential to occur within the Study Area.

Status (Federal/State)

FE = Federal Endangered
FT = Federal Threatened
FPE = Federal Proposed Endangered
FPT = Federal Proposed Threatened
FD = Federal Delisted
FC = Federal Candidate
SE = State Endangered
ST = State Threatened
SCE = State Candidate Endangered
SCT = State Candidate Threatened
SR = State Rare
SD = State Delisted
SSC = CDFW Species of Special Concern
FP = CDFW Fully Protected

CRPR (CNPS California Rare Plant Rank)

1A = Presumed extirpated in California, and rare or extinct elsewhere
1B = Rare, Threatened, or Endangered in California and elsewhere
2A = Presumed extirpated in California, but common elsewhere
2B= Rare, Threatened, or Endangered in California, but more common elsewhere
3 = Need more information (Review List)
4 = Limited Distribution (Watch List)

CRPR Threat Code Extension

.1 = Seriously endangered in California (>80% of occurrences threatened/high degree and immediacy of threat)
.2 = Moderately threatened in California (20-80% of occurrences threatened/moderate degree and immediacy of threat)
.3 = Not very endangered in California (<20% of occurrences threatened/low degree and immediacy of threat)

Other Statuses

G1 or S1 Critically Imperiled Globally or Subnationally (state)
G2 or S2 Imperiled Globally or Subnationally (state)
G3 or S3 Vulnerable to extirpation or extinction Globally or Subnationally (state)

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Appendix E

Native Tree Matrix

Tree ID #	Species	Number of Trunks	DBH (in)	Tree Height (ft)	Canopy Spread (ft)	Health Condition	Protected (yes/no)
Tree Points							
1	Coast live oak (*Quercus agrifolia)*	1	18	30	30	Good	yes
2	Coast live oak	1	8	30	20	Good	yes
3	Willow (*Salix* sp.)	2	9, 10	30	25	Good	yes
4	Coast live oak	1	6	30	10	Good	no
5	Willow	1	3	20	10	Good	no
6	Willow	1	5	20	15	Good	no
7	Willow	1	6	20	20	Good	no
8	Coast live oak	1	6	25	15	Good	no
9	Willow	1	13	40	20	Good	yes
10	Willow	2	4, 6	30	15	Good	no
11	Willow	1	5	20	10	Good	no
12	Willow	1	12	50	30	Good	yes
13	Willow	1	9	20	20	Good	yes
14	Willow	2	11, 13	25	15	Good	yes
15	Willow	1	6	35	20	Good	no
16	Black cottonwood (*Populus trichocarpa*)	1	6	30	20	Good	no
17	Coast live oak	2	10, 11	40	40	Good	yes
18	Coast live oak	1	9	25	20	Good	yes
19	Coast live oak	1	15	25	30	Excellent	yes
20	Coast live oak	1	4	10	10	Good	no
21	Coast live oak	1	5	10	10	Good	no
22	Coast live oak	2	9, 9	15	15	Good	yes
23	Coast live oak	1	18	25	20	Good	yes
24	Coast live oak	1	16	20	20	Good	yes
25	Coast live oak	1	20	25	30	Good	yes
26	Coast live oak	1	3	15	10	Good	no
27	Coast live oak	2	4, 2	15	10	Good	no
28	Coast live oak	1	7	15	10	Good	no
29	Coast live oak	1	6	15	10	Good	no
30	Coast live oak	1	5	20	10	Good	no
31	Coast live oak	1	8	15	10	Good	yes
32	Coast live oak	1	8	20	15	Good	yes
33	Coast live oak	1	17	30	35	Good	yes
34	Valley oak (*Quercus lobata*)	1	4	15	10	Fair	no
35	Coast live oak	1	5	15	10	Good	no
36	Coast live oak	1	13	20	15	Good	yes
37	Coast live oak	1	4	10	10	Good	no
38	Coast live oak	1	25	40	40	Good	yes
39	Coast live oak	2	8, 9	20	15	Good	yes
40	Coast live oak	1	10	15	15	Good	yes

Tree ID #	Species	Number of Trunks	DBH (in)	Tree Height (ft)	Canopy Spread (ft)	Health Condition	Protected (yes/no)
41	Coast live oak	2	9, 9	20	20	Good	yes
42	Coast live oak	1	15	35	40	Good	yes
43	Coast live oak	1	13	35	30	Good	yes
44	Coast live oak	1	38	50	50	Good	yes
45	Coast live oak	1	9	25	15	Good	yes
46	Coast live oak	1	10	25	15	Good	yes
47	Coast live oak	2	11, 10	25	40	Good	yes
48	Coast live oak	1	9	25	20	Good	yes
49	Coast live oak	1	13	35	35	Good	yes
50	Coast live oak	1	4	15	10	Good	no
51	Coast live oak	2	4, 2	15	10	Good	no
52	Coast live oak	1	5	15	15	Good	no
53	Coast live oak	1	5	20	10	Good	no
54	Coast live oak	1	10	30	15	Fair	yes
55	Coast live oak	1	4	20	10	Fair	no
56	Coast live oak	2	9, 12	35	20	Good	yes
57	Coast live oak	1	10	40	15	Good	yes
58	Coast live oak	1	5	15	10	Good	no
59	Coast live oak	1	4	20	10	Good	no
60	Coast live oak	1	7	30	15	Good	no
61	Coast live oak	2	12, 9	25	20	Good	yes
62	Coast live oak	1	3	15	10	Good	no
63	Coast live oak	1	5	15	15	Good	no
64	Coast live oak	1	6	15	10	Good	no
65	Coast live oak	1	4	10	5	Good	no
66	Coast live oak	1	3	15	10	Good	no
67	Coast live oak	1	10	20	20	Good	yes
68	Coast live oak	1	3	15	10	Good	no
69	Coast live oak	2	13, 11	35	35	Good	yes
70	Coast live oak	1	6	25	10	Good	no
71	Coast live oak	1	10	30	20	Good	yes
72	Coast live oak	1	15	35	30	Good	yes
73	Coast live oak	1	16	40	30	Good	yes
74	Coast live oak	1	3	10	10	Good	no
75	Coast live oak	1	3	15	10	Good	no
76	Coast live oak	1	4	20	15	Good	no
77	Coast live oak	1	9	15	15	Good	yes
78	Coast live oak	1	12	30	30	Good	yes
79	Coast live oak	1	6	20	15	Good	no
80	Coast live oak	1	4	10	10	Good	no
81	Coast live oak	1	13	25	35	Good	yes

Tree ID #	Species	Number of Trunks	DBH (in)	Tree Height (ft)	Canopy Spread (ft)	Health Condition	Protected (yes/no)
82	Coast live oak	1	39	45	50	Good	yes
83	Coast live oak	1	25	40	40	Good	yes
84	Coast live oak	1	20	30	35	Good	yes
85	Coast live oak	1	37	40	40	Good	yes
86	Coast live oak	2	7, 9	15	15	Good	yes
87	Coast live oak	1	7	10	10	Good	no
88	Coast live oak	1	30	30	40	Good	yes
89	Box elder (*Acer negundo*)	1	12	15	20	Good	yes
90	Coast live oak	1	8	10	10	Good	yes
91	Coast live oak	1	10	15	10	Good	yes
92	Coast live oak	1	4	10	5	Good	no
93	Coast live oak	2	9, 10	20	20	Excellent	yes
94	Coast live oak	1	4	15	10	Good	no
95	Coast live oak	2	5,4	10	10	Good	no
96	Coast live oak	2	10, 4	15	10	Good	yes
97	Coast live oak	2	5, 5	10	10	Good	no
98	Coast live oak	1	6	10	15	Good	no
99	Coast live oak	1	7	10	10	Excellent	no
100	Coast live oak	1	10	15	10	Poor	yes
101	Coast live oak	1	9	15	10	Good	yes
102	Coast live oak	1	10	15	20	Fair	yes
103	Coast live oak	1	10	20	15	Good	yes
104	Coast live oak	1	11	15	10	Good	yes
105	Coast live oak	1	13	20	20	Excellent	yes
106	Coast live oak	2	9, 13	15	10	Good	yes
107	Coast live oak	2	11, 11	20	15	Good	yes
108	Coast live oak	1	10	10	15	Fair	yes
109	Unknown native	1	7	10	10	Good	no
110	Coast live oak	1	13	20	15	Excellent	yes
111	Coast live oak	1	8	15	10	Excellent	yes
112	Coast live oak	1	10	15	15	Poor	yes
113	Coast live oak	1	7	15	10	Good	no
114	Coast live oak	2	3, 1	5	5	Excellent	no
115	Coast live oak	3	2, 2, 2	5	10	Good	no
116	Coast live oak	2	3,2	10	10	Good	no
117	Coast live oak	1	4	10	10	Excellent	no
118	Coast live oak	2	6, 8	10	15	Fair	yes
119	Coast live oak	1	4	15	10	Good	no
120	Coast live oak	1	4	15	10	Good	no
121	Coast live oak	1	13	15	15	Good	yes
122	Coast live oak	1	14	20	20	Good	yes

Tree ID #	Species	Number of Trunks	DBH (in)	Tree Height (ft)	Canopy Spread (ft)	Health Condition	Protected (yes/no)
123	Coast live oak	2	10, 9	15	10	Good	yes
124	Coast live oak	2	6, 8	15	15	Good	yes
125	Coast live oak	1	4	10	5	Good	no
126	Coast live oak	1	4	10	10	Good	no
127	Coast live oak	1	5	10	10	Good	no
128	Coast live oak	1	6	10	10	Good	no
129	Coast live oak	2	5, 3	10	10	Excellent	no
130	Coast live oak	1	3	10	5	Good	no
131	Coast live oak	1	3	5	5	Poor	no
132	Coast live oak	1	3	10	10	Good	no
133	Coast live oak	1	3	5	10	Fair	no
134	Coast live oak	1	4	10	10	Good	no
135	Coast live oak	1	3	10	5	Good	no
136	Coast live oak	1	5	10	10	Good	no
137	Coast live oak	2	4, 4	5	10	Excellent	no
138	Coast live oak	1	4	10	10	Good	no
139	Coast live oak	1	5	10	10	Good	no
140	Coast live oak	1	4	10	10	Fair	no
141	Coast live oak	1	3	10	10	Good	no
142	Coast live oak	2	3, 2	10	10	Good	no
143	Coast live oak	1	5	10	10	Fair	no
144	Coast live oak	1	6	10	10	Good	no
145	Coast live oak	2	4, 6	10	10	Good	no
146	Coast live oak	1	8	15	15	Good	yes
147	Coast live oak	1	4	15	10	Fair	no
148	Coast live oak	1	6	15	10	Good	no
149	Coast live oak	1	7	20	15	Fair	no
150	Coast live oak	1	4	10	10	Good	no
151	Coast live oak	1	5	20	10	Good	no
152	Coast live oak	1	3	15	10	Fair	no
153	Coast live oak	2	3, 2	10	10	Good	no
154	Coast live oak	1	3	10	5	Good	no
155	Coast live oak	1	4	15	10	Good	no
156	Coast live oak	1	5	20	10	Good	no
157	Coast live oak	1	5	15	10	Excellent	no
158	Coast live oak	2	3, 3	10	10	Good	no
159	Coast live oak	1	4	20	10	Fair	no
160	Coast live oak	1	3	5	10	Fair	no
161	Coast live oak	2	3, 2	10	5	Good	no
162	Willow	6	10, 10, 14, 10, 14, 9	25	40	Good	yes
163	Coast live oak	1	5	15	10	Fair	no

Tree ID #	Species	Number of Trunks	DBH (in)	Tree Height (ft)	Canopy Spread (ft)	Health Condition	Protected (yes/no)
164	Coast live oak	1	7	15	15	Good	no
165	Coast live oak	1	12	25	15	Good	yes
166	Fremont cottonwood (*Populus fremontii*)	1	7	20	10	Good	no
167	Willow	2	3, 4	20	15	Fair	no
168	Arroyo willow (*Salix lasiolepis*)	4	15, 8, 8, 10	25	50	Good	yes
169	Arroyo willow	6	4, 5, 5, 9, 10, 13	20	40	Good	yes
170	Coast live oak	1	3	15	5	Fair	no
171	Coast live oak	1	12	25	15	Good	yes
172	Coast live oak	1	4	10	10	Good	no
173	Coast live oak	2	13, 10	15	15	Excellent	yes
174	Coast live oak	2	3, 2	10	10	Fair	no
175	Coast live oak	1	20	30	25	Good	yes
176	Coast live oak	1	12	25	20	Good	yes
177	Coast live oak	3	15, 15, 10	20	30	Excellent	yes
178	Coast live oak	1	13	15	20	Good	yes
179	Blue elderberry (*Sambucus nigra* ssp. *caerulea*)	5	17, 8, 4, 4, 4	10	20	Fair	yes
180	Coast live oak	1	11	20	20	Excellent	yes
181	Coast live oak	2	20, 20	25	20	Good	yes
182	Coast live oak	1	11	10	15	Good	yes
183	Coast live oak	1	12	15	20	Good	yes
184	Coast live oak	3	10, 10, 8	20	20	Excellent	yes
185	Coast live oak	3	10, 9, 10	25	20	Excellent	yes
186	Coast live oak	1	10	25	20	Good	yes
187	Coast live oak	1	18	20	20	Good	yes
188	Fremont cottonwood	1	4	20	10	Fair	no
189	Blue elderberry	6	7, 4, 3, 3, 4, 4	10	30	Fair	no
190	Coast live oak	2	6, 3	15	10	Good	no
191	Blue elderberry	6	3, 1, 2, 4, 1, 2	10	10	Poor	no
192	Blue elderberry	6	20, 13, 13, 13, 4, 10	20	30	Fair	yes
193	Coast live oak	1	12	20	15	Good	yes
194	Blue elderberry	4	4, 2, 1, 1	10	10	Fair	no
195	Coast live oak	1	8	15	10	Good	yes
196	Coast live oak	1	3	10	10	Fair	no
197	Catalina cherry (*Prunus ilicifolia* ssp. *lyonia*)	1	4	30	15	Good	no
198	Catalina cherry	1	3	30	15	Good	no
199	Coast live oak	1	4	10	15	Good	no
200	Coast live oak	1	5	20	10	Fair	no
201	Coast live oak	1	3	20	10	Fair	no
202	Coast live oak	1	3	25	10	Good	no

Tree ID #	Species	Number of Trunks	DBH (in)	Tree Height (ft)	Canopy Spread (ft)	Health Condition	Protected (yes/no)
203	Coast live oak	1	3	25	10	Fair	no
204	Toyon (*Heteromeles arbutifolia*)	1	6	25	25	Good	no
205	Coast live oak	1	3	25	10	Fair	no
206	Coast live oak	1	7	25	15	Good	no
207	Coast live oak	1	3	20	10	Good	no
208	Coast live oak	1	3	20	10	Good	no
209	Toyon	2	3, 1	15	15	Fair	no
210	Coast live oak	1	4	20	15	Fair	no
211	Coast live oak	1	10	30	20	Good	yes
212	Coast live oak	2	6, 7	25	20	Good	no
213	Coast live oak	1	9	25	20	Good	yes
214	Coast live oak	1	6	30	15	Good	no
215	Coast live oak	2	4, 4	15	15	Fair	no
216	Coast live oak	1	8	25	20	Fair	yes
217	Coast live oak	2	8, 2	25	20	Good	yes
218	Coast live oak	1	28	50	40	Good	yes
219	Coast live oak	1	6	25	20	Good	no
220	Coast live oak	1	13	40	30	Good	yes
221	Coast live oak	2	6, 7	15	20	Fair	no
222	Coast live oak	1	8	25	20	Fair	yes
223	Coast live oak	1	18	40	50	Good	yes
224	Coast live oak	1	12	20	15	Good	yes
225	Western sycamore (*Platanus racemosa*)	1	10	25	15	Good	yes
226	Coast live oak	3	10, 5, 6	35	30	Excellent	yes
227	Coast live oak	1	14	25	15	Excellent	yes
228	Coast live oak	1	4	15	10	Good	no
229	Coast live oak	1	5	15	15	Good	no
230	Tanoak (*Notholithocarpus densiflorus*)	1	4	10	10	Good	no
231	Coast live oak	1	4	10	10	Good	no
232	Coast live oak	6	6, 4, 4, 4, 2, 3	15	15	Excellent	no
233	Coast live oak	1	9	10	10	Good	yes
234	Coast live oak	2	22, 24	40	40	Excellent	yes
235	Coast live oak	1	20	25	25	Good	yes
236	Coast live oak	1	10	25	20	Good	yes
237	Coast live oak	1	10	35	20	Good	yes
238	Coast live oak	1	16	30	30	Fair	yes
239	Coast live oak	2	10, 15	30	20	Fair	yes
240	Coast live oak	1	12	35	25	Good	yes
241	Coast live oak	1	14	30	20	Good	yes
242	Willow	4	15, 10, 10, 4	25	25	Fair	yes
243	Willow	6	10, 10, 10, 15, 15, 4	30	30	Poor	yes

Tree ID #	Species	Number of Trunks	DBH (in)	Tree Height (ft)	Canopy Spread (ft)	Health Condition	Protected (yes/no)
244	Coast live oak	2	22, 12	30	20	Good	yes
245	Coast live oak	1	20	35	30	Good	yes
246	Coast live oak	1	18	25	20	Good	yes
247	Coast live oak	1	15	40	30	Good	yes
248	Coast live oak	1	8	36	15	Good	yes
249	Coast live oak	1	8	25	20	Good	yes
250	Coast live oak	1	8	25	15	Good	yes
251	Coast live oak	2	2, 6	20	10	Good	no
252	Coast live oak	3	4, 2, 2	15	15	Good	no
253	Coast live oak	1	15	30	30	Good	yes
254	Coast live oak	3	4, 5, 4	15	15	Good	no
255	Coast live oak	1	10	25	20	Fair	yes
256	Coast live oak	1	13	25	15	Fair	yes
257	Coast live oak	2	4, 3	10	10	Fair	no
258	Catalina cherry	1	3	15	10	Good	no
259	Coast live oak	2	8, 9	30	25	Good	yes
260	Coast live oak	2	8, 7	20	20	Good	yes
261	Coast live oak	2	18, 6	35	40	Excellent	yes
262	Coast live oak	1	16	40	40	Good	yes
263	Coast live oak	1	18	40	25	Fair	yes
264	Coast live oak	1	22	40	40	Good	yes
265	Tanoak	1	7	15	10	Good	no
266	Willow	9	10, 6, 5, 8, 3, 3, 3, 4, 4	20	30	Fair	yes
267	Willow	3	7, 6, 6	10	15	Poor	no
268	Toyon	1	12	10	15	Good	yes
269	Tanoak	1	3	15	10	Good	no
270	Coast live oak	1	8	15	15	Excellent	yes
271	Coast live oak	1	3	20	10	Fair	no
272	Coast live oak	1	9	15	15	Excellent	yes
273	Willow	2	14, 15	20	40	Fair	yes
274	Western sycamore	1	30	45	30	Good	yes

Tree ID #	Species	Number of Trees	DBH (in)	Tree Height (ft)	Total Canopy Coverage (ft)	Health Condition	
Tree Polygons							
1	Arroyo willow	5	5 to 8	20 to 30	165	Good	Yes
2	Arroyo willow	10	8 to 12	25 to 30	240	Good	Yes
3	Willow	5	5 to 7	20 to 30	270	Fair	no

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Appendix F

Ellwood Mesa/Sperling Preserve Open Space Overwintering Monarch Butterfly Survey Report 2021-2022

Ellwood Mesa/Sperling Preserve Open Space

Overwintering Monarch Butterfly Survey Report 2021-2022

April 2022

CITY OF GOLETA

Prepared by:

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1.0 INTRODUCTION

1.1 BACKGROUND

This Monarch Butterfly Survey Report is the third annual report prepared by the City of Goleta (City) to meet the goals of the Ellwood Mesa/Sperling Preserve Open Space Monarch Butterfly Habitat Management Plan (MBHMP) (City of Goleta 2019) and the reporting requirements of the California State Coastal Conservancy's (Conservancy's) and the California Coastal Commission's (CCC's) Notice of Intent to Issue Permit for a Coastal Development Permit dated October 2019. This report provides the yearly findings for monarch butterfly overwintering surveys at the City's Ellwood Mesa/Sperling Preserve Open Space conducted during the 2021-2022 overwintering season.

The population of overwintering monarch butterflies (*Danaus plexippus*) has been tracked and recorded at the Ellwood Mesa Complex during the monarch butterfly overwintering season (October 1st through March 15th) for over three decades by biologists, various volunteers, and citizen scientists. The Ellwood Mesa Complex includes eight monarch butterfly aggregation sites: Ellwood Main, Sandpiper, Ellwood West, Ellwood North, Ellwood East, Ellwood Ironbark, Ellwood Main Annex and Ocean Meadows (Figure 1). The complex originally had six aggregation sites which did not include Ellwood Ironbark and Ellwood Main Annex, first defined as such by Dr. Dan Meade in the 1999 Santa Barbara County Monarch Report (Meade 1999) and later in the Santa Barbara County Monarch Butterfly Overwintering Sites Report (Meade et al. 2018). Ellwood Main Annex and Ellwood Ironbark were added as new aggregation sites within the Ellwood Mesa Complex during the 2019-2020 overwintering season due to observations of roosting monarchs at those locations that year. Ellwood Main Annex and Ellwood Ironbark sites were not observed at the time that the MBHMP was written, so they are not shown there, but they will continue to be surveyed and reported on.

The City Council approved MBHMP (May 2019) outlines a programmatic approach and methods for the City to manage and improve the Ellwood Mesa eucalyptus forest. While the MBHMP notes that there are eight aggregation sites, only seven are technically located within the management plan area. The Ellwood East site is located outside of the management plan area but is within the contiguous eucalyptus grove. Counts were conducted at the Ellwood East site for continuity and the data is included in this report.

1.2 PURPOSE

This report provides the results of monarch surveys conducted within the MBMHP area during the 2021-2022 monarch butterfly overwintering season. The surveys were conducted as directed by Action 20-1.1 of the MBHMP. The purpose of the surveys is to monitor the monarch population and roosting locations within the MBMHP area, shown in Figure 1.

The City's MBHMP sets forth the following objectives in the Biological Monitoring Program (Program 20):

Figure 1 Ellwood Mesa MBHMP Area and Monarch 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).

The Conservancy administers State funding for the restoration of Ellwood Mesa per the MBHMP. The Conservancy approved a work program prepared by the City that describes tasks that will be completed and funded by the State. The work program states in Subtask 2.2:

> Monarch butterfly counts at the five aggregation sites will occur every two weeks during the overwintering period, October through March. Counts will follow the Xerces Society protocol for estimating number of monarch butterflies. A comprehensive survey of Ellwood Mesa eucalyptus forest will be performed once per month during the overwintering period. A report will be prepared at the end of the monarch season.

The CCC's Notice of Intent to Issue the approved Coastal Development Permit No. 4-18-1223, dated October 17, 2019 states under Special Condition 1. Final Implementation Plan, A. Prior to Issuance of the coastal Development Permit, 3.A Final Monitoring Plan that:

> The annual reports must include the Ellwood North aggregation site monarch butterfly population status/data (arrival dates, tree use, climate observations, counts, departure dates, etc.) from the ongoing Ellwood Mesa monarch butterfly monitoring program.

This report will satisfy all three agencies' reporting requirements and will be submitted to the Conservancy and the CCC.

Section 4 of this report also provides data from the prior 2020-2021 season for context. Section 5 summarizes the available monarch count data from the past, provides it in context with the 2021-2022 survey results, and discusses population trends.

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2.0 METHODOLOGY

2.1 MONARCH BUTTERFLY SURVEYS AT AGGREGATION SITES

Monarch surveys and counts were performed at the eight known aggregation sites (Figure 1) twice a month during the overwintering period, October 1st through March 15th. The counts followed the Xerces Society's protocol for estimating number of monarchs, and the *Step-by-Step Western Monarch Thanksgiving Count Monitoring Guide*. Surveys were conducted by at least two observers in early mornings while temperatures were low (typically below 55°F) and monarch butterflies were still clustered (Xerces Society 2017a). Rincon biologists Kendra Bonsall, Holly Harris, Kaitlyn Weaver, Yuling Huo, Stephanie Lopez, and Melissa Pechter performed the monarch surveys during the 2021-2022 overwintering season.

Monarchs typically roost in the upper portion of the lower third of the trees in the center of a grove of trees and they tend to select the outward reaching branches to roost. Roosting branches are commonly found over drainages, as the drainage provides an exit for cold air in extreme weather, helping to protect butterflies from freezing (Meade 2013). Monarch butterfly biologists scanned these areas with binoculars looking for roosting monarchs. When monarchs were observed, individuals were counted or estimated and recorded on a datasheet according to their behavior. Monarchs sunning/basking, flying or on the ground were counted separately from roosting monarchs. After each survey, the total number of monarchs observed, including monarchs clustered, fliers, loners, sunners, and grounders were tallied. Mortalities were counted separately and not included in the total count. Cluster locations, defined as more than two adjacent butterflies with closed wings, were recorded and included details of the tree species, tree number (if applicable), cluster height in the tree, orientation of the clusters, and number of clusters in that specific tree (Xerces 2017a). The date and time of the survey, and the weather conditions were also recorded.

2.2 FOREST-WIDE SURVEYS

The health of eucalyptus forest of Ellwood Mesa has declined since 2011 and, as a result, the quality and composition of the grove has changed. In order to determine if monarchs are overwintering at sites other than those observed in the past, biologists scanned the grove for suitable habitat and flying or roosting monarchs while walking between survey sites. Biologists used binoculars to scan throughout the eucalyptus forest for roosting monarchs with a focus on areas with suitable habitat structure (tall trees and dense canopy with an open interior). No new locations of roosting monarchs were observed during the 2021-2022 survey season.

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3.0 RESULTS AND DISCUSSION

3.1 2021-2022 SURVEYS

The monarch butterfly survey results are presented in Table 1 for the 2021-2022 overwintering season. The totals include monarchs clustered, fliers, loners, sunners, and grounders. Mortalities are not included in the survey results.

During this year's overwintering season, the highest monarch count throughout the entire Ellwood Mesa was 15,055 monarchs on December 15, 2021, with 4,719 monarchs observed at Ellwood Main, 8,900 monarchs observed at Ellwood East, 1,435 monarchs observed at Ellwood West, and 1 monarch observed at Ocean Meadows. The lowest monarch count for the 2021-2022 overwintering season was recorded on March 15, 2022, where two fliers were observed at Ellwood North (Table 1). This trend is typical for monarch counts to decrease towards the end of the overwintering season (late February/early March) as they begin to disperse out of the overwintering area after mating (Meade 2013).

The surveys recorded monarchs roosting at 4 of the 8 previously known monarch overwintering sites in the Ellwood Mesa eucalyptus grove: Ellwood Main, Ellwood East, Ellwood West, and Sandpiper. Figure 2 shows the cluster locations at the 4 sites, where the cluster were typically within approximately 150 feet of each other (Figure 2). Ellwood East contained the highest number of monarchs out of the 8 aggregation sites. The peak monarch count at Ellwood East was 11,840 monarchs observed on January 17, 2022 compared to Ellwood Main which had the highest monarch count of 4,719 on December 15, 2021. Ellwood West had a peak observation count of 2,564 on December 1, 2021, and Sandpiper had a peak observation count of 346 on November 15, 2021. All monarchs observed at Ellwood North, Ellwood Main Annex and Ocean Meadows were flying but not roosting. No monarchs were observed at Ellwood Ironbark for the duration of the overwintering season (Table 1). Less than 50 mortalities were recorded throughout the Ellwood Mesa eucalyptus grove during this year's overwintering season.

The 2021-2022 year's numbers are significantly higher than the previous year when the peak monarch count was five individuals observed at the Ellwood Main aggregation site. Ellwood Main has consistently been the highest populated aggregation site in the Ellwood Complex even as the population fluctuated yearly. However, Ellwood East was the highest populated aggregation site during this year's surveys. The peak monarch count at Ellwood East was 11,840 compared to the peak monarch count at Ellwood Main of 4,719. The 2021-2022 numbers are higher than all historical monarch counts at the Ellwood Mesa since 2018. Seasons in 2018-2020 saw the lowest counts ever recorded at Ellwood Mesa. See Section 3.2 Past Seasons for more details. The increase at Ellwood during this overwintering season is consistent with that observed at other sites in central and southern California (Xerces Society 2022a). However, compared to historical data prior to 2010 when monarch counts reached upward of 50,000, the 2021-2022 monarch numbers are still low.

Table 1. Monarch Butterfly Survey Results, 2021-2022

Monarch Counts	10/15/2021	10/18/2021	11/1/2021	11/2/2021	11/15/2021	12/1/2021	12/15/2021	1/4/2022	1/17/2022	2/1/2022	2/15/2022	3/1/2022	3/15/2022
Ellwood Main	-	0	6*	295	3,874	2,719	4,719	3,378	250	0	0	0	0
Ellwood East	-	0	18	-	4,292	3,645	8,900	10,714	11,840	9,555	1	1	0
Ellwood West	1	-	-	36	1,551	2,564	1,435	50	3	0	0	3	0
Ellwood North	6	-	-	14	6	3	0	0	0	0	3	16	2
Sandpiper	18	-	-	129	346	5	0	0	0	0	0	20	0
Ellwood Ironbark	3	-	-	0	0	0	0	0	0	0	0	0	0
Ellwood Main Annex	-	0	0	-	0	0	0	0	0	0	0	5	0
Ocean Meadows	-	1	0	-	1	0	1	0	0	0	0	0	0
Subtotal	**28**	**1**	**24**	**474**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Total	**29**		**498**		**10,070**	**8,936**	**15,055**	**14,142**	**12,093**	**9,555**	**4**	**45**	**2**

* Eastern portion of Ellwood Main (outside of historic aggregation site).

Figure 2 2021-2022 Monarch Butterfly Aggregation Locations



The MBHMP will be implemented to restore monarch habitat in the hopes that the species will return to Ellwood Mesa to roost. Changes in the habitat characteristics within the grove and the potential corresponding change in site selection for roosting monarchs indicate that it will be important to continue to monitor the entire grove for overwintering monarchs. The next section discusses past seasons and possible reasons for the increase in monarch populations this year.

3.2 PAST SEASONS

Surveys for overwintering monarch butterflies have been conducted at Ellwood Mesa for over three decades. Starting in 1989, surveys were conducted and data collected by biologist Dr. Daniel E. Meade (Althouse and Meade), specializing in monarch butterflies. In 1997, volunteers with the Western Monarch Thanksgiving Count (WMTC) began collecting population estimates at Ellwood Mesa aggregation sites. WMTC is a volunteer effort to survey the monarch aggregation sites along the California coast during a 3-week period around Thanksgiving using a standard protocol method (Xerces Society 2017a). Later, the City docents in the Monarch Butterfly Docent Program and monarch butterfly biologist, Charis van der Heide (formerly of Rincon Consultants), conducted surveys of the monarch population. Data regarding overwintering observations on Ellwood Mesa is tracked by the City and shared with the WMTC.

The Ellwood Mesa Complex has been included in the WMTC since the organization's inception in 1997. Figure 3 shows WMTC data. The Ellwood Main aggregation site has been consistently counted, while the other sites in the complex have been counted periodically. WMTC data for Ellwood Mesa shows interesting trends in the population at each site. If we assume that the monarchs are expressing a habitat preference with their individual presence at a particular site, we can infer the comparative quality of the sites at Ellwood Mesa from these data. Figure 3 shows available data at each of six sites since 1997.

Ellwood Main has consistently been the highest populated aggregation site in the Ellwood Complex even as the population fluctuated yearly, and one of the largest sites in California until recent years. Ellwood Main is so named because this site held the most aggregating monarchs for decades. As shown on Figure 3, upwards of 50,000 monarchs have been observed in this location in the past. Figure 4 shows the population trend at Ellwood Main from 1989 to 2021. This graph shows the peak count recorded at Ellwood Main for each year and the natural fluctuations of the population over the years. Monarch counts at Ellwood Main have displayed a declining trend since 2010.

This year's WMTC shows an increase in monarch counts at Ellwood Main, Sandpiper, Ellwood West, and Ellwood East compared to last year's WMTC. However, the monarch counts remained low at all aggregation sites in comparison to counts conducted prior to 2012, where monarch numbers reached upwards of 50,000 at Ellwood Main (Figure 4). Ellwood East had the highest count recorded during this year's WMTC. The 2020-2021 data had roosting at 2 of the 8 aggregation sites (Ellwood Main and Ellwood East) compared to this year's data which had roosting at 4 of the 8 aggregation sites (Ellwood Main, Ellwood East, Ellwood West, and Sandpiper).

Figure 3 WMTC Data for Ellwood Mesa Complex

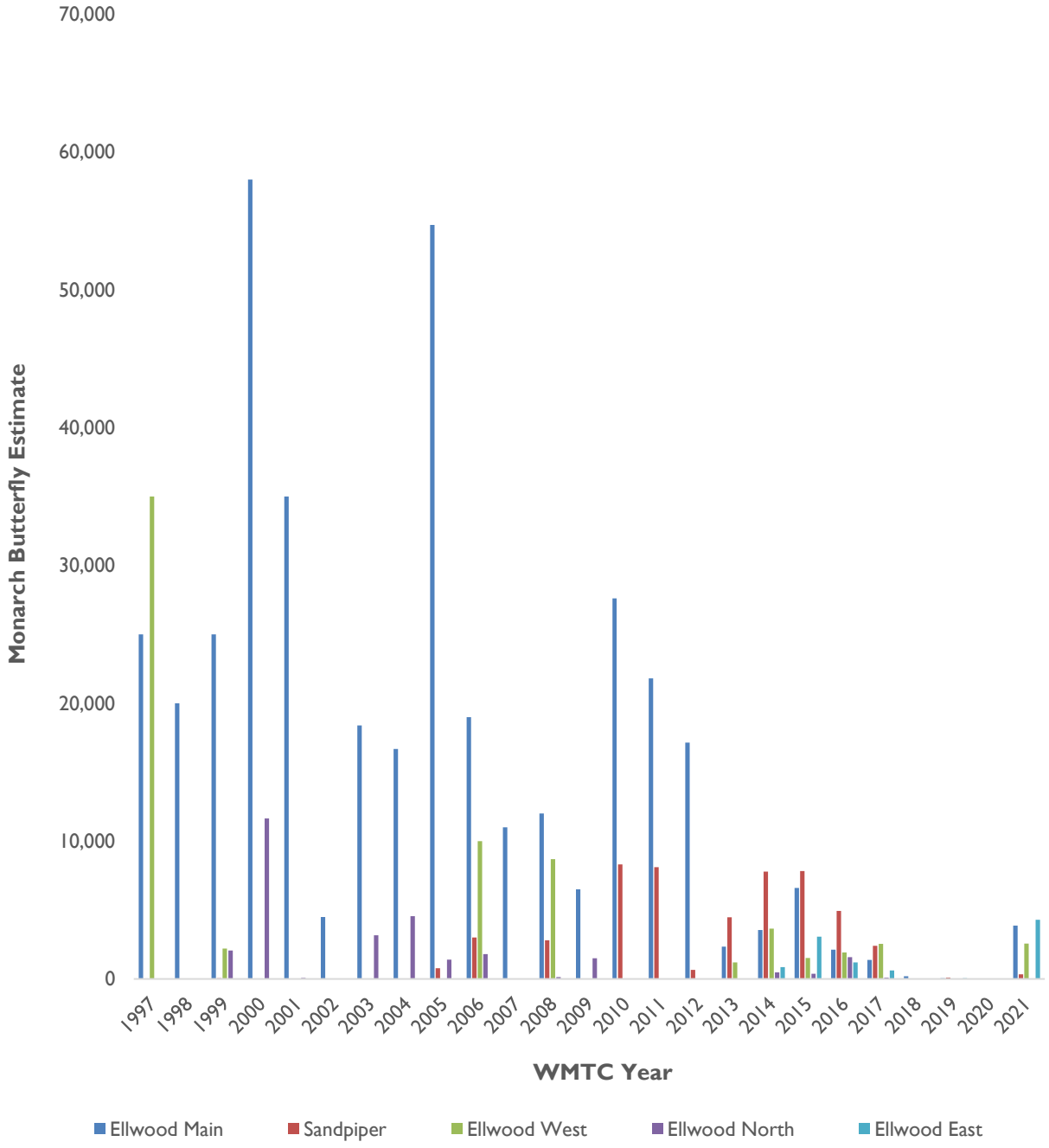
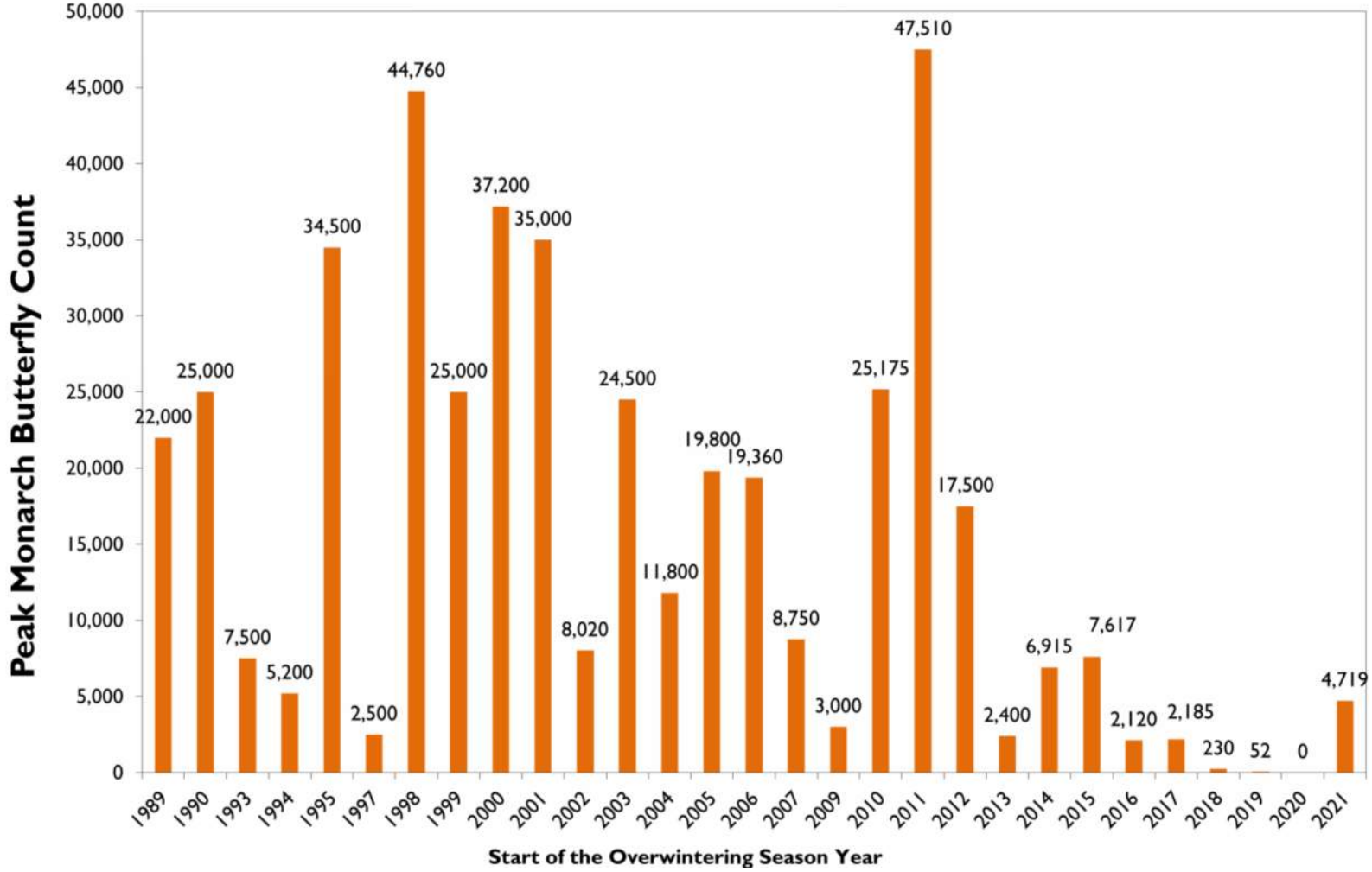


Figure 4 Monarch Butterfly Peak Population Graph at Ellwood Main, 1989-2021



Source: Data from Daniel Meade (1989-2014) and Charis van der Heide (2015-2020) and managed by the City (City of Goleta 2021)

The increase in monarch butterfly population observed at the Ellwood Mesa during the 2021-2022 overwintering season may reflect good habitat conditions and abundant milkweed (Meade 2013). Another possible reason for this year's increase is the lack of smoke from wildfires in the area compared to previous seasons. Natural factors, such as wildfires, severe storms, or diseases of trees, can alter the structure and microclimate of an overwintering site and reduce its suitability for monarchs (Jepson et al. 2015; Sakai & Calvert 199). The past seasons have seen increases in wildfires across California, including the Whittier and Thomas Fires in 2017 and the Cave Fire in 2019 in Santa Barbara County. The wildfires could have affected populations of overwintering monarchs due to the excessive amount of smoke within the Ellwood Mesa eucalyptus grove.

Despite the general uptick in monarch counts for the 2021-2022 overwintering season, the monarch counts remain drastically low compared to previous years when numbers reached upwards of 50,000 at Ellwood Main (Figure 4). The region has experienced a below average rainfall since 2013, with the exception of the average rainfall in 2016 (SBC 2022). Trees at Ellwood Main have suffered from drought stress and loss of canopy. The combination of lack of rain and drought stress/loss of canopy within the eucalyptus groves over the past years is an indication that the habitat quality continues to decrease at the Ellwood Main site and throughout the Ellwood Mesa. Other threats to the monarch habitat include pests, such as the eucalyptus longhorn borers (family Cerambycidae) and eucalyptus tortoise beetles (family Chrysomelidae). These pests attack eucalyptus causing severe damage to the trees. Eucalyptus experiencing dying limbs and drought stress are especially susceptible to pest attacks (Millar et al. 2009). Additional factors that disrupt monarch butterfly populations include climate change (Oberhauser et al. 2003, Walther et al. 2002), overwintering habitat loss (University of Kansas 2008), and habitat loss that reduces host plant abundance (Monarch Watch 2008, Brower et al. 2006). Although it is difficult to distinguish the exact reasons for declines, it is suspected that it's likely due to a combination of these factors.

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4.0 CONCLUSION

The monarch butterfly population in Ellwood Mesa has fluctuated as shown in Figure 3 and Figure 4, and has declined steeply since 2012. This year's survey counts showed an increase in monarch butterfly populations at 4 aggregation sites (Ellwood Main, Ellwood East, Ellwood West, and Sandpiper) compared to previous year's surveys. Monarch counts were the highest at the Elwood East aggregation site during the 2021-2022 overwintering season. Statewide, a total number of 247,237 monarchs were reported during the 2021 Thanksgiving count, compared to 1,899 monarchs during last year's Thanksgiving count (Xerces 2022a, Xerces 2022b).

Despite the increase in monarch counts statewide this year, migratory population of western monarchs has undergone a dramatic decline. Although it is difficult to distinguish the exact reason for the monarch butterfly decline, it is suspected that a combination of factors cause the decline, including but not limited to, loss of overwintering and breeding habitat, pesticides, increased temperatures, loss of nectar resources, and disease (Xerces 2017b). Natural factors such as wildfires could affect monarch butterfly populations in California, as well. Immediate support that includes restoration of aggregation sites (e.g., planting milkweeds and nectar plants) is needed to continue to increase the western monarch butterfly populations.

Monarch butterflies are a highly mobile species and are actively seeking out suitable aggregation habitat to protect themselves for the length of the overwintering season and during inclement weather. Their movements, and presence and absence can reveal areas where habitat enhancement and restoration would be beneficial. The habitat quality on Ellwood Mesa has declined significantly for aggregating monarchs due to the die off of the eucalyptus trees that comprise their habitat and as a result of prolonged drought and climate change. Future actions guided by the MBHMP need to be implemented to improve the monarch aggregation habitat on Ellwood Mesa and help to sustain this species. The City is implementing a State funded grant, administered by the Conservancy, to enhance monarch habitat at Ellwood Mesa by preparing applications and biological studies for submission to regulatory agencies. The city has also submitted a grant application to CAL FIRE for funding to reduce the high fire risk of the eucalyptus forest. The City is preparing to conduct restoration and habitat enhancement activities on site in 2022, pending approval from regulatory agencies.

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Appendix G

MBHMP Final Initial Study – Mitigated Negative Declaration (State Clearinghouse [SCH] No. 2019011059



Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan

Final Initial Study – Mitigated Negative Declaration

prepared by

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Anne Wells, Advance Planning Manager

prepared with the assistance of

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March 2019

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers
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Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan

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March 2019

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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.

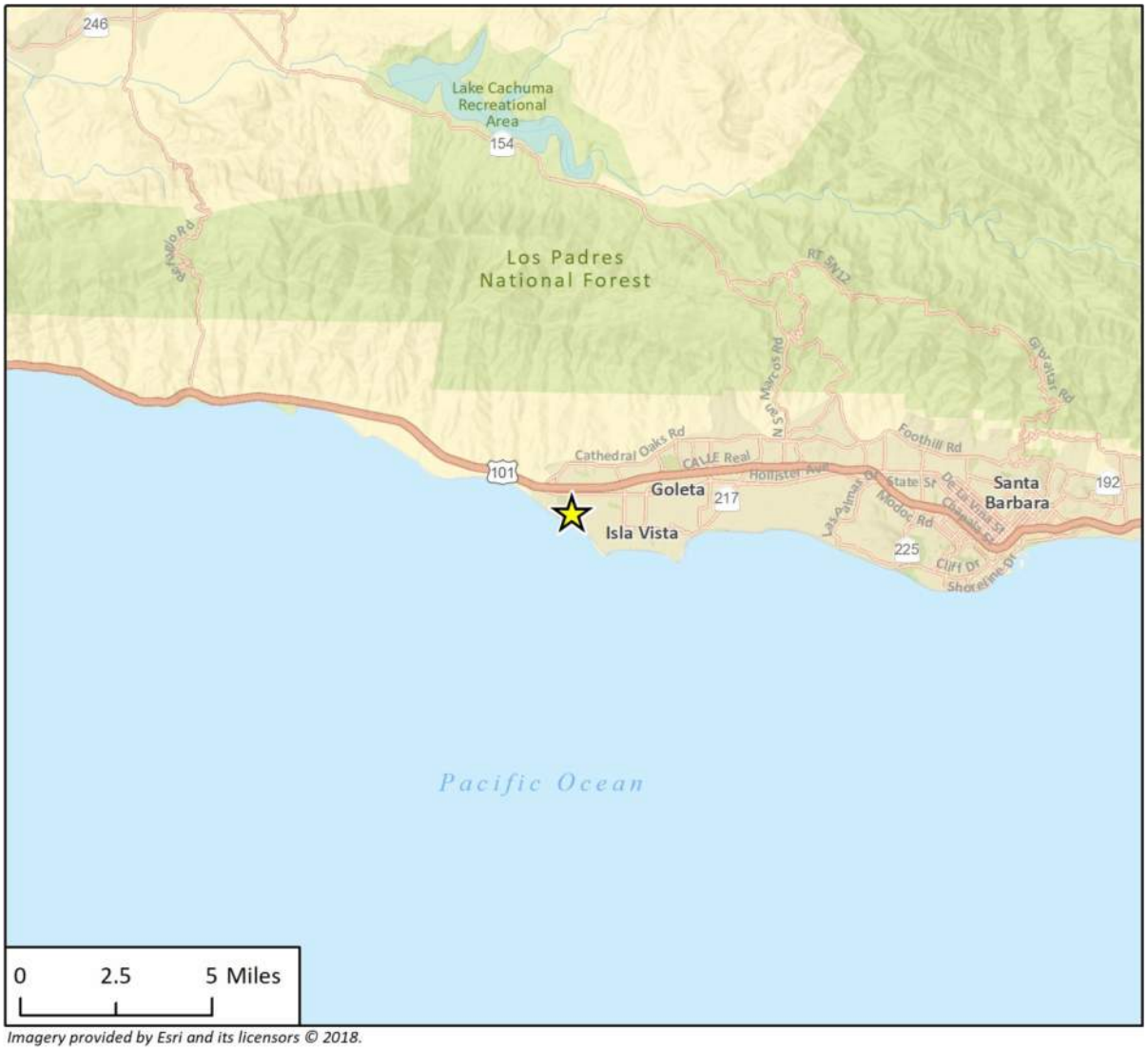
5. Project Sponsor's Name and Address

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



Imagery provided by Esri and its licensors © 2018.

MBHMP Location

N



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.

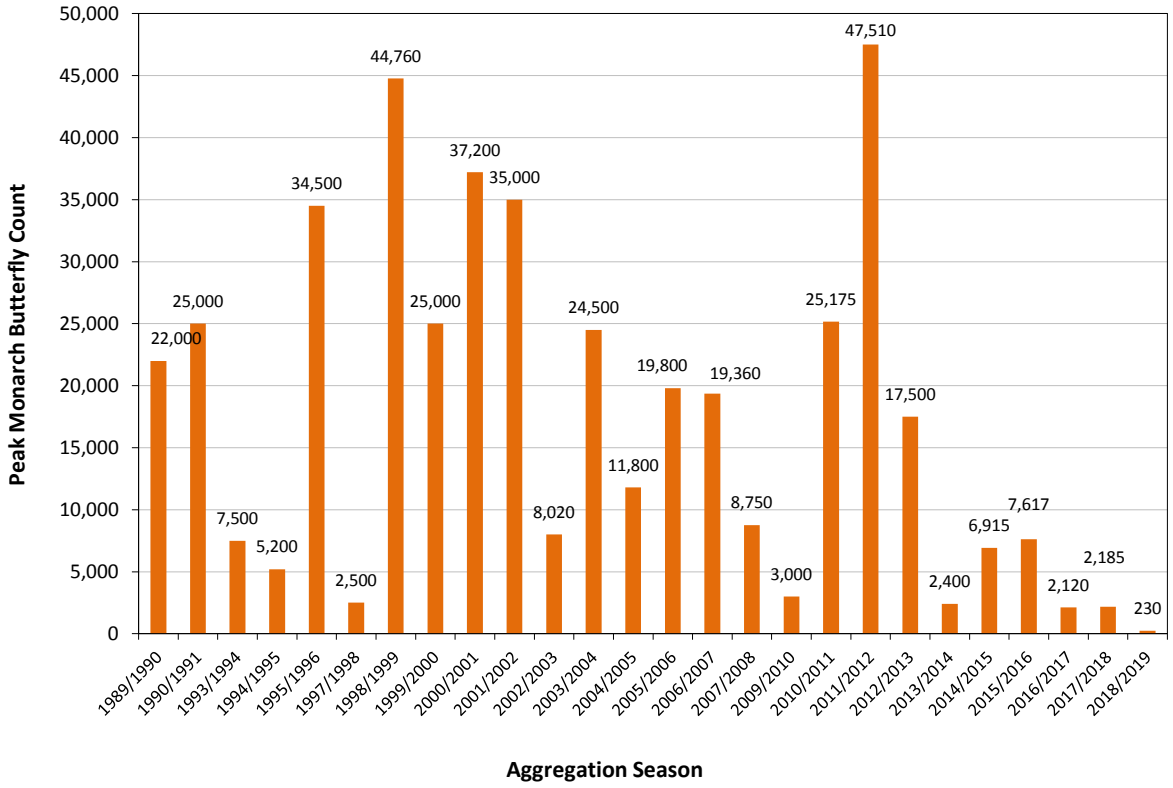
The City Council adopted the Community Wildfire Protection Plan (CWPP) in March 2012 to enhance the City's wildlife protection by identifying key hazard treatments that are in balance with sustainable ecological management and fiscal resources (City of Goleta 2012). The CWPP covers the city of Goleta, 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.

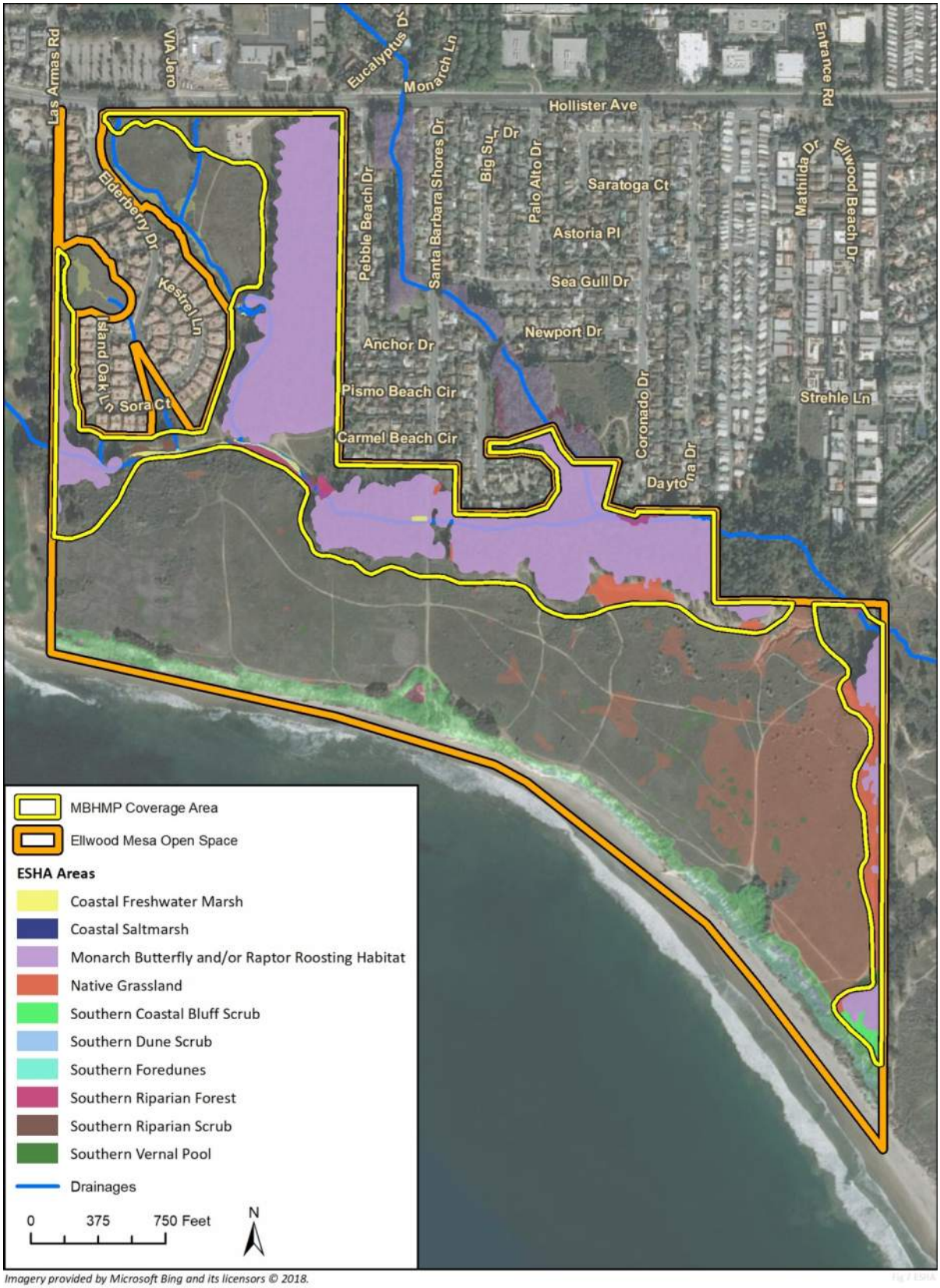
Table 3 Habitat Types in the Coverage Area with Current Classification

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

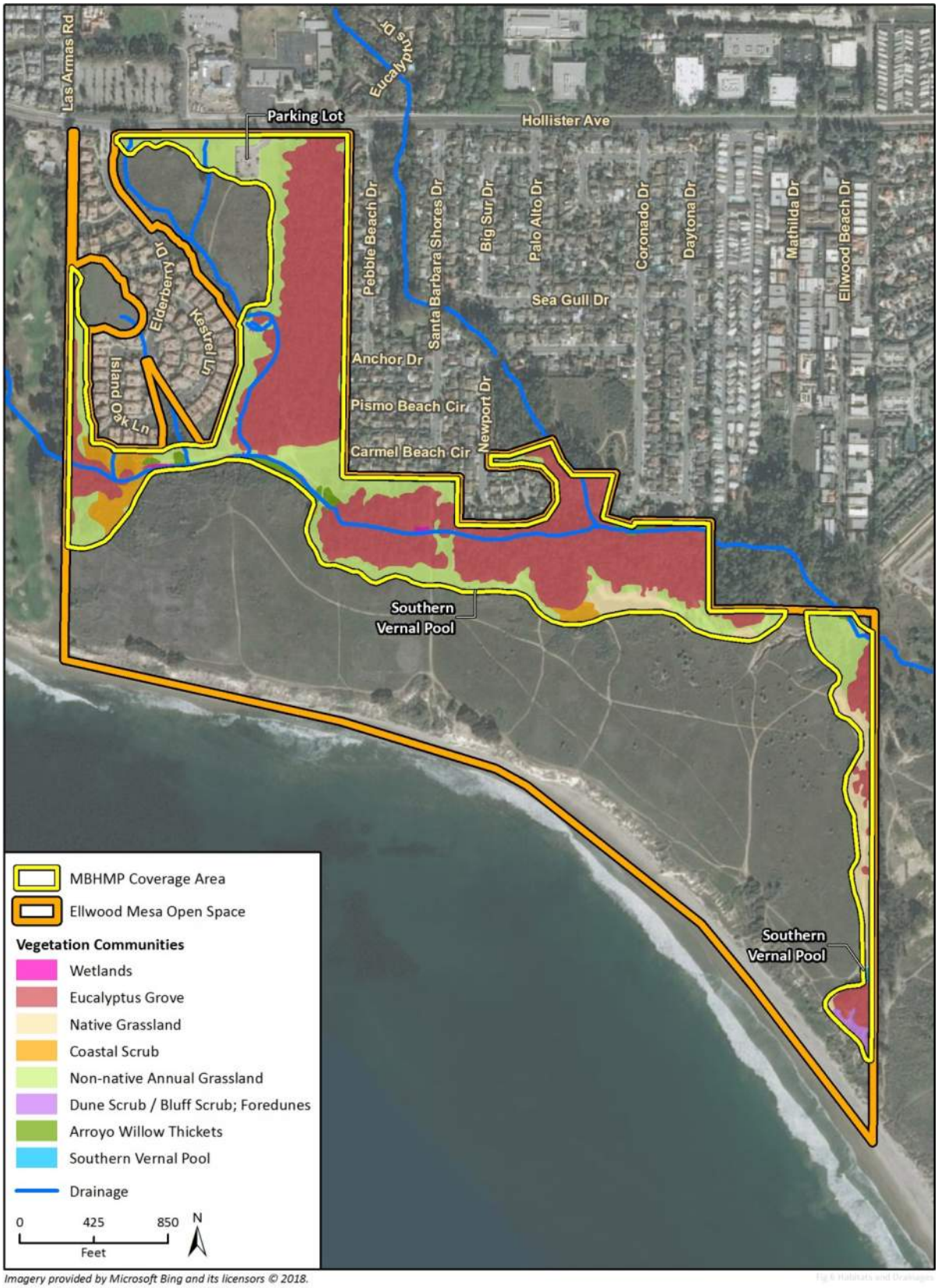
The approximate distribution of these habitats in the Coverage Area, based on the February 2018 survey and review of previous habitat mapping, is shown in Figure 7. The current condition of habitats in the Coverage Area is described below and depicted in site photographs presented as Photographs 3 through 6 in Figure 8.

Figure 6 Environmentally Sensitive Habitat Areas



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Figure 7 Drainages and Vegetation Communities



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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

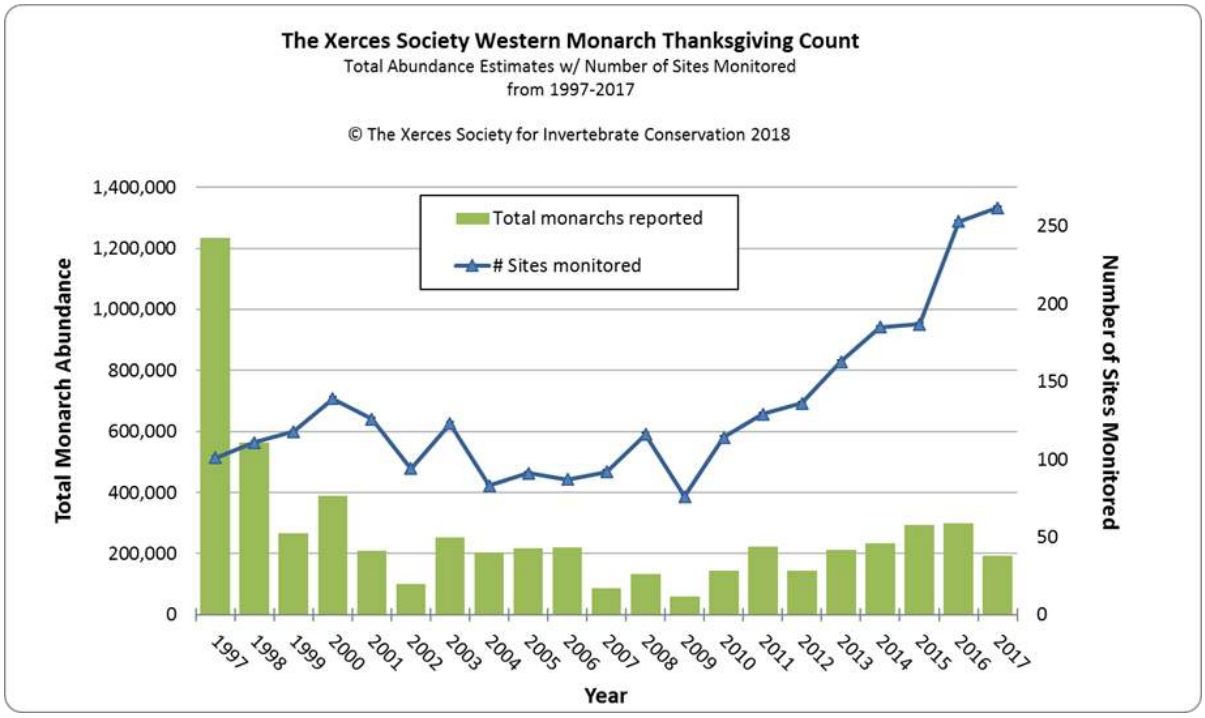
Monarch Butterfly

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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Appendix H

MBHMP IS/MND Appendix D - Mitigation and Monitoring Plan

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			

Appendix I - Jurisdictional Delineation Report



Ellwood Mesa/ Sperling Preserve Monarch Butterfly Habitat Management Plan Implementation – Phase 1

Jurisdictional Delineation Report

prepared for

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February 2023

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1 Introduction

This report has been prepared by Rincon Consultants, Inc. (Rincon) to assist the City of Goleta (City) with the planning of the Ellwood Mesa Sperling Preserve Monarch Butterfly Habitat Management Plan Implementation – Phase 1 (project), and for use by the United States Army Corps of Engineers (USACE) to confirm extent of potential jurisdiction pursuant to Section 404 of the federal Clean Water Act (CWA), the Central Coast Regional Water Quality Control Board (RWQCB) to confirm extent of potential jurisdiction pursuant to Section 401 of the CWA and the Porter-Cologne Water Quality Control Act, the California Department of Fish and Wildlife (CDFW) to confirm extent of potential jurisdiction pursuant to California Fish and Game Code (CFGC) Section 1600 et seq, and the California Coastal Commission (CCC) to confirm extent of coastal wetlands pursuant to the California Coastal Act (CCA). For the purpose of this report, the Monarch Butterfly Habitat Management Plan (MBHMP) area plus a 100-foot buffer is collectively referred to as the study area.

The MBHMP was approved by the City Council in 2019. The project includes improvements to wildlife habitat, reduction of wildfire risk, invasive plant management, trail maintenance and improvements, signage, drainage improvements, and various other stewardship actions. Specifically, the project involves habitat enhancements (site preparation, removal of downed and dead eucalyptus trees, eucalyptus tree replacement, nectar and native vegetation plantings, temporary irrigation, sourced plant materials, and seed storage and propagation) and public access and trail improvements (viewing areas repair and enhancement, trail improvements, signage program, emergency/maintenance road repairs, footbridge replacement, open space accessories, and culvert and drainage repairs).

This Jurisdictional Delineation (JD) identified 11 features (i.e., Devereux Creek, eight unnamed ephemeral drainages, and two coastal wetlands) that are potentially subject to USACE, RWQCB, and CDFW jurisdictions and City/CCC wetlands policies. The findings and conclusions presented in this report, including the location and extent of areas potentially subject to regulatory jurisdictions, represent the professional opinion of the consultant biologists. These findings and conclusions should be considered preliminary and at final discretion of the resource agencies.

1.1 Project Location

The project is located 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), in the City of Goleta, Santa Barbara County, California (Figure 1 and Figure 2). More specifically, the project is entirely within the Ellwood Mesa/Sperling Preserve Open Space (Ellwood Mesa Open Space), a 137-acre open space area located on Ellwood Mesa. The approximate center of the project 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 (USGS 2022a), and is located within Township 4 North, Range 29 West, Sections 14, 15 and 23 (San Bernardino base and meridian, Earthpoint 2022). The Pacific Ocean is less than 200 feet to the south from the southeastern corner of the project and the Santa Ynez Mountains are approximately 3.5 miles to the north.

The project is in the Santa Ynez – Sulphur Mountains subsection of the Southern California Coast (USFS 2011), an ecological sub-unit that extends from the mouth of the Santa Ynez River 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 form relatively steep hillsides vegetated 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 project is on the coastal plain between the southern foot of the mountains and the Pacific Ocean.

Devereux Creek bisects the project site in a generally east to west trajectory, is associated with the arroyo willow riparian corridor, and is part of an Environmentally Sensitive Habitat Area, along with eight other habitat types shown in the Habitat Types and Biological Resources Impact sections below.

Ten unnamed ephemeral drainages and two coastal wetlands that are potentially subject to federal and state regulations including United States Army Corps of Engineers, Regional Water Quality Control Board, The CCC/City, and California Department of Fish and Wildlife are present within the project site. These jurisdictional waters along with the eucalyptus grove support habitat that is key for monarch butterflies and other wildlife movement; however, the project is not located within an *Essential Connectivity Area*, as determined by the California Essential Habitat Connectivity Project. Ellwood is part of the Goleta Coast Important Bird Area, considered to be globally important due to its location on the Pacific Flyway.

Ellwood Mesa Open Space

Ellwood Mesa is a City-owned open space area on the coastal bluffs between Sandpiper Golf Club and UCSB. The current configuration of Ellwood Mesa Open Space was formed in 2004 when private development rights were 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).

1.2 Project Description

The City will implement Phase 1 of the MBHMP to manage and improve the Ellwood Mesa eucalyptus forest for the benefit of the overwintering monarch butterfly (*Danaus plexippus*), other wildlife, and for the public’s use and enjoyment. Phase 1 of the MBHMP will implement 20 of the 22 programs outlined in the MBHMP. 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.

Over the past several years the City and its team of consultants have conducted focused studies of Ellwood Mesa, specifically the eucalyptus grove and trees that comprise the monarch overwintering habitat, to determine an enhancement approach that will address the immediate concerns of high fire risk and the rapidly declining characteristics of the monarch overwintering sites. Phase 1 addresses implementation of the MBHMP at four aggregation sites in Ellwood Mesa (referred to as the Ellwood Complex per the Goleta General Plan/Coastal Land Use Plan (GP/CLUP): Ellwood North, Ellwood Ironbark, Ellwood West, and Ellwood Main.

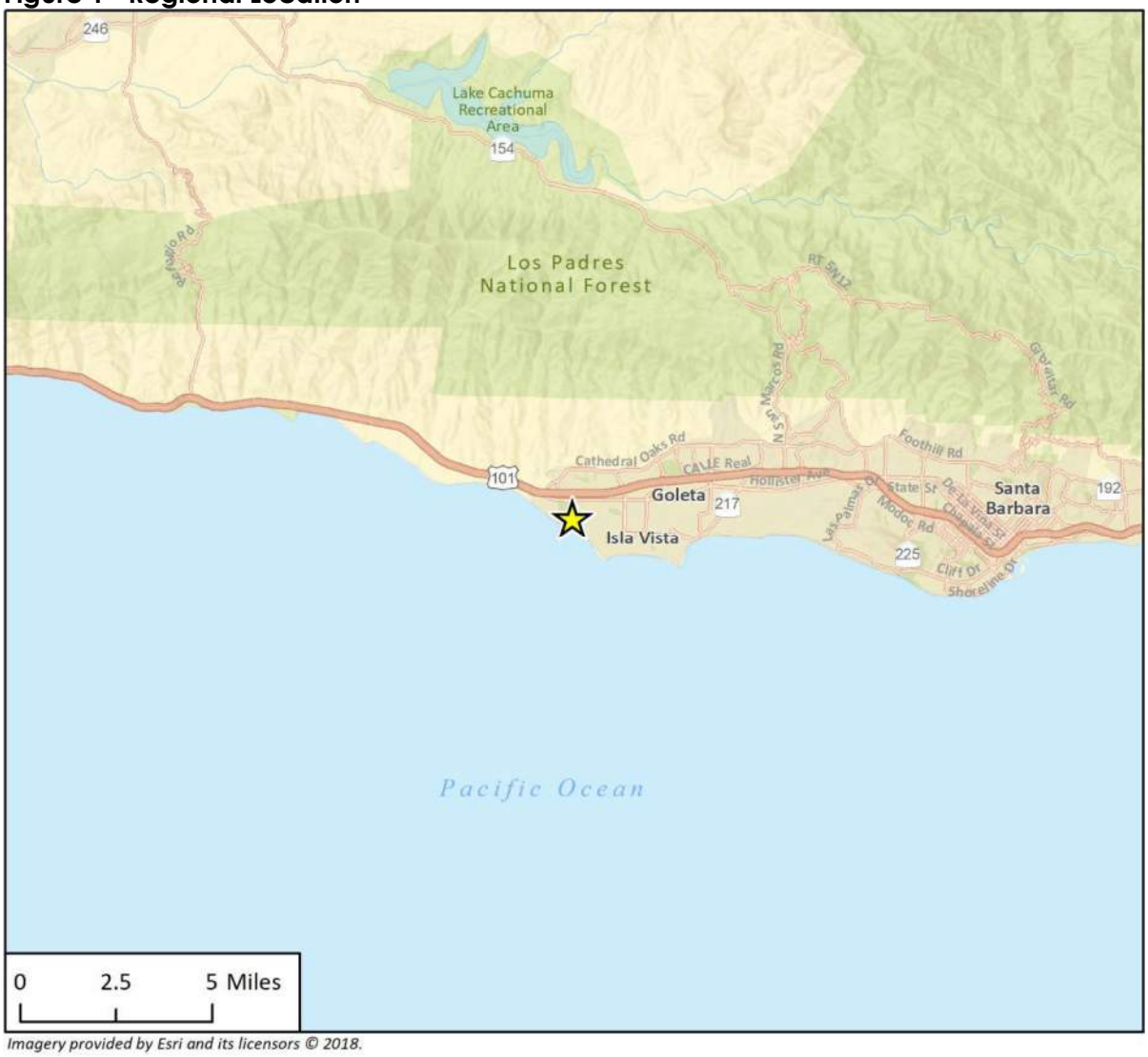
Two types of activities will occur in Phase 1:

1. Habitat enhancement of the management area. Habitat enhancement will include strategic planting of trees for monarch roosting, specific tree planting to create a wind break around roosting sites, planting of nectaring vegetation for monarchs, and planting of native vegetation for other wildlife and the overall habitat health of the complex.
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, installation of three culverts to improve site drainage near trails, improvements to the two viewing areas at Ellwood Main, and way-finding signage.

All activities planned in Phase 1 were considered in the Initial Study/Mitigated Negative Declaration (IS-MND) for the MBHMP.

The project site is a portion of the Monarch Butterfly Habitat Management Plan area. This report describes aquatic resources within the entire Monarch Butterfly Habitat Management Plan Phase 1 area plus a 100-foot buffer (the study area), however impact analysis is limited to the MBHMP Phase 1 project area, which is where the activities that the City of Goleta is proposing at this time will occur over the next 1 to 2 years. The study area consists of a large eucalyptus grove that provides habitat to four overwintering sites of Monarch butterflies, raptor and wildlife habitat, riparian habitat, and native grasslands and shrublands.

Figure 1 Regional Location



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MBHMP Location

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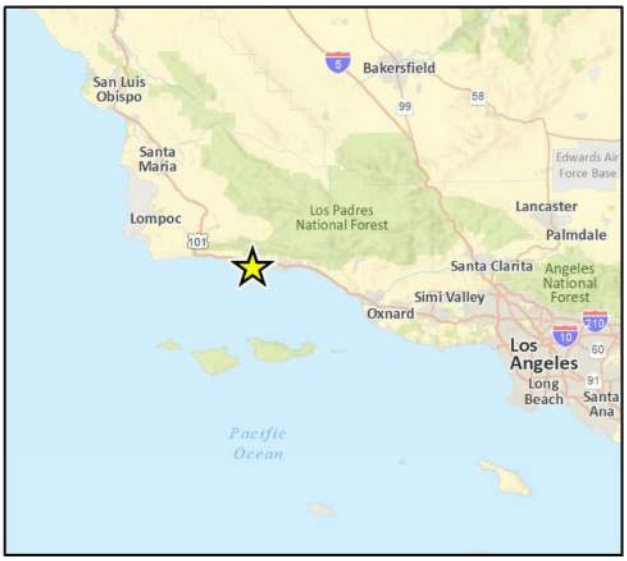


Figure 2 Project Location



2 Methodology

The JD included a literature review of existing studies, maps, and other publications. After completion of the literature review, a field delineation was conducted to identify, describe, and map all potential jurisdictional waters within the study area. The JD was conducted in accordance with USACE, RWQCB, CDFW, and CCC procedures, as outlined below. For a more detailed description of the applicable jurisdictional regulations, see Appendix A. In addition, vegetation communities and land covers were mapped (Section 3.4), a plant list was compiled (Appendix B), representative site photographs were taken (Appendix C), and wetland determination data forms were completed (Appendix D) as further described below.

2.1 Literature Review

Prior to the field survey, Rincon reviewed the results of previous biological surveys conducted by Rincon in the study area, aerial imagery (Google Earth Pro 2022) depicting the study area, the *Dos Pueblos Canyon, California* USGS 7.5-minute topographic quadrangle (USGS 2022a), and the Web Soil Survey (United States Department of Agriculture, Natural Resources Conservation Service [USDA, NRCS] 2022a) to better characterize the site and its surroundings from a hydrologic and geologic/topographic perspective. The GP/CLUP were referenced to determine the extents of Environmentally sensitive habitat areas (ESHA) mapped in the study area.

Additionally, the National Wetlands Inventory (NWI) (United States Fish and Wildlife Service [USFWS] 2022) and the National Hydrography Dataset (NHD; USGS 2022) were reviewed to determine if any wetlands or other waters were previously documented and mapped in or near the study area. The National Hydric Soils List by State (USDA, NRCS 2022b) was also reviewed to determine if any soil map units mapped in the study area are classified as hydric.

2.2 Field Delineation

A jurisdictional delineation survey was conducted within the central portion of the study area on October 5, 2021 by Rincon Senior Biologist Robin Murray and Associate Biologist Yuling Huo and on December 10, 2021 by Robin Murray and Rincon Biologist Kendra Bonsall. On February 4 and 7, 2022, Robin Murray and Rincon Biologist Carolyn Welch surveyed the remainder of the study area. Additional investigation was conducted by Robin Murray on May 31 and November 2, 2022.

Surveys were conducted on foot for potential wetlands and non-wetland aquatic resources that might exhibit an ordinary high water mark (OHWM) and/or bed and bank that might constitute waters of the United States (U.S.), CDFW-jurisdictional streambeds, waters of the State, and/or coastal wetlands. During the field delineation, general site characteristics were noted and vegetation present on site was documented. Current federal and state policies, methods, and guidelines were used to identify and delineate potential jurisdictional areas, as described below in detail. Data collection points in the study area were focused on areas containing a potential waterway and were chosen as best representation of the conditions at the study area.

Non-Wetland Waters of the U.S.

The lateral limits of United States Army Corps of Engineers (USACE) jurisdiction (i.e., width) of non-wetland waters were determined by the presence of physical characteristics indicative of the OHWM. The OHWM was identified in accordance with the applicable Code of Federal Regulations (CFR) sections (33 CFR 328.3 and 33 CFR 328.4) and Regulatory Guidance Letter 05-05 (USACE 2005), and in reference to various relevant technical publications, including, but not limited to: *Review of Ordinary High Water Mark Indicators for Delineating Arid Streams in the Southwestern United States* (USACE 2004), *Distribution of OHWM Indicators and Their Reliability in Identifying the Limits of "Waters of the United States" in Arid Southwestern Channels* (USACE 2006), and *A Field Guide to Identification of the OHWM in the Arid West Region of the United States* (USACE 2008b). The regulations were also reviewed in the determination of non-jurisdictional features including ephemeral drainages, artificially irrigated areas, and roadway ditches excavated in uplands.

Rincon biologists evaluated sources of water, potential connections, distances to traditional navigable waters (TNW) and streams that are perennial or intermittent in nature, and other factors that affect whether waters qualify as "waters of the United States" under the current USACE regulations (33 CFR 328.3) and the *Rapanos Guidance Memorandum* (USACE and USEPA 2008). A more detailed regulatory definition of USACE jurisdiction is provided in Appendix A.

Wetland Waters of the U.S.

Potential wetland features were evaluated for presence of wetland indicators including a predominance of hydrophytic vegetation, hydric soils, and wetland hydrology, according to routine delineation procedures in the Wetlands Delineation Manual (Environmental Laboratory 1987) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008a). The USACE *Arid West 2020 Regional Wetland Plant List* was used to determine the wetland status of the examined vegetation by the following indicator status categories: Upland (UPL), Facultative Upland (FACU), Facultative (FAC), Facultative Wetland (FACW), and Obligate Wetland (OBL) (USACE 2020). Representative sample points were sited in areas most likely to exhibit wetland characteristics (i.e., those with a prevalence of hydrophytic vegetation and suitable landform) and examined in the field for potential wetland indicators.

In total, five sample points were evaluated in the study area. Three sample points were located in areas with an abundance of hydrophytic vegetation and the presence of wetland hydrology indicators. Two additional sample points were evaluated in uplands adjacent to wetland waters to delineate the boundary of the jurisdictional area.

Waters of the State

The limits of "waters of the State," as defined under the Porter-Cologne Act, are any surface water or groundwater, including saline waters, within the boundaries of the state. This limit was delineated coterminous with the boundary of CDFW jurisdictional streambeds (i.e., extending to the outer limit of riparian vegetation, where present, or the tops of banks).

Potential State wetland features were evaluated pursuant to the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*. The SWRCB's definition relies on the same three parameters as the USACE definition (hydrophytic vegetation, wetland hydrology, and hydric soils) but allows for naturally unvegetated areas meeting the other two parameters to be considered wetlands. A more detailed regulatory definition of Regional Water Quality Control Board (RWQCB) jurisdiction is provided in Appendix A.

CDFW Streambeds

The extent of potential streambeds, streambanks, and riparian habitat subject to CDFW jurisdiction under Sections 1600 et seq. of the CFGC was delineated by reviewing the topography and morphology of potentially jurisdictional features to determine the outer limit of riparian vegetation, where present, or the tops of banks for stream features. A more detailed regulatory definition of CDFW jurisdiction is provided in Appendix A.

Coastal Wetlands

Under the California Coastal Act (California Public Resources Code Sections 30000 et seq.), the CCC oversees development within California's Coastal Zone. The Coastal Zone in each coastal county was mapped following passage of the Coastal Act and extends generally 1,000 yards inland from the mean high tide line, though this distance varies from a maximum of five miles in significant coastal estuarine, habitat, and recreational areas to less than 1,000 yards in developed urban areas. The Coastal Act grants special protection to wetlands in the Coastal Zone, and protects these areas from dredging, diking, or filling except under very limited circumstances. Section 30121 of the California Coastal Act defines the term "wetland" as:

> *"Lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens."*

This definition is clarified by Coastal Commission regulations at 14 CCR 13577(b), which state in part:

> *…the upland limit of a wetland shall be defined as:*
>
> *(A) the boundary between land with predominantly hydrophytic cover and land with predominantly mesophytic or xerophytic cover;*
>
> *(B) the boundary between soil that is predominantly hydric and soil that is predominantly nonhydric; or*
>
> *(C) in the case of wetlands without vegetation or soils, the boundary between land that is flooded or saturated at some time during years of normal precipitation, and land that is not.*

This definition relies on the same three parameters considered by the USACE's delineation method but requires only a single parameter to be present (i.e., hydric soils, hydrophytic vegetation, or wetland hydrology would qualify an area as wetland, rather than requiring all three). The CCC wetland definition is generally more encompassing than the USACE definition in most cases.

City Wetlands

Pursuant to General Plan Conservation Element sub policy CE 3.1, Definition of Wetlands, the City defines wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology) and directly cites the Coastal Commission definitions contained in 14 CCR 13577(b). Boundaries of City wetlands were delineated as coterminous with CCC coastal wetlands.

Data Processing

Following field collection, all collected data were subsequently transferred to Rincon's Geographic Information System (GIS) software package. The results of collected data are described in Section 4.

Representative photographs within the study area are presented in Appendix C and figures in Section 4 include the location and direction from where each photograph was taken.

Vegetation Community and Land Cover Mapping

In 2021 Rincon conducted survey efforts including vegetation community mapping within a portion of the study area assessed in this report. Vegetation communities and land cover types within this area were reviewed in 2022 and were confirmed to not have substantially changed since the 2021 mapping effort.

Throughout the remainder of the study area, vegetation communities were classified using *A Manual of California Vegetation, Second Edition* (MCV2, Sawyer et al. 2009), which establishes systematic classifications and definitions of vegetation communities. Updates to the MCV2 provided in the online database (CNPS 2022) were taken into account. Each vegetation mapping unit was analyzed for characteristics to define the applicable vegetation community, such as dominant or co-dominant plant species and community membership rules.

For those vegetated areas that could not be classified per MCV2, descriptive vegetation community names were used (e.g., ornamental). Additionally, land covers were characterized in areas that lacked vegetation (e.g., disturbed). The limits of vegetation communities and land covers within the study area are presented in Section 3.4 below.

A list of dominant, abundant, and conspicuous plant species for each vegetation community within the study area was compiled during the surveys, and is included in Appendix B. The *Jepson Manual: Vascular Plants of California, Second Edition* and online Jepson eFlora were used for plant identification and nomenclature (Baldwin et al. 2012; Jepson Flora Project 2022).

3 Existing Conditions

3.1 Topography, Climate and Land Use

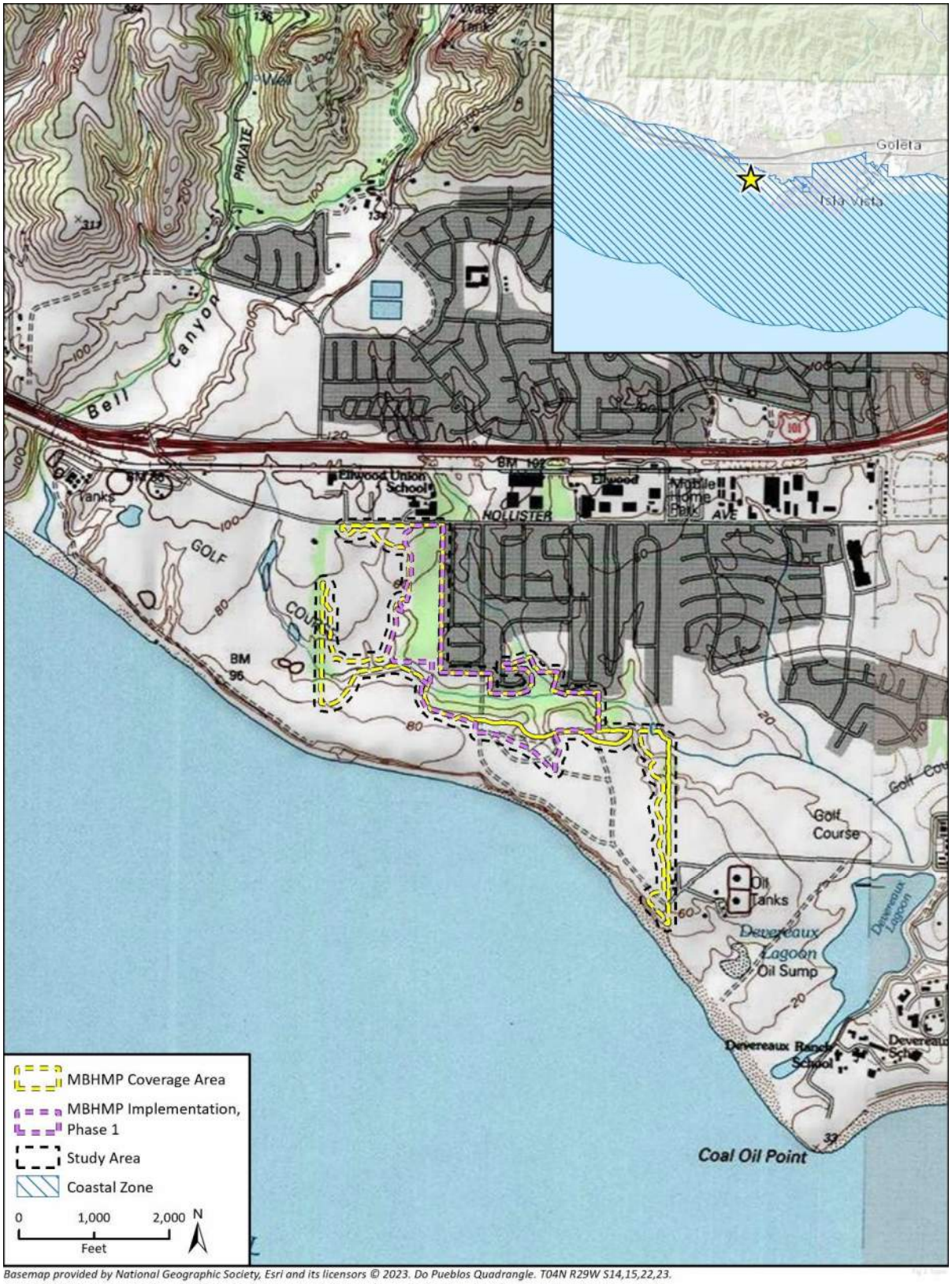
The study area is located entirely within the Ellwood Mesa Open Space, situated on Ellwood Mesa, on gentle slopes and terraces immediately north of the Ellwood bluffs. Ellwood Mesa Open Space was historically utilized for oil development, wood lots, and ranching uses (City of Goleta et al 2006; Campbell Geo 2010) and over the years has transformed into a local recreational area. Existing trails meander throughout the entire Ellwood Mesa within the eucalyptus grove, undeveloped open spaces, and through Devereux Creek riparian corridor. These trails are compacted soils and highly disturbed from public use (e.g., hikers, bicyclists). The study area consists primarily of eucalyptus groves.

Land uses within the vicinity of the study area include roadways (Hollister Avenue), a golf course, undeveloped open space, a paved parking lot, existing trails, active restoration of a former golf course, and residential developments. The northwest corner of the study area wraps around the western, southern, and eastern perimeters of a residential development and existing residential development also abuts the northeastern perimeter of the study area. A developed roadway leading to a paved parking lot off Hollister Avenue is present in the northern portion of the study area. An access road at the end of Santa Barbara Shores Drive divides the center portion of the study area, between the eucalyptus groves, that eventually leads to the beach. The study area is less than 200 feet away from the ocean at the southeastern corner of the study area and is bordered by Sandpiper Golf Club to the west and UCSB's North Campus Open Space (NCOS) to the east. The study area is bordered by a combination of residential developments, eucalyptus groves, and Hollister Avenue to the north. South of the study area consists of undeveloped open space.

The regional climate is Mediterranean, influenced by proximity to the ocean with hot, dry summers and mild winters. According to the Natural Resources Conservation Service's National Water and Climate Center data records between 1941 and 2000, average annual temperatures in Goleta ranged between 49- and 69-degrees Fahrenheit, with the warmest temperatures occurring between August and September and the coldest temperatures occurring between January and February. Goleta receives an average rainfall of approximately 17.37 inches, with the most rain occurring between January and March (USDA, NRCS 2000).

Elevations on-site range from 12 to 115 feet above mean sea level (amsl) and the topography of the study area is primarily flat.

Figure 3 Topographic Map



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.

3.2 Hydrology

The study area is located within the eastern portion of the Jalama Creek-Frontal Santa Barbara Channel Hydrologic Unit Code (HUC) watershed (HUC-10 No. 1806001301) (USGS 2022b). The Jalama Creek-Frontal Santa Barbara Channel watershed and adjacent San Pedro Creek-Frontal Santa Barbara Channel (HUC-10 No. 1806001302) compose the Santa Barbara Coastal watershed (HUC-8 No. 18060013) shown in Figure 4 below.

Within the Jalama Creek-Frontal Santa Barbara Channel watershed, the study area is contained entirely in the Devereux Creek watershed as described in the City of Goleta Creek and Watershed Management Plan (CWMP, City of Goleta 2020). The CWMP identifies Devereux Creek as a seasonal/intermittent system composed of a network of small tributaries which direct flows into Devereux Creek and then into Devereux Slough and the Pacific Ocean. The watershed encompasses approximately 3.5 square miles. Open spaces compose 46 percent of the watershed area, and the remainder is designated for residential, street, or golf course use.

The National Hydrography Dataset (NHD) identifies Devereux Creek as both an ephemeral stream and an intermittent stream within the study area (USGS 2022). Devereux Creek is hydrologically connected to Devereux Slough, and during heavy precipitation events, also connected to the Pacific Ocean, which is a TNW. Hydrology within Devereux Creek is supplied by storm flows, runoff from residential neighborhoods and Sandpiper golf course upstream (west of the study area), as well as sheet flow from the adjacent uplands in the study area. Devereux Creek exits the eastern boundary of the study area and flows into Devereux Slough, which connects to the Pacific Ocean. NWI identifies Devereux Creek as an intermittent riverine system with freshwater forested/shrub wetlands, and also maps freshwater emergent wetland within the study area (USFWS 2022). Figure 5 below depicts NHD and NWI data within and adjacent to the study area.

It is noted that mapping presented in NHD and NWI provide useful context but are not a completely accurate depiction of current existing conditions nor the extent of jurisdiction in the study area.

Figure 4 Watersheds

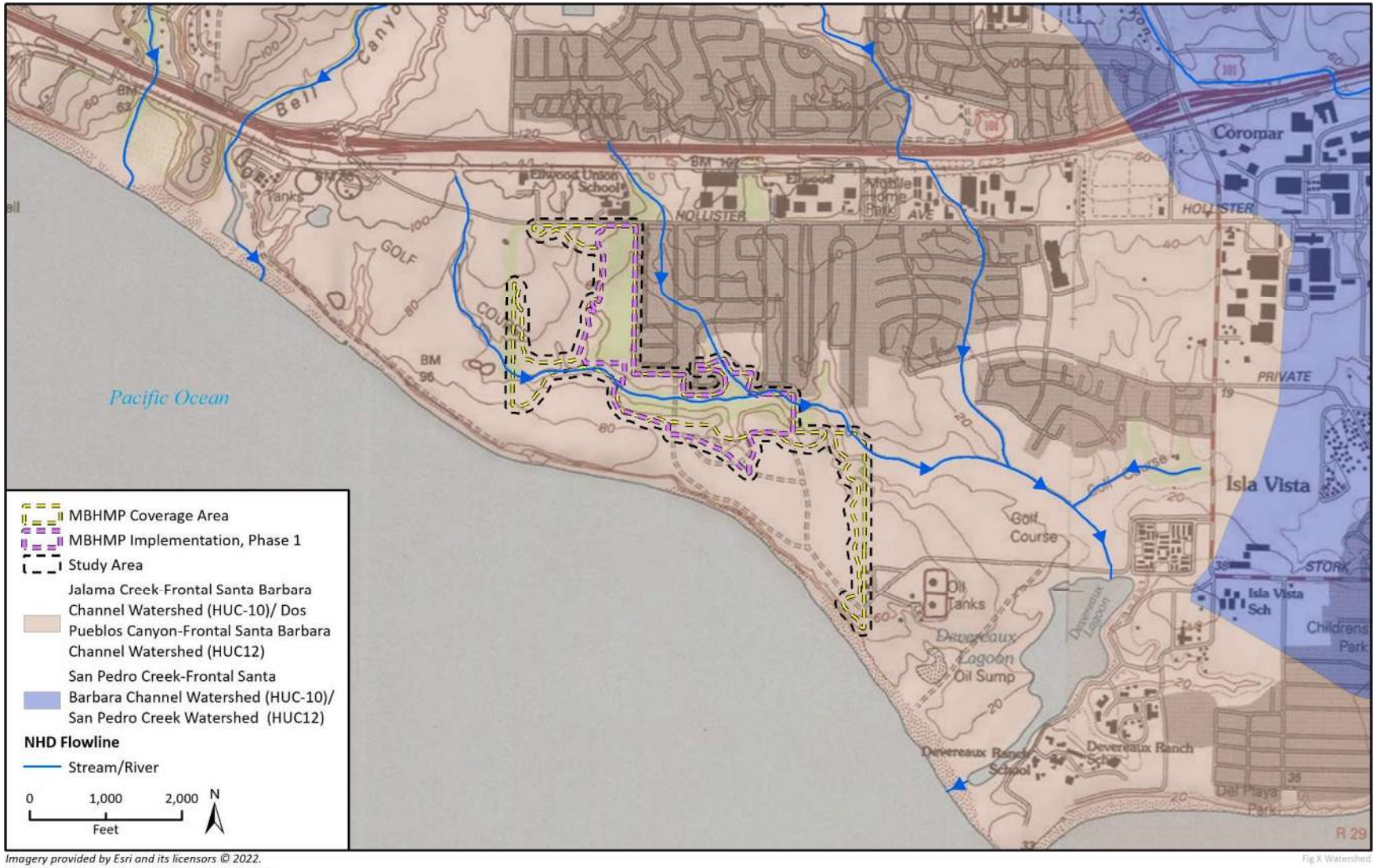


Figure 5 NHD and NWI Resources



Imagery provided by Microsoft Bing and its licensors © 2023.
Additional data provided by USGS and USFWS, 2021.

3.3 Soils

According to the NRCS Web Soil Survey, the study area includes nine soil map units, as described below (Figure 6). One soil type (Camarillo fine sandy loam, fine substratum) is included on the National Hydric Soils List (USDA, NRCS 2022b).

- **Camarillo fine sandy loam, fine substratum,** consists of very deep, somewhat poorly drained soils located on relatively flat floodplains from 10 to 100 feet amsl. A typical soil profile is composed of alluvium derived from sedimentary rocks and extends from the surface to 80 inches in depth. Camarillo series soils are frequently used in agriculture. The Camarillo fine sandy loam, fine substratum, is a hydric soil (USDA, NRCS 2022b).
- **Concepcion fine sandy loam, 0 to 2 percent slopes,** consists of deep, moderately well drained soils located on relatively flat terraces between 40 to 200 feet amsl within 1 to 2 miles of the Pacific Ocean. A typical soil profile is composed of weakly consolidated stratified alluvium or wind-deposited sandy material to a depth of 64 inches. Concepcion series soils are often used for grazing, agriculture, and urban development. The Concepcion fine sandy loam, 0 to 2 percent slopes, is not a hydric soil (USDA, NRCS 2022b).
- **Concepcion fine sandy loam, 2 to 9 percent slopes,** eroded, consists of deep, moderately well drained soils located on gentle slopes between 40 to 200 feet amsl within 1 to 2 miles of the Pacific Ocean. A typical soil profile is composed of weakly consolidated stratified alluvium or wind-deposited sandy material to a depth of 64 inches. Concepcion series soils are often used for grazing, agriculture, and urban development. The Concepcion fine sandy loam, 2 to 9 percent slopes, eroded, is not a hydric soil (USDA, NRCS 2022b).
- **Concepcion fine sandy loam, 15 to 30 percent slopes, eroded,** consists of deep, moderately well drained soils located on slopes between 40 to 200 feet amsl within 1 to 2 miles of the Pacific Ocean. A typical soil profile is composed of weakly consolidated stratified alluvium or wind-deposited sandy material to a depth of 64 inches. Concepcion series soils are often used for grazing, agriculture, and urban development. The Concepcion fine sandy loam, 15 to 30 percent slopes, eroded, is not a hydric soil (USDA, NRCS 2022b).
- **Diablo clay, 2 to 9 percent slopes,** consists of well drained soils with slow permeability located on gently sloped uplands between 25 to 3,000 feet amsl. A typical soil profile is composed of residuum weathered from shale, sandstone, and consolidated sediments with minor areas of tuffaceous material to a depth of 60 inches. Diablo series soils may be used for grazing or agriculture. Diablo clay, 2 to 9 percent slopes, is not a hydric soil (USDA, NRCS 2022b).
- **Diablo clay, 9 to 15 percent slopes, warm MAAT,** consists of well drained soils with slow permeability located on hilly uplands between 25 to 3,000 feet amsl. A typical soil profile is composed of residuum weathered from shale, sandstone, and consolidated sediments with minor areas of tuffaceous material to a depth of 60 inches. Diablo series soils may be used for grazing or agriculture. Diablo clay, 2 to 9 percent slopes, is not a hydric soil (USDA, NRCS 2022b).

Figure 6 Soils



- **Milpitas-Positas fine sandy loams, 2 to 9 percent slopes,** consists of Milpitas series soils and Positas series soils. Milpitas series soils are moderately well drained soils with medium runoff and very slow permeability located on gently sloped old terraces between 30 to 500 feet amsl. A typical soil profile is moderately acidic to slightly alkaline and is composed of alluvium derived largely from sandstone to a depth of 68 inches. Milpitas series soils may support native herbaceous, scrub, and oak savannah communities, and may be used for pasture, agriculture, or urban development.

  Positas series soils are moderately well drained soils located on stream terraces and terrace side slopes between 200 to 1,600 feet amsl. A typical soil profile is composed of alluvial material from mixed rock sources to a depth of 64 inches. Positas series soils support annual herbaceous and oak savannah communities and may be used as rangeland and agriculture. Milpitas-Positas fine sandy loams, 2 to 9 percent slopes, is not a hydric soil (USDA, NRCS 2022b).
- **Milpitas-Positas fine sandy loam, 9 to 15 percent slopes, eroded,** consists of Milpitas series soils and Positas series soils. Milpitas series soils are moderately well drained soils with medium runoff and very slow permeability located on moderately sloped old terraces between 30 to 500 feet amsl. A typical soil profile is moderately acidic to slightly alkaline and is composed of alluvium derived largely from sandstone to a depth of 68 inches. Milpitas series soils support native herbaceous, scrub, and oak savannah communities, and may be used for pasture, agriculture, or urban development.

  Positas series soils are moderately well drained soils located on stream terraces and terrace side slopes between 200 to 1,600 feet amsl. A typical soil profile is composed of alluvial material from mixed rock sources to a depth of 64 inches. Positas series soils support annual herbaceous and oak savannah communities and may be used as rangeland and agriculture. Milpitas-Positas fine sandy loam, 9 to 15 percent slopes, eroded, is not a hydric soil (USDA, NRCS 2022b).
- **Xerorthents, cut and fill areas,** consists of man-modified material, either soils rearranged in a cut and fill or as tailings heaps. Xerorthents, cut and fill areas, is not a hydric soil (USDA, NRCS 2022b).

3.4 Vegetation

Fourteen vegetation communities and four land cover types occur within the study area and are described below and shown in Table 1 and Figure 7 and 7b. A list of all plant species observed during the field surveys is provided in Appendix B.

Each vegetation community/land cover type is partially or entirely considered Environmentally Sensitive Habitat Areas (ESHA) per the CCA and Goleta GP/CLUP Conservation Element (CE) definitions. Some vegetation communities also contain 2006 City-mapped ESHA per the Goleta GP/CLUP CE Figure 4.1. Total acreage of each vegetation community/land cover type is provided in Table 1, as well as ESHA acreage within each vegetation community/land cover type (including both those that are mapped by the City and those mapped by Rincon in 2021).

Table 1 Summary of Vegetation Community and Land Cover Types in the Study Area

Vegetation Community	Total Acres	ESHA Acres	CDFW Sensitive Natural Community Rank (Yes/No)[1]	Notes
Vegetation Community				
Alkali Heath Marsh	0.99	0.99	G4S3; Yes	Considered riparian and/or wetland ESHA per GP/CLUP and contains CCA coastal wetland ESHA
Arroyo Willow Thickets	1.52	1.52	G4S4; Yes (Arroyo willow association)	Considered riparian and/or wetland ESHA per GP/CLUP and contains CCA coastal wetland ESHA
Coast Live Oak Woodland and Forest	1.14	1.14	G5S4; No	Considered woodland ESHA per GP/CLUP
Coyote Brush Scrub	14.06	2.51	G5S5; No	Contains 2006 City-mapped coastal bluff scrub/coastal sage scrub ESHA in three locations as well as creeks/riparian ESHA
Creeping Wildrye Turfs	0.64	0.64	G3G3; Yes	Considered native grassland ESHA per GP/CLUP
Eucalyptus Grove	65.32	65.32	GNA SNA; No	Considered monarch butterfly ESHA per GP/CLUP and contains CCA coastal wetland ESHA
Hardstem Bulrush Marshes	0.19	0.19	GNR S3S4: Yes	Considered wetland ESHA per GP/CLUP and CCA coastal wetland ESHA
Ice Plant Mats	1.98	-	GNA SNA; No	
Iris-Leaf Rush Seeps	0.11	0.11	G2?S2?; Yes	Considered riparian ESHA per GP/CLUP and CCA coastal wetland ESHA
Lemonade Berry Scrub	0.06	0.06	G3S3; Yes	Considered coastal bluff scrub ESHA per GP/CLUP
Perennial Rye Grass Fields	0.09	0.09	GNA SNA; No	Contains 2006 City-mapped ESHA

Purple Needle Grass Grassland	7.28	7.28	G3G4 S3S4; Yes	Considered native grassland ESHA per GP/CLUP
Upland Mustards	2.73	0.19	GNA SNA; No	Contains 2006 City-mapped ESHA
Wild Oats and Annual Brome Grasslands	22.51	2.98	GNA SNA; No	Contains 2006 City-mapped ESHA
Land Cover Type				
Bare Ground	3.93	1.5	N/A	Contains 2006 City-mapped ESHA
Developed/Ornamental	17.57	0.36	N/A	Contains 2006 City-mapped ESHA
Native Landscaping/Restoration	0.54	0.54	N/A	Considered ESHA per GP/CLUP where it supports special status plant species (Santa Barbara honeysuckle) in one location. Other locations contain 2006 City-mapped ESHA
Undifferentiated Ornamental Shrubland	0.69	0.22	N/A	Contains 2006 City-mapped ESHA

[1]Notes:

Source: CDFW 2021

G – Global

S – State

GNA SNA – No Global and State rankings

Figure 7a Vegetation Communities and Land Cover Types



Imagery provided by Microsoft Bing and its licensors © 2023

Fig X Vegetation_11x17

Figure 7b Vegetation Communities and Land Cover Types



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Alkali Heath Marsh (*Frankenia salina* Herbaceous Alliance)

Alkali heath marsh (*Frankenia salina* Herbaceous Alliance) is typically located in coastal salt marshes, brackish marshes, alkali meadows, and alkali playas with soils that are saline and composed of sandy to clayey alluvium. Elevations range between sea level and 300 meters. This community is characterized by an open to continuous herbaceous canopy. Alkali heath (*Frankenia salina*) has over 30 percent relative cover in the herbaceous layer and may be codominant with other herbs and subshrubs such as salt grass (*Distichlis spicata*). This alliance is ranked G4S3 and is considered a CDFW sensitive natural community (CDFW 2021).

This community is located in the northeast portion of the study area, where Devereux Creek exits the study area. The thick herbaceous layer is dominated by alkali heath, Italian rye grass (*Festuca perennis*), and creeping wildrye (*Elymus triticoides*). Several dirt footpaths cross the alkali heath marsh. The study area contains 0.99 acres of this alliance.

Arroyo Willow Thickets (*Salix lasiolepis* Shrubland Alliance)

Arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance) typically occurs along stream banks and benches, slope seeps, and stringers along drainages from sea level to 2,170 meters in elevation. This alliance is characterized by an open to continuous shrub layer and a variable herbaceous layer. The community is dominated by arroyo willow (*Salix lasiolepis*) with over 50 percent relative cover in the tree or shrub layer and co-dominant species including Fremont cottonwood (*Populus fremontii*), giant reed (*Arundo donax*), and mulefat (*Baccharis salicifolia*). This alliance is ranked G4S4 and the arroyo willow association of this alliance is considered a CDFW sensitive natural community (CDFW 2021).

Arroyo willow thickets are present along Devereux Creek in the central portion of the study area. The tree and shrub layers are dominated by arroyo willow. Other tree species present include coast live oak (*Quercus agrifolia*) and California sycamore (*Platanus racemosa*). The diverse shrub layer includes mulefat, coyote brush (*Baccharis pilularis*), and giant wild rye (*Elymus condensatus*). The herbaceous layer consists of species including ripgut brome (*Bromus diandrus*), common spikerush (*Eleocharis macrostachya*), Parish's spike rush (*Eleocharis parishii*), and cutleaf geranium (*Geranium dissectum*). This community contains several large open patches dominated by common spikerush and Parish's spike rush, with few to no shrubs or trees. The study area contains 1.52 acres of this alliance.

Coast Live Oak Woodland and Forest (*Quercus agrifolia* Forest & Woodland Alliance)

Coast live oak woodland and forest (*Quercus agrifolia* Woodland Alliance) is typically found on canyon bottoms, slopes, and flats between sea level and 1,200 meters in elevation. Soils are typically deep and sandy or loamy with high organic matter. This vegetation community is characterized by a tree layer that ranges from continuous to open and sparse shrub and herbaceous layers. Coast live oak contributes to at least 60 percent relative cover in the tree layer (Sawyer et al. 2009). This vegetation community is ranked G5S4 and is not considered a CDFW sensitive natural community (CDFW 2021).

This alliance is located in the central and eastern portions of the study area. Coast live oak is dominant in the tree canopy, and shrub species present include coyote brush, arroyo willow, and

giant wild rye. The dense herbaceous layer is dominated by ripgut brome and black mustard (*Brassica nigra*). The study area contains 1.14 acres of this alliance.

Coyote Brush Scrub (*Baccharis pilularis* Shrubland Alliance)

Coyote brush scrub (*Baccharis pilularis* Shrubland Alliance) may occur on coastal bluffs, terraces, stabilized dunes of coastal bars, spits along the coastline, river mouths, stream sides, open exposed slopes, ridges, and gaps in forest stands. Soils are variable, ranging from sandy to relatively heavy clay, between sea level and 1,500 meters in elevation. The shrub and herbaceous layers are variable. Coyote brush (*Baccharis pilularis*) is dominant with over 50 percent absolute or relative cover in the shrub canopy. California coffeeberry (*Frangula californica*) or coast silk tassel (*Garrya elliptica*) may be codominant in the shrub layer. This alliance is ranked G5S5 and is not considered a CDFW sensitive natural community (CDFW 2021).

Coyote brush scrub is found in several patches throughout the study area. Coyote brush is dominant along with giant wild rye and California sagebrush (*Artemisia californica*). Other species present in this community include mulefat, toyon (*Heteromeles arbutifolia*), ripgut brome, creeping wildrye, creeping wildrye, Italian rye grass, and emergent coast live oaks. The study area contains 12.78 acres of this alliance.

Creeping Wildrye Turfs (*Elymus triticoides* Herbaceous Alliance)

Creeping wildrye turfs (*Elymus triticoides* Herbaceous Alliance [*Leymus triticoides* Herbaceous Alliance]) are typically found on poorly drained floodplains, playas, drainage and valley bottoms, or marsh margins with mesic flat to sloping topography between sea level and 3,000 meters. Soils are generally alkaline or saline clays and loams. creeping wildrye contributes at least 50 percent relative cover in the herbaceous layer, and the herbaceous layer is open to continuous. Creeping wildrye turfs are ranked G3S3 and are considered a CDFW sensitive natural community (CDFW 2021).

Several small patches of creeping wildrye turfs are present near the center of the study area. Creeping wildrye is overwhelmingly dominant in the herbaceous layer. The study area contains 0.02 acres of this alliance.

Eucalyptus Grove (*Eucalyptus globulus* Semi-Natural Alliance)

Eucalyptus Grove (*Eucalyptus globulus* Semi-Natural Alliance) is found planted as trees, groves, and windbreaks, as well as in settings where it has become naturalized on uplands or bottomlands and adjacent to stream courses, lakes, or levees from sea level to 1,900 meters in elevation. Eucalyptus species consist of over 80 percent cover within the tree layer. This vegetation community is ranked GNA SNA and is not considered a CDFW sensitive natural community (CDFW 2021).

This alliance is found throughout the study area and is crossed by dirt footpaths. Within the study area, this alliance is dominated by blue gum eucalyptus (*Eucalyptus globulus*), which forms a closed canopy. Other trees and shrubs present in the understory include arroyo willow, shamel ash (*Fraxinus uhdei*), golden wattle (*Acacia longifolia*) and myoporum (*Myoporum laetum*). The herbaceous layer is sparse, and primarily consists of weedy non-native species such as black mustard, ripgut brome, and upright veldt grass (*Ehrharta erecta*). Vines present include poison oak (*Toxicodendron diversilobum*) and cape ivy (*Delairea odorata*). The study area contains 65.31 acres of this alliance.

Hardstem Bulrush Marshes (*Schoenoplectus acutus* Herbaceous Alliance)

Hardstem bulrush marshes (*Schoenoplectus acutus* Herbaceous Alliance) typically occur in brackish to freshwater marshes, including along stream shores, bars, channels of river mouth estuaries, ponds and lakes, sloughs, swamps, and roadside ditches. Soils are poorly aerated with a high organic content between sea level and 2,500 meters in elevation. This alliance is characterized by an intermittent to continuous herbaceous layer. Hardstem bulrush (*Schoenoplectus acutus*) has over 50 percent relative cover in the herbaceous layer and at least 10 percent absolute cover. This community is ranked GNR S3S4 and is considered a CDFW sensitive natural community (CDFW 2021).

This community is located in the northeast portion of the study area where Devereux Creek exits the study area. Hardstem bulrush is the dominant species. Other species present at low cover include curly dock (*Rumex crispus*), wild radish (*Raphanus sativus*), and bristly oxtongue (*Helminthotheca echioides*). The study area contains 0.19 acres of this alliance.

Ice Plant Mats (*Carpobrotus* spp. Herbaceous Semi-Natural Alliance)

Ice plant mats (*Carpobrotus* spp. Herbaceous Semi-Natural Alliance) typically occurs on bluffs, disturbed, land, and sand dunes near the coastline between sea level and 10 meters in elevation. This alliance is characterized by an intermittent to continuous herbaceous layer. Ice plant (*Carpobrotus* spp.) is dominant with over 50 percent relative cover. This community is ranked GNA SNA and is not considered a CDFW sensitive natural community (CDFW 2021).

Ice plant mats are present in several areas of the study area, including at the top of the seaside bluffs in the southeastern part of the study area. Ice plant (*Carpobrotus edulis*) is dominant in the dense herbaceous layer, along with ripgut brome, black mustard, slender oats (*Avena barbata*), and wild oats (*Avena fatua*). Scattered shrubs are present including deerweed (*Acmispon glaber*), pampas grass (*Cortaderia selloana*), and seacliff buckwheat (*Eriogonum parvifolium*). The study area contains 2.13 acres of this alliance.

Iris-Leaf Rush Seeps (*Juncus phaeocephalus* Provisional Herbaceous Alliance)

Iris-leaf rush seeps (*Juncus phaeocephalus* Provisional Herbaceous Alliance) typically occurs on seeps, mainly on metamorphic, serpentine, and volcanic substrates between sea level and 1,600 meters in elevation. This alliance is characterized by an intermittent to continuous herbaceous cover. Pointed rush (*Juncus oxymeris*), irisleaf rush (*Juncus xiphioides*) or another iris-leaved rush, such as brown headed rush (*Juncus phaeocephalus*) is dominant. This alliance is ranked G2?S2? and is considered a CDFW sensitive natural community (CDFW 2021).

This community is present in a coastal wetland along the eastern boundary of the study area. Brown headed rush is dominant in the dense herbaceous layer. Other species present include coyote thistle (*Eryngium vaseyi*), woolly marbles (*Psilocarphus brevissimus*), common spikerush and common rush (*Juncus patens*). The study area contains 0.11 acres of this alliance.

Lemonade Berry Scrub (*Rhus integrifolia* Shrubland Alliance)

Lemonade berry scrub (*Rhus integrifolia* Shrubland Alliance) generally occurs on gentle to abrupt slopes and coastal bluffs of variable aspect with loam and clay soils between 5-750 meters in elevation. This community is characterized by an open to continuous two-tiered shrub canopy and

an open herbaceous layer. Lemonade berry (*Rhus integrifolia*) has over 50 percent relative cover in the shrub canopy or is co-dominant along with other coastal scrub species, with over 30 percent relative cover in the shrub canopy. This community is ranked G3S3 and is considered a CDFW sensitive natural community (CDFW 2021).

One lemonade berry patch is located near the southeastern extent of the study area. Lemonade berry is the only species in the closed shrub canopy, and the herbaceous layer is sparse. The study area contains 0.06 acres of this alliance.

Perennial Rye Grass Fields (*Festuca perennis* Herbaceous Semi-Natural Alliance)

Perennial rye grass fields (*Festuca perennis* Herbaceous Semi-Natural Alliance [*Lolium perenne* Herbaceous Semi-Natural Alliance) typically occur on lowlands with periodic flooding, disked fields, and uplands including serpentine substrates between sea level and 1,325 meters in elevation. This alliance is characterized by an intermittent to continuous herbaceous layer. Italian rye grass has at least 50 percent relative cover in the herbaceous layer. This community is ranked GNA SNA and is not considered a CDFW sensitive natural community (CDFW 2021).

This community is located in the southeastern corner of the study area. Italian rye grass is dominant in the dense herbaceous layer. Other species present include creeping wildrye, California burclover (*Medicago polymorpha*), and curly dock. The study area contains 0.09 acres of this alliance.

Purple Needle Grass Grassland (*Stipa* pulchra Herbaceous Alliance)

Purple needle grass grassland (*Stipa pulchra* Herbaceous Alliance [*Nassella pulchra* Herbaceous Alliance)] may occur on all topographic locations with deep soils with high clay content, or loamy, sandy, or silty soils derived from mudstone, sandstone, or serpentine substrates. Elevations range between sea level and 1,700 meters in elevation. This community is characterized by an open to continuous herbaceous layer. Needle grass (*Stipa* spp.) is characteristically present with at least two percent absolute cover or at least ten percent relative cover in the herbaceous layer. This alliance is ranked S3S4 G3G4 and is considered a CDFW sensitive natural community (CDFW 2021).

Patches of purple needle grass grassland are present throughout grasslands in the study area, and the eastern portion of the study area contains a large amount of this community. Purple needlegrass (*Stipa pulchra*) is dominant along with ripgut brome, slender oats, and wild oats. Scattered emergent coyote brush, coast live oak, and olive trees (*Olea europaea*). Several dirt footpaths cross this community. The study area contains 6.83 acres of this alliance.

Upland Mustards (*Brassica nigra* Herbaceous Semi-Natural Alliance)

Upland mustards (*Brassica nigra* Herbaceous Semi-Natural Alliance) are typically found in fallow fields, grasslands, roadsides, levee slopes, disturbed coastal scrub, riparian areas, cleared roadsides, and waste places between sea level and 2,800 meters in elevation. This vegetation community is characterized by an open to continuous herbaceous layer. Black mustard, summer mustard, wild radish, or other mustards occur with non-native plants at over 80% cover in the herbaceous layer. This vegetation community is ranked GNA SNA and is not considered a CDFW sensitive natural community (CDFW 2021).

Patches of upland mustards are found in the north, western, and central portions of the study area. Black mustard is the dominant species, and other herbaceous plants present include summer

mustards, wild radish, ripgut brome, slender oats, and wild oats. The study area contains 2.05 acres of this alliance.

Wild Oats and Annual Brome Grasslands (*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance)

Wild oats and annual brome grasslands (*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance) are found in all topographic settings in foothills, waste places, rangelands, and openings in woodlands between sea level and 2,200 meters in elevation. This alliance is characterized by an open to continuous herbaceous layer. Wild oats (*Avena* spp.) or annual bromes (*Bromus* spp.) are dominant or co-dominant with other non-native species in the herbaceous layer. Emergent trees and shrubs may be present at low cover. This vegetation community is ranked GNA SNA and is not considered a CDFW sensitive natural community (CDFW 2021).

Wild oats and annual brome grasslands are located throughout the study area. Ripgut brome, slender oats, and wild oats are dominant in the herbaceous layer. Other widely present herbaceous species include black mustard, wild radish, and summer mustard (*Hirschfeldia incana*). Emergent coyote brush, California sagebrush, and blue oak are present at low cover. The study area contains 18.38 acres of this alliance.

Bare Ground

This land cover type consists of paved and unpaved roads and footpaths, including the parking lot off Hollister Avenue (Ave) and numerous dirt paths. Little to no vegetation is present in this land cover type. The study area contains 3.30 acres of this land cover type.

Developed/Ornamental

This land cover type consists of paved roads, sidewalks, parking areas, buildings and yards, and includes portions of Sandpiper Golf Course. Vegetated areas in this land cover type are regularly maintained by people and do not constitute a natural vegetation community as described in MCV2 (Sawyer et al. 2009, CNPS 2021a). Ornamental land cover is present around the houses surrounding much of the study area to the north. The study area contains 17.52 acres of this land cover type.

Native Landscaping/Restoration

This land cover type consists of areas with native plants that have been installed, either as part of landscaping or as restoration work. These areas are regularly maintained by people and do not constitute a natural vegetation community as described in MCV2 (Sawyer et al. 2009, CNPS 2021a). Native landscaping/restoration areas are present in the central portion of the study area, adjacent to homes. This land cover type contains a wide array of species, including coast live oak, valley oak (*Quercus lobata*), giant wild rye, California sunflower (*Encelia californica*), lemonade berry, and deergrass (*Muhlenbergia rigens*). The study area contains 0.54 acres of this land cover type.

Undifferentiated Ornamental Shrubland

This land cover type consists of areas landscaped with primarily non-native ornamental plants. These areas are regularly maintained by people and do not constitute a natural vegetation community as described in MCV2 (Sawyer et al. 2009, CNPS 2021a). Undifferentiated ornamental shrubland is present near the houses near the center of the study area. A diverse selection of plants are found in this land cover type, including acacias (*Acacia* spp.), Mexican fan palm (*Washingtonia*

robusta), bougainvillea (*Bougainvillea spectabilis*), mission cactus (*Opuntia ficus-indica),* and ice plant. The study area contains 0.69acres of this land cover type.

4 Field Results

Based on the JD, the study area contains areas potentially subject to USACE, CDFW, RWQCB, and CCC/City jurisdictions. Potentially jurisdictional features include Devereux Creek, seven unnamed drainages tributary to Devereux Creek, one unnamed drainage tributary to Devereux Slough, and two coastal wetlands. These features are described in detail below. Representative photographs are included in Appendix C.

4.1 Devereux Creek

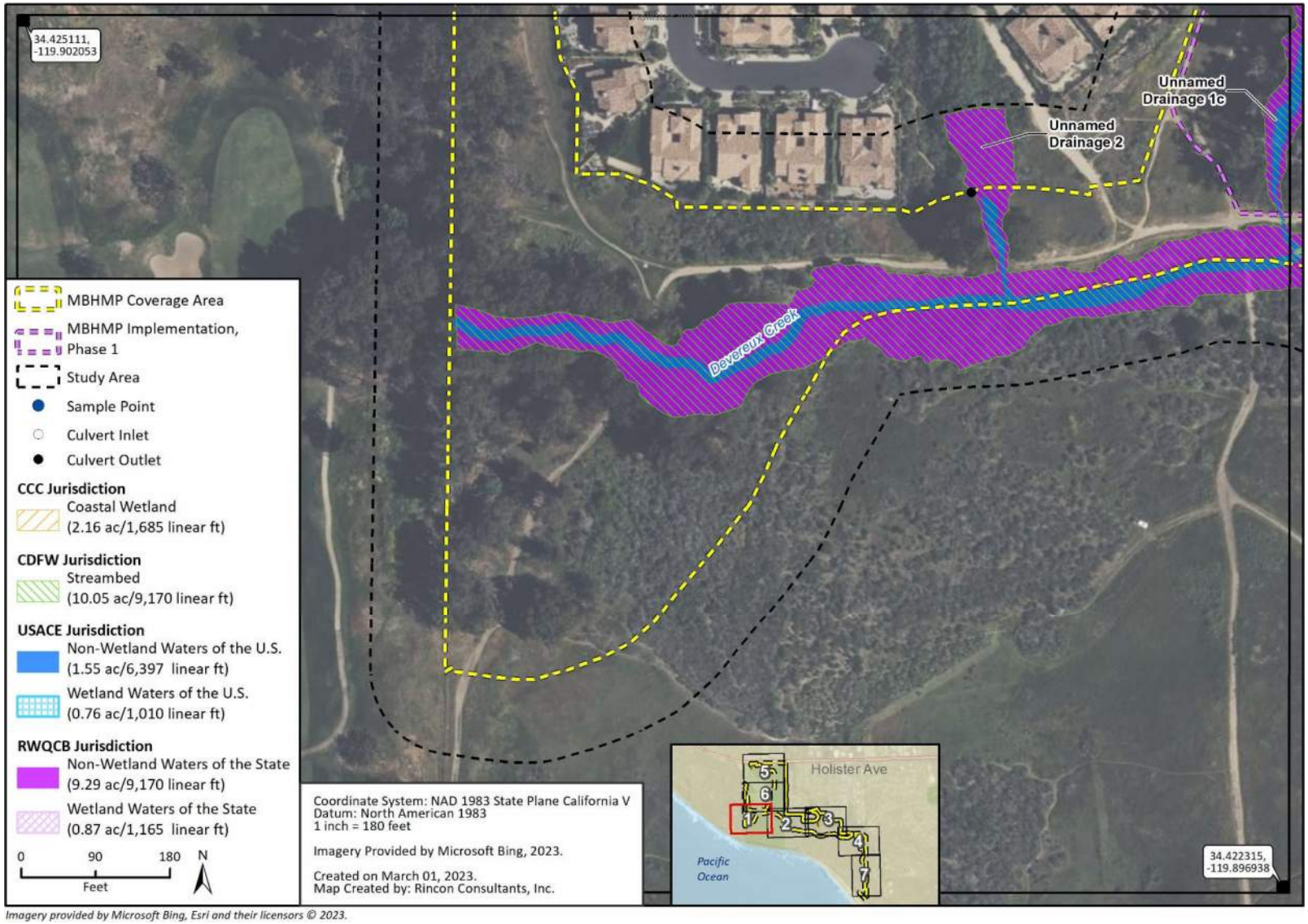
Devereux Creek enters the study area from the west and flows eastward across the study area (Figure 8a-Figure 8b). As it exits the study area, Devereux Creek flows into Devereux Slough, which is a seasonally flooded tidal lagoon periodically connected to the Pacific Ocean. Devereux Creek is an intermittent system maintained by groundwater, storm flows, and urban runoff from surrounding neighborhoods and the Sandpiper Golf Course, which is adjacent to the western boundary of the study area. The drainage characteristics of Devereux Creek, including channel dimensions, vegetation type, and hydrology, change as the creek flows through the study area, as described below.

Western

Between the western (upstream) boundary of the study area and the confluence of Devereux Creek and Unnamed Drainage 1c (Figure 8a), Devereux Creek is generally flat and characterized by a single active channel which flows eastward through eucalyptus groves and arroyo willow thickets. No surface water was present in the channel in this area during the delineation. The bed of the channel is approximately 6 feet wide, and the top of bank ranges from 35 to 100 feet wide and 5 to 10 feet in height. Where Devereux Creek crosses the eucalyptus groves, the channel is generally unvegetated due to the dense leaf litter, and the fine sandy loam soils are compacted (Photograph 1). In the arroyo willow thickets, more vegetation is present, including arroyo willow and coyote brush. The channel is well defined and broad floodplains are not present. The OHWM is defined by the presence of break in slope and change in vegetation cover, and largely coincides with the width of channel bottom from toe of slope to toe of slope.

Along the active channel in the western part of the study area, no primary wetland hydrology indicators were observed. Secondary wetland hydrology indicators were occasionally present on the sloped banks near the OHWM, including riverine drift deposits and water marks. However, wetland hydrology indicators were not consistently present in the abundance needed to indicate the presence of wetland hydrology.

Figure 8a Jurisdictional Delineation

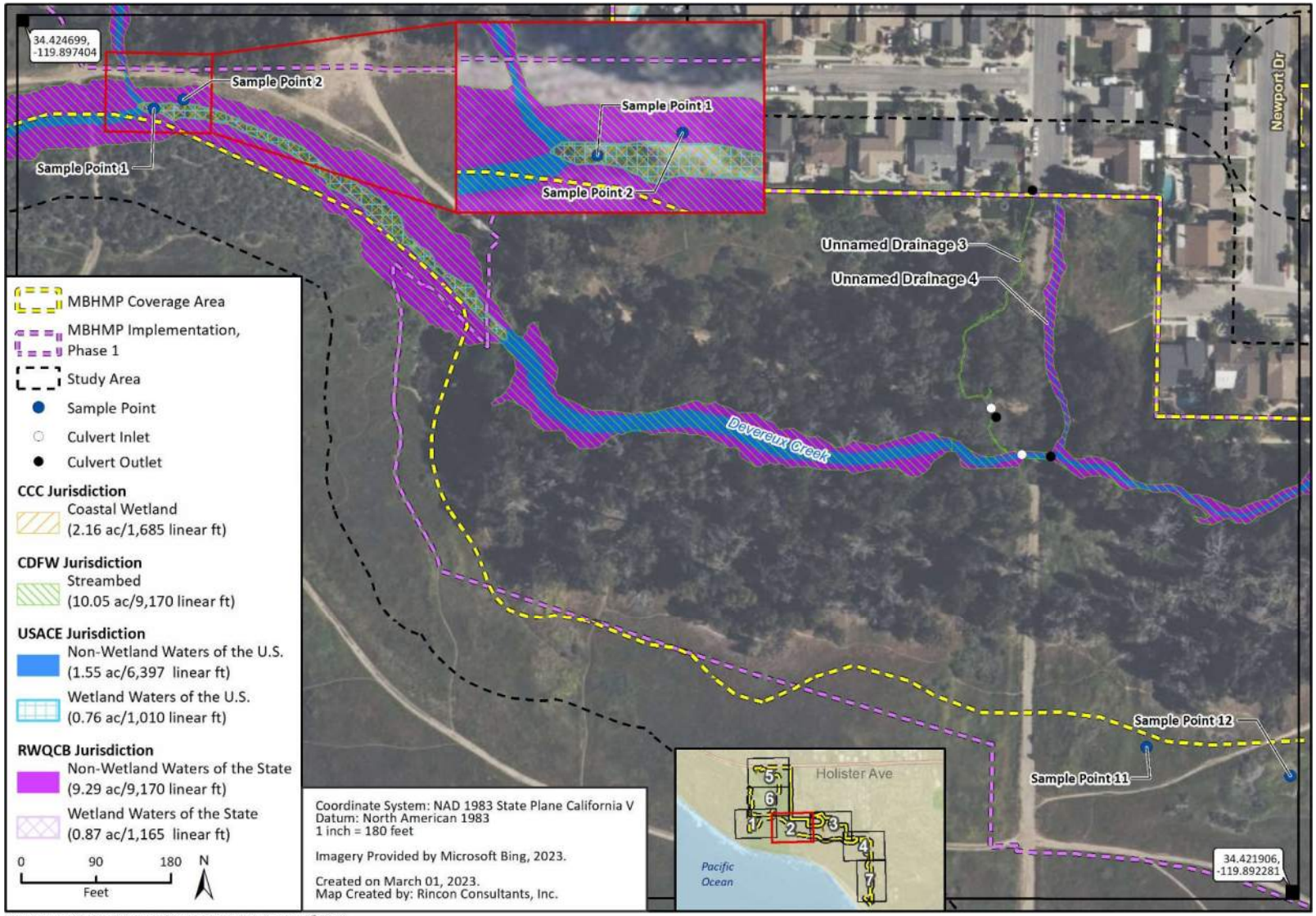


Central

The central portion of Devereux Creek begins at the confluence of Unnamed Drainage 1c with Devereux Creek (Figure 8b) and extends eastward to the point where Devereux Creek exits the study area for the first time (Figure 8c). The characteristics of Devereux Creek change at the confluence of Drainage 1c (described below) and Devereux Creek. The creek continues to flow eastward across a flat plain vegetated with arroyo willow thickets (Photograph 2), then further into dense eucalyptus groves. In this central portion of the study area, the creekbed of Devereux Creek is relatively flat and characterized by a single active channel, which varies between approximately 3 to 10 feet in width. Surface water was present in portions of the creek, with water depth between 3 to 6 inches (Photographs 3-5). The floodplain along much of this section of the creek is approximately 25 feet in total width (Photograph 6). These floodplains are characterized by saturated soils and a dominance of hydrophytic vegetation, including arroyo willows, soft chess, Parish's spike rush, and common rush. The top of bank ranges from approximately one to 10 feet high and 30 to 115 feet wide in this area. As Devereux Creek flows east into dense eucalyptus groves, the herbaceous layer is sparse (Photograph 8). As it continues east, the eucalyptus canopy becomes more open with a more developed herbaceous layer, including the hydrophytic species basin saltbush (*Atriplex prostrata*), brown sedge (*Carex subfusca*), cocklebur (*Xanthium strumarium*), and curly dock. Five sample points (Sample Points 1-5) were assessed to determine hydrology and presence of other wetland characteristics, as described below.

While much of the topography of Devereux Creek is natural, several small portions of the creek have been manipulated by human activity. Grouted rip rap boulders are present along Devereux Creek near the center of the study area, extending the width of the banks (Photograph 7). South of Santa Barbara Shores Drive, east of the confluence of Unnamed Drainage 3 and west of the confluence of Unnamed Drainage 4, an unpaved road crosses Devereux Creek with a 5-foot wide corrugated pipe culvert (Photograph 10). Further downstream, an approximately 250-foot long section of the creek has been modified into a trapezoidal concrete channel. This portion of the channel has a steeper gradient than upstream, and is lined with concrete-grouted rip-rap. Other than these two anthropogenically manipulated areas, the creek is not confined or deeply incised.

Figure 9b Jurisdictional Delineation



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Sample Points 1 and 2

Sample Point 1 was taken in a low gradient depressional floodplain directly adjacent to the channel of Devereux Creek near the center of the study area (Figure 8b). The sample point is located within the arroyo willow thickets community, and dominant plant species were arroyo willow, soft chess (*Bromus hordeaceus*), and Parish's spike rush. Hydrophytic vegetation was dominant. The soils were silty clay loam, and redox features were present in the matrix and along pore linings. Based on the presence of soil that was depleted below the dark surface and depleted matrix, it was determined that hydric soils are present. Multiple wetland hydrology indicators were present, including surface water, water-stained leaves, oxidized rhizospheres along living roots, and the presence of reduced iron. Therefore, wetland hydrology was present. Sample Point 1 meets the criteria for a three-parameter wetland. See Appendix C, Photograph 2 for documentation of Sample Point 1.

Sample Point 2 is located further up the bank of Devereux Creek adjacent to Sample Point 1 (Figure 8a). The dominant plant species observed were giant wild rye, California burclover, and ripgut brome. Hydrophytic vegetation was determined to be absent. Soils at Sample Point 2 were silty clay loam and exhibited no hydric soil indicators. No hydrology indicators were observed at Sample Point 2. Based on these results, it was determined that a wetland is not present. See Appendix C, Photograph 3 for documentation of Sample Point 2.

Sample Points 3 and 4

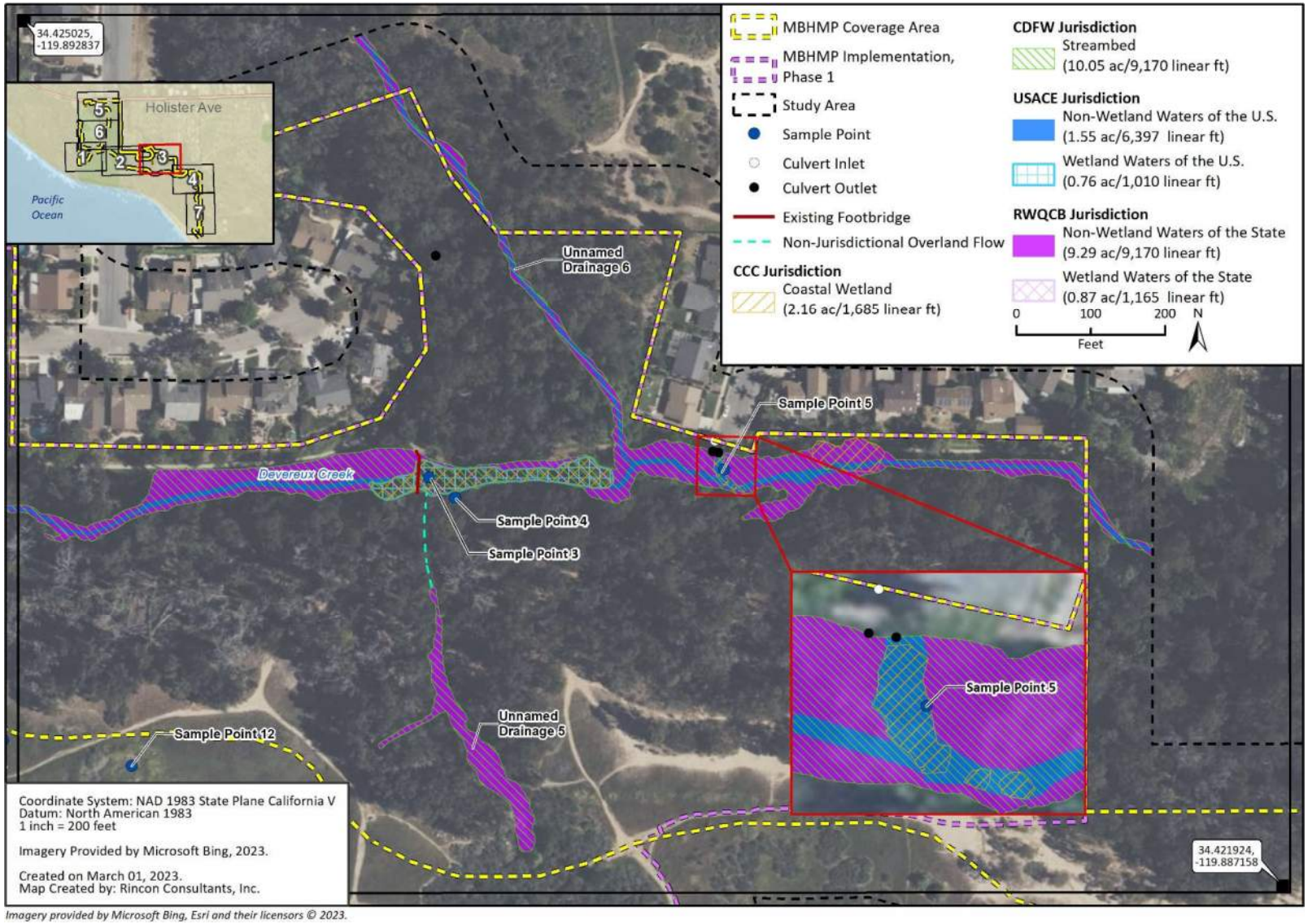
Sample Point 3 was taken in a low flow channel of Devereux Creek within an opening in the canopy of eucalyptus groves, immediately east of an existing wooden plank footbridge (Figure 8c). Basin saltbush was the dominant plant species, with brown sedge and curly dock present as subdominant species. Hydrophytic vegetation was dominant. The soil surface layer was clay loam, dark in color (matrix value 3, chroma 2), and distinct redox concentrations were observed along ped faces and within pore linings. Based on these factors, it was determined that hydric soils are present. Wetland hydrology indicators observed included oxidized rhizospheres along living roots, drainage patterns, and the FAC-neutral test. Therefore, wetland hydrology was present. Sample Point 3 meets the criteria for a three-parameter wetland. See Appendix C, Photograph 11 for documentation of Sample Point 3.

Sample Point 4 is located on a low terrace within Devereux Creek, situated at the edge of an opening within an overstory of eucalyptus groves (Figure 8c). The dominant plant species observed were blue gum eucalyptus, coast live oak, poison oak, and English ivy (*Hedera helix*). Hydrophytic vegetation was determined to be absent. Soils at Sample Point 4 were sandy loam and exhibited no hydric soil indicators. No hydrology indicators were observed at Sample Point 4. Based on these results, it was determined that a wetland is not present. See Appendix C, Photograph 12 for documentation of Sample Point 4.

Sample Point 5

Sample Point 5 was taken along Devereux Creek in the northeastern portion of the study area (Figure 8b, Photograph 13). The sample point is located within the eucalyptus groves vegetation community. Dominant plant species were shamel ash, arroyo willow, and English ivy (*Hedera helix*). Hydrophytic vegetation was not dominant. The soils were sandy clay loam and loamy sand. No indicators of hydric soils were observed. Two hydrology indicators were present at Sample Point 5: surface water and saturation. Therefore, wetland hydrology is present. Sample Point 5 is situated within a one-parameter wetland.

Figure 10c Jurisdictional Delineation



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Eastern

The creek characteristics change as Devereux Creek re-enters the study area and approaches the far eastern boundary of the study area, where it flows into upper Devereux Slough (Figure 8d, Photograph 12). The creek cuts a narrow, shallowly incised channel approximately 5 feet wide and 2 feet deep through a dense alkali heath herbaceous layer. The OHWM is defined by the presence of break in slope, change in vegetation cover, and drift debris accumulation, and largely coincides with the width of channel bottom from toe of slope to toe of slope. A broad floodplain defined by topography and presence of hydrophytic vegetation is present, extending approximately 150 to 250 feet across.

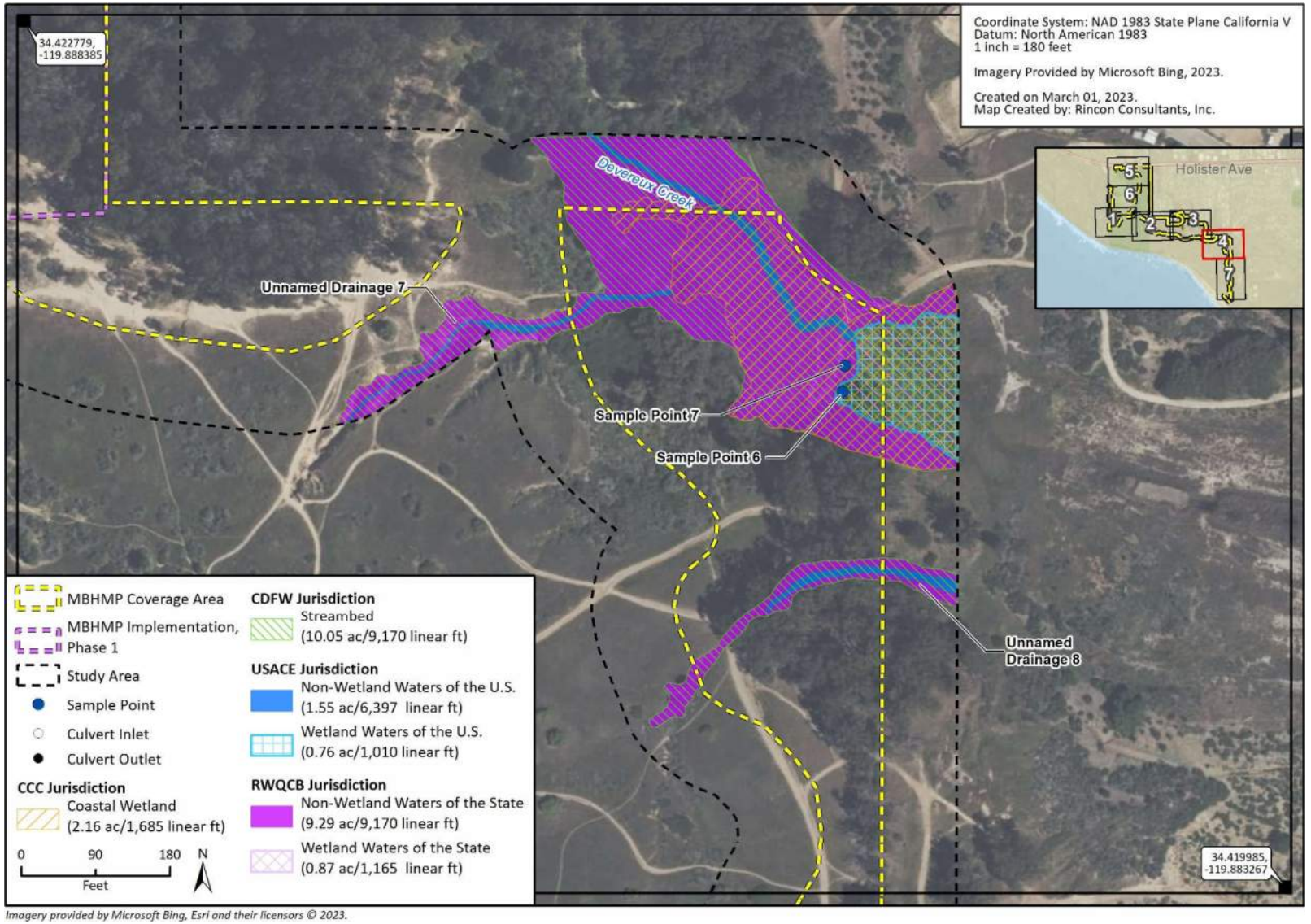
Based on the presence of hydrophytic vegetation and other hydrology indicators, two sample points (Sample Points 6 and 7) were assessed near the outlet of Devereux Creek into upper Devereux Slough. A total of seven sampling points were assessed along Devereux Creek to determine hydrology and presence of other wetland characteristics. Results are summarized in Table 3**Error! Reference source not found.**.

Sample Points 6 and 7

Sample Point 6 was taken in a low flow channel of Devereux Creek as it transitions into upper Devereux Slough and exits the eastern boundary of the study area (Figure 8b). The sample point is located within hardstem bulrush marshes, and dominant plant species were blue gum eucalyptus, hardstem bulrush, and curly dock. Hydrophytic vegetation was dominant. The soils were clay loam, and redox features were present. Hydric soil indicators present at Sample Point 6 include hydrogen sulfide and soil that was depleted below the dark surface. Therefore, hydric soils were present. Multiple wetland hydrology indicators were present, including a high water table, soil saturation, hydrogen sulfide odor, oxidized rhizospheres along living roots, and the presence of reduced iron. Therefore, wetland hydrology was present. Sample Point 6 meets the criteria for a three-parameter wetland. See Appendix C, Photograph 16 for documentation of Sample Point 4.

Sample Point 7 is located upslope of Sample Point 6 (Figure 8b) in the alkali heath marsh vegetation community. Alkali heath was the dominant plant species, and hydrophytic vegetation was determined to be present. Soils at this sample point were silty clay loam and exhibited no hydric soil indicators. Therefore, hydric soils are absent. No hydrology indicators were observed at Sample Point 7. Based on these results, Sample Point 7 is situated within a one-parameter wetland. See Appendix C, Photograph 17 for documentation of Sample Point 7.

Figure 11d Jurisdictional Delineation



4.2 Unnamed Drainage 1

An unnamed ephemeral drainage (herein described as Unnamed Drainage 1) intersects with the northwest corner of the study area (Figure 8e-Figure 8f) in three areas, referenced as segments 1a, 1b, and 1c. Flows are conveyed from Unnamed Drainages 1a and 1b southward and outside the study area as non-jurisdictional overland flow before converging into Unnamed Drainage 1c outside the study area. Unnamed Drainage 1c then flows south approximately 830 feet to converge with Devereux Creek.

Unnamed Drainage 1a

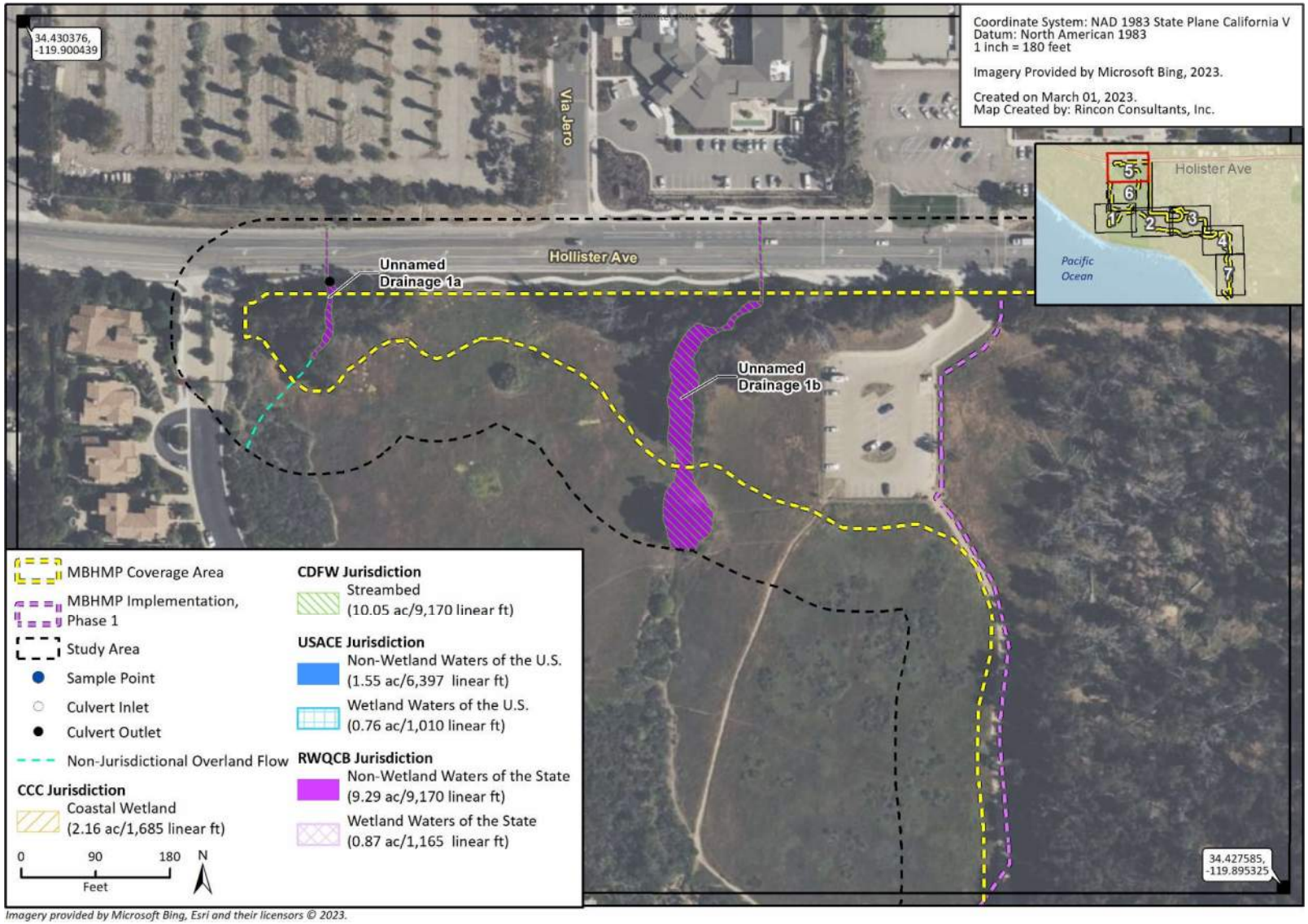
Unnamed Drainage 1a enters the study area through a 2-foot-diameterpipe culvert which crosses under Hollister Avenue and outlets into a natural bottomed drainage which flows southward. The natural portion of the drainage channel has sloping to steep banks composed of natural soil and is approximately 2 to 5 feet high; the drainage is approximately 5 to 12 feet wide in this area (Photograph 18). Although the channel is incised, it is not confined. Unnamed Drainage 1a does not exhibit indicators of an OHWM. The natural portion of the drainage is dominated by upland vegetation and is located within the eucalyptus groves vegetation community (Photograph 19). Dominant plant species in the channel include garden nasturtium (*Tropaeolum majus*) and upright veldt grass, while the canopy is dominated by blue gum eucalyptus. No hydrophytic vegetation is present and the drainage appears to receive flows during rain events and primarily from urban runoff. Based on these factors, Unnamed Drainage 1a was determined to be ephemeral.

As Unnamed Drainage 1a flows south, the banks flatten and become indistinct, with water either infiltrating the soil or transitioning to sheet flow with no hydrologic indicators or evidence of ordinary flow. During heavy rain events, water travels as overland sheet flow outside the study area and south into Unnamed Drainage 1c.

Unnamed Drainage 1b

Unnamed Drainage 1b flows southward through the study area to the east of Unnamed Drainage 1a (Figure 8e). Like Unnamed Drainage 1a, Unnamed Drainage 1b enters the study area as a 2-foot-wide pipe culvert which crosses under Hollister Avenue and outlets into a natural bottomed drainage. The natural portion of the drainage is characterized by a top of bank which ranges between 7 and 30 feet wide and 2 to 20 feet tall. The channel is incised and is not confined. A collection of un-grouted rip rap is present along the banks in the natural portion of the drainage just south of Hollister Avenue (Photograph 20). No surface water was present in Unnamed Drainage 2 during the time of the field surveys. Unnamed Drainage 1b does not exhibit indicators of an OHWM. The drainage appears to receive flows during rain events and from urban runoff and was determined to be ephemeral. The natural portion of the drainage is unvegetated and dominated fallen eucalyptus leaves. Herbaceous vegetation includes upland species such as upright veldt grass and smilo grass (*Stipa miliacea* var*. miliacea*). It is located within the eucalyptus groves vegetation community and blue gum eucalyptus forms a closed canopy over the drainage. No hydrophytic vegetation is present.

Figure 8e Jurisdictional Delineation



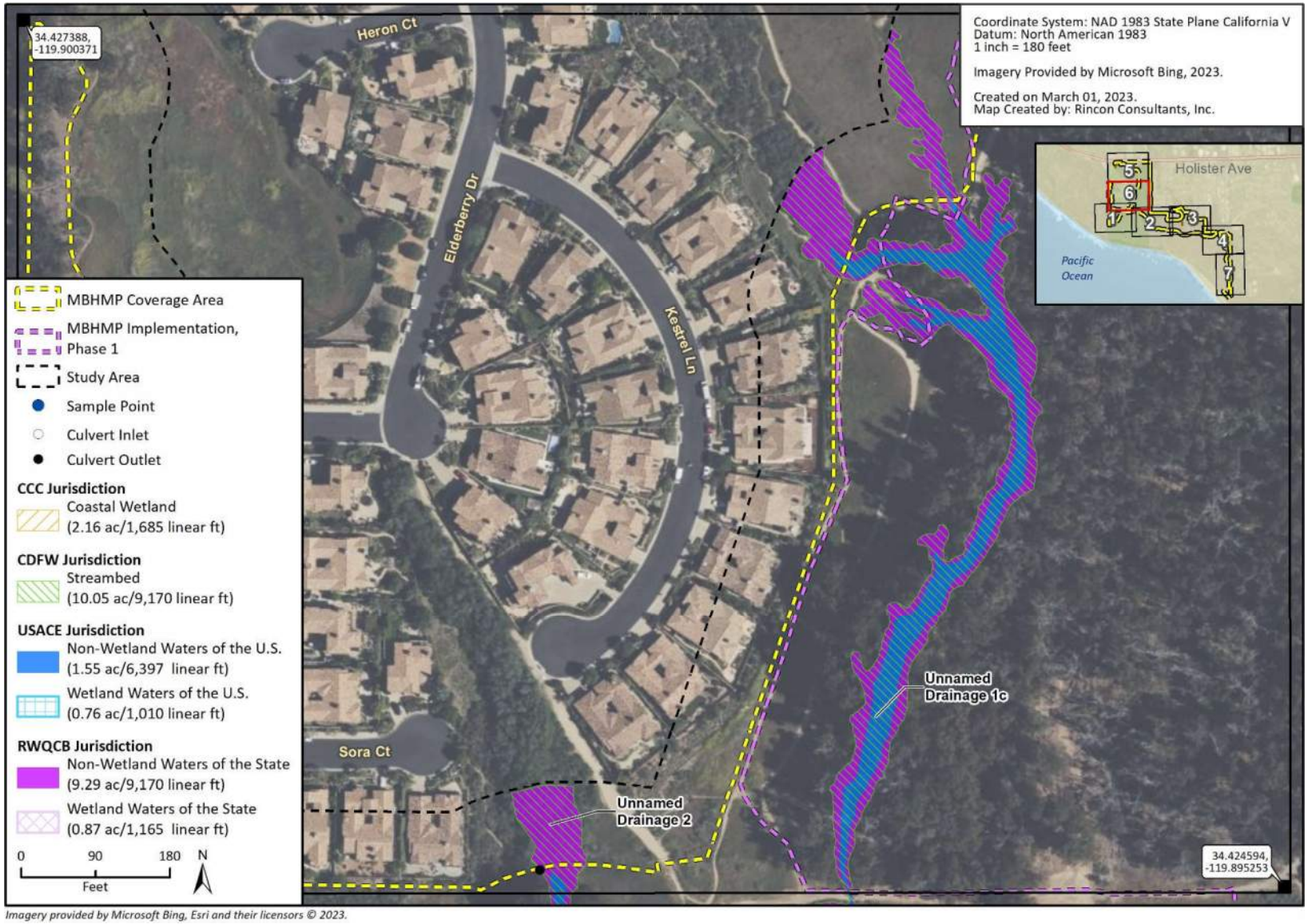
After exiting the southern boundary of the study area, Unnamed Drainage 1b transitions into overland sheet flow. Similar to Unnamed Drainage 1a, the banks flatten and water either infiltrates the soil or transitions to sheet flow with no hydrologic indicators or evidence of ordinary flow. During heavy rain events, water travels from Unnamed Drainage 1b as overland sheet flow outside the study area and south into Unnamed Drainage 1c.

Unnamed Drainage 1c

Unnamed Drainage 1c flows southward through the northwestern portion of the study area (Figure 8f). Outside the study area, Unnamed Drainages 1a and 1b contribute overland flow to this drainage. The upstream part of the drainage is characterized by a system of deeply incised branching channels which have highly disturbed, flat unvegetated bottoms (Photographs 21, 22). An OHWM was delineated based on the presence of a break in the bank slope and change in vegetation cover. These erosional channels range between 5 and 10 feet deep and 15 to 45 feet wide, and appear to have developed through rill and gully erosion. Several dirt footpaths cross the channels under the canopy of the eucalyptus groves (Photograph 6), resulting in highly compacted and unvegetated channel bottoms in the northern portion of the drainage. In some areas, the channels are characterized by coyote brush scrub and arroyo willow thickets, including a small patch of common spikerush (Photograph 24).

The channels combine into a single drainage which flows southward through the eucalyptus groves, characterized by banks which range between 35 to 65 feet in width and 2 to 6 feet in height (Photograph 9). The channel is generally unvegetated due to the dense layer of dead eucalyptus leaves. At the southern end of Unnamed Drainage 1c, the drainage crosses a dirt footpath and intersects with Devereux Creek (Photograph 27). No surface water was present in Unnamed Drainage 1c during the assessment. The drainage appears to receive flows during rain events and from urban runoff and based on the factors described above, was determined to be ephemeral.

Figure 8f Jurisdictional Delineation



4.3 Unnamed Drainage 2

Unnamed Drainage 2 flows southeastward from The Bluffs residential neighborhood into Devereux Creek in the western portion of the study area (Figure 8a). The drainage has very shallow sloping banks which are approximately 10 to 20 feet wide and one foot deep. The channel bottom contains an OHWM defined by a break in slope. Unnamed Drainage 2 flows through arroyo willow thickets and eucalyptus groves before crossing a dirt footpath and entering Devereux Creek. No surface water was present in Unnamed Drainage 2 during the field surveys. The drainage appears to receive flows during rain events and from urban runoff, including from a one-foot-wide pipe culvert outlet (Photograph 28) which conveys runoff from the residential neighborhood.

In the absence of urban runoff, this drainage would likely be ephemeral due to the topography and lack of natural water sources. However, the regular supply of urban runoff from the culvert outlet has contributed to the development of an intermittent feature.

4.4 Unnamed Drainage 3

Unnamed Drainage 3 is located in the central portion of the study area and flows southward from the gutter on the western side of Santa Barbara Shores Drive and the residential neighborhood at the northern boundary of the study area. This drainage flows south through the coyote brush scrub and eucalyptus groves communities, crosses under a dirt trail through an 18-inch corrugated pipe culvert, exits the culvert, and continues south to connect to Devereux Creek (Figure 8b, Photographs 8, 29). The drainage consists of a weakly defined, shallow two-foot-wide unvegetated channel with a substrate of dense leaf litter. The drainage Unnamed Drainage 3 does not exhibit indicators of an OHWM. No surface water was present in Unnamed Drainage 3. The drainage appears to receive flows during rain events and from urban runoff and is ephemeral.

4.5 Unnamed Drainage 4

Unnamed Drainage 4 is located in the central portion of the study area, just east of Unnamed Drainage 3 (Figure 8b). This drainage flows southward from the gutter on the eastern side of Santa Barbara Shores Drive and the residential neighborhood at the northern boundary of the study area into Devereux Creek. Unnamed Drainage 4 is characterized by a shallow but clearly defined one-foot-wide channel with banks that extend to 5 to 18 feet wide (Photograph 26). Within the northern portion of the channel, vegetation consists of wild oats. As it flows south, the drainage passes through a small patch of coyote brush, then enters the eucalyptus grove. Within the northern portion of the eucalyptus grove, the drainage has a dense herbaceous layer of iceplant (*Carpobrotus* spp.); as the drainage continues south, the herbaceous layer becomes sparse, with a dense layer of leaf litter. The drainage then crosses a dirt trail and converges with Devereux Creek. The drainage contained evidence of flow, including channel incision, scouring, and drift deposits. The drainage appears to receive flows during rain events and from urban runoff. No surface water was present in Unnamed Drainage 4.

4.6 Unnamed Drainage 5

Unnamed Drainage 5 travels through the Ellwood Main monarch aggregation site located in the central portion of the study area (Figure 8c, Photograph 31). The drainage consists of a branched channel that converges and flows in a northerly direction, and then transitions into a wide swale without evidence of bed, bank, or ordinary flow. During heavy rain events, water travels as overland sheet flow approximately 130 feet north into Devereux Creek. There is no channelized connection between the mouth of Unnamed Drainage 5 and Devereux Creek, and the area between the two features has been compacted by heavy foot traffic along the main route to the butterfly viewing area.

Within the southern, upstream extent of Unnamed Drainage 5, vegetation consists of dense coyote brush. As it flows north, vegetation transitions to an overstory of eucalyptus. The drainage is unvegetated beneath the eucalyptus grove canopy, with a dense layer of leaf litter. The banks of Unnamed Drainage 5 range from approximately 15 to 40 feet from bank to bank. Banks are steeply incised and eroded in the southern, upstream extent. Large pieces of concrete rubble were observed within this portion of the drainage. As it flows north the channel widens and bank slopes become more gentle, eventually broadening to a wide swale. Unnamed Drainage 5 does not exhibit indicators of an OHWM and no surface water was present during the field survey. Unnamed Drainage 5 appears to receive flows only during rain events and is ephemeral.

4.7 Unnamed Drainage 6

Unnamed Drainage 6 flows generally southeast from the Coronado Butterfly Preserve into the central portion of the study area, north of Devereux Creek (Figure 8c, Photograph 32). This drainage flows southeast through eucalyptus groves into Devereux Creek. Unnamed Drainage 6 is characterized by a shallow channel bottom defined by a three-foot-wide OHWM with banks that extend between 10 to 20 feet wide. The drainage is mostly unvegetated beneath the eucalyptus grove canopy, with a dense layer of leaf litter. Occasional patches of smilo grass are present. Human influences on the drainage include an informal wooden foot bridge (Photograph 33) and a series of ungrouted rip-rap check dams (Photograph 34). The drainage did not contain surface water during the field survey and appears to receive flows during rain events and from urban runoff. The channel is unvegetated and contains a dense layer of leaf litter.

4.8 Unnamed Drainage 7

Unnamed Drainage 7 consists of a deeply incised erosional ravine that conveys flows eastward into Devereux Creek, in the northeastern corner of the study area (Figure 8d, Photograph 35). This drainage has steep, highly eroded banks which range between 5 and 25 feet deep and 20 to 65 feet wide. The OHWM ranges from two to eight feet wide, and was clearly defined by scour marks. Vegetation consists of a sparse layer of coyote brush. The drainage appears to receive flows only during rain events and was determined to be ephemeral. No surface water was present in Unnamed Drainage 7 during the field survey. The drainage converges with Devereux Creek approximately 300 feet north of its transition to upper Devereux Slough.

4.9 Unnamed Drainage 8

Unnamed Drainage 8 consists of a single channel that conveys flows eastward into upper Devereux Slough in the northeastern corner of the study area (Figure 8d). The drainage originates in the purple needle grass grassland community as a shallow erosional feature with banks between 10 to 30 feet wide and a depth of approximately one foot (Photograph 19). Unnamed Drainage 8 then crosses a dirt trail and continues eastward into the adjacent eucalyptus groves. In the eucalyptus groves, the drainage transitions to a wide, flat channel with banks approximately 15 to 35 feet in width and 2 to 5 feet in depth (Photographs 36 and 37). The OHWM is approximately 8 feet wide and was discernable from a break in bank slope and drift deposits. The entire drainage is characterized by a combination of bare ground, leaf litter, and sparse upland vegetation consisting of ripgut brome, slender oats, and wild oats. No hydrophytic vegetation is present. No surface water was present during the field survey, and the drainage appears to receive flows only during rain events. Based on these factors, the drainage was determined to be ephemeral.

4.10 Coastal Wetland 1

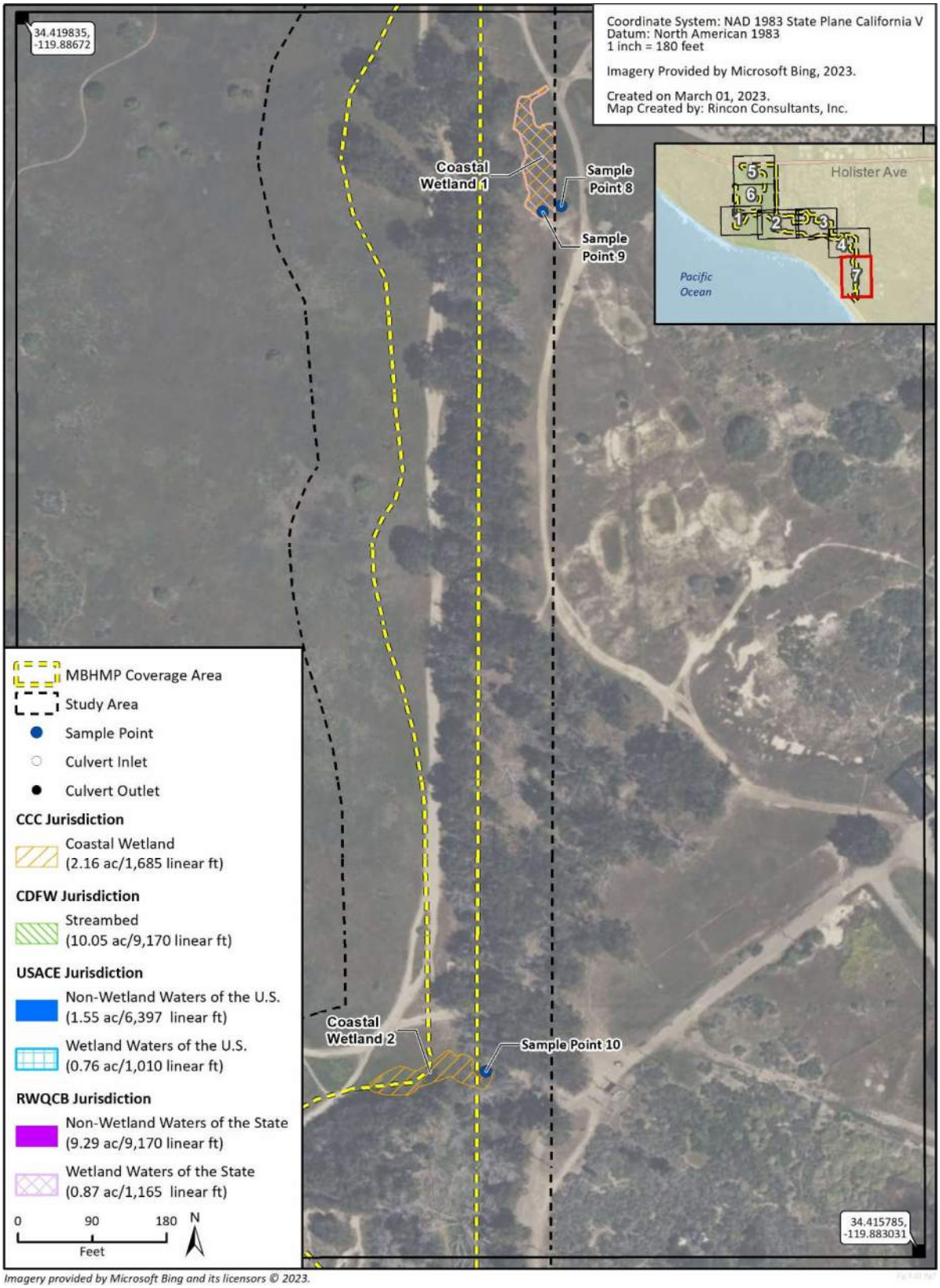
Coastal Wetland 1 is located along the eastern boundary of the study area, south of Devereux Creek within a relatively flat coastal terrace (Figure 8g). The feature consists of a shallow depression approximately 160 feet in length and 50 feet in width, is generally defined by the topography and limits of the iris-leaf rush seeps vegetation community (Photograph 38). The feature is mapped as a seasonally flooded emergent freshwater wetland by NWI. Coastal Wetland 1 appears to receive water from rainfall and overland surface flows from seasonal pools in the North Campus Open Space to the southeast. Ponded water and tadpoles were observed within this feature on February 7, 2022.The depression appears to be isolated, lacking a hydrologic connection to downgradient jurisdictional aquatic features. According to weather records, the most recent rainfall events were 41 days prior on December 28, 2021, which contributed approximately 0.5 inch of rain, and 20 days prior on January 18, 2022, which contributed 0.06 inch.

Sample Points 8 and 9

Sample Point 8 was taken within a low point within Coastal Wetland 1 (Figure 8d). The sample point is vegetated by brown headed rush, coyote thistle, and woolly marbles. Hydrophytic vegetation was dominant. A soil pit was not excavated due to the environmental sensitivity of the feature. Based on direct observation of inundation over 14 days within the growing season, soils were assumed hydric. Multiple wetland hydrology indicators were present, including surface water, saturation, and surface soil cracks. Therefore, wetland hydrology was present. Sample Point 8 meets the criteria for a three-parameter wetland.

Sample Point 9 is located upslope and west of Sample Point 8 (Figure 8d) in the understory of the blue gum eucalyptus vegetation community. The dominant plant species observed were blue gum eucalyptus, coyote brush, and wild oat. Hydrophytic vegetation was determined to be absent. Soils at Sample Point 9 were sandy loam and exhibited no hydric soil indicators. No hydrology indicators were observed at Sample Point 9. Based on these results, it was determined that the point is upland in nature and outside Coastal Wetland 1.

Figure 8g Jurisdictional Delineation



4.11 Coastal Wetland 2

Coastal Wetland 2 is located in the southeast corner of the study area, approximately 300 feet north of the Pacific Ocean (Figure 8g). The feature consists of a shallow depression approximately 150 feet in length and 30 feet in width, which is generally defined by the topography and limits of the perennial rye grass fields vegetation community (Photographs 39 and 40). The feature is mapped as a seasonally flooded emergent freshwater wetland by NWI. The feature appears to receive water from rainfall and overland surface flows from the north. A metal gate extends across Coastal Wetland 2. Surface water was not observed within this feature on February 7, 2022.

Sample Point 10

Sample Point 10 was taken within a low point within Coastal Wetland 2 (Figure 8g). The sample point is vegetated by Italian rye grass, foxtail barley, and curly dock and is situated adjacent to an overstory of blue gum eucalyptus. Hydrophytic vegetation was dominant. Soils at Sample Point 10 were sandy loam and exhibited no hydric soil indicators. No hydrology indicators were observed at Sample Point 10. Sample Point 10 meets the criteria for a one-parameter wetland, and the boundary of this wetland was mapped according to the extent of hydrophytic vegetation present.

4.12 Non-Jurisdictional Features

Sample Points 11 and 12 were collected to evaluate the presence of wetland indicators within two areas mapped by NWI as freshwater emergent freshwater wetlands. These features are situated south of the study area and blue gum eucalyptus groves, but within the study area (Figure 5). These features did not contain evidence of water flow, hydrophytic vegetation, hydric soils, or wetland hydrology. The sample points are discussed in greater detail below.

Sample Point 11

Sample Point 11 was taken in an area of low topography within the mapped feature (Figure 8b, Photograph 41). However, indicators of a freshwater wetland were not observed at this location. The dominant vegetation is ice plant and wild oat. Hydrophytic vegetation was determined to be absent. Soils at Sample Point 11 were sandy loam and exhibited no hydric soil indicators. No hydrology indicators were observed at Sample Point 11. Based on these results, it was determined that a wetland is not present.

Sample Point 12

Sample Point 12 was taken in an area of low topography within the mapped feature (Figure 8c, Photograph 42). The local topography appears to have been historically manipulated to create an artificial berm with a depression at the center. The dominant vegetation is upland mustards. Hydrophytic vegetation was determined to be absent. Soils at Sample Point 12 were sandy loam and exhibited no hydric soil indicators, and showed evidence of inhabitance by gophers. No hydrology indicators were observed at Sample Point 12. Based on these results, it was determined that a wetland is not present.

5 Discussion

Eleven potentially jurisdictional features are present within the study area, consisting of Devereux Creek, Unnamed Drainages 1-8, and Coastal Wetlands 1 and 2 (Table 2, Figure 8a-g).

Table 2 USACE, RWQCB, CCC/City, and CDFW Jurisdiction within the Study Area

	USACE Jurisdiction		RWQCB Jurisdiction		CCC/City Jurisdiction	CDFW Jurisdiction
Feature	Non-Wetland Waters of the U.S. (acres/ linear feet)	Wetland Waters of the U.S. (acres/ linear feet)	Non-Wetland Waters of the State (acres/ linear feet)	Wetland Waters of the State (acres/ linear feet)	Coastal Wetland (acres/ linear feet)	Streambed and Associated Riparian Habitat (acres/ linear feet)
Devereux Creek	0.88/3,634	0.76/1,010	6.34/4,635	0.76/1,010	1.96/1,387	7.10/4,635
Unnamed Drainage 1a	0/0	0/0	0.02/170	0/0	0/0	0.02/170
Unnamed Drainage 1b	0/0	0/0	0.24/456	0/0	0/0	0.24/456
Unnamed Drainage 1c	0.50/975	0/0	1.42/1,066	0/0	0/0	1.42/1,066
Unnamed Drainage 2	0.02/90	0/0	0.21/205	0/0	0/0	0.21/205
Unnamed Drainage 3	0/0	0/0	0.01/394	0/0	0/0	0.01/394
Unnamed Drainage 4	0.01/308	0/0	0.08/308	0/0	0/0	0.08/308
Unnamed Drainage 5	0/0	0/0	0.20/374	0/0	0/0	0.20/374
Unnamed Drainage 6	0.05/688	0/0	0.18/688	0/0	0/0	0.18/688
Unnamed Drainage 7	0.04/455	0/0	0.31/396	0/0	0/0	0.31/396
Unnamed Drainage 8	0.05/247	0/0	0.24/446	0/0	0/0	0.24/446
Coastal Wetland 1	0/0	0/0	0/0	0.11/155	0.11/155	0/0
Coastal Wetland 2	0/0	0/0	0.09/144	0/0	0.09/144	0/0
Total	1.55/6,397	0.76/1,010	9.34/9,281	0.87/1,165	2.16/1,685	10.01/9,138

5.1 USACE Jurisdiction

Devereux Creek

Jurisdictional waters that are not "relatively permanent" must have a significant nexus to navigable or interstate waters. Relatively Permanent Waters (RPWs) are those that flow perennially or seasonally (e.g. at least three months of the year). A significant nexus is defined as waterways that "either alone or in combination with similarly situated [waters] in the region, significantly affect the chemical, physical, or biological integrity of traditional navigable waters." In other words, if a waterway has potential to significantly affect biological, hydrological, or ecological attributes of a Traditionally Navigable Water (TNW) downstream, it can be regulated under the significant nexus standard. A significant nexus evaluation is required to determine USACE jurisdiction for any non-navigable tributaries to TNWs that are not RPWs (see Appendix A for additional details).

Devereux Creek is an intermittent tributary which provides surface flow to the Pacific Ocean. While Devereux Creek has an intermittent flow regime, it does not flow at least three months per year, so it is not an RPW. Devereux Creek transports sediment, pollutants, water flow, and seeds downstream to Devereux Slough and the Pacific Ocean, which is a TNW. These inputs have the potential to affect the water quality and biological attributes of Devereux Slough, which is a wetland adjacent to the territorial sea and Waters of the U.S. Given these factors, it is reasonable to conclude that Devereux Creek has a significant nexus with a TNW and thereby is subject to USACE jurisdiction as a tributary. USACE wetland waters of the U.S. are also present within Devereux Creek, in the central and eastern portions of the active channel where indicators of hydrophytic vegetation, hydric soils, and wetland hydrology were observed.

Unnamed Drainages 1-8

An Ordinary High Water Mark was not evident within Unnamed Drainages 1a, 1b, 3, and 5. Due to the absence of wetland indicators and an OHWM, these features do not meet the criteria for wetland or non-wetland waters of the U.S, respectively.

Unnamed Drainages 1c, 2, 4, 6, and 7 are tributaries with a direct hydrologic connection to Devereux Creek, and Unnamed Drainage 8 has a direct connection to Devereux Slough. These features transport sediment, pollutants, water flow, and seeds downstream to Devereux Slough and the Pacific Ocean. These inputs have the potential to affect the water quality and biological attributes of Devereux Slough, which is a tidal water of the U.S. Given these factors, it is reasonable to conclude that Unnamed Drainages 1c, 2, 4, and 6-8 have a significant nexus with a TNW and thereby are subject to USACE jurisdiction as non-wetland waters of the U.S; wetland waters of the U.S. are absent.

Coastal Wetlands 1 and 2

While Coastal Wetland 1 meets the criteria for a USACE three-parameter wetland, the feature is an isolated, intrastate water which does not possess a hydrologic connection or a significant nexus to any TNW. Coastal Wetland 2 is similarly an isolated feature, and additionally does not meet the criteria of a three-parameter USACE wetland. Accordingly, Coastal Wetlands 1 and 2 are not waters of the U.S.

Table 3 Summary of Hydrophytic Vegetation, Hydric Soils, and Wetlands Hydrology Indicator Status by Sample Point

Feature	Sample Point	Meets Hydrophytic Vegetation Criterion	Meets Hydric Soils Criterion	Meets Wetland Hydrology Criterion	Wetland Waters of the U.S.	Wetland Waters of the State	Coastal Wetland
Devereux Creek	1	Yes	Yes	Yes	Yes	Yes	Yes
	2	No	No	No	No	No	No
	3	Yes	Yes	Yes	Yes	Yes	Yes
	4	No	No	No	No	No	No
	5	No	No	Yes	No	No	Yes
	6	Yes	Yes	Yes	Yes	Yes	Yes
	7	Yes	No	No	No	No	Yes
Coastal Wetland 1	8	Yes	Yes	Yes	No	Yes	Yes
	9	No	No	No	No	No	No
Coastal Wetland 2	10	Yes	No	No	No	No	Yes
N/A	11	No	No	No	No	No	No
N/A	12	No	No	No	No	No	No

5.2 RWQCB Jurisdiction

Devereux Creek

Devereux Creek is potentially regulated by the Central Coast RWQCB under CWA Section 401 and the Porter-Cologne Water Quality Control Act. Potential non-wetland waters of the State were determined to be present and were determined to be coterminous with limits of CDFW jurisdiction per Central Coast RWQCB practice and as described further below. RWQCB wetland waters of the State were determined to be coterminous with USACE wetland waters of the U.S.

Unnamed Drainages 1-8

Due to the presumed presence of surface water within Unnamed Drainages 1-8 during the rainy season, these features are potentially regulated by Central Coast RWQCB under CWA Section 401 and the Porter-Cologne Water Quality Control Act. Potential non-wetland waters of the State were determined to be present and were determined to be coterminous with limits of CDFW jurisdiction.

Wetland waters of the State were not present in any of these drainages due to the lack of hydrology indicators, hydric soils, and limited presence of hydrophytic vegetation. Scattered hydrophytic vegetation is present in Unnamed Drainage 2 in the form of arroyo willow thickets, however it is not present in sufficient quantity or density to indicate a dominance of hydrophytic vegetation. No hydrophytic or riparian vegetation is present in Unnamed Drainages 1a, 1b, 1c, and 3-8.

Coastal Wetland 1

Coastal Wetland 1 contained evidence of wetland hydrology, hydrophytic vegetation and hydric soils. Accordingly, wetland waters of the State were determined to be present and were defined by the limits of the hydrophytic vegetation.

Coastal Wetland 2

Coastal Wetland 2 contains evidence of hydrophytic vegetation, but indicators of hydric soils and wetland hydrology were absent. Therefore, CCC wetlands were determined to be present and were defined by the limits of the hydrophytic vegetation.

5.3 CDFW Jurisdiction

Devereux Creek

Since Devereux Creek contains defined bed and banks as well as riparian vegetation, it is potentially subject to CDFW jurisdiction pursuant to CFGC Section 1600 et seq. In areas without riparian vegetation, the limits of CDFW jurisdiction were defined by the top of bank. Where riparian vegetation is present, the CDFW-jurisdictional streambed was largely defined by the riparian vegetation which extended past the top of bank.

Unnamed Drainages 1-8

Since Unnamed Drainages 1-8 contain defined bed and banks, these features are potentially subject to CDFW jurisdiction pursuant to CFGC Section 1600 et seq. The CDFW-jurisdictional streambed was defined by the extent of the top of bank in cases where no riparian vegetation is present (i.e., Unnamed Drainages 1a, 1b, 1c, and 3-8 and the southern portion of Unnamed Drainage 2). Riparian vegetation in the form of arroyo willow thickets is present in the northern portion of Unnamed Drainage 2, therefore in this area the extent of CDFW-jurisdictional streambed was defined by the extent of riparian vegetation. Potentially jurisdictional culverts are present in Unnamed Drainages 1a and 1b; in these cases, CDFW-jurisdictional streambed was defined by the width of the culvert. CDFW-jurisdictional streambed is conterminous with non-wetland waters of the State.

Coastal Wetland 1 and 2

Coastal Wetlands 1 and 2 do not exhibit bed, bank, or channel and are isolated from CDFW-jurisdictional streams. As such, these features would not fall under CDFW jurisdiction pursuant to CFGC Section 1600 et seq.

5.4 CCC/City Water Resource Considerations

Devereux Creek

Devereux Creek may be subject to CCC and City wetland policies, due to its location within the Coastal Zone and the presence of one-parameter wetlands as assessed at Sample Points 1, 3, and 5. The limits of coastal wetlands were determined based on the results of sample points and the presence of wetland hydrology such as surface water, or a predominance of hydrophytic vegetation (including the canopy of dense arroyo willow stands which extend past areas subject to regular inundation).

Unnamed Drainages 1-8

Unnamed Drainages 1a, 1b, 1c, and 3-8 do not exhibit any wetland indicators. Hydrophytic vegetation is extremely limited in the drainages, hydric soils were not observed, and no wetland hydrology indicators are present. Limited hydrophytic vegetation in the form of arroyo willow

thickets is present in the northern portion of Unnamed Drainage 2, however it is not present in sufficient quantity or density to indicate a dominance of hydrophytic vegetation. No hydric soils or wetland hydrology indicators are present at Unnamed Drainage 2. Therefore, although Unnamed Drainages 1-8 are in the Coastal Zone, no wetland parameters are present and coastal wetlands are absent.

Coastal Wetlands 1 and 2

Coastal Wetland 1 exhibited evidence of hydrophytic vegetation, hydric soils and wetland hydrology, and Coastal Wetland 2 contained hydrophytic vegetation. Therefore, Coastal Wetlands 1 and 2 may be regulated by CCC and City, due to their locations within the Coastal Zone and the presence of at least one wetland parameter. The limits of coastal wetlands were defined by the limits of hydrophytic vegetation.

6 Conclusion

As described above, the delineation identified jurisdictional features within the study area likely subject to regulation by the USACE, RWQCB, CDFW, CCC, and City. Where feasible, jurisdictional waters should be considered and avoided during project design. Impacts associated with project development would likely require the acquisition of permits from the USACE, RWQCB, CDFW, CCC, and City, as applicable.

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Appendix A

Regulatory Setting

Regulatory Setting

The following is a brief summary of the regulatory context under which biological resources are managed at the federal, State, and local levels. A number of federal and State statutes provide a regulatory structure which guide the protection of jurisdictional features. Agencies with the responsibility for protection of jurisdictional features within the project site include:

- United States Army Corps of Engineers (non-wetland waters and wetlands of the United States)
- Regional Water Quality Control Board (waters of the State)
- California Department Fish and Wildlife (riparian areas, streambeds, and lakes)
- California Coastal Commission (coastal wetlands)

United States Army Corps of Engineers Jurisdiction

The United States Army Corps of Engineers (USACE) is responsible for administering several federal programs related to ensuring the quality and navigability of the nation's waters.

Clean Water Act Section 404

Congress enacted the Clean Water Act (CWA) "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Section 404 of the CWA authorizes the Secretary of the Army, acting through the USACE, to issue permits regulating the discharge of dredged or fill materials into the "navigable waters at specified disposal sites."

Section 502 of the CWA further defines "navigable waters" as "waters of the United States, including the territorial seas." "Waters of the United States" are broadly defined at 33 CFR Part 328.3 to include navigable waters, perennial and intermittent streams, lakes, rivers, ponds, as well as wetlands, marshes, and wet meadows. In recent years the USACE and US Environmental Protection Agency (USEPA) have undertaken several efforts to modernize their regulations defining "waters of the United States" (e.g., the 2015 Clean Water Rule and 2020 Navigable Waters Protection Rule), but these efforts have been frustrated by legal challenges which have invalidated the updated regulations. Thus, the agencies' longstanding definition of "waters of the United States," which dates from 1986, remains in effect albeit with supplemental guidance interpreting applicable court decisions as described below.

Waters of the U.S.

In summary, USACE and USEPA regulations define "waters of the United States" as follows:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or

ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

iii. Which are used or could be used for industrial purpose by industries in interstate commerce;

4. All impoundments of waters otherwise defined as waters of the United States;
5. Tributaries of waters identified in paragraphs (a)(1)-(4) of this section;
6. The territorial sea;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in items 1-6 above.

Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with the USEPA.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA are not waters of the United States.

The lateral limits of USACE jurisdiction in non-tidal waters is defined by the "ordinary high-water mark" (OHWM) unless adjacent wetlands are present. The OHWM is a line on the shore or edge of a channel established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed upon the bank, shelving, changes in the character of soil, destruction of vegetation, or the presence of debris (33 CFR 328.3(e)). As such, waters are recognized in the field by the presence of a defined watercourse with appropriate physical and topographic features. If wetlands occur within, or adjacent to, waters of the United States, the lateral limits of USACE jurisdiction extend beyond the OHWM to the outer edge of the wetlands (33 CFR 328.4 (c)). The upstream limit of jurisdiction in the absence of adjacent wetlands is the point beyond which the OHWM is no longer perceptible (33 CFR 328.4; see also 51 FR 41217).

Wetlands

The USACE defines wetlands as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3). The USACE’s delineation procedures identify wetlands in the field based on indicators of three wetland parameters: hydrophytic vegetation, hydric soils, and wetland hydrology. The following is a discussion of each of these parameters.

Hydrophytic Vegetation

Hydrophytic vegetation dominates areas where frequency and duration of inundation or soil saturation exerts a controlling influence on the plant species present. Plant species are assigned wetland indicator status according to the probability of their occurring in wetlands. More than fifty percent of the dominant plant species must have a wetland indicator status to meet the hydrophytic vegetation criterion. The USACE published the National Wetland Plant List (USACE 2020), which separates vascular plants into the following four basic categories based on plant species frequency of occurrence in wetlands:

- **Obligate Wetland (OBL).** Almost always occur in wetlands
- **Facultative Wetland (FACW).** Usually occur in wetlands, but occasionally found in non-wetlands
- **Facultative (FAC).** Occur in wetlands or non-wetlands
- **Facultative Upland (FACU).** Usually occur in non-wetlands, but may occur in wetlands
- **Obligate Upland (UPL).** Almost never occur in wetlands

The USACE considers OBL, FACW and FAC species to be indicators of wetlands. An area is considered to have hydrophytic vegetation when greater than 50 percent of the dominant species in each vegetative stratum (tree, shrub, and herb) fall within these categories. Any species not appearing on the United States Fish and Wildlife Service's list is assumed to be an upland species, almost never occurring in wetlands. In addition, an area needs to contain at least 5% vegetative cover to be considered as a vegetated wetland.

Hydric Soils

Hydric soils are saturated or inundated for a sufficient duration during the growing season to develop anaerobic or reducing conditions that favor the growth and regeneration of hydrophytic vegetation. Field indicators of wetland soils include observations of ponding, inundation, saturation, dark (low chroma) soil colors, bright mottles (concentrations of oxidized minerals such as iron), gleying (indicates reducing conditions by a blue-grey color), or accumulation of organic material. Additional supporting information includes documentation of soil as hydric or reference to wet conditions in the local soils survey, both of which must be verified in the field.

Wetland Hydrology

Wetland hydrology is inundation or soil saturation with a frequency and duration long enough to cause the development of hydric soils and plant communities dominated by hydrophytic vegetation. If direct observation of wetland hydrology is not possible (as in seasonal wetlands), or records of wetland hydrology are not available (such as stream gauges), assessment of wetland hydrology is frequently supported by field indicators, such as water marks, drift lines, sediment deposits, or drainage patterns in wetlands.

Applicable Case Law and Agency Guidance

The USACE's regulations defining "waters of the United States" have been subject to legal interpretation, and two influential Supreme Court decisions have narrowed the definition to exclude certain classes of waters that bear an insufficient connection to navigable waters. In *Solid Waste Agency of Northern Cook County v. Army Corps of Engineers* (2001), the United States Supreme Court stated that the USACE's CWA jurisdiction does not extend to ponds that "are not adjacent to open water." In reaching its decision, the Court concluded that the "Migratory Bird Rule," which served as the basis for the USACE's asserted jurisdiction, was not supported by the CWA. The Migratory Bird Rule extended CWA jurisdiction to intrastate waters "which are or would be used as habitat by birds protected by Migratory Bird Treaties or which are or would be used as habitat by other migratory birds which cross state lines…" The Court was concerned that application of the Migratory Bird Rule resulted in "reading the term 'navigable waters' out of the statute. Highlighting the language of the CWA to determine the statute's jurisdictional reach, the Court stated, "the term 'navigable' has at least the import of showing us what Congress had in mind as its authority for enacting the CWA: its traditional jurisdiction over waters that were or had been navigable in fact or which could reasonably be so made." This decision stands for the proposition that non-navigable

isolated, intrastate waters are not waters of the United States and thus are not jurisdictional under the CWA.

In 2006 the United States Supreme Court decided *Rapanos v. United States* and *Carabell v. United States* (collectively "Rapanos"), which were consolidated cases determining the extent of CWA jurisdiction over waters that carry only an infrequent surface flow. The court issued no majority opinion in Rapanos. Instead, the justices authored five separate opinions including the "plurality" opinion, authored by Justice Scalia (joined by three other justices), and a concurring opinion by Justice Kennedy. To guide implementation of the decision, the USACE and USEPA issued a joint guidance memorandum ("Rapanos Guidance Memorandum") in 2008 stating that "regulatory jurisdiction under the CWA exists over a water body if either the plurality's or Justice Kennedy's standard is satisfied."

According to the plurality opinion in Rapanos, "the waters of the United States include only relatively permanent, standing or flowing bodies of water" and do not include "ordinarily dry channels through which water occasionally or intermittently flows." In addition, while all wetlands that meet the USACE definition are considered adjacent wetlands, only those adjacent wetlands that have a continuous surface connection because they directly about the tributary (e.g., they are not separated by uplands, a berm, dike, or similar feature) are considered jurisdictional under the plurality standard.

Under Justice Kennedy's opinion, "the USACE's jurisdiction over wetlands depends upon the existence of a significant nexus between the wetlands in question and navigable waters in the traditional sense. Wetlands possess the requisite nexus, and thus come within the statutory phrase 'navigable waters,' if the wetlands, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable.' When, in contrast, wetlands' effects on water quality are speculative or insubstantial, they fall outside the zone fairly encompassed by the statutory term 'navigable waters.'" Justice Kennedy identified "pollutant trapping, flood control, and runoff storage" as some of the critical functions wetlands can perform relative to other waters. He concluded that, given wetlands' ecological role, "mere adjacency" to a non-navigable tributary was insufficient to establish CWA jurisdiction, and that "a more specific inquiry, based on the significant nexus standard, is therefore necessary."

Interpreting these decisions, and according to the Rapanos Guidance Memorandum, the USACE and USEPA will assert jurisdiction over the following waters:

- Traditional navigable waters;
- Wetlands adjacent to traditional navigable waters;
- Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); and,
- Wetlands that directly abut such tributaries.

The USACE and USEPA will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water:

- Non-navigable tributaries that are not relatively permanent;
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent; and,

- Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

Where a significant nexus analysis is required, the USACE and USEPA will apply the significant nexus standard as follows:

- A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters; and,
- Significant nexus includes consideration of hydrologic and ecologic factors.

The USACE and USEPA generally will not assert jurisdiction over the following features:

- Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow); and,
- Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

Rivers and Harbors Act Section 10

Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the USACE for the construction of any structure in or over any navigable water of the United States. Structures or work outside the limits defined for navigable waters of the United States require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, re-channelization, or any other modification of a navigable water of the United States, and applies to all structures and work. It further includes, without limitation, any wharf, dolphin, weir, boom breakwater, jetty, groin, bank protection (e.g., riprap, revetment, bulkhead), mooring structures such as pilings, aerial or subaqueous power transmission lines, intake or outfall pipes, permanently moored floating vessel, tunnel, artificial canal, boat ramp, aids to navigation, and any other permanent, or semi-permanent obstacle or obstruction. It is important to note that Section 10 applies only to navigable waters, and thus does not apply to work in non-navigable wetlands or tributaries. In some cases, Section 10 authorization is issued by the USACE concurrently with CWA Section 404 authorization, such as when certain Nationwide Permits are used.

Regional Water Quality Control Board Jurisdiction

The State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs) have jurisdiction over “waters of the State,” which are defined as any surface water or groundwater, including saline waters, within the boundaries of the state (California Water Code sec. 13050(e)). These agencies also have responsibilities for administering portions of the CWA.

Clean Water Act Section 401

Section 401 of the CWA requires an applicant requesting a federal license or permit for an activity that may result in any discharge into navigable waters (such as a Section 404 Permit) to provide state certification that the proposed activity will not violate state and federal water quality

standards. In California, CWA Section 401 Water Quality Certification (Section 401 Certification) is issued by the RWQCBs and by the SWRCB for multi-region projects. The process begins when an applicant submits an application to the RWQCB and informs the USACE (or the applicable agency from which a license or permit was requested) that an application has been submitted. The USACE will then determine a "reasonable period of time" for the RWQCB to act on the application; this is typically 60 days for routine projects and longer for complex projects but may not exceed one year. When the period has elapsed, if the RWQCB has not either issued or denied the application for Section 401 Certification, the USACE may determine that Certification has been waived and issue the requested permit. If a Section 401 Certification is issued it may include binding conditions, imposed either through the Certification itself or through the requested federal license or permit.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is the principal law governing water quality regulation in California. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act applies to surface waters, wetlands, and ground water and to both point and nonpoint sources of pollution. Pursuant to the Porter-Cologne Act (California Water Code section 13000 et seq.), the policy of the State is as follows:

- The quality of all the waters of the State shall be protected
- All activities and factors affecting the quality of water shall be regulated to attain the highest water quality within reason
- The State must be prepared to exercise its full power and jurisdiction to protect the quality of water in the State from degradation

The Porter-Cologne Act established nine RWQCBs (based on watershed boundaries) and the SWRCB, which are charged with implementing its provisions and which have primary responsibility for protecting water quality in California. The SWRCB provides program guidance and oversight, allocates funds, and reviews RWQCB decisions. In addition, the SWRCB allocates rights to the use of surface water. The RWQCBs have primary responsibility for individual permitting, inspection, and enforcement actions within each of nine hydrologic regions. The SWRCB and RWQCBs have numerous nonpoint source related responsibilities, including monitoring and assessment, planning, financial assistance, and management.

Section 13260 of the Porter-Cologne Act requires any person discharging or proposing to discharge waste that could affect the quality of waters of the State to file a Report of Waste Discharge with the appropriate RWQCB. The RWQCB may then authorize the discharge, subject to conditions, by issuing Waste Discharge Requirements (WDRs). While this requirement was historically applied primarily to outfalls and similar point source discharges, the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*, effective May 2020, make it clear that the agency will apply the Porter-Cologne Act's requirements to discharges of dredge and fill material as well. The *Procedures* state that they are to be used in issuing CWA Section 401 Certifications and WDRs, and largely mirror the existing review requirements for CWA Section 404 Permits and Section 401 Certifications, incorporating most elements of the USEPA's *Section 404(b)(1) Guidelines*. Following issuance of the *Procedures*, the SWRCB produced a consolidated application form for dredge/fill discharges that can be used to obtain a CWA Section 401 Water Quality Certification, WDRs, or both.

Non-Wetland Waters of the State

The SWRCB and RWQCBs have not established regulations for field determinations of waters of the State except for wetlands currently. In many cases the RWQCBs interpret the limits of waters of the State to be bounded by the OHWM unless isolated conditions or ephemeral waters are present. However, in the absence of statewide guidance each RWQCB may interpret jurisdictional boundaries within their region and the SWRCB has encouraged applicants to confirm jurisdictional limits with their RWQCB before submitting applications. As determined by the RWQCB, waters of the State may include riparian areas or other locations outside the OHWM, leading to a larger jurisdictional area over a given water body compared to the USACE.

Wetland Waters of the State

Procedures for defining wetland waters of the State pursuant to the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* went into effect May 28, 2020. The SWRCB defines an area as wetland if, under normal circumstances:

(i) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both;

(i) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and

(ii) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.

The SWRCB's *Implementation Guidance for the Wetland Definition and Procedures for Discharges of Dredge and Fill Material to Waters of the State* (2020), states that waters of the U.S. and waters of the State should be delineated using the standard USACE delineation procedures, taking into consideration that the methods shall be modified only to allow for the fact that a lack of vegetation does not preclude an area from meeting the definition of a wetland.

California Department of Fish and Wildlife Jurisdiction

California Fish and Game Code Section 1602 states that it is unlawful for any person to "substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake" without first notifying the California Department of Fish and Wildlife (CDFW) of that activity. Thereafter, if CDFW determines and informs the entity that the activity will not substantially adversely affect any existing fish or wildlife resources, the entity may commence the activity. If, however, CDFG determines that the activity may substantially adversely affect an existing fish or wildlife resource, the entity may be required to obtain from CDFW a Streambed Alteration Agreement (SAA), which will include reasonable measures necessary to protect the affected resource(s), before the entity may conduct the activity described in the notification. Upon receiving a complete Notification of Lake/Streambed Alteration, CDFW has 60 days to present the entity with a Draft SAA. Upon review of the Draft SAA by the applicant, any problematic terms are negotiated with CDFW and a final SAA is executed.

The CDFW has not defined the term "stream" for the purposes of implementing its regulatory program under Section 1602, and the agency has not promulgated regulations directing how jurisdictional streambeds may be identified, or how their limits should be delineated. However, four relevant sources of information offer insight as to the appropriate limits of CDFW jurisdiction as discussed below.

- **The plain language of Section 1602 of CFGC** establishes the following general concepts:
  - References "river," "stream," and "lake"
  - References "natural flow"
  - References "bed," "bank," and "channel"

- **Applicable court decisions**, in particular *Rutherford v. State of California* (188 Cal App. 3d 1276 (1987), which interpreted Section 1602's use of "stream" to be as defined in common law. The Court indicated that a "stream" is commonly understood to:
  - Have a source and a terminus
  - Have banks and a channel
  - Convey flow at least periodically, but need not flow continuously and may at times appear outwardly dry
  - Represent the depression between the banks worn by the regular and usual flow of the water
  - Include the area between the opposing banks measured from the foot of the banks from the top of the water at its ordinary stage, including intervening sand bars
  - Include the land that is covered by the water in its ordinary low stage
  - Include lands below the OHWM

- **CDFW regulations** defining "stream" for other purposes, including sport fishing (14 CCR 1.72) and streambed alterations associated with cannabis production (14 CCR 722(c)(21)), which indicate that a stream:
  - Flows at least periodically or intermittently
  - Flows through a bed or channel having banks
  - Supports fish or aquatic life
  - Can be dry for a period of time
  - Includes watercourses where surface or subsurface flow supports or has supported riparian vegetation

- **Guidance documents**, *including A Field Guide to Lake and Streambed Alteration Agreements* (CDFG 1994) and *Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-Scale Solar Power Plants* (Brady and Vyverberg 2013), which suggest the following:
  - A stream may flow perennially or episodically
  - A stream is defined by the course in which water currently flows, or has flowed during the historic hydrologic course regime (approximately the last 200 years)
  - Width of a stream course can reasonably be identified by physical or biological indicators
  - A stream may have one or more channels (single thread vs. compound form)
  - Features such as braided channels, low-flow channels, active channels, banks associated with secondary channels, floodplains, islands, and stream-associated vegetation, are interconnected parts of the watercourse
  - Canals, aqueducts, irrigation ditches, and other means of water conveyance can be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife

- Biologic components of a stream may include aquatic and riparian vegetation, all aquatic animals including fish, amphibians, reptiles, invertebrates, and terrestrial species which derive benefits from the stream system
- The lateral extent of a stream can be measured in different ways depending on the particular situation and the type of fish or wildlife resource at risk

The tenets listed above, among others, are applied to establish the boundaries of streambeds in various environments. Importance of each factor may be weighted based on site-specific considerations and the applicability of the indicators to the streambed at hand.

California Coastal Commission Jurisdiction

In October 1972, the United States Congress passed Title 16 USC Sections 1451-1464, which established a federal coastal zone management policy and created a federal coastal zone. By that legislation, the Congress declared a national interest in the effective management, beneficial use, protection and development of the coastal zone in order to balance the nation's natural, environmental and aesthetic resource needs with commercial-economic growth. The Congress found and declared that it was a national policy "to encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone giving full consideration to ecological, cultural, historic, and aesthetic values as well as to the need for economic development (16 USC Section 1452b). As a result of that federal enactment, coastal states were provided a policy and source of funding for the implementation of federal goals.

The California Coastal Zone Conservation Act of 1972 (Proposition 20) was a temporary measure passed by the voters of the state as a ballot initiative. It set up temporary regional Coastal Commissions with permit authority and a directive to prepare a comprehensive coastal plan. The coastal commissions under Proposition 20 lacked the authority to implement the Coastal Plan but were required to submit the Plan to the legislature for "adoption and implementation."

The California Coastal Act (CCA) of 1976 is the permanent enacting law approved by the State legislature. The Coastal Act established a different set of policies, a different boundary line, and different permitting procedures than Proposition 20. Furthermore, it provides for the transfer of permitting authority, with certain limitations reserved for the State, to local governments through adoption and certification of LCPs by the California Coastal Commission (CCC).

In accordance with the CCA, the CCC defines coastal wetlands as generally extending seaward to the state's outer limit of jurisdiction (i.e., three nautical miles from the Mean Hight Tide Line (MHTL) and inland generally 1,000 yards from the MHTL (CCC 2011). In contrast to wetland waters of the U.S., potential coastal wetland features are defined by the presence of one of the three USACE wetland indicators (California Code of Regulations Title 14 (14 CCR)). The one parameter definition as follows:

> Wetland shall be defined as land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated

> substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deep-water habitats. (14 CCR Section 13577).

Local Jurisdiction

City of Goleta General Plan/Coastal Land Use Plan

This plan governs land use and physical development within the geographic area of the incorporated City of Goleta limits. As of January 1, 2006, this area included 5,075 acres, or approximately 7.9 square miles. The Goleta General Plan/Coastal Land Use Plan, which is required by California law, is the most important policy document that guides future physical changes and public decision making within a community. California law places the general plan atop the hierarchy of land use planning regulations; by analogy, it has been described as a "constitution" for decision making by a city for its future physical development and change. General plans are required to be comprehensive, long-range, and internally consistent. Every general plan must address seven specific topics, or elements: land use, housing, conservation, open space, transportation, safety, and noise. While state law establishes specific requirements for the contents of the plan, within that legal framework each community has latitude to design its own future. State law allows flexibility in how elements are organized and the additional topics that may be included. All elements have the same legal status, and no element, goal, or policy can supersede any other. The Goleta General Plan/Coastal Land Use Plan is the primary means for guiding future change in Goleta as it faces difficult choices on a daily basis about growth, housing, environmental protection, neighborhood compatibility and preservation, and transportation. The plan provides a guide for making these choices by relating day-to-day decisions to the goals, objectives, and policies of this document. The plan has four major purposes:

- To provide a unified and coherent framework and vision for the future of the community.
- To provide a basis for future decisions by the City on implementing ordinances such as zoning and subdivision codes, individual development project applications, and public investments in infrastructure and services, so as to achieve consistency with the framework.
- To inform the public of the City's policies and provide a means to invite public participation in the City's decision-making processes.
- To guide private landowners, developers, and other public agencies in formulating projects and designs that will be consistent with Goleta's policies.

Coastal Wetlands

The CCC coastal wetlands are determined in accordance with the CCA, which defines coastal wetlands as generally extending seaward to the state's outer limit of jurisdiction (i.e., three nautical miles from the MHTL) and inland generally 1,000 yards from the MHTL (CCC 2011). The CCA contains specific policies aimed at preserving biological resources, such as wetlands, riparian habitat, and marine habitat.

Potential coastal wetland features are evaluated for the presence of one of the three USACE wetland indicators (California Code of Regulations [CCR] Title 14). The one-parameter definition as follows:

> Wetland shall be defined as land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly

developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deep-water habitats. (14 CCR Section 13577).

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Appendix B

Floral Compendium

Plant Species Observed in Study Area (March 2020, September 2021, February 2022)

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced[1] Status	Wetland Indicator Status[2]	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping /Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Trees																			
Acacia spp.	acacia	Invasive Introduced	UPL						X								X		
Acer negundo	box elder	Native	FACW						X										
Ailanthus altissima	tree of heaven	Invasive Introduced	FACU				X												
Corymbia sp.	flowering gum	Introduced	-														X		
Cupressus sp.	cypress tree	-	UPL			X			X										
Eucalyptus camaldulensis	red gum	Introduced	FAC						X								X[d]		
Eucalyptus cladocalyx	sugar gum	Introduced	UPL						X										
Eucalyptus globulus	blue gum	Introduced	UPL			X	X		X*										X
Eucalyptus sideroxylon	red ironbark	Introduced	UPL						X										
Fraxinus sp.	ash	Introduced	-						X										
Fraxinus udhei	shamel ash	Introduced	UPL			X			X										
Juniperus communis	common juniper	Native	FACU						X										
Olea europaea	olive tree	Invasive Introduced	UPL						X							X			X
Pinus sp.	pine tree	-	-			X			X										
Prunus ilicifolia ssp. *lyonii*	Catalina cherry	Native	UPL						X										
Platanus racemosa	western sycamore	Native	FAC		X		X										X		
Phoenix canariensis	canary palm	Invasive Introduced	UPL						X										
Populus balsamifera ssp. *trichocarpa*	Black cottonwood	Native	FAC		X														
Populus fremontii	Fremont cottonwood	Native	FAC		X		X												
Quercus agrifolia	coast live oak	Native	UPL		X	X*	X		X					X					X
Quercus lobata	valley oak	Native	FACU											X					
Salix lasiolepis	arroyo willow	Native	FACW		X	X			X										

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced[1] Status	Wetland Indicator Status[2]	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping /Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Schinus terebinthifolius	Brazilian pepper	Introduced	FAC						X										
Washingtonia robusta	Mexican fan palm	Invasive Introduced	FACW						X								X		
Shrubs																			
Acacia longifolia	golden wattle	Introduced	UPL						X										
Acmispon glaber	deerweed	Native	UPL								X								
Artemisia californica	California sagebrush	Native	UPL		X		X		X		X								X
Atriplex lentiformis	quailbush	Native	FACU											X*					
Agave sp.	Ornamental agave	Introduced	UPL														X		
Baccharis pilularis	coyote brush	Native	UPL		X	X	X*		X							X	X	X	X
Baccharis plummerae ssp. Plummerae	Plummer's baccharis	Native (CRPR 4.3)	UPL						X										
Baccharis salicifolia	mulefat	Native	FAC		X														
Bougainvillea spectabilis	bougainvillea	Introduced	UPL														X		
Caesalpinia gilliesii	bird of paradise	Introduced	UPL														X		
Ceanothus sp.	ornamental ceanothus	-	UPL											-					
Cortaderia selloana	pampas grass	Invasive Introduced	FACU								X								
Crassula ovata	jade plant	Introduced	UPL						X										
Diplacus aurantiacus	sticky monkeyflower	Native	FACU						X										
Elymus condensatus	giant wild rye	Native	UPL		X	X	X		X					X	X				
Encelia californica	California sunflower	Native	UPL		X									X					
Eriogonum grande	island buckwheat	Native	UPL											X					
Eriogonum parvifolium	seacliff buckwheat	Native	UPL								X			X					

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced[1] Status	Wetland Indicator Status[2]	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping /Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Hazardia squarrosa	sawtooth goldenbush	Native	UPL						X										
Hedera helix	English ivy	Invasive Introduced	FACU						X								X		
Heteromeles arbutifolia	toyon	Native	UPL		X		X		X								X		X
Lonicera subspicata var. *subspicata*	Santa Barbara honeysuckle	Native (CRPR 1B.2)	UPL						X					X					
Opuntia ficus-indica	mission cactus	Introduced	UPL														X		
Myoporum laetum	myoporum	Invasive Introduced	FACU						X										
Nerium oleander	oleander	Introduced	UPL														X		
Phyllostachys bambusoides	Japanese timber bamboo	Introduced	UPL														X		
Pittosporum sp.	pittosporum	Introduced	-						X										
Polygala myrtifolia	myrtle leaf milkwort	Introduced	UPL																X
Pyracantha coccinea	scarlet firethorn	Introduced	UPL														X		
Pyracantha sp.	Pyracantha	Introduced	-						X										
Ribes speciosum	fuchsia flowered gooseberry	Native	UPL						X										
Rosa californica	California rose	Native	FAC											X					
Rhus integrifolia	lemonade berry	Native	UPL				X		X				X*	X					X
Rubus armeniacus	Himalayan blackberry	Introduced	FAC						X										
Rubus ursinus	California blackberry	Native	FAC		X		X		X										
Ruscus aculeatus	Butcher's broom	Introduced	UPL																X
Salvia mellifera	black sage	Native	UPL											X					
Sambucus nigra ssp. *caerulea*	blue elderberry	Native	FACU						X										
Tecoma capensis	cape honeysuckle	Introduced	UPL														X		

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced[1] Status	Wetland Indicator Status[2]	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping /Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Yucca sp.	ornamental yucca	Introduced	UPL						X								X		
Herbs																			
Agapanthus sp.	lily of the Nile	Introduced	-						X										X
Ambrosia psilostachya	western ragweed	Native	FACU		X				X		X								X
Araujia sericifera	bladder vine	Introduced	UPL																X
Artemisia douglasiana	mugwort	Native	FAC		X		X												
Asparagus asparagoides	African asparagus fern	Invasive Introduced	UPL				X		X										
Atriplex prostrata	basin saltbush	Introduced	FACW						X[d]										
Atriplex semibaccata	Australian saltbush	Invasive Introduced	FAC		X														X
Avena barbata	slender oat	Invasive Introduced	UPL				X[d]		X		X					X[d]		X	X[*d]
Avena fatua	common wild oats	Invasive Introduced	UPL				X[d]				X					X[d]		X	X[*d]
Brassica nigra	black mustard	Invasive Introduced	UPL	X	X	X	X[d]		X	X						X		X[*]	X
Brassica rapa	field mustard	Invasive Introduced	FACU								X								
Bromus sitchensis var. *carinatus*	California brome	Native	UPL						X										X
Bromus diandrus	ripgut brome	Invasive Introduced	UPL	X	X		X[d]		X		X				X	X		X	X[d]
Bromus hordeaceus	soft chess	Invasive Introduced	FACU		X		X[d]								X			X	X[d]
Bolboschoenus maritimus	alkali bulrush	Native	UPL						X										
Campsis radicans	trumpet creeper	Introduced	FACU														X		
Calystegia macrostegia	coast morning glory	Native	UPL				X		X					X					X
Carduus pycnocephalus	Italian thistle	Invasive Introduced	UPL				X[d]												X
Carex sp.	sedge	-	-																X

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced[1] Status	Wetland Indicator Status[2]	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping /Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Carex subfusca	brown sedge	Native	FAC	X	X				X										X
Carpobrotus edulis	ice plant	Invasive Introduced	UPL						X		X*						X		X
Claytonia parviflora	miner's lettuce	Native	FACU						X										
Clematis pauciflora	hill clematis	Native	UPL						X										
Cressa truxillensis	alkali weed	Native	FACW														X		
Cynodon dactylon	Bermuda grass	Invasive Introduced	FACU						X										
Cyperus eragrostis	umbrella sedge	Native	FACW	X					X										
Datura wrightii	jimsonweed	Native	UPL						X										
Delairea odorata	cape ivy	Invasive Introduced	FAC						X										
Dichelostemma capitatum	blue dicks	Native	FACU						X										
Distichlis spicata	salt grass	Native	FAC	X	X						X								
Echinochloa crus-galli	barnyard grass	Introduced	UPL						X										
Ehrharta erecta	upright veldt grass	Invasive Introduced	UPL						X										
Eleocharis macrostachya	common spikerush	Native	UPL	X	X				X			X*							
Eleocharis parishii	Parish's spike rush	Native	FACW		X														
Elymus triticoides	creeping wildrye	Native	UPL	X			X	X*	X										X
Erodium botrys	big heron bill	Introduced	FACU				X		X										X
Erodium cicutarium	red stemmed filaree	Invasive Introduced	UPL				X									X			X
Eryngium vaseyi	coyote thistle	Native	FACW									X							
Festuca perennis	Italian rye grass	Invasive Introduced	FAC	X			X									X			X
Foeniculum vulgare	sweet fennel	Invasive Introduced	UPL		X		X				X							X	X
Frankenia salina	alkali heath	Native	FACW	X	X				X	X									
Galium sp.	bedstraw	-	-						X										

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced[1] Status	Wetland Indicator Status[2]	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping /Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Geranium dissectum	cutleaf geranium	Invasive Introduced	UPL		X				X										
Geranium molle	crane's bill geranium	Introduced	UPL				X									X			X
Hedera canariensis	Algerian ivy	Invasive Introduced	UPL						X								X		
Helminthotheca echioides	bristly ox-tongue	Invasive Introduced	FAC	X	X		X								X				X
Hirschfeldia incana	summer mustard	Invasive Introduced	UPL								X								X
Hordeum murinum	foxtail barley	Invasive Introduced	FACU				X												X
Ipomoea indica	ornamental morning glory	Introduced	OBL														X		
Isocoma menziesii	Menzies' goldenbush	Native	FAC				X						X						X
Juncus bufonius	common toad rush	Native	FACW						X										
Juncus patens	common rush	Native	FACW	X	X				X			X							X
Juncus phaeocephalus	brown headed rush	Native	FACW		X							X*							
Juncus sp.	rush	Native	-						X										
Lythrum hyssopifolia	hyssop loosestrife	Invasive Introduced	OBL									X							
Malephora crocea	Coppery mesembryant hemum	Invasive Introduced	FACU						X										
Malvella leprosa	alkali mallow	Native	FACU						X										
Medicago polymorpha	California burclover	Invasive Introduced	FACU		X										X				X
Muhlenbergia rigens	deergrass	Native	FAC											X					
Narcissus papyraceus	paperwhite	Introduced	FACU																X
Narcissus sp.	daffodil	Introduced	-																X
Nasturtium officinale	watercress	Native	OBL																
Oxalis pes-caprae	sourgrass	Invasive Introduced	UPL		X		X		X	X					X				X

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced[1] Status	Wetland Indicator Status[2]	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping /Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Pennisetum clandestinum	kikuyu grass	Invasive Introduced	UPL						X										
Pentagramma triangularis ssp. *triangularis*	gold back fern	Native	UPL						X										
Phalaris aquatica	harding grass	Invasive Introduced	FACU						X										X
Plantago lanceolata	English plantain	Invasive Introduced	FAC		X		X		X						X			X	X
Pseudognaphalium bioletti	two-color rabbit-tobacco	Native	UPL								X								
Pseudognaphalium californicum	ladies' tobacco	Native	UPL						X										
Psilocarphus brevissimus	woolly marbles	Native	FACW									X							
Pteridium aquilinum var. *pubescens*	western bracken fern	Native	FACU						X										
Raphanus sativus	wild radish	Invasive Introduced	UPL	X	X				X	X									X
Rudbeckia hirta var. *pulcherrima*	black eyed susan	Introduced	FACU														X		
Rumex crispus	curly dock	Invasive Introduced	FAC	X	X		X			X					X			X	X
Salicornia pacifica	pickleweed	Native	OBL	X															
Salsola tragus	Russian thistle	Invasive Introduced	FACU				X												
Salvia leucophylla	purple sage	Native	UPL						X										
Sanicula sp.	sanicle	-	-						X										X
Schoenoplectus acutus var. *occidentalis*	tule	Native	OBL	X						X									
Scrophularia californica	California bee plant	Native	FAC											X					
Silybum marianum	milk thistle	Invasive Introduced	UPL																X
Sisyrinchium bellum	blue-eyed grass	Native	FACW						X							X			X

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced[1] Status	Wetland Indicator Status[2]	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping /Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Solanum xanti	purple nightshade	Native	UPL														X		X
Solidago californica	California goldenrod	Native	UPL						X										
Sonchus asper	spiny sowthistle	Introduced	FAC						X										X
Sonchus asper ssp. *asper*	sowthistle	Introduced	FAC		X				X										X
Sonchus oleaceus	common sow thistle	Introduced	UPL		X				X										X
Stellaria media	chickweed	Introduced	FACU												X				
Stipa miliacea var. *miliacea*	smilo grass	Invasive Introduced	UPL			X			X										X
Stipa pulchra	purple needle grass	Native	UPL													X*			X
Tetragonia tegragoniodes	New Zealand spinach	Introduced	UPL						X										
Toxicodendron diversilobum	poison oak	Native	FACU			X			X										
Tragopogon porrifolius	purple salsify	Introduced	UPL																X
Triteleia crocea	goldenstar	Native	UPL						X										
Tropaeolum majus	garden nasturtium	Introduced	UPL				X		X										X
Typha sp.	cattails	-	OBL		X														
Verbena lasiostachys	verbena	Native	FAC				X									X			X
Vicia sp.	common vetch	-	-																X
Vicia sativa ssp. *sativa*	spring vetch	Introduced	FACU	X	X		X		X	X						X			X
Vinca major	periwinkle	Invasive Introduced	UPL						X										
Xanthium strumarium	cocklebur	Native	FAC						X										
Zeltnera muehlenbergii	Muehlenberg centaury	Native										X							
Poaceae	Unidentifiable annual non-native grasses	Introduced	UPL		X	X	X		X	X	X	X	X	X		X	X	X	X

Sources:

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced[1] Status	Wetland Indicator Status[2]	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping /Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands

[1] CDFW 2022, Jepson Flora Project 2022, and Cal-IPC 2022

Appendix C

Site Photographs



Photograph 1. Photo Point 1. View of western portion of Devereux Creek in eucalyptus groves, looking upstream (aspect west; February 4, 2022).



Photograph 2. Photo Point 2. View of Sample Point 1 in central portion of Devereux Creek (aspect east; February 7, 2022).



Photograph 3. Photo Point 3. View of Sample Point 2 adjacent to central portion of Devereux Creek (aspect southwest, February 7, 2022).



Photograph 4. Photo Point 4. View of pooled water in arroyo willow community along the central portion of Devereux Creek, looking upstream (aspect west; February 4, 2022).



Photograph 5. Photo Point 5. View of water present in channel of the central portion of Devereux Creek, looking downstream (aspect southeast, February 7, 2022).



Photograph 6. Photo Point 5. View of channel and floodplains along the central portion of Devereux Creek, looking upstream (aspect northwest; February 7, 2022).



Photograph 7. Photo Point 6. View of grouted rip-rap within central portion of Devereux Creek (aspect: northwest; February 7, 2022).



Photograph 8. Photo Point 7. View of the central portion of Unnamed Devereux Creek in eucalyptus groves, looking upstream (aspect west; February 7, 2022).



Photograph 9. Photo Point 8. View of confluence of Unnamed Drainage 3 with Devereux Creek (aspect west; December 10, 2021).



Photograph 10. Photo Point 8. View of culvert inlet within central portion of Devereux Creek (aspect: east; October 5, 2021).



Photograph 11. Photo Point 9. View of Sample Point 3 within central portion of Devereux Creek, looking upstream (aspect west; November 2, 2022). Wooden plank footbridge is visible in background.



Photograph 12. Photo Point 10. View of Sample Point 4 within central portion of Devereux Creek, looking downstream (aspect east; November 2, 2022).



Photograph 13. Photo Point 11. View of Sample Point 5 in central portion of Devereux Creek (aspect south; October 5, 2021).



Photograph 14. Photo Point 12. View of alkali heath marsh along Devereux Creek, looking upstream (aspect northwest; February 7, 2022).



Photograph 15. Photo Point 12. View of alkali heath marsh and hardstem bulrush marshes where Devereux Creek enters upper Devereux Slough, looking downstream (aspect east; February 7, 2022).



Photograph 16. Photo Point 13. View of Sample Point 6 in hardstem bulrush marshes near outlet of Devereux Creek into upper Devereux Slough (aspect east; February 7, 2022).



Photograph 17. Photo Point 14. View of Sample Point 7 in alkali heath marsh adjacent to Devereux Creek (aspect west; February 7, 2022).



Photograph 18. Photo Point 15. View of Unnamed Drainage 1a in eucalyptus groves, looking upstream (aspect northeast; February 4, 2022).



Photograph 19. Photo Point 16. View of Unnamed Drainage 1a, looking upstream (aspect north; February 4, 2022).



Photograph 20. Photo Point 17. View of Unnamed Drainage 1b, looking downstream at rip rap in channel (aspect south; February 4, 2022).



Photograph 21. Photo Point 18. View of Unnamed Drainage 1c from channel bottom within dirt footpath, looking upstream (aspect north; February 4, 2022).



Photograph 22. Photo Point 18. View of Unnamed Drainage 1c channel bottom, looking downstream (aspect southeast; February 4, 2022).



Photograph 23. Photo Point 19. View of dirt footpath that crosses Unnamed Drainage 1c (aspect south; February 4, 2022).



Photograph 24. Photo Point 20. View of vegetated bottom of Unnamed Drainage 1c, looking upstream (aspect west; February 4, 2022).



Photograph 25. Photo Point 21. View of incised channels of Unnamed Drainage 1c including dirt footpaths that cross the drainage, looking upstream (aspect northwest; February 4, 2022).



Photograph 26. Photo Point 22. View of Unnamed Drainage 1c in eucalyptus groves, looking downstream (aspect south; February 4, 2022).



Photograph 27. Photo Point 23. View of Unnamed Drainage 1c as it exits eucalyptus groves, looking upstream (aspect north; February 4, 2022).



Photograph 28. Photo Point 24. View of culvert that outlets into Unnamed Drainage 2 (aspect northwest; February 4, 2022).



Photograph 29. Photo Point 25. View of Unnamed Drainage 3 as it enters a pipe culvert, looking upstream (aspect north; February 4, 2022).



Photograph 30. Photo Point 26. View of Unnamed Drainage 4, facing downstream (aspect southeast; October 5, 2021).



Photograph 31. Photo Point 27. View of Unnamed Drainage 5, facing upstream (aspect south; October 5, 2021).



Photograph 32. Photo Point 28. View of Unnamed Drainage 6, facing upstream (aspect northwest, October 5, 2021).



Photograph 33. Photo Point 29. View of wooden foot bridge crossing Unnamed Drainage 6, looking upstream (aspect southwest; October 5, 2021).



Photograph 34. Photo Point 30. View of ungrouted rip-rap within northern portion of Unnamed Drainage 6 (aspect: northwest; February 7, 2022).



Photograph 35. Photo Point 31. View of incised channel of Unnamed Drainage 7, looking upstream (aspect west; February 7, 2022).



Photograph 36. Photo Point 32. View of Unnamed Drainage 8 in eucalyptus groves, looking upstream (aspect west; February 7, 2022).



Photograph 37. Photo Point 32. View of channel bottom of Unnamed Drainage 8 (aspect northeast; February 7, 2022).



Photograph 38. Photo Point 33. View of Coastal Wetland 1 (aspect north; February 7, 2022).



Photograph 39. Photo Point 34. View of Coastal Wetland 2 and perennial rye grass fields surrounded by eucalyptus groves (aspect south; February 7, 2022).



Photograph 40. Photo Point 34. View of Sample Point 10 within Coastal Wetland 2 including fence and fallen logs (aspect west; February 7, 2022).



Photograph 41. Photo Point 35. View of Sample Point 11 within area dominated by ice plant and wild oat (aspect northeast; May 31, 2022).



Photograph 42. Photo Point 36. View of Sample Point 12 within upland mustards vegetation community (aspect east; May 31, 2022).

Appendix D

Wetland Determination Forms

Appendix J

MBHMP Implementation – Phase 1 Mitigation and Monitoring Plan



Ellwood Mesa/Sperling Preserve Monarch Butterfly Habitat Management Plan Implementation – Phase 1

Mitigation and Monitoring Plan

prepared for

City of Goleta
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Goleta, California 93117
Contact: George Thomson
Via email: gthomson@cityofgoleta.org

prepared by

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Introduction

Mitigation restoration described in this section is related to impacts resulting from access improvements associated with this project and is a separate effort than the foundational habitat enhancement components of this project. As required by regulatory agencies (CDFW, RWQCB, USACE, and CCC), jurisdictional impacts resulting from project activities must be mitigated in order to restore the riparian habitat, water conveyance, and wetland functions of the impacted area as applicable. Consistent with policies in the City of Goleta General Plan, impacts to jurisdictional resources and riparian habitat will be mitigated by riparian creation and/or restoration at a ratio of 3:1 for permanent impacts. Temporary impacts to jurisdictional resources within the project area will be restored in place at a 1:1 ratio. The mitigation areas must include sufficient habitat creation to ensure no net loss of riparian vegetation or hydrologic resources.

Project-related impacts were calculated by overlaying the work footprint with CDFW, USACE, RWQCB, and CCC jurisdictional resources mapped within the Project area. CDFW jurisdictional riparian habitat and streambed extents were found to encompass the CCC, USACE, and RWQCB jurisdictional extents. Impacts to CDFW jurisdictional riparian habitat and streambed were used to calculate the area of required restoration as they were found to be the most expansive jurisdictional impacts.

Jurisdictional features would be impacted by the culvert repairs proposed along the Santa Barbara Shores Drive entrance to Ellwood Mesa, and construction of the footbridge located between the Santa Barbara Shores Drive and Coronado Drive entrances to Ellwood Mesa. This Project would permanently impact 0.09 acres and temporarily impact 0.04 acres of riparian and streambed jurisdictional areas as displayed in Figure 1. Currently the jurisdictional impact locations are primarily within eucalyptus groves with a small area vegetated with coast live oak woodland in the northern portion of the footbridge development footprint. A total of 0.32 acres of jurisdictional habitat will be restored to fulfill the mitigation requirements associated with the Project.

Mitigation of permanently impacted areas would expand the extent and functional capacity of the riparian corridor and stream banks by increasing native species diversity and abundance along otherwise non-native species-dominated waterways. Compensatory restoration of permanently impacted areas will occur immediately upstream and downstream of the proposed pedestrian pathway located along Devereaux Creek between Santa Barbara Shores Drive and Coronado Drive, and along unnamed drainage 5 as displayed in Figure 2. Temporary impacts to be restored in place will occur along Devereaux Creek and along unnamed drainages 3 and 4 as shown in Figure 2.

Temporary impact areas will be restored with native seed while the permanent impact mitigation areas will have native container plants installed. Additional restoration techniques proposed for the mitigation areas include removing non-native understory species and removing trash and debris throughout the entirety of the mitigation site. City of Goleta staff or an authorized monitor will inspect the construction and mitigation sites to verify implementation of the Mitigation Restoration requirements during construction.

Table 1 below provides a summary of the permanent and temporary impacts to jurisdictional areas and the mitigation requirements based on these impacts.

Table 1 Temporary and Permanent Impacts to Jurisdictional Areas

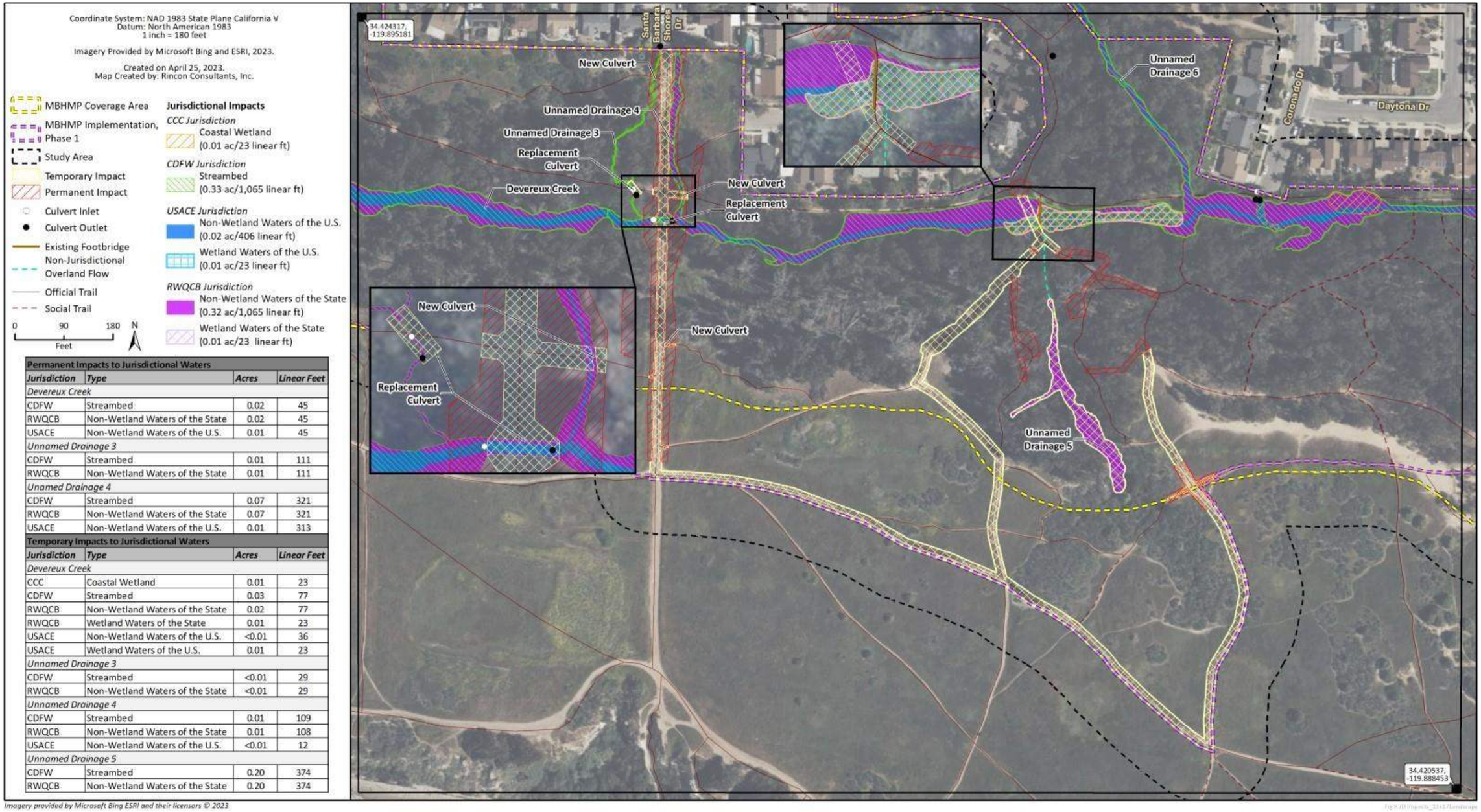
Impact Type	Agency	Length of Impact (feet)	Area of Impact (acres)
Temporary Impact	CCC Coastal Wetland	23	0.01
	CDFW Streambed and Riparian Habitat	588	0.24
	RWQCB Non-Wetland Waters of the State	588	0.23
	RWQCB Wetland Waters of the State	23	0.01
	USACE Non-Wetland Waters of the U.S.	48	<0.01
	USACE Wetland Waters of the U.S.	23	0.01
	Total[1]	**588**	**0.24**
	Temporary Impact Restoration (1:1)[2]	**588**	**0.24**
Permanent Impact	CDFW Streambed and Riparian Habitat	477	0.09
	RWQCB Non-Wetland Waters of the State	477	0.09
	USACE Non-Wetland Waters of the U.S.	358	0.01
	Total[1]	**477**	**0.09**
	Permanent Impact Restoration (3:1)	**477**	**0.28**

[1]Totals are equivalent to CDFW streambed and riparian habitat

[2]Temporary impacts associated with Unnamed Drainage 5 are due to the restoration and enhancement of this feature. Restoration of unnamed Drainage 5 will be included as mitigation for permanent impacts.

Note: Exact acreages were calculated using GIS. Small discrepancies within the table are due to rounding.

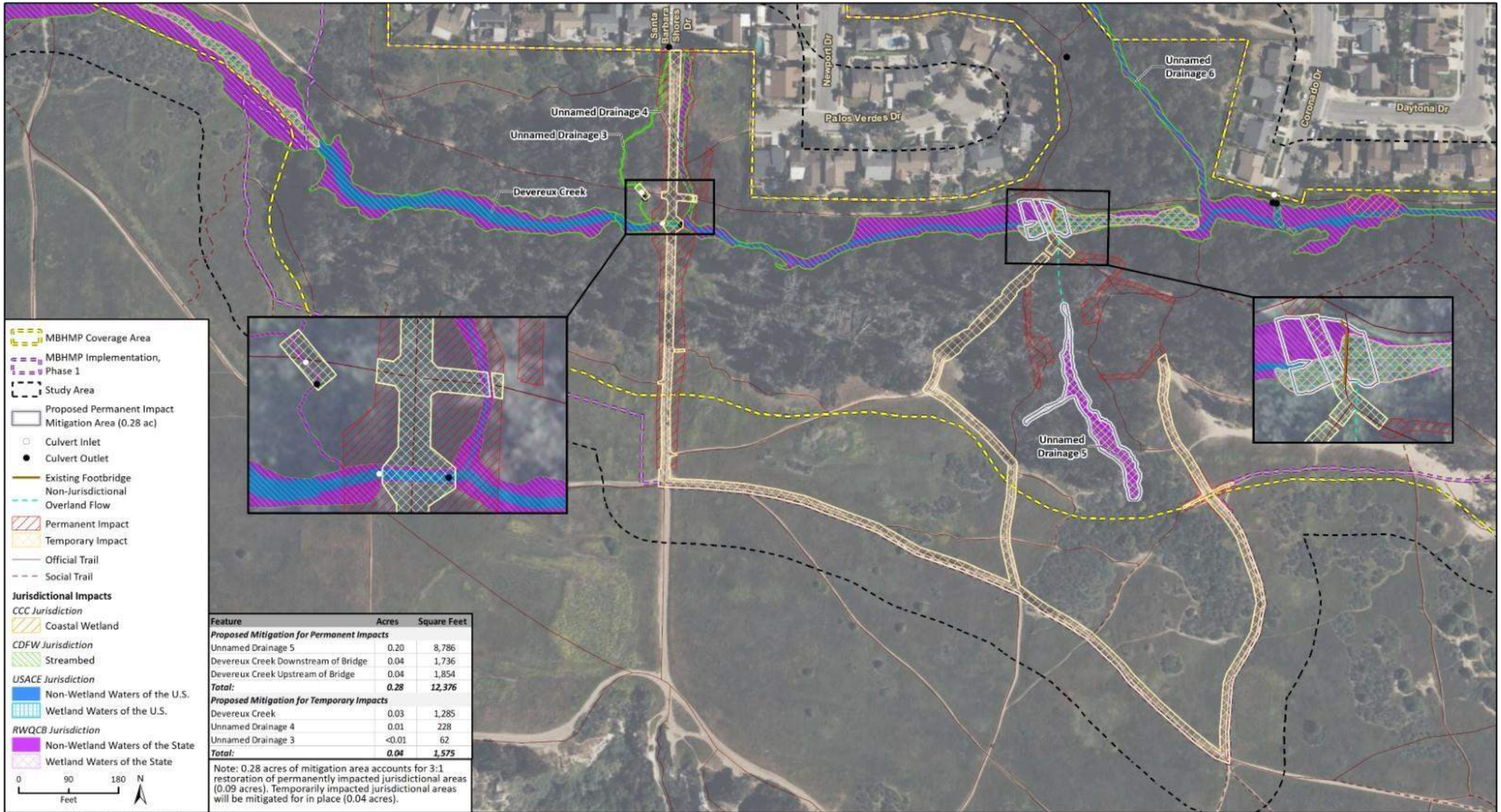
Figure 1. Jurisdictional Impact Areas



Permanent Impacts to Jurisdictional Waters			
Jurisdiction	*Type*	*Acres*	*Linear Feet*
Devereux Creek			
CDFW	Streambed	0.02	45
RWQCB	Non-Wetland Waters of the State	0.02	45
USACE	Non-Wetland Waters of the U.S.	0.01	45
Unnamed Drainage 3			
CDFW	Streambed	0.01	111
RWQCB	Non-Wetland Waters of the State	0.01	111
Unamed Drainage 4			
CDFW	Streambed	0.07	321
RWQCB	Non-Wetland Waters of the State	0.07	321
USACE	Non-Wetland Waters of the U.S.	0.01	313
Temporary Impacts to Jurisdictional Waters			
Jurisdiction	*Type*	*Acres*	*Linear Feet*
Devereux Creek			
CCC	Coastal Wetland	0.01	23
CDFW	Streambed	0.03	77
RWQCB	Non-Wetland Waters of the State	0.02	77
RWQCB	Wetland Waters of the State	0.01	23
USACE	Non-Wetland Waters of the U.S.	<0.01	36
USACE	Wetland Waters of the U.S.	0.01	23
Unnamed Drainage 3			
CDFW	Streambed	<0.01	29
RWQCB	Non-Wetland Waters of the State	<0.01	29
Unnamed Drainage 4			
CDFW	Streambed	0.01	109
RWQCB	Non-Wetland Waters of the State	0.01	108
USACE	Non-Wetland Waters of the U.S.	<0.01	12
Unnamed Drainage 5			
CDFW	Streambed	0.20	374
RWQCB	Non-Wetland Waters of the State	0.20	374

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Figure 2. Mitigation Restoration Areas



Feature	Acres	Square Feet
Proposed Mitigation for Permanent Impacts		
Unnamed Drainage 5	0.20	8,786
Devereux Creek Downstream of Bridge	0.04	1,736
Devereux Creek Upstream of Bridge	0.04	1,854
Total:	***0.28***	***12,376***
Proposed Mitigation for Temporary Impacts		
Devereux Creek	0.03	1,285
Unnamed Drainage 4	0.01	228
Unnamed Drainage 3	<0.01	62
Total:	***0.04***	***1,575***

Note: 0.28 acres of mitigation area accounts for 3:1 restoration of permanently impacted jurisdictional areas (0.09 acres). Temporarily impacted jurisdictional areas will be mitigated for in place (0.04 acres).

Imagery provided by Microsoft Bing ESRI and their licensors © 2023

1.1 Restoration Approach

This section describes restoration activities to be implemented throughout the mitigation areas described above.

1.1.1 Non-native Plant Removal

Prior to plant installation, non-native plants will be removed throughout the entirety of each mitigation site by a qualified native landscape contractor with oversight by the City of Goleta-approved biologist. Non-native plants (with the exception of mature trees) will be removed to the greatest extent possible, primarily using hand removal methods, e.g., hand-held weed whips, loppers, and hoes. If hand removal is not feasible due to the characteristics of the species, such as resistance to hand removal methods, the size of the plants, or the number of plants, perennial invasive non-native species may be treated with herbicides if necessary, consistent with the City of Goleta General Plan/Coastal Land Use Plan.

Large vegetation with potential to contain bird nests will not be removed during the breeding bird season (March 1 to September 15) unless the City of Goleta-approved biologist determines that it does not contain active bird nests.

1.1.2 Erosion Control

If deemed necessary, erosion control materials will be installed by a qualified contractor with oversight by the City of Goleta-approved biologist. It may be necessary to install erosion control materials in select areas, such as larger barren areas or highly eroded areas, until plant cover is sufficient to stabilize the slopes. Erosion control devices may include low silt fences, hay bales at the base of slopes, and/or straw wattle. Erosion control materials containing plastics will not be used due to the hazards they pose to wildlife. Erosion control materials will be certified as weed free. If large plants (e.g., shrubs) need to be removed in order to install erosion control materials, it will not be removed during the breeding bird season (March 1 to September 15) unless the City of Goleta-approved biologist determines that it does not contain active bird nests. The erosion control materials will be maintained during the 5-year maintenance period or until plants are well established.

1.1.3 Plant Installation Methods

Plants will be installed by the qualified native landscape contractor with oversight by the City of Goleta-approved biologist. Plants will be installed to coincide with the first major winter storm (approximately October to December), as feasible, when soil conditions are moist.

Planting locations will be determined in the field by the County-approved restoration biologist. On average, shrubs, grasses, and wetland plants will be installed at 4- to 5-foot spacing. Most non-tree species will be installed as 1-gallon containers, but other sizes may be used depending on the species. On average, tree species will be installed at 8- to 10-foot spacing. Mitigation trees will be installed mainly as 5-gallon containers, with some being installed as 1-gallon containers in select areas. Any trees installed as an addition to the mitigation trees will be installed as 1-gallon containers or live stakes. Table 1 provides the mix of plants and quantities proposed for each riparian habitat type to be created or enhanced.

Table 1 Plant Palette

Scientific Name	Common Name	Number of Plants
Artemisia douglasiana	mugwort	
Baccharis salicifolia	mule fat	
Bromus carinatus	California brome	
Distichlis spicata	saltgrass	
Elymus condensatus	giant wild rye	
Elymus triticoides	alkali ryegrass	
Heteromeles arbutifolia	toyon	
Hordeum brachyantherum	California barley	
Juncus patens	Common California rush	
Juncus phaeocephalus	Brown-headed rush	
Phacelia ramossisima	branching phacelia	
Quercus agrifolia	coast live oak	
Rosa californica	California rose	
Rubus ursinus	California blackberry	
Salix exigua	sandbar willow	
Salix laevigata	red willow	
Salix lasiolepis	arroyo willow	
Salvia spathacea	hummingbird sage	
Sambucus nigra	blue elderberry	
Solanum douglasii	Douglas nightshade	
Solidago velutina subsp. *californica*	velvety goldenrod	
Verbena lasiostachys	verbena	
Subtotal		

Care will be taken not to disturb the root ball, stems, or branches when installing container plants. Planting pits will be backfilled with native soil so as not to leave air spaces around the plant's soil and roots, so that the soil surface of the container plant is approximately ¼ to ½ inch above grade. After installation, wood mulch will be placed around each plant in areas where water movement will not disrupt the mulch to prevent non-native plants from establishing and to help increase soil moisture. Mulch will be placed around each container plant at a depth of at least 3 inches, and at least a 2-foot radius for trees and a 1-foot radius for other species. Each container plant will be immediately watered with an irrigation system or by hand as conditions allow. Long term irrigation will be applied as described in Section 1.2.

1.1.4 Plant Protection

Individual container plantings will not have any specific protection; however, signage and temporary construction fencing will be placed around the mitigation sites to inform people to stay out of the restoration area to minimize trampling of native plants. The temporary fencing will be made of green

construction mesh-like fence approximately 4 feet high and t-posts (or similar). Fencing will follow the outer borders of each planting area shown above in Figure 2. If herbivory becomes substantially problematic, wire cages would be placed around container plants where feasible.

1.2 Performance Criteria

Performance criteria will be used to determine if the Project is successful during the 5-year maintenance and monitoring period. As described in the CDFW Notification of Streambed Alteration, the following performance criteria have been proposed for the restored mitigation sites. These criteria are typical for the region and biologically appropriate for the sites.

Temporary Impact Mitigation Areas (1-year maintenance period):

- At the end of year one, native vegetation cover will reach the equivalent or exceed the native plant cover present prior to project implementation.
- If native vegetative cover requirements have not been met, Permittee is responsible for replacement seeding and/or planting to achieve these requirements. Replacement seeds/plants shall be monitored with the same survival and growth requirements for one year after planting.

Permanent Impact Mitigation Areas (5-year maintenance period):

- All plantings shall have a minimum of 80% survival the first year and 100% survival thereafter.
- All plantings shall attain 75% cover after three years and 90% cover after five years.
- The mitigation site shall be entirely without supplemental irrigation for a minimum of two years.
- No single species shall constitute more than 50% of the vegetative cover.
- No woody invasive species shall be present.
- Herbaceous invasive species shall not exceed 5% cover.
- If the survival, cover and other requirements described in this Agreement and in the submitted documents have not been met, Permittee is responsible for replacement planting to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements for five years after planting.

The City of Goleta-approved biologist will monitor to determine if performance criteria are being achieved as described above. If performance criteria are not being achieved, the City of Goleta may be required to replant, as necessary, to ensure performance criteria are met.

1.3 Maintenance Plan

Maintenance will be conducted by the qualified native landscape contractor with oversight by the City of Goleta-approved biologist. The temporary impact mitigation sites will be maintained for 1-year period and the permanent impact mitigation sites will be maintained for a 5-year period, beginning after initial restoration installation is completed. Changes may be made as necessary based on annual monitoring reports, per the City of Goleta General Plan. Maintenance activities will be adjusted with oversight by the City of Goleta-approved biologist to assure that the performance criteria for the mitigation sites are achieved. All maintenance will be managed by the City of Goleta. Maintenance will include non-native plant removal; watering; replanting; and repairing damage to plants, erosion control devices, fencing, and/or signs that result from erosion or vandalism.

1.3.1 Long-term Maintenance Methods and Schedule

During the maintenance period, the maintenance contractor will conduct routine activities to maintain the plantings in a healthy condition, control erosion of the site, and ensure performance criteria are being achieved throughout the entirety of the mitigation sites. Non-native plant removal will be performed throughout the entirety of the mitigation sites to comply with the performance criteria as described in above in Section 1.2. The majority of invasive non-native plant removal efforts will be conducted during the peak growing seasons (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.

The City of Goleta-approved biologist will monitor to determine if performance criteria are being achieved as described in Section 1.2. If performance criteria are not being achieved, the City of Goleta may be required to replant, as necessary, to ensure performance criteria are met.

1.3.2 Long-term Irrigation Methods and Schedule

Where feasible, a temporary irrigation system may be installed in areas where creek flows would not be prohibitive. If employed, the irrigation system would be set up to target individual plants, and would avoid watering in between the plants to help prevent the growth of non-natives. Irrigation options may include: 1) installing a drip emitter system, 2) watering by hand via hose in conjunction with deep pipe irrigation tubes installed next to each plant, 3) watering by hand via hose, or 4) utilizing a water truck with side sprayers. The source of the water may be a permanent hookup, or a temporary water source such as a holding tank or water truck.

The City of Goleta-approved biologist will establish an irrigation schedule in conjunction with the landscape contractor. Irrigation will be scheduled to maximize growth of native species and will account for natural rainfall, while minimizing 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.

Towards the end of spring of the second year, the irrigation schedule for the permanent impact mitigation areas will be gradually reduced over several weeks to wean the plants to adapt to a reduced watering schedule over the summer and fall. The irrigation system will be used for up to two years and plants will be completely weaned from the irrigation prior to the end of the second year. If irrigation materials are installed, they will be removed once the plants are weaned.

1.4 Monitoring Plan

Monitoring will be conducted by City of Goleta-approved biologist. The temporarily impacted mitigation areas will be monitored for a one-year period and the permanent impact mitigation sites will be monitored for a 5-year period to ensure successful establishment. Each year of the 5-year monitoring and maintenance period is defined as a 12-month period starting when restoration installation is complete. Changes may be made as necessary based on annual monitoring reports, per the City of Goleta General Plan.

1.4.1 Monitoring Methods and Schedule

The mitigation sites will be qualitatively monitored by the City of Goleta-approved biologist monthly of each year (beginning at the completion of restoration installation), and quantitatively once in the spring and once in the winter of each year during the monitoring period. This monitoring schedule will apply to both the 1-year monitoring period for temporarily impacted areas and the 5-year monitoring period for permanently impacted areas restored at a 3:1 ratio.

Monthly monitoring will qualitatively assess the success of the mitigation sites. Visual estimates of percent cover of native and non-native plants will be made to determine if performance criteria are being met, or likely to be met, by the end of the monitoring period. The City of Goleta-approved biologist will ensure the qualified native landscape contractor manages non-native species populations and applies supplemental water as appropriate.

Photographs will be taken each year during the spring and winter monitoring to qualitatively document plant establishment, hydrologic conditions, and other site conditions. Permanent photo-documentation points will be established throughout the mitigation sites, primarily prior to installation. 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 monitoring period. The photographs will be included in the annual monitoring report to allow comparison between monitoring years.

Spring and winter monitoring will quantitatively assess the success of the mitigation sites. Fixed-line transects will be installed throughout the mitigation sites to sample the following parameters via the point-intercept method (10 centimeter intervals):

- Species occurring within the transect and whether the species is native or non-native
- Percent absolute plant cover, and cover of native versus non-native species

Each transect location will be documented using GPS and marked in the field with PVC pipes anchored by rebar, or similar mechanism, which will be removed after completion of the monitoring period. Transect locations will be selected systematically to sample different habitat types across the sites so that statiscially significant bological data can be obtained. Photographs will be taken at each transect during the quantitative monitoring events. The photographs will be included in the annual monitoring report to allow comparison between monitoring years.

The number of dead container plants in permanent impact mitigation areas will also be recorded during the spring and winter quantitative monitoring events. If replacement plants are installed, they will be monitored for a minimum of 3 years (within the 5-year monitoring period) to ensure successful establishment.

Qualitative information about the weather conditions and mitigation site conditions (e.g., wildlife use, vegetation establishment trends, non-native plant invasion, evidence and extent of erosion, and the need for corrective actions) will also be collected during all monitoring activities. Recommendations for maintenance needs will be made to the qualified native landscape contractor based on observations made during the monitoring activities.

Upon completion of the 1-year monitoring period for temporary impact mitigation areas and the 5-year monitoring period of permanent impact mitigation areas, the City of Goleta will conduct a final

inspection. Any outstanding items will need to be completed before the regulatory agencies give final approval and accept the restoration project as complete.

1.5 Reporting Requirements

Reports will be prepared by the City of Goleta-approved biologist and transmitted to the appropriate permitting agencies, i.e., CCC, USACE, CDFW, and RWQCB. As described above, the restored mitigation sites will be monitored and maintained for a 1-year period for temporary impacts restoration areas and a 5-year period for permanent impact compensatory restoration areas with changes made as necessary based on annual monitoring reports, per the City of General Plan. Annual monitoring reports will be prepared within 1 month of the end of each year (a 12-month period) of the 5-year monitoring and maintenance period, which begins when restoration installation is complete. Annual reports will document the "As Built" condition of the mitigations sites, maintenance efforts, and monitoring methods and results. The annual reports will also contain a quantitative analysis of performance criteria achievement and progress toward meeting final performance criteria. Lastly, the annual reports will also provide photographs taken at photo documentation points, photographs taken at transects, and relevant GIS-based maps. The 5th and final annual report will be noted as such and will summarize activities throughout the 5-year maintenance and monitoring period as described above.

Appendix K

Special 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**		
Ensure proper disposal of solid debris unsuitable for placement into the environment	See Staff Report for Requirements		Debris will be disposed of during project activities.
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 G

Jurisdictional Delineation Report



Ellwood Mesa/ Sperling Preserve Monarch Butterfly Habitat Management Plan Implementation – Phase 1

Jurisdictional Delineation Report

prepared for

City of Goleta
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February 2023

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1 Introduction

This report has been prepared by Rincon Consultants, Inc. (Rincon) to assist the City of Goleta (City) with the planning of the Ellwood Mesa Sperling Preserve Monarch Butterfly Habitat Management Plan Implementation – Phase 1 (project), and for use by the United States Army Corps of Engineers (USACE) to confirm extent of potential jurisdiction pursuant to Section 404 of the federal Clean Water Act (CWA), the Central Coast Regional Water Quality Control Board (RWQCB) to confirm extent of potential jurisdiction pursuant to Section 401 of the CWA and the Porter-Cologne Water Quality Control Act, the California Department of Fish and Wildlife (CDFW) to confirm extent of potential jurisdiction pursuant to California Fish and Game Code (CFGC) Section 1600 et seq, and the California Coastal Commission (CCC) to confirm extent of coastal wetlands pursuant to the California Coastal Act (CCA). For the purpose of this report, the Monarch Butterfly Habitat Management Plan (MBHMP) area plus a 100-foot buffer is collectively referred to as the study area.

The MBHMP was approved by the City Council in 2019. The project includes improvements to wildlife habitat, reduction of wildfire risk, invasive plant management, trail maintenance and improvements, signage, drainage improvements, and various other stewardship actions. Specifically, the project involves habitat enhancements (site preparation, removal of downed and dead eucalyptus trees, eucalyptus tree replacement, nectar and native vegetation plantings, temporary irrigation, sourced plant materials, and seed storage and propagation) and public access and trail improvements (viewing areas repair and enhancement, trail improvements, signage program, emergency/maintenance road repairs, footbridge replacement, open space accessories, and culvert and drainage repairs).

This Jurisdictional Delineation (JD) identified 11 features (i.e., Devereux Creek, eight unnamed ephemeral drainages, and two coastal wetlands) that are potentially subject to USACE, RWQCB, and CDFW jurisdictions and City/CCC wetlands policies. The findings and conclusions presented in this report, including the location and extent of areas potentially subject to regulatory jurisdictions, represent the professional opinion of the consultant biologists. These findings and conclusions should be considered preliminary and at final discretion of the resource agencies.

1.1 Project Location

The project is located 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), in the City of Goleta, Santa Barbara County, California (Figure 1 and Figure 2). More specifically, the project is entirely within the Ellwood Mesa/Sperling Preserve Open Space (Ellwood Mesa Open Space), a 137-acre open space area located on Ellwood Mesa. The approximate center of the project 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 (USGS 2022a), and is located within Township 4 North, Range 29 West, Sections 14, 15 and 23 (San Bernardino base and meridian, Earthpoint 2022). The Pacific Ocean is less than 200 feet to the south from the southeastern corner of the project and the Santa Ynez Mountains are approximately 3.5 miles to the north.

The project is in the Santa Ynez – Sulphur Mountains subsection of the Southern California Coast (USFS 2011), an ecological sub-unit that extends from the mouth of the Santa Ynez River 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 form relatively steep hillsides vegetated 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 project is on the coastal plain between the southern foot of the mountains and the Pacific Ocean.

Devereux Creek bisects the project site in a generally east to west trajectory, is associated with the arroyo willow riparian corridor, and is part of an Environmentally Sensitive Habitat Area, along with eight other habitat types shown in the Habitat Types and Biological Resources Impact sections below.

Ten unnamed ephemeral drainages and two coastal wetlands that are potentially subject to federal and state regulations including United States Army Corps of Engineers, Regional Water Quality Control Board, The CCC/City, and California Department of Fish and Wildlife are present within the project site. These jurisdictional waters along with the eucalyptus grove support habitat that is key for monarch butterflies and other wildlife movement; however, the project is not located within an *Essential Connectivity Area*, as determined by the California Essential Habitat Connectivity Project. Ellwood is part of the Goleta Coast Important Bird Area, considered to be globally important due to its location on the Pacific Flyway.

Ellwood Mesa Open Space

Ellwood Mesa is a City-owned open space area on the coastal bluffs between Sandpiper Golf Club and UCSB. The current configuration of Ellwood Mesa Open Space was formed in 2004 when private development rights were 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).

1.2 Project Description

The City will implement Phase 1 of the MBHMP to manage and improve the Ellwood Mesa eucalyptus forest for the benefit of the overwintering monarch butterfly (*Danaus plexippus*), other wildlife, and for the public's use and enjoyment. Phase 1 of the MBHMP will implement 20 of the 22 programs outlined in the MBHMP. 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.

Over the past several years the City and its team of consultants have conducted focused studies of Ellwood Mesa, specifically the eucalyptus grove and trees that comprise the monarch overwintering habitat, to determine an enhancement approach that will address the immediate concerns of high fire risk and the rapidly declining characteristics of the monarch overwintering sites. Phase 1 addresses implementation of the MBHMP at four aggregation sites in Ellwood Mesa (referred to as the Ellwood Complex per the Goleta General Plan/Coastal Land Use Plan (GP/CLUP): Ellwood North, Ellwood Ironbark, Ellwood West, and Ellwood Main.

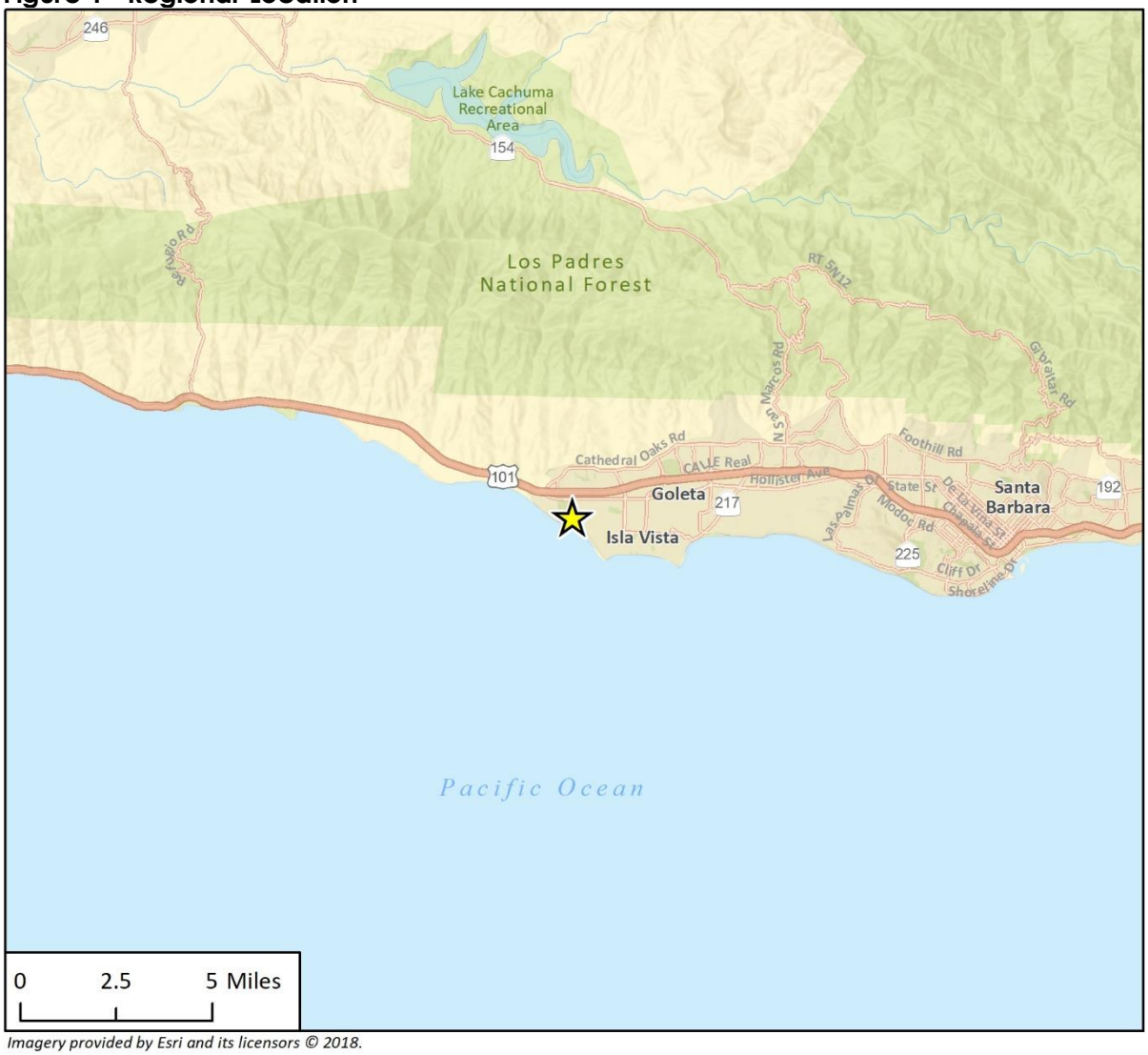
Two types of activities will occur in Phase 1:

1. Habitat enhancement of the management area. Habitat enhancement will include strategic planting of trees for monarch roosting, specific tree planting to create a wind break around roosting sites, planting of nectaring vegetation for monarchs, and planting of native vegetation for other wildlife and the overall habitat health of the complex.
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, installation of three culverts to improve site drainage near trails, improvements to the two viewing areas at Ellwood Main, and way-finding signage.

All activities planned in Phase 1 were considered in the Initial Study/Mitigated Negative Declaration (IS-MND) for the MBHMP.

The project site is a portion of the Monarch Butterfly Habitat Management Plan area. This report describes aquatic resources within the entire Monarch Butterfly Habitat Management Plan Phase 1 area plus a 100-foot buffer (the study area), however impact analysis is limited to the MBHMP Phase 1 project area, which is where the activities that the City of Goleta is proposing at this time will occur over the next 1 to 2 years. The study area consists of a large eucalyptus grove that provides habitat to four overwintering sites of Monarch butterflies, raptor and wildlife habitat, riparian habitat, and native grasslands and shrublands.

Figure 1 Regional Location



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MBHMP Location

N

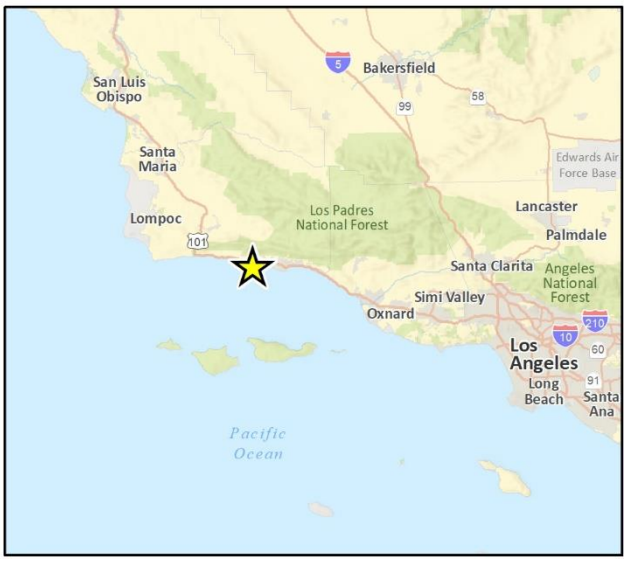
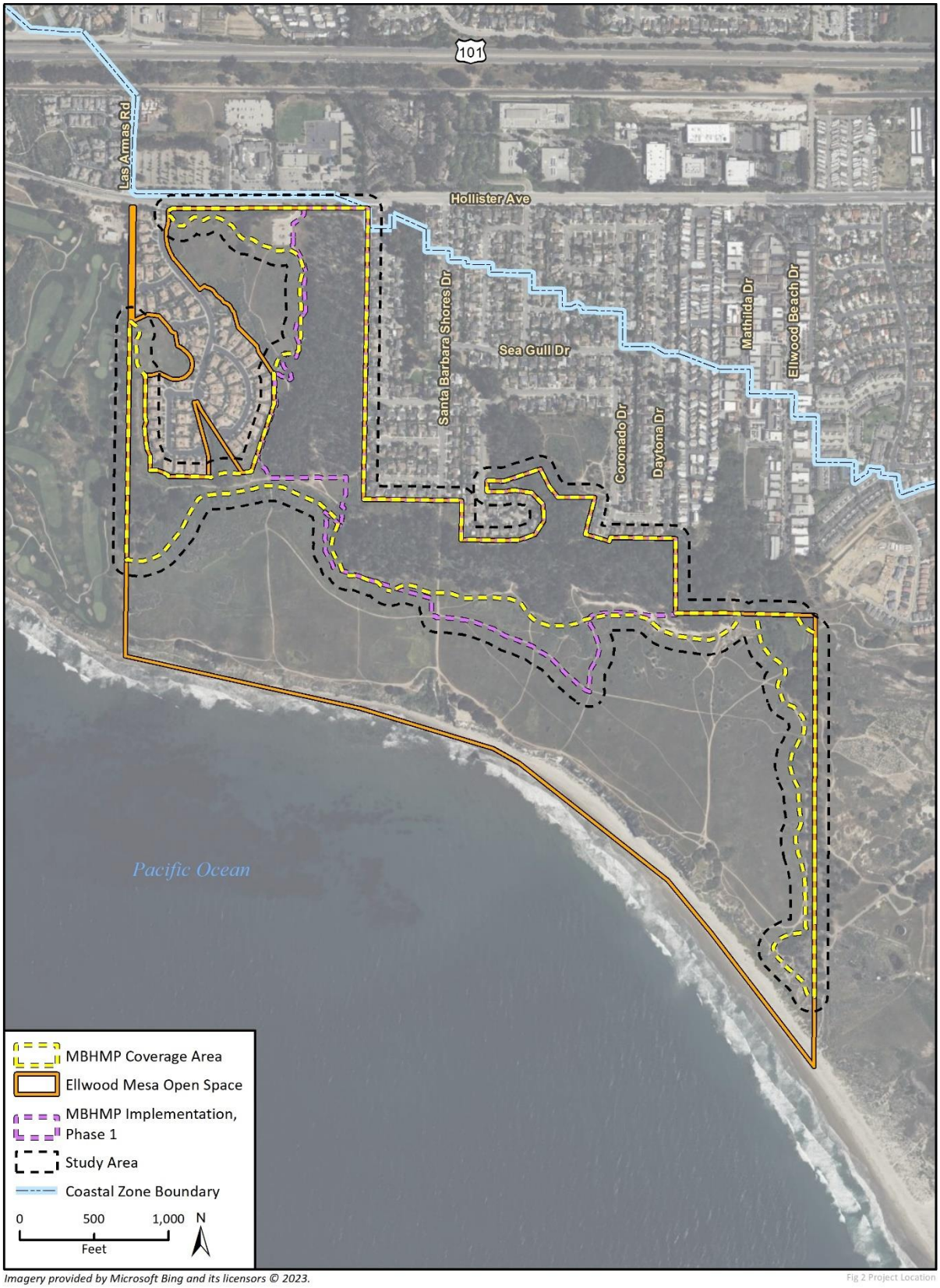


Figure 2 Project Location



Imagery provided by Microsoft Bing and its licensors © 2023.

Fig 2 Project Location

2 Methodology

The JD included a literature review of existing studies, maps, and other publications. After completion of the literature review, a field delineation was conducted to identify, describe, and map all potential jurisdictional waters within the study area. The JD was conducted in accordance with USACE, RWQCB, CDFW, and CCC procedures, as outlined below. For a more detailed description of the applicable jurisdictional regulations, see Appendix A. In addition, vegetation communities and land covers were mapped (Section 3.4), a plant list was compiled (Appendix B), representative site photographs were taken (Appendix C), and wetland determination data forms were completed (Appendix D) as further described below.

2.1 Literature Review

Prior to the field survey, Rincon reviewed the results of previous biological surveys conducted by Rincon in the study area, aerial imagery (Google Earth Pro 2022) depicting the study area, the *Dos Pueblos Canyon, California* USGS 7.5-minute topographic quadrangle (USGS 2022a), and the Web Soil Survey (United States Department of Agriculture, Natural Resources Conservation Service [USDA, NRCS] 2022a) to better characterize the site and its surroundings from a hydrologic and geologic/topographic perspective. The GP/CLUP were referenced to determine the extents of Environmentally sensitive habitat areas (ESHA) mapped in the study area.

Additionally, the National Wetlands Inventory (NWI) (United States Fish and Wildlife Service [USFWS] 2022) and the National Hydrography Dataset (NHD; USGS 2022) were reviewed to determine if any wetlands or other waters were previously documented and mapped in or near the study area. The National Hydric Soils List by State (USDA, NRCS 2022b) was also reviewed to determine if any soil map units mapped in the study area are classified as hydric.

2.2 Field Delineation

A jurisdictional delineation survey was conducted within the central portion of the study area on October 5, 2021 by Rincon Senior Biologist Robin Murray and Associate Biologist Yuling Huo and on December 10, 2021 by Robin Murray and Rincon Biologist Kendra Bonsall. On February 4 and 7, 2022, Robin Murray and Rincon Biologist Carolyn Welch surveyed the remainder of the study area. Additional investigation was conducted by Robin Murray on May 31 and November 2, 2022.

Surveys were conducted on foot for potential wetlands and non-wetland aquatic resources that might exhibit an ordinary high water mark (OHWM) and/or bed and bank that might constitute waters of the United States (U.S.), CDFW-jurisdictional streambeds, waters of the State, and/or coastal wetlands. During the field delineation, general site characteristics were noted and vegetation present on site was documented. Current federal and state policies, methods, and guidelines were used to identify and delineate potential jurisdictional areas, as described below in detail. Data collection points in the study area were focused on areas containing a potential waterway and were chosen as best representation of the conditions at the study area.

Non-Wetland Waters of the U.S.

The lateral limits of United States Army Corps of Engineers (USACE) jurisdiction (i.e., width) of non-wetland waters were determined by the presence of physical characteristics indicative of the OHWM. The OHWM was identified in accordance with the applicable Code of Federal Regulations (CFR) sections (33 CFR 328.3 and 33 CFR 328.4) and Regulatory Guidance Letter 05-05 (USACE 2005), and in reference to various relevant technical publications, including, but not limited to: *Review of Ordinary High Water Mark Indicators for Delineating Arid Streams in the Southwestern United States* (USACE 2004), *Distribution of OHWM Indicators and Their Reliability in Identifying the Limits of "Waters of the United States" in Arid Southwestern Channels* (USACE 2006), and *A Field Guide to Identification of the OHWM in the Arid West Region of the United States* (USACE 2008b). The regulations were also reviewed in the determination of non-jurisdictional features including ephemeral drainages, artificially irrigated areas, and roadway ditches excavated in uplands.

Rincon biologists evaluated sources of water, potential connections, distances to traditional navigable waters (TNW) and streams that are perennial or intermittent in nature, and other factors that affect whether waters qualify as "waters of the United States" under the current USACE regulations (33 CFR 328.3) and the *Rapanos Guidance Memorandum* (USACE and USEPA 2008). A more detailed regulatory definition of USACE jurisdiction is provided in Appendix A.

Wetland Waters of the U.S.

Potential wetland features were evaluated for presence of wetland indicators including a predominance of hydrophytic vegetation, hydric soils, and wetland hydrology, according to routine delineation procedures in the Wetlands Delineation Manual (Environmental Laboratory 1987) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008a). The USACE *Arid West 2020 Regional Wetland Plant List* was used to determine the wetland status of the examined vegetation by the following indicator status categories: Upland (UPL), Facultative Upland (FACU), Facultative (FAC), Facultative Wetland (FACW), and Obligate Wetland (OBL) (USACE 2020). Representative sample points were sited in areas most likely to exhibit wetland characteristics (i.e., those with a prevalence of hydrophytic vegetation and suitable landform) and examined in the field for potential wetland indicators.

In total, five sample points were evaluated in the study area. Three sample points were located in areas with an abundance of hydrophytic vegetation and the presence of wetland hydrology indicators. Two additional sample points were evaluated in uplands adjacent to wetland waters to delineate the boundary of the jurisdictional area.

Waters of the State

The limits of "waters of the State," as defined under the Porter-Cologne Act, are any surface water or groundwater, including saline waters, within the boundaries of the state. This limit was delineated coterminous with the boundary of CDFW jurisdictional streambeds (i.e., extending to the outer limit of riparian vegetation, where present, or the tops of banks).

Potential State wetland features were evaluated pursuant to the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*. The SWRCB's definition relies on the same three parameters as the USACE definition (hydrophytic vegetation, wetland hydrology, and hydric soils) but allows for naturally unvegetated areas meeting the other two parameters to be considered wetlands. A more detailed regulatory definition of Regional Water Quality Control Board (RWQCB) jurisdiction is provided in Appendix A.

CDFW Streambeds

The extent of potential streambeds, streambanks, and riparian habitat subject to CDFW jurisdiction under Sections 1600 et seq. of the CFGC was delineated by reviewing the topography and morphology of potentially jurisdictional features to determine the outer limit of riparian vegetation, where present, or the tops of banks for stream features. A more detailed regulatory definition of CDFW jurisdiction is provided in Appendix A.

Coastal Wetlands

Under the California Coastal Act (California Public Resources Code Sections 30000 et seq.), the CCC oversees development within California's Coastal Zone. The Coastal Zone in each coastal county was mapped following passage of the Coastal Act and extends generally 1,000 yards inland from the mean high tide line, though this distance varies from a maximum of five miles in significant coastal estuarine, habitat, and recreational areas to less than 1,000 yards in developed urban areas. The Coastal Act grants special protection to wetlands in the Coastal Zone, and protects these areas from dredging, diking, or filling except under very limited circumstances. Section 30121 of the California Coastal Act defines the term "wetland" as:

> *"Lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens."*

This definition is clarified by Coastal Commission regulations at 14 CCR 13577(b), which state in part:

> *…the upland limit of a wetland shall be defined as:*
>
> *(A) the boundary between land with predominantly hydrophytic cover and land with predominantly mesophytic or xerophytic cover;*
>
> *(B) the boundary between soil that is predominantly hydric and soil that is predominantly nonhydric; or*
>
> *(C) in the case of wetlands without vegetation or soils, the boundary between land that is flooded or saturated at some time during years of normal precipitation, and land that is not.*

This definition relies on the same three parameters considered by the USACE's delineation method but requires only a single parameter to be present (i.e., hydric soils, hydrophytic vegetation, or wetland hydrology would qualify an area as wetland, rather than requiring all three). The CCC wetland definition is generally more encompassing than the USACE definition in most cases.

City Wetlands

Pursuant to General Plan Conservation Element sub policy CE 3.1, Definition of Wetlands, the City defines wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology) and directly cites the Coastal Commission definitions contained in 14 CCR 13577(b). Boundaries of City wetlands were delineated as coterminous with CCC coastal wetlands.

Data Processing

Following field collection, all collected data were subsequently transferred to Rincon's Geographic Information System (GIS) software package. The results of collected data are described in Section 4.

Representative photographs within the study area are presented in Appendix C and figures in Section 4 include the location and direction from where each photograph was taken.

Vegetation Community and Land Cover Mapping

In 2021 Rincon conducted survey efforts including vegetation community mapping within a portion of the study area assessed in this report. Vegetation communities and land cover types within this area were reviewed in 2022 and were confirmed to not have substantially changed since the 2021 mapping effort.

Throughout the remainder of the study area, vegetation communities were classified using *A Manual of California Vegetation, Second Edition* (MCV2, Sawyer et al. 2009), which establishes systematic classifications and definitions of vegetation communities. Updates to the MCV2 provided in the online database (CNPS 2022) were taken into account. Each vegetation mapping unit was analyzed for characteristics to define the applicable vegetation community, such as dominant or co-dominant plant species and community membership rules.

For those vegetated areas that could not be classified per MCV2, descriptive vegetation community names were used (e.g., ornamental). Additionally, land covers were characterized in areas that lacked vegetation (e.g., disturbed). The limits of vegetation communities and land covers within the study area are presented in Section 3.4 below.

A list of dominant, abundant, and conspicuous plant species for each vegetation community within the study area was compiled during the surveys, and is included in Appendix B. The *Jepson Manual: Vascular Plants of California, Second Edition* and online Jepson eFlora were used for plant identification and nomenclature (Baldwin et al. 2012; Jepson Flora Project 2022).

3 Existing Conditions

3.1 Topography, Climate and Land Use

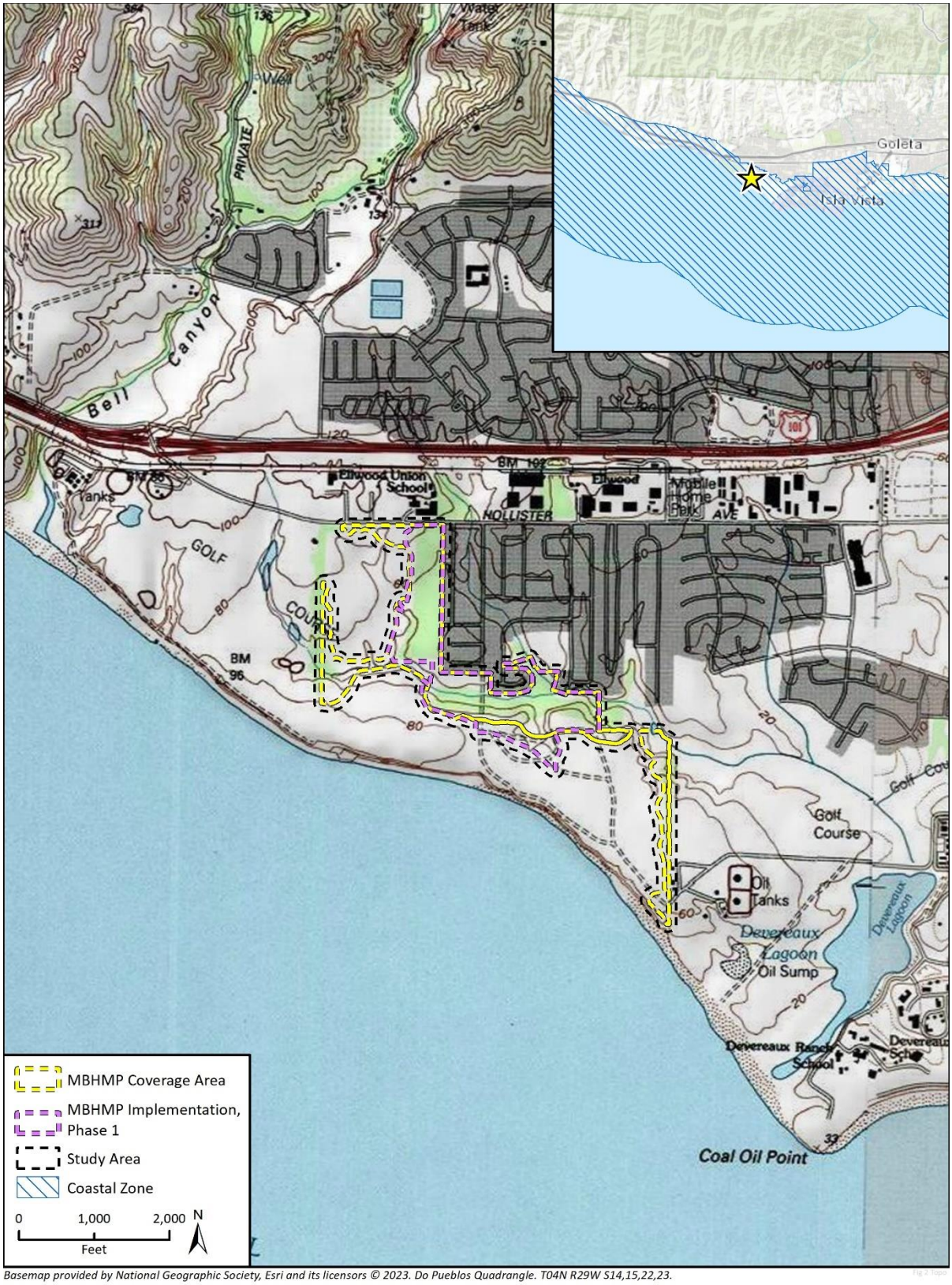
The study area is located entirely within the Ellwood Mesa Open Space, situated on Ellwood Mesa, on gentle slopes and terraces immediately north of the Ellwood bluffs. Ellwood Mesa Open Space was historically utilized for oil development, wood lots, and ranching uses (City of Goleta et al 2006; Campbell Geo 2010) and over the years has transformed into a local recreational area. Existing trails meander throughout the entire Ellwood Mesa within the eucalyptus grove, undeveloped open spaces, and through Devereux Creek riparian corridor. These trails are compacted soils and highly disturbed from public use (e.g., hikers, bicyclists). The study area consists primarily of eucalyptus groves.

Land uses within the vicinity of the study area include roadways (Hollister Avenue), a golf course, undeveloped open space, a paved parking lot, existing trails, active restoration of a former golf course, and residential developments. The northwest corner of the study area wraps around the western, southern, and eastern perimeters of a residential development and existing residential development also abuts the northeastern perimeter of the study area. A developed roadway leading to a paved parking lot off Hollister Avenue is present in the northern portion of the study area. An access road at the end of Santa Barbara Shores Drive divides the center portion of the study area, between the eucalyptus groves, that eventually leads to the beach. The study area is less than 200 feet away from the ocean at the southeastern corner of the study area and is bordered by Sandpiper Golf Club to the west and UCSB's North Campus Open Space (NCOS) to the east. The study area is bordered by a combination of residential developments, eucalyptus groves, and Hollister Avenue to the north. South of the study area consists of undeveloped open space.

The regional climate is Mediterranean, influenced by proximity to the ocean with hot, dry summers and mild winters. According to the Natural Resources Conservation Service's National Water and Climate Center data records between 1941 and 2000, average annual temperatures in Goleta ranged between 49- and 69-degrees Fahrenheit, with the warmest temperatures occurring between August and September and the coldest temperatures occurring between January and February. Goleta receives an average rainfall of approximately 17.37 inches, with the most rain occurring between January and March (USDA, NRCS 2000).

Elevations on-site range from 12 to 115 feet above mean sea level (amsl) and the topography of the study area is primarily flat.

Figure 3 Topographic Map



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.

3.2 Hydrology

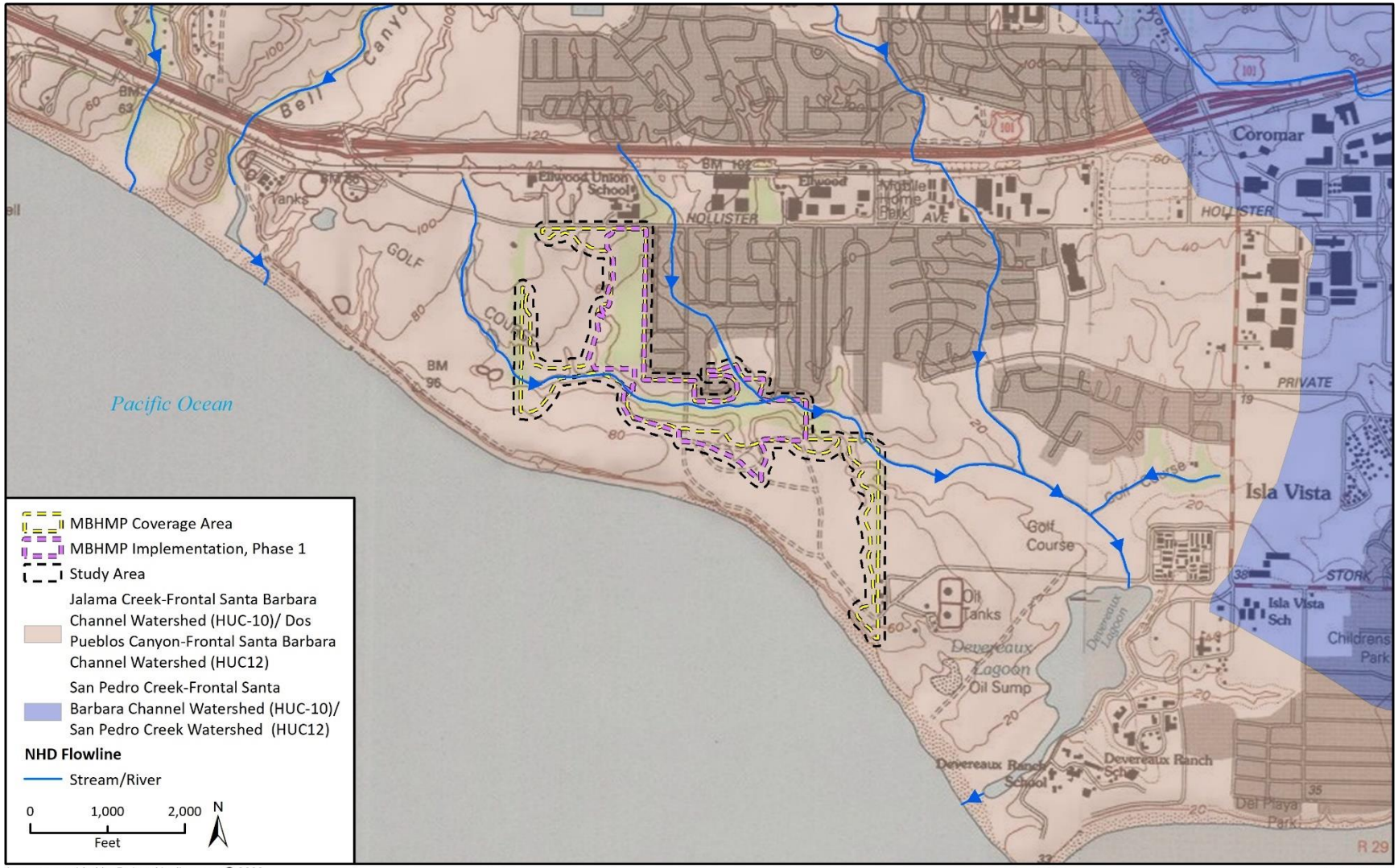
The study area is located within the eastern portion of the Jalama Creek-Frontal Santa Barbara Channel Hydrologic Unit Code (HUC) watershed (HUC-10 No. 1806001301) (USGS 2022b). The Jalama Creek-Frontal Santa Barbara Channel watershed and adjacent San Pedro Creek-Frontal Santa Barbara Channel (HUC-10 No. 1806001302) compose the Santa Barbara Coastal watershed (HUC-8 No. 18060013) shown in Figure 4 below.

Within the Jalama Creek-Frontal Santa Barbara Channel watershed, the study area is contained entirely in the Devereux Creek watershed as described in the City of Goleta Creek and Watershed Management Plan (CWMP, City of Goleta 2020). The CWMP identifies Devereux Creek as a seasonal/intermittent system composed of a network of small tributaries which direct flows into Devereux Creek and then into Devereux Slough and the Pacific Ocean. The watershed encompasses approximately 3.5 square miles. Open spaces compose 46 percent of the watershed area, and the remainder is designated for residential, street, or golf course use.

The National Hydrography Dataset (NHD) identifies Devereux Creek as both an ephemeral stream and an intermittent stream within the study area (USGS 2022). Devereux Creek is hydrologically connected to Devereux Slough, and during heavy precipitation events, also connected to the Pacific Ocean, which is a TNW. Hydrology within Devereux Creek is supplied by storm flows, runoff from residential neighborhoods and Sandpiper golf course upstream (west of the study area), as well as sheet flow from the adjacent uplands in the study area. Devereux Creek exits the eastern boundary of the study area and flows into Devereux Slough, which connects to the Pacific Ocean. NWI identifies Devereux Creek as an intermittent riverine system with freshwater forested/shrub wetlands, and also maps freshwater emergent wetland within the study area (USFWS 2022). Figure 5 below depicts NHD and NWI data within and adjacent to the study area.

It is noted that mapping presented in NHD and NWI provide useful context but are not a completely accurate depiction of current existing conditions nor the extent of jurisdiction in the study area.

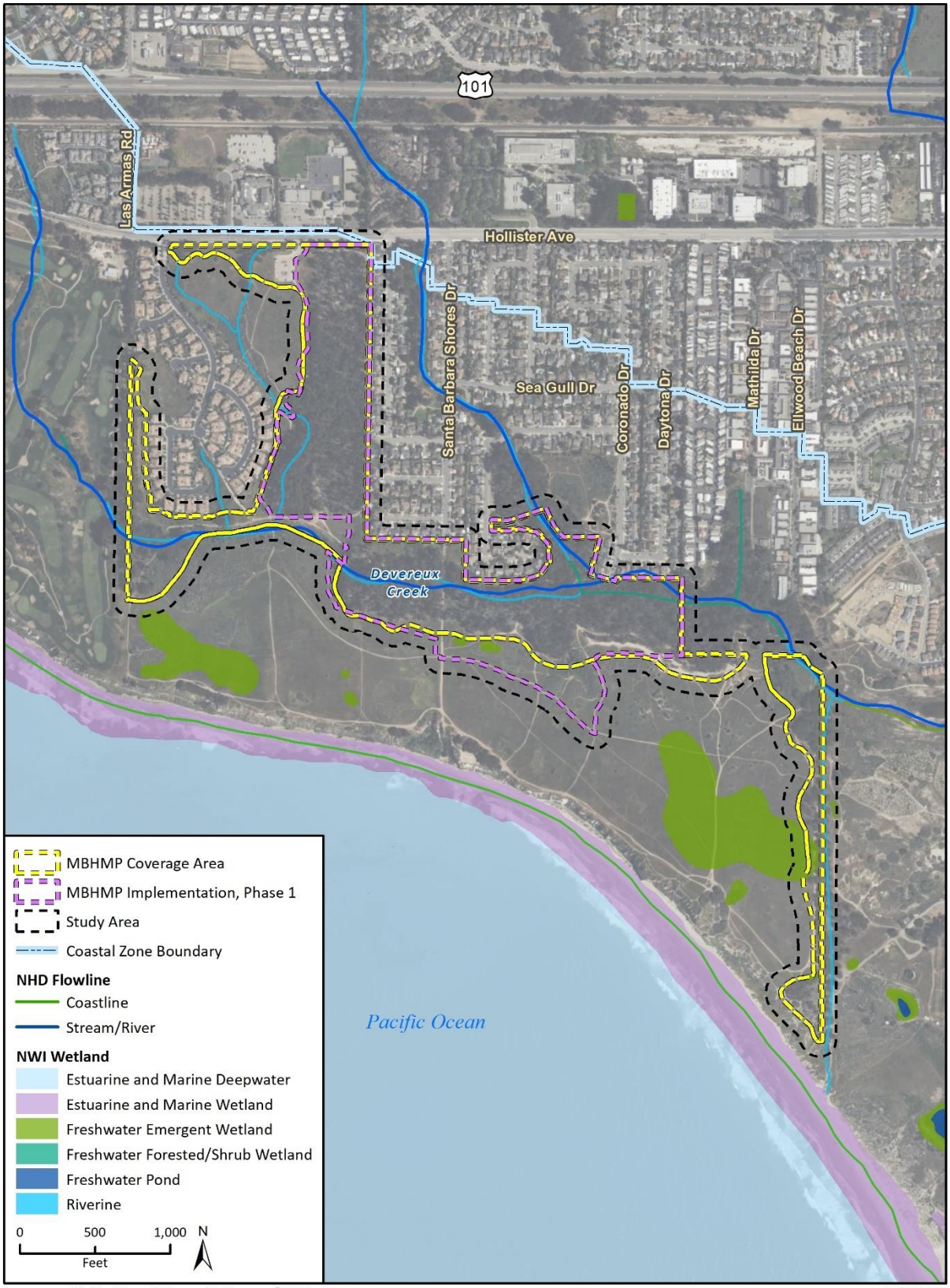
Figure 4 Watersheds



Imagery provided by Esri and its licensors © 2022.
Additional data provided by USGS and USFWS, 2022.

Fig X Watershed

Figure 5 NHD and NWI Resources



Imagery provided by Microsoft Bing and its licensors © 2023.
Additional data provided by USGS and USFWS, 2021.

Fig X NHD NWI

3.3 Soils

According to the NRCS Web Soil Survey, the study area includes nine soil map units, as described below (Figure 6). One soil type (Camarillo fine sandy loam, fine substratum) is included on the National Hydric Soils List (USDA, NRCS 2022b).

- **Camarillo fine sandy loam, fine substratum,** consists of very deep, somewhat poorly drained soils located on relatively flat floodplains from 10 to 100 feet amsl. A typical soil profile is composed of alluvium derived from sedimentary rocks and extends from the surface to 80 inches in depth. Camarillo series soils are frequently used in agriculture. The Camarillo fine sandy loam, fine substratum, is a hydric soil (USDA, NRCS 2022b).
- **Concepcion fine sandy loam, 0 to 2 percent slopes,** consists of deep, moderately well drained soils located on relatively flat terraces between 40 to 200 feet amsl within 1 to 2 miles of the Pacific Ocean. A typical soil profile is composed of weakly consolidated stratified alluvium or wind-deposited sandy material to a depth of 64 inches. Concepcion series soils are often used for grazing, agriculture, and urban development. The Concepcion fine sandy loam, 0 to 2 percent slopes, is not a hydric soil (USDA, NRCS 2022b).
- **Concepcion fine sandy loam, 2 to 9 percent slopes,** eroded, consists of deep, moderately well drained soils located on gentle slopes between 40 to 200 feet amsl within 1 to 2 miles of the Pacific Ocean. A typical soil profile is composed of weakly consolidated stratified alluvium or wind-deposited sandy material to a depth of 64 inches. Concepcion series soils are often used for grazing, agriculture, and urban development. The Concepcion fine sandy loam, 2 to 9 percent slopes, eroded, is not a hydric soil (USDA, NRCS 2022b).
- **Concepcion fine sandy loam, 15 to 30 percent slopes, eroded,** consists of deep, moderately well drained soils located on slopes between 40 to 200 feet amsl within 1 to 2 miles of the Pacific Ocean. A typical soil profile is composed of weakly consolidated stratified alluvium or wind-deposited sandy material to a depth of 64 inches. Concepcion series soils are often used for grazing, agriculture, and urban development. The Concepcion fine sandy loam, 15 to 30 percent slopes, eroded, is not a hydric soil (USDA, NRCS 2022b).
- **Diablo clay, 2 to 9 percent slopes,** consists of well drained soils with slow permeability located on gently sloped uplands between 25 to 3,000 feet amsl. A typical soil profile is composed of residuum weathered from shale, sandstone, and consolidated sediments with minor areas of tuffaceous material to a depth of 60 inches. Diablo series soils may be used for grazing or agriculture. Diablo clay, 2 to 9 percent slopes, is not a hydric soil (USDA, NRCS 2022b).
- **Diablo clay, 9 to 15 percent slopes, warm MAAT,** consists of well drained soils with slow permeability located on hilly uplands between 25 to 3,000 feet amsl. A typical soil profile is composed of residuum weathered from shale, sandstone, and consolidated sediments with minor areas of tuffaceous material to a depth of 60 inches. Diablo series soils may be used for grazing or agriculture. Diablo clay, 2 to 9 percent slopes, is not a hydric soil (USDA, NRCS 2022b).

Figure 6 Soils



- **Milpitas-Positas fine sandy loams, 2 to 9 percent slopes,** consists of Milpitas series soils and Positas series soils. Milpitas series soils are moderately well drained soils with medium runoff and very slow permeability located on gently sloped old terraces between 30 to 500 feet amsl. A typical soil profile is moderately acidic to slightly alkaline and is composed of alluvium derived largely from sandstone to a depth of 68 inches. Milpitas series soils may support native herbaceous, scrub, and oak savannah communities, and may be used for pasture, agriculture, or urban development.

  Positas series soils are moderately well drained soils located on stream terraces and terrace side slopes between 200 to 1,600 feet amsl. A typical soil profile is composed of alluvial material from mixed rock sources to a depth of 64 inches. Positas series soils support annual herbaceous and oak savannah communities and may be used as rangeland and agriculture. Milpitas-Positas fine sandy loams, 2 to 9 percent slopes, is not a hydric soil (USDA, NRCS 2022b).
- **Milpitas-Positas fine sandy loam, 9 to 15 percent slopes, eroded,** consists of Milpitas series soils and Positas series soils. Milpitas series soils are moderately well drained soils with medium runoff and very slow permeability located on moderately sloped old terraces between 30 to 500 feet amsl. A typical soil profile is moderately acidic to slightly alkaline and is composed of alluvium derived largely from sandstone to a depth of 68 inches. Milpitas series soils support native herbaceous, scrub, and oak savannah communities, and may be used for pasture, agriculture, or urban development.

  Positas series soils are moderately well drained soils located on stream terraces and terrace side slopes between 200 to 1,600 feet amsl. A typical soil profile is composed of alluvial material from mixed rock sources to a depth of 64 inches. Positas series soils support annual herbaceous and oak savannah communities and may be used as rangeland and agriculture. Milpitas-Positas fine sandy loam, 9 to 15 percent slopes, eroded, is not a hydric soil (USDA, NRCS 2022b).
- **Xerorthents, cut and fill areas,** consists of man-modified material, either soils rearranged in a cut and fill or as tailings heaps. Xerorthents, cut and fill areas, is not a hydric soil (USDA, NRCS 2022b).

3.4 Vegetation

Fourteen vegetation communities and four land cover types occur within the study area and are described below and shown in Table 1 and Figure 7 and 7b. A list of all plant species observed during the field surveys is provided in Appendix B.

Each vegetation community/land cover type is partially or entirely considered Environmentally Sensitive Habitat Areas (ESHA) per the CCA and Goleta GP/CLUP Conservation Element (CE) definitions. Some vegetation communities also contain 2006 City-mapped ESHA per the Goleta GP/CLUP CE Figure 4.1. Total acreage of each vegetation community/land cover type is provided in Table 1, as well as ESHA acreage within each vegetation community/land cover type (including both those that are mapped by the City and those mapped by Rincon in 2021).

Table 1 Summary of Vegetation Community and Land Cover Types in the Study Area

Vegetation Community	Total Acres	ESHA Acres	CDFW Sensitive Natural Community Rank (Yes/No)[1]	Notes
Vegetation Community				
Alkali Heath Marsh	0.99	0.99	G4S3; Yes	Considered riparian and/or wetland ESHA per GP/CLUP and contains CCA coastal wetland ESHA
Arroyo Willow Thickets	1.52	1.52	G4S4; Yes (Arroyo willow association)	Considered riparian and/or wetland ESHA per GP/CLUP and contains CCA coastal wetland ESHA
Coast Live Oak Woodland and Forest	1.14	1.14	G5S4; No	Considered woodland ESHA per GP/CLUP
Coyote Brush Scrub	14.06	2.51	G5S5; No	Contains 2006 City-mapped coastal bluff scrub/coastal sage scrub ESHA in three locations as well as creeks/riparian ESHA
Creeping Wildrye Turfs	0.64	0.64	G3G3; Yes	Considered native grassland ESHA per GP/CLUP
Eucalyptus Grove	65.32	65.32	GNA SNA; No	Considered monarch butterfly ESHA per GP/CLUP and contains CCA coastal wetland ESHA
Hardstem Bulrush Marshes	0.19	0.19	GNR S3S4: Yes	Considered wetland ESHA per GP/CLUP and CCA coastal wetland ESHA
Ice Plant Mats	1.98	-	GNA SNA; No	
Iris-Leaf Rush Seeps	0.11	0.11	G2?S2?; Yes	Considered riparian ESHA per GP/CLUP and CCA coastal wetland ESHA
Lemonade Berry Scrub	0.06	0.06	G3S3; Yes	Considered coastal bluff scrub ESHA per GP/CLUP
Perennial Rye Grass Fields	0.09	0.09	GNA SNA; No	Contains 2006 City-mapped ESHA

Purple Needle Grass Grassland	7.28	7.28	G3G4 S3S4; Yes	Considered native grassland ESHA per GP/CLUP
Upland Mustards	2.73	0.19	GNA SNA; No	Contains 2006 City-mapped ESHA
Wild Oats and Annual Brome Grasslands	22.51	2.98	GNA SNA; No	Contains 2006 City-mapped ESHA
Land Cover Type				
Bare Ground	3.93	1.5	N/A	Contains 2006 City-mapped ESHA
Developed/Ornamental	17.57	0.36	N/A	Contains 2006 City-mapped ESHA
Native Landscaping/Restoration	0.54	0.54	N/A	Considered ESHA per GP/CLUP where it supports special status plant species (Santa Barbara honeysuckle) in one location. Other locations contain 2006 City-mapped ESHA
Undifferentiated Ornamental Shrubland	0.69	0.22	N/A	Contains 2006 City-mapped ESHA

[1]Notes:

Source: CDFW 2021

G – Global

S – State

GNA SNA – No Global and State rankings

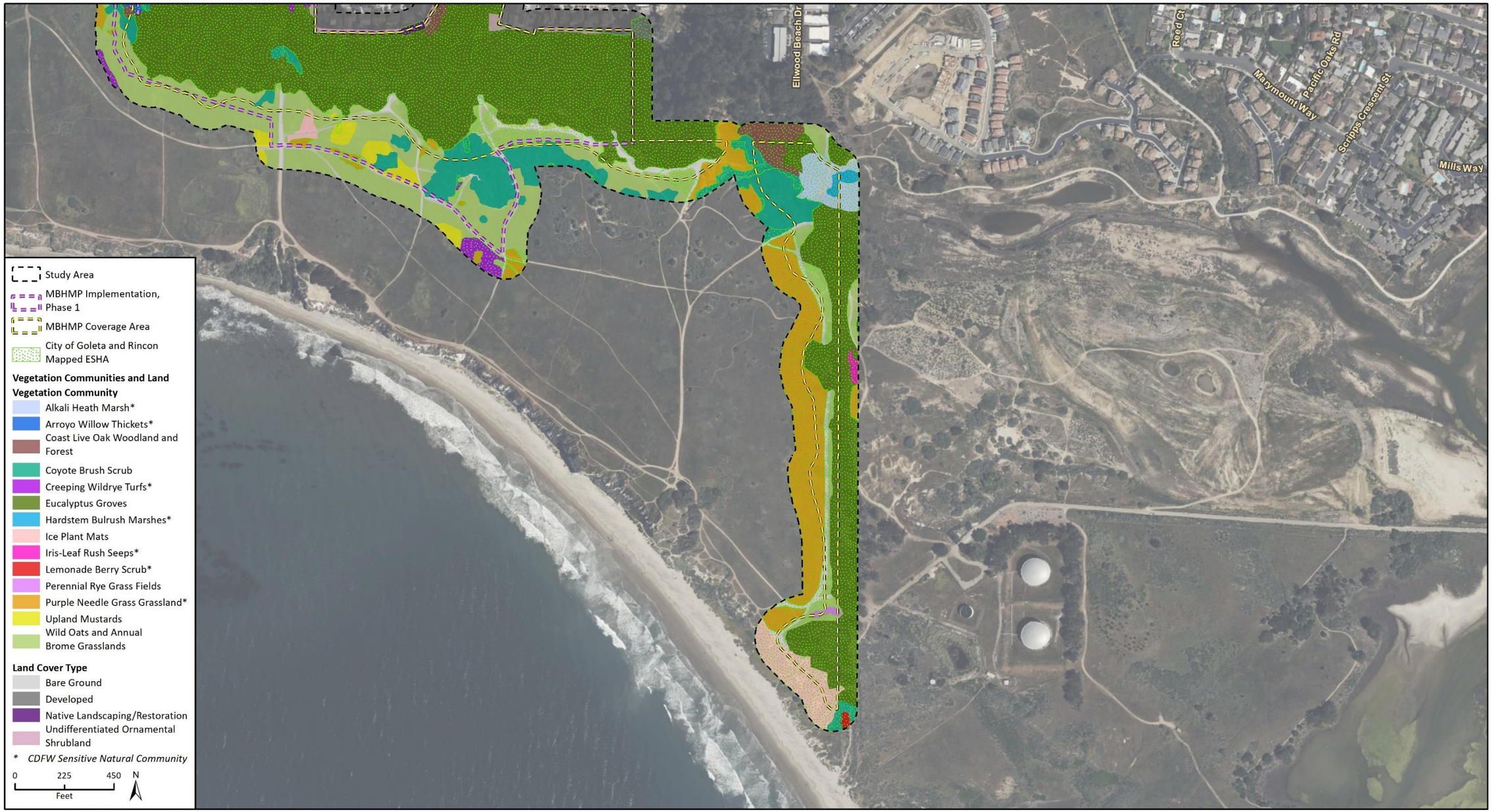
Figure 7a Vegetation Communities and Land Cover Types



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Fig X Vegetation_11x17

Figure 7b Vegetation Communities and Land Cover Types



Imagery provided by Microsoft Bing and its licensors © 2023

Fig X Vegetation_11x17

Alkali Heath Marsh (*Frankenia salina* Herbaceous Alliance)

Alkali heath marsh (*Frankenia salina* Herbaceous Alliance) is typically located in coastal salt marshes, brackish marshes, alkali meadows, and alkali playas with soils that are saline and composed of sandy to clayey alluvium. Elevations range between sea level and 300 meters. This community is characterized by an open to continuous herbaceous canopy. Alkali heath (*Frankenia salina*) has over 30 percent relative cover in the herbaceous layer and may be codominant with other herbs and subshrubs such as salt grass (*Distichlis spicata*). This alliance is ranked G4S3 and is considered a CDFW sensitive natural community (CDFW 2021).

This community is located in the northeast portion of the study area, where Devereux Creek exits the study area. The thick herbaceous layer is dominated by alkali heath, Italian rye grass (*Festuca perennis*), and creeping wildrye (*Elymus triticoides*). Several dirt footpaths cross the alkali heath marsh. The study area contains 0.99 acres of this alliance.

Arroyo Willow Thickets (*Salix lasiolepis* Shrubland Alliance)

Arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance) typically occurs along stream banks and benches, slope seeps, and stringers along drainages from sea level to 2,170 meters in elevation. This alliance is characterized by an open to continuous shrub layer and a variable herbaceous layer. The community is dominated by arroyo willow (*Salix lasiolepis*) with over 50 percent relative cover in the tree or shrub layer and co-dominant species including Fremont cottonwood (*Populus fremontii*), giant reed (*Arundo donax*), and mulefat (*Baccharis salicifolia*). This alliance is ranked G4S4 and the arroyo willow association of this alliance is considered a CDFW sensitive natural community (CDFW 2021).

Arroyo willow thickets are present along Devereux Creek in the central portion of the study area. The tree and shrub layers are dominated by arroyo willow. Other tree species present include coast live oak (*Quercus agrifolia*) and California sycamore (*Platanus racemosa*). The diverse shrub layer includes mulefat, coyote brush (*Baccharis pilularis*), and giant wild rye (*Elymus condensatus*). The herbaceous layer consists of species including ripgut brome (*Bromus diandrus*), common spikerush (*Eleocharis macrostachya*), Parish's spike rush (*Eleocharis parishii*), and cutleaf geranium (*Geranium dissectum*). This community contains several large open patches dominated by common spikerush and Parish's spike rush, with few to no shrubs or trees. The study area contains 1.52 acres of this alliance.

Coast Live Oak Woodland and Forest (*Quercus agrifolia* Forest & Woodland Alliance)

Coast live oak woodland and forest (*Quercus agrifolia* Woodland Alliance) is typically found on canyon bottoms, slopes, and flats between sea level and 1,200 meters in elevation. Soils are typically deep and sandy or loamy with high organic matter. This vegetation community is characterized by a tree layer that ranges from continuous to open and sparse shrub and herbaceous layers. Coast live oak contributes to at least 60 percent relative cover in the tree layer (Sawyer et al. 2009). This vegetation community is ranked G5S4 and is not considered a CDFW sensitive natural community (CDFW 2021).

This alliance is located in the central and eastern portions of the study area. Coast live oak is dominant in the tree canopy, and shrub species present include coyote brush, arroyo willow, and

giant wild rye. The dense herbaceous layer is dominated by ripgut brome and black mustard (*Brassica nigra*). The study area contains 1.14 acres of this alliance.

Coyote Brush Scrub (*Baccharis pilularis* Shrubland Alliance)

Coyote brush scrub (*Baccharis pilularis* Shrubland Alliance) may occur on coastal bluffs, terraces, stabilized dunes of coastal bars, spits along the coastline, river mouths, stream sides, open exposed slopes, ridges, and gaps in forest stands. Soils are variable, ranging from sandy to relatively heavy clay, between sea level and 1,500 meters in elevation. The shrub and herbaceous layers are variable. Coyote brush (*Baccharis pilularis*) is dominant with over 50 percent absolute or relative cover in the shrub canopy. California coffeeberry (*Frangula californica*) or coast silk tassel (*Garrya elliptica*) may be codominant in the shrub layer. This alliance is ranked G5S5 and is not considered a CDFW sensitive natural community (CDFW 2021).

Coyote brush scrub is found in several patches throughout the study area. Coyote brush is dominant along with giant wild rye and California sagebrush (*Artemisia californica*). Other species present in this community include mulefat, toyon (*Heteromeles arbutifolia*), ripgut brome, creeping wildrye, creeping wildrye, Italian rye grass, and emergent coast live oaks. The study area contains 12.78 acres of this alliance.

Creeping Wildrye Turfs (*Elymus triticoides* Herbaceous Alliance)

Creeping wildrye turfs (*Elymus triticoides* Herbaceous Alliance [*Leymus triticoides* Herbaceous Alliance]) are typically found on poorly drained floodplains, playas, drainage and valley bottoms, or marsh margins with mesic flat to sloping topography between sea level and 3,000 meters. Soils are generally alkaline or saline clays and loams. creeping wildrye contributes at least 50 percent relative cover in the herbaceous layer, and the herbaceous layer is open to continuous. Creeping wildrye turfs are ranked G3S3 and are considered a CDFW sensitive natural community (CDFW 2021).

Several small patches of creeping wildrye turfs are present near the center of the study area. Creeping wildrye is overwhelmingly dominant in the herbaceous layer. The study area contains 0.02 acres of this alliance.

Eucalyptus Grove (*Eucalyptus globulus* Semi-Natural Alliance)

Eucalyptus Grove (*Eucalyptus globulus* Semi-Natural Alliance) is found planted as trees, groves, and windbreaks, as well as in settings where it has become naturalized on uplands or bottomlands and adjacent to stream courses, lakes, or levees from sea level to 1,900 meters in elevation. Eucalyptus species consist of over 80 percent cover within the tree layer. This vegetation community is ranked GNA SNA and is not considered a CDFW sensitive natural community (CDFW 2021).

This alliance is found throughout the study area and is crossed by dirt footpaths. Within the study area, this alliance is dominated by blue gum eucalyptus (*Eucalyptus globulus*), which forms a closed canopy. Other trees and shrubs present in the understory include arroyo willow, shamel ash (*Fraxinus uhdei*), golden wattle (*Acacia longifolia*) and myoporum (*Myoporum laetum*). The herbaceous layer is sparse, and primarily consists of weedy non-native species such as black mustard, ripgut brome, and upright veldt grass (*Ehrharta erecta*). Vines present include poison oak (*Toxicodendron diversilobum*) and cape ivy (*Delairea odorata*). The study area contains 65.31 acres of this alliance.

Hardstem Bulrush Marshes (*Schoenoplectus acutus* Herbaceous Alliance)

Hardstem bulrush marshes (*Schoenoplectus acutus* Herbaceous Alliance) typically occur in brackish to freshwater marshes, including along stream shores, bars, channels of river mouth estuaries, ponds and lakes, sloughs, swamps, and roadside ditches. Soils are poorly aerated with a high organic content between sea level and 2,500 meters in elevation. This alliance is characterized by an intermittent to continuous herbaceous layer. Hardstem bulrush (*Schoenoplectus acutus*) has over 50 percent relative cover in the herbaceous layer and at least 10 percent absolute cover. This community is ranked GNR S3S4 and is considered a CDFW sensitive natural community (CDFW 2021).

This community is located in the northeast portion of the study area where Devereux Creek exits the study area. Hardstem bulrush is the dominant species. Other species present at low cover include curly dock (*Rumex crispus*), wild radish (*Raphanus sativus*), and bristly oxtongue (*Helminthotheca echioides*). The study area contains 0.19 acres of this alliance.

Ice Plant Mats (*Carpobrotus* spp. Herbaceous Semi-Natural Alliance)

Ice plant mats (*Carpobrotus* spp. Herbaceous Semi-Natural Alliance) typically occurs on bluffs, disturbed, land, and sand dunes near the coastline between sea level and 10 meters in elevation. This alliance is characterized by an intermittent to continuous herbaceous layer. Ice plant (*Carpobrotus* spp.) is dominant with over 50 percent relative cover. This community is ranked GNA SNA and is not considered a CDFW sensitive natural community (CDFW 2021).

Ice plant mats are present in several areas of the study area, including at the top of the seaside bluffs in the southeastern part of the study area. Ice plant (*Carpobrotus edulis*) is dominant in the dense herbaceous layer, along with ripgut brome, black mustard, slender oats (*Avena barbata*), and wild oats (*Avena fatua*). Scattered shrubs are present including deerweed (*Acmispon glaber*), pampas grass (*Cortaderia selloana*), and seacliff buckwheat (*Eriogonum parvifolium*). The study area contains 2.13 acres of this alliance.

Iris-Leaf Rush Seeps (*Juncus phaeocephalus* Provisional Herbaceous Alliance)

Iris-leaf rush seeps (*Juncus phaeocephalus* Provisional Herbaceous Alliance) typically occurs on seeps, mainly on metamorphic, serpentine, and volcanic substrates between sea level and 1,600 meters in elevation. This alliance is characterized by an intermittent to continuous herbaceous cover. Pointed rush (*Juncus oxymeris*), irisleaf rush (*Juncus xiphioides*) or another iris-leaved rush, such as brown headed rush (*Juncus phaeocephalus*) is dominant. This alliance is ranked G2?S2? and is considered a CDFW sensitive natural community (CDFW 2021).

This community is present in a coastal wetland along the eastern boundary of the study area. Brown headed rush is dominant in the dense herbaceous layer. Other species present include coyote thistle (*Eryngium vaseyi*), woolly marbles (*Psilocarphus brevissimus*), common spikerush and common rush (*Juncus patens*). The study area contains 0.11 acres of this alliance.

Lemonade Berry Scrub (*Rhus integrifolia* Shrubland Alliance)

Lemonade berry scrub (*Rhus integrifolia* Shrubland Alliance) generally occurs on gentle to abrupt slopes and coastal bluffs of variable aspect with loam and clay soils between 5-750 meters in elevation. This community is characterized by an open to continuous two-tiered shrub canopy and

an open herbaceous layer. Lemonade berry (*Rhus integrifolia*) has over 50 percent relative cover in the shrub canopy or is co-dominant along with other coastal scrub species, with over 30 percent relative cover in the shrub canopy. This community is ranked G3S3 and is considered a CDFW sensitive natural community (CDFW 2021).

One lemonade berry patch is located near the southeastern extent of the study area. Lemonade berry is the only species in the closed shrub canopy, and the herbaceous layer is sparse. The study area contains 0.06 acres of this alliance.

Perennial Rye Grass Fields (*Festuca perennis* Herbaceous Semi-Natural Alliance)

Perennial rye grass fields (*Festuca perennis* Herbaceous Semi-Natural Alliance [*Lolium perenne* Herbaceous Semi-Natural Alliance) typically occur on lowlands with periodic flooding, disked fields, and uplands including serpentine substrates between sea level and 1,325 meters in elevation. This alliance is characterized by an intermittent to continuous herbaceous layer. Italian rye grass has at least 50 percent relative cover in the herbaceous layer. This community is ranked GNA SNA and is not considered a CDFW sensitive natural community (CDFW 2021).

This community is located in the southeastern corner of the study area. Italian rye grass is dominant in the dense herbaceous layer. Other species present include creeping wildrye, California burclover (*Medicago polymorpha*), and curly dock. The study area contains 0.09 acres of this alliance.

Purple Needle Grass Grassland (*Stipa* pulchra Herbaceous Alliance)

Purple needle grass grassland (*Stipa pulchra* Herbaceous Alliance [*Nassella pulchra* Herbaceous Alliance)] may occur on all topographic locations with deep soils with high clay content, or loamy, sandy, or silty soils derived from mudstone, sandstone, or serpentine substrates. Elevations range between sea level and 1,700 meters in elevation. This community is characterized by an open to continuous herbaceous layer. Needle grass (*Stipa* spp.) is characteristically present with at least two percent absolute cover or at least ten percent relative cover in the herbaceous layer. This alliance is ranked S3S4 G3G4 and is considered a CDFW sensitive natural community (CDFW 2021).

Patches of purple needle grass grassland are present throughout grasslands in the study area, and the eastern portion of the study area contains a large amount of this community. Purple needlegrass (*Stipa pulchra*) is dominant along with ripgut brome, slender oats, and wild oats. Scattered emergent coyote brush, coast live oak, and olive trees (*Olea europaea*). Several dirt footpaths cross this community. The study area contains 6.83 acres of this alliance.

Upland Mustards (*Brassica nigra* Herbaceous Semi-Natural Alliance)

Upland mustards (*Brassica nigra* Herbaceous Semi-Natural Alliance) are typically found in fallow fields, grasslands, roadsides, levee slopes, disturbed coastal scrub, riparian areas, cleared roadsides, and waste places between sea level and 2,800 meters in elevation. This vegetation community is characterized by an open to continuous herbaceous layer. Black mustard, summer mustard, wild radish, or other mustards occur with non-native plants at over 80% cover in the herbaceous layer. This vegetation community is ranked GNA SNA and is not considered a CDFW sensitive natural community (CDFW 2021).

Patches of upland mustards are found in the north, western, and central portions of the study area. Black mustard is the dominant species, and other herbaceous plants present include summer

mustards, wild radish, ripgut brome, slender oats, and wild oats. The study area contains 2.05 acres of this alliance.

Wild Oats and Annual Brome Grasslands (*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance)

Wild oats and annual brome grasslands (*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance) are found in all topographic settings in foothills, waste places, rangelands, and openings in woodlands between sea level and 2,200 meters in elevation. This alliance is characterized by an open to continuous herbaceous layer. Wild oats (*Avena* spp.) or annual bromes (*Bromus* spp.) are dominant or co-dominant with other non-native species in the herbaceous layer. Emergent trees and shrubs may be present at low cover. This vegetation community is ranked GNA SNA and is not considered a CDFW sensitive natural community (CDFW 2021).

Wild oats and annual brome grasslands are located throughout the study area. Ripgut brome, slender oats, and wild oats are dominant in the herbaceous layer. Other widely present herbaceous species include black mustard, wild radish, and summer mustard (*Hirschfeldia incana*). Emergent coyote brush, California sagebrush, and blue oak are present at low cover. The study area contains 18.38 acres of this alliance.

Bare Ground

This land cover type consists of paved and unpaved roads and footpaths, including the parking lot off Hollister Avenue (Ave) and numerous dirt paths. Little to no vegetation is present in this land cover type. The study area contains 3.30 acres of this land cover type.

Developed/Ornamental

This land cover type consists of paved roads, sidewalks, parking areas, buildings and yards, and includes portions of Sandpiper Golf Course. Vegetated areas in this land cover type are regularly maintained by people and do not constitute a natural vegetation community as described in MCV2 (Sawyer et al. 2009, CNPS 2021a). Ornamental land cover is present around the houses surrounding much of the study area to the north. The study area contains 17.52 acres of this land cover type.

Native Landscaping/Restoration

This land cover type consists of areas with native plants that have been installed, either as part of landscaping or as restoration work. These areas are regularly maintained by people and do not constitute a natural vegetation community as described in MCV2 (Sawyer et al. 2009, CNPS 2021a). Native landscaping/restoration areas are present in the central portion of the study area, adjacent to homes. This land cover type contains a wide array of species, including coast live oak, valley oak (*Quercus lobata*), giant wild rye, California sunflower (*Encelia californica*), lemonade berry, and deergrass (*Muhlenbergia rigens*). The study area contains 0.54 acres of this land cover type.

Undifferentiated Ornamental Shrubland

This land cover type consists of areas landscaped with primarily non-native ornamental plants. These areas are regularly maintained by people and do not constitute a natural vegetation community as described in MCV2 (Sawyer et al. 2009, CNPS 2021a). Undifferentiated ornamental shrubland is present near the houses near the center of the study area. A diverse selection of plants are found in this land cover type, including acacias (*Acacia* spp.), Mexican fan palm (*Washingtonia*

robusta), bougainvillea (*Bougainvillea spectabilis*), mission cactus (*Opuntia ficus-indica),* and ice plant. The study area contains 0.69acres of this land cover type.

4 Field Results

Based on the JD, the study area contains areas potentially subject to USACE, CDFW, RWQCB, and CCC/City jurisdictions. Potentially jurisdictional features include Devereux Creek, seven unnamed drainages tributary to Devereux Creek, one unnamed drainage tributary to Devereux Slough, and two coastal wetlands. These features are described in detail below. Representative photographs are included in Appendix C.

4.1 Devereux Creek

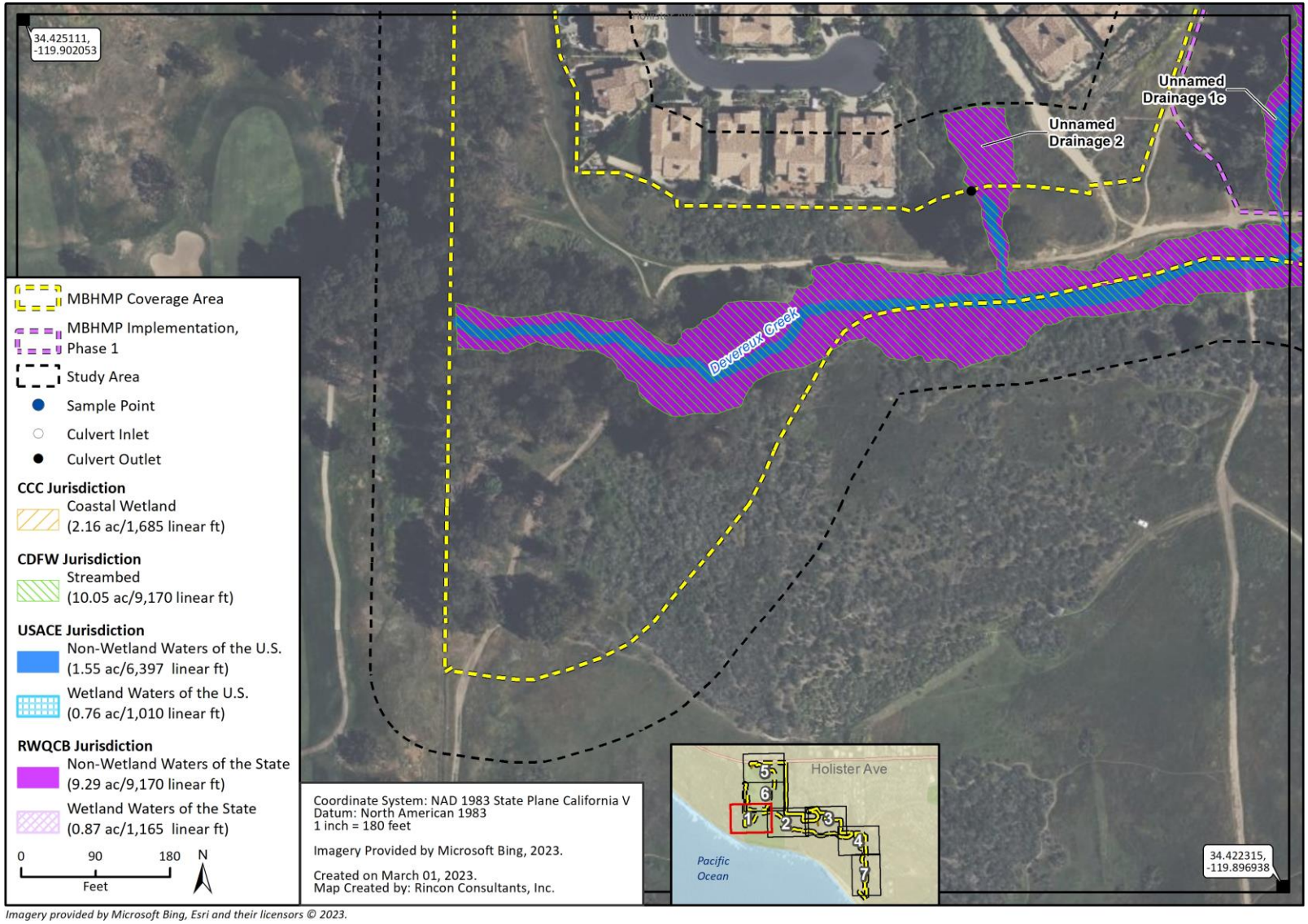
Devereux Creek enters the study area from the west and flows eastward across the study area (Figure 8a-Figure 8b). As it exits the study area, Devereux Creek flows into Devereux Slough, which is a seasonally flooded tidal lagoon periodically connected to the Pacific Ocean. Devereux Creek is an intermittent system maintained by groundwater, storm flows, and urban runoff from surrounding neighborhoods and the Sandpiper Golf Course, which is adjacent to the western boundary of the study area. The drainage characteristics of Devereux Creek, including channel dimensions, vegetation type, and hydrology, change as the creek flows through the study area, as described below.

Western

Between the western (upstream) boundary of the study area and the confluence of Devereux Creek and Unnamed Drainage 1c (Figure 8a), Devereux Creek is generally flat and characterized by a single active channel which flows eastward through eucalyptus groves and arroyo willow thickets. No surface water was present in the channel in this area during the delineation. The bed of the channel is approximately 6 feet wide, and the top of bank ranges from 35 to 100 feet wide and 5 to 10 feet in height. Where Devereux Creek crosses the eucalyptus groves, the channel is generally unvegetated due to the dense leaf litter, and the fine sandy loam soils are compacted (Photograph 1). In the arroyo willow thickets, more vegetation is present, including arroyo willow and coyote brush. The channel is well defined and broad floodplains are not present. The OHWM is defined by the presence of break in slope and change in vegetation cover, and largely coincides with the width of channel bottom from toe of slope to toe of slope.

Along the active channel in the western part of the study area, no primary wetland hydrology indicators were observed. Secondary wetland hydrology indicators were occasionally present on the sloped banks near the OHWM, including riverine drift deposits and water marks. However, wetland hydrology indicators were not consistently present in the abundance needed to indicate the presence of wetland hydrology.

Figure 8a Jurisdictional Delineation

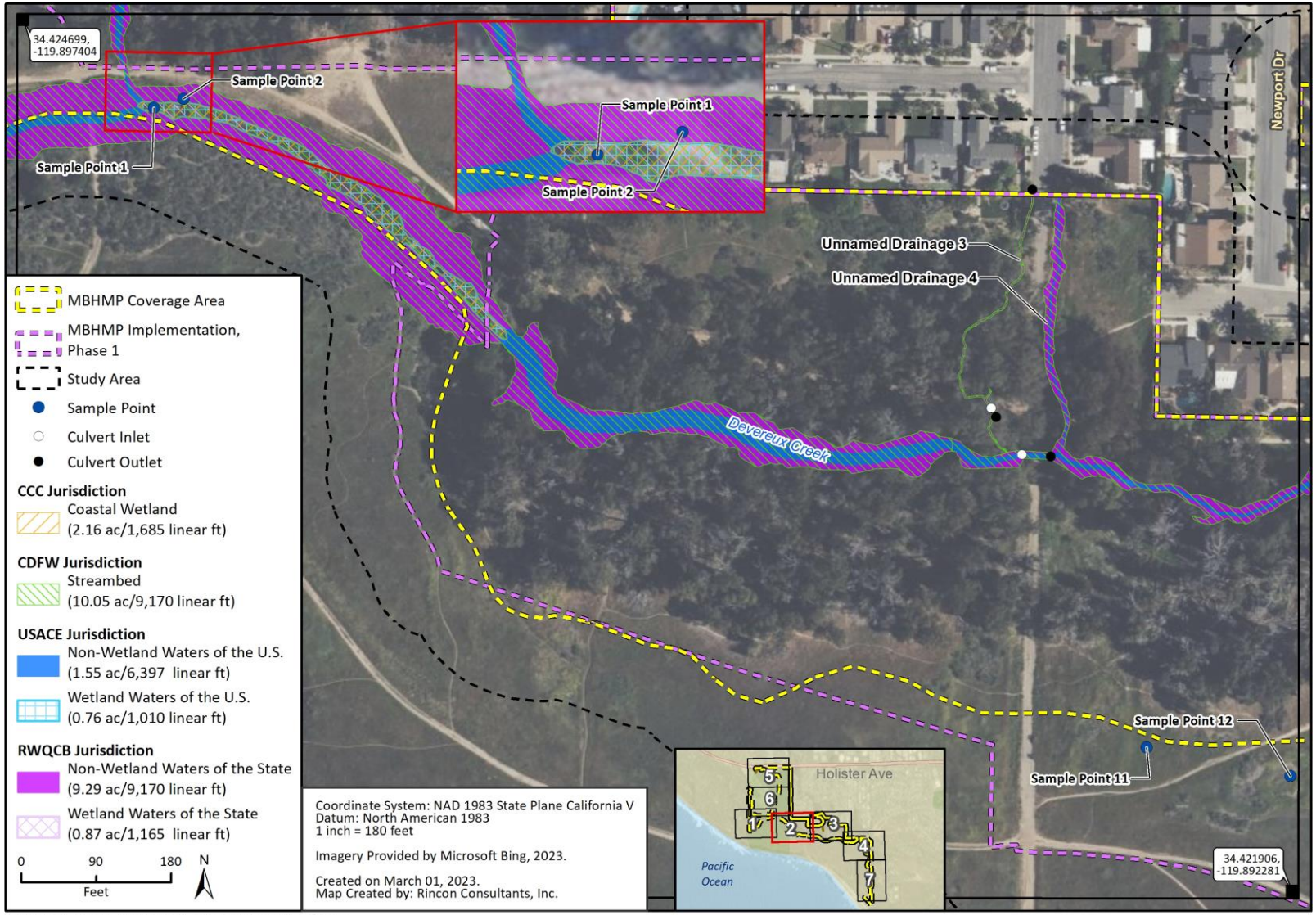


Central

The central portion of Devereux Creek begins at the confluence of Unnamed Drainage 1c with Devereux Creek (Figure 8b) and extends eastward to the point where Devereux Creek exits the study area for the first time (Figure 8c). The characteristics of Devereux Creek change at the confluence of Drainage 1c (described below) and Devereux Creek. The creek continues to flow eastward across a flat plain vegetated with arroyo willow thickets (Photograph 2), then further into dense eucalyptus groves. In this central portion of the study area, the creekbed of Devereux Creek is relatively flat and characterized by a single active channel, which varies between approximately 3 to 10 feet in width. Surface water was present in portions of the creek, with water depth between 3 to 6 inches (Photographs 3-5). The floodplain along much of this section of the creek is approximately 25 feet in total width (Photograph 6). These floodplains are characterized by saturated soils and a dominance of hydrophytic vegetation, including arroyo willows, soft chess, Parish's spike rush, and common rush. The top of bank ranges from approximately one to 10 feet high and 30 to 115 feet wide in this area. As Devereux Creek flows east into dense eucalyptus groves, the herbaceous layer is sparse (Photograph 8). As it continues east, the eucalyptus canopy becomes more open with a more developed herbaceous layer, including the hydrophytic species basin saltbush (*Atriplex prostrata*), brown sedge (*Carex subfusca*), cocklebur (*Xanthium strumarium*), and curly dock. Five sample points (Sample Points 1-5) were assessed to determine hydrology and presence of other wetland characteristics, as described below.

While much of the topography of Devereux Creek is natural, several small portions of the creek have been manipulated by human activity. Grouted rip rap boulders are present along Devereux Creek near the center of the study area, extending the width of the banks (Photograph 7). South of Santa Barbara Shores Drive, east of the confluence of Unnamed Drainage 3 and west of the confluence of Unnamed Drainage 4, an unpaved road crosses Devereux Creek with a 5-foot wide corrugated pipe culvert (Photograph 10). Further downstream, an approximately 250-foot long section of the creek has been modified into a trapezoidal concrete channel. This portion of the channel has a steeper gradient than upstream, and is lined with concrete-grouted rip-rap. Other than these two anthropogenically manipulated areas, the creek is not confined or deeply incised.

Figure 9b Jurisdictional Delineation



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Sample Points 1 and 2

Sample Point 1 was taken in a low gradient depressional floodplain directly adjacent to the channel of Devereux Creek near the center of the study area (Figure 8b). The sample point is located within the arroyo willow thickets community, and dominant plant species were arroyo willow, soft chess (*Bromus hordeaceus*), and Parish's spike rush. Hydrophytic vegetation was dominant. The soils were silty clay loam, and redox features were present in the matrix and along pore linings. Based on the presence of soil that was depleted below the dark surface and depleted matrix, it was determined that hydric soils are present. Multiple wetland hydrology indicators were present, including surface water, water-stained leaves, oxidized rhizospheres along living roots, and the presence of reduced iron. Therefore, wetland hydrology was present. Sample Point 1 meets the criteria for a three-parameter wetland. See Appendix C, Photograph 2 for documentation of Sample Point 1.

Sample Point 2 is located further up the bank of Devereux Creek adjacent to Sample Point 1 (Figure 8a). The dominant plant species observed were giant wild rye, California burclover, and ripgut brome. Hydrophytic vegetation was determined to be absent. Soils at Sample Point 2 were silty clay loam and exhibited no hydric soil indicators. No hydrology indicators were observed at Sample Point 2. Based on these results, it was determined that a wetland is not present. See Appendix C, Photograph 3 for documentation of Sample Point 2.

Sample Points 3 and 4

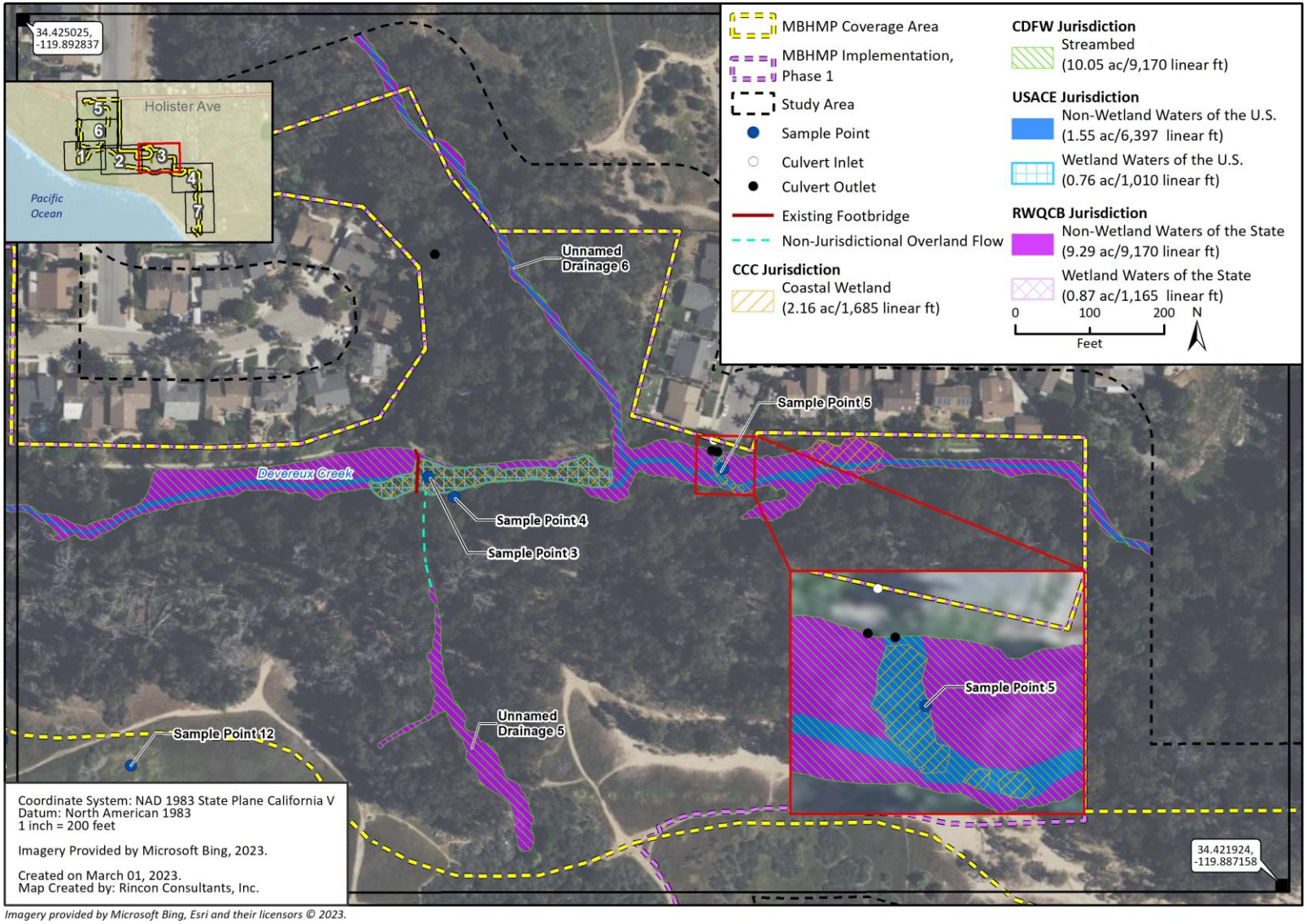
Sample Point 3 was taken in a low flow channel of Devereux Creek within an opening in the canopy of eucalyptus groves, immediately east of an existing wooden plank footbridge (Figure 8c). Basin saltbush was the dominant plant species, with brown sedge and curly dock present as subdominant species. Hydrophytic vegetation was dominant. The soil surface layer was clay loam, dark in color (matrix value 3, chroma 2), and distinct redox concentrations were observed along ped faces and within pore linings. Based on these factors, it was determined that hydric soils are present. Wetland hydrology indicators observed included oxidized rhizospheres along living roots, drainage patterns, and the FAC-neutral test. Therefore, wetland hydrology was present. Sample Point 3 meets the criteria for a three-parameter wetland. See Appendix C, Photograph 11 for documentation of Sample Point 3.

Sample Point 4 is located on a low terrace within Devereux Creek, situated at the edge of an opening within an overstory of eucalyptus groves (Figure 8c). The dominant plant species observed were blue gum eucalyptus, coast live oak, poison oak, and English ivy (*Hedera helix*). Hydrophytic vegetation was determined to be absent. Soils at Sample Point 4 were sandy loam and exhibited no hydric soil indicators. No hydrology indicators were observed at Sample Point 4. Based on these results, it was determined that a wetland is not present. See Appendix C, Photograph 12 for documentation of Sample Point 4.

Sample Point 5

Sample Point 5 was taken along Devereux Creek in the northeastern portion of the study area (Figure 8b, Photograph 13). The sample point is located within the eucalyptus groves vegetation community. Dominant plant species were shamel ash, arroyo willow, and English ivy (*Hedera helix*). Hydrophytic vegetation was not dominant. The soils were sandy clay loam and loamy sand. No indicators of hydric soils were observed. Two hydrology indicators were present at Sample Point 5: surface water and saturation. Therefore, wetland hydrology is present. Sample Point 5 is situated within a one-parameter wetland.

Figure 10c Jurisdictional Delineation



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Eastern

The creek characteristics change as Devereux Creek re-enters the study area and approaches the far eastern boundary of the study area, where it flows into upper Devereux Slough (Figure 8d, Photograph 12). The creek cuts a narrow, shallowly incised channel approximately 5 feet wide and 2 feet deep through a dense alkali heath herbaceous layer. The OHWM is defined by the presence of break in slope, change in vegetation cover, and drift debris accumulation, and largely coincides with the width of channel bottom from toe of slope to toe of slope. A broad floodplain defined by topography and presence of hydrophytic vegetation is present, extending approximately 150 to 250 feet across.

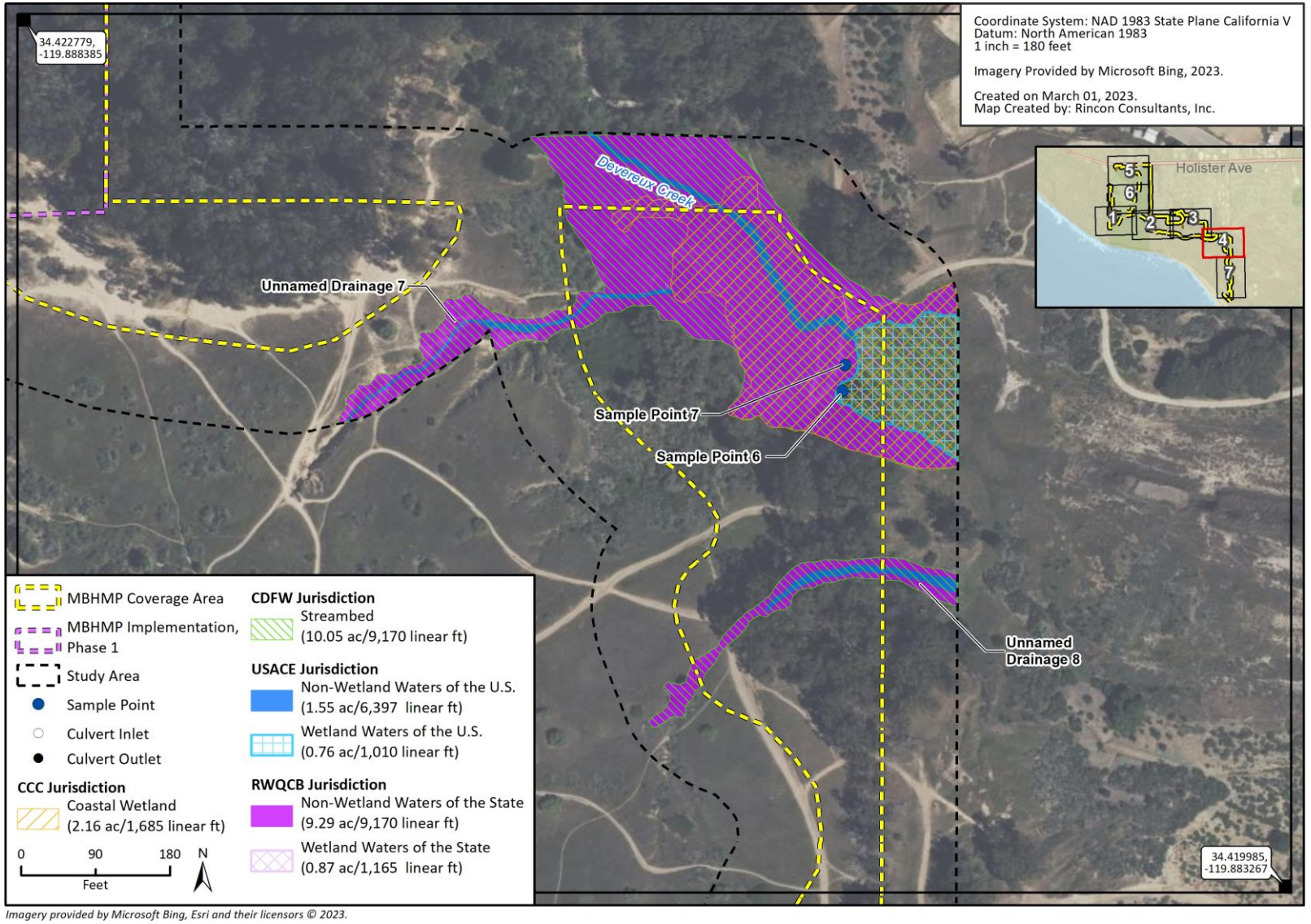
Based on the presence of hydrophytic vegetation and other hydrology indicators, two sample points (Sample Points 6 and 7) were assessed near the outlet of Devereux Creek into upper Devereux Slough. A total of seven sampling points were assessed along Devereux Creek to determine hydrology and presence of other wetland characteristics. Results are summarized in Table 3**Error! Reference source not found.**.

Sample Points 6 and 7

Sample Point 6 was taken in a low flow channel of Devereux Creek as it transitions into upper Devereux Slough and exits the eastern boundary of the study area (Figure 8b). The sample point is located within hardstem bulrush marshes, and dominant plant species were blue gum eucalyptus, hardstem bulrush, and curly dock. Hydrophytic vegetation was dominant. The soils were clay loam, and redox features were present. Hydric soil indicators present at Sample Point 6 include hydrogen sulfide and soil that was depleted below the dark surface. Therefore, hydric soils were present. Multiple wetland hydrology indicators were present, including a high water table, soil saturation, hydrogen sulfide odor, oxidized rhizospheres along living roots, and the presence of reduced iron. Therefore, wetland hydrology was present. Sample Point 6 meets the criteria for a three-parameter wetland. See Appendix C, Photograph 16 for documentation of Sample Point 4.

Sample Point 7 is located upslope of Sample Point 6 (Figure 8b) in the alkali heath marsh vegetation community. Alkali heath was the dominant plant species, and hydrophytic vegetation was determined to be present. Soils at this sample point were silty clay loam and exhibited no hydric soil indicators. Therefore, hydric soils are absent. No hydrology indicators were observed at Sample Point 7. Based on these results, Sample Point 7 is situated within a one-parameter wetland. See Appendix C, Photograph 17 for documentation of Sample Point 7.

Figure 11d Jurisdictional Delineation



4.2 Unnamed Drainage 1

An unnamed ephemeral drainage (herein described as Unnamed Drainage 1) intersects with the northwest corner of the study area (Figure 8e-Figure 8f) in three areas, referenced as segments 1a, 1b, and 1c. Flows are conveyed from Unnamed Drainages 1a and 1b southward and outside the study area as non-jurisdictional overland flow before converging into Unnamed Drainage 1c outside the study area. Unnamed Drainage 1c then flows south approximately 830 feet to converge with Devereux Creek.

Unnamed Drainage 1a

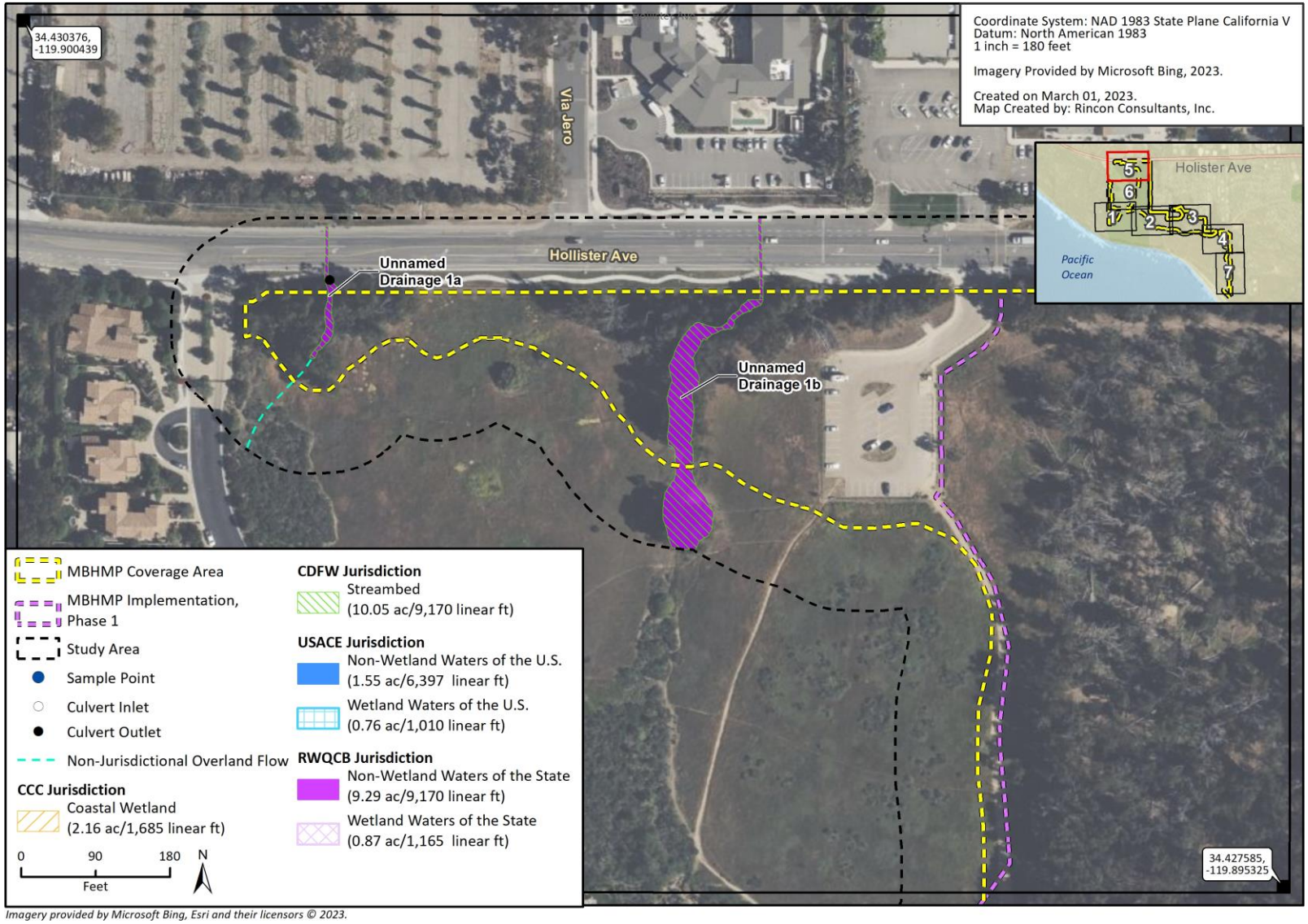
Unnamed Drainage 1a enters the study area through a 2-foot-diameterpipe culvert which crosses under Hollister Avenue and outlets into a natural bottomed drainage which flows southward. The natural portion of the drainage channel has sloping to steep banks composed of natural soil and is approximately 2 to 5 feet high; the drainage is approximately 5 to 12 feet wide in this area (Photograph 18). Although the channel is incised, it is not confined. Unnamed Drainage 1a does not exhibit indicators of an OHWM. The natural portion of the drainage is dominated by upland vegetation and is located within the eucalyptus groves vegetation community (Photograph 19). Dominant plant species in the channel include garden nasturtium (*Tropaeolum majus*) and upright veldt grass, while the canopy is dominated by blue gum eucalyptus. No hydrophytic vegetation is present and the drainage appears to receive flows during rain events and primarily from urban runoff. Based on these factors, Unnamed Drainage 1a was determined to be ephemeral.

As Unnamed Drainage 1a flows south, the banks flatten and become indistinct, with water either infiltrating the soil or transitioning to sheet flow with no hydrologic indicators or evidence of ordinary flow. During heavy rain events, water travels as overland sheet flow outside the study area and south into Unnamed Drainage 1c.

Unnamed Drainage 1b

Unnamed Drainage 1b flows southward through the study area to the east of Unnamed Drainage 1a (Figure 8e). Like Unnamed Drainage 1a, Unnamed Drainage 1b enters the study area as a 2-foot-wide pipe culvert which crosses under Hollister Avenue and outlets into a natural bottomed drainage. The natural portion of the drainage is characterized by a top of bank which ranges between 7 and 30 feet wide and 2 to 20 feet tall. The channel is incised and is not confined. A collection of un-grouted rip rap is present along the banks in the natural portion of the drainage just south of Hollister Avenue (Photograph 20). No surface water was present in Unnamed Drainage 2 during the time of the field surveys. Unnamed Drainage 1b does not exhibit indicators of an OHWM. The drainage appears to receive flows during rain events and from urban runoff and was determined to be ephemeral. The natural portion of the drainage is unvegetated and dominated fallen eucalyptus leaves. Herbaceous vegetation includes upland species such as upright veldt grass and smilo grass (*Stipa miliacea* var*. miliacea*). It is located within the eucalyptus groves vegetation community and blue gum eucalyptus forms a closed canopy over the drainage. No hydrophytic vegetation is present.

Figure 8e Jurisdictional Delineation



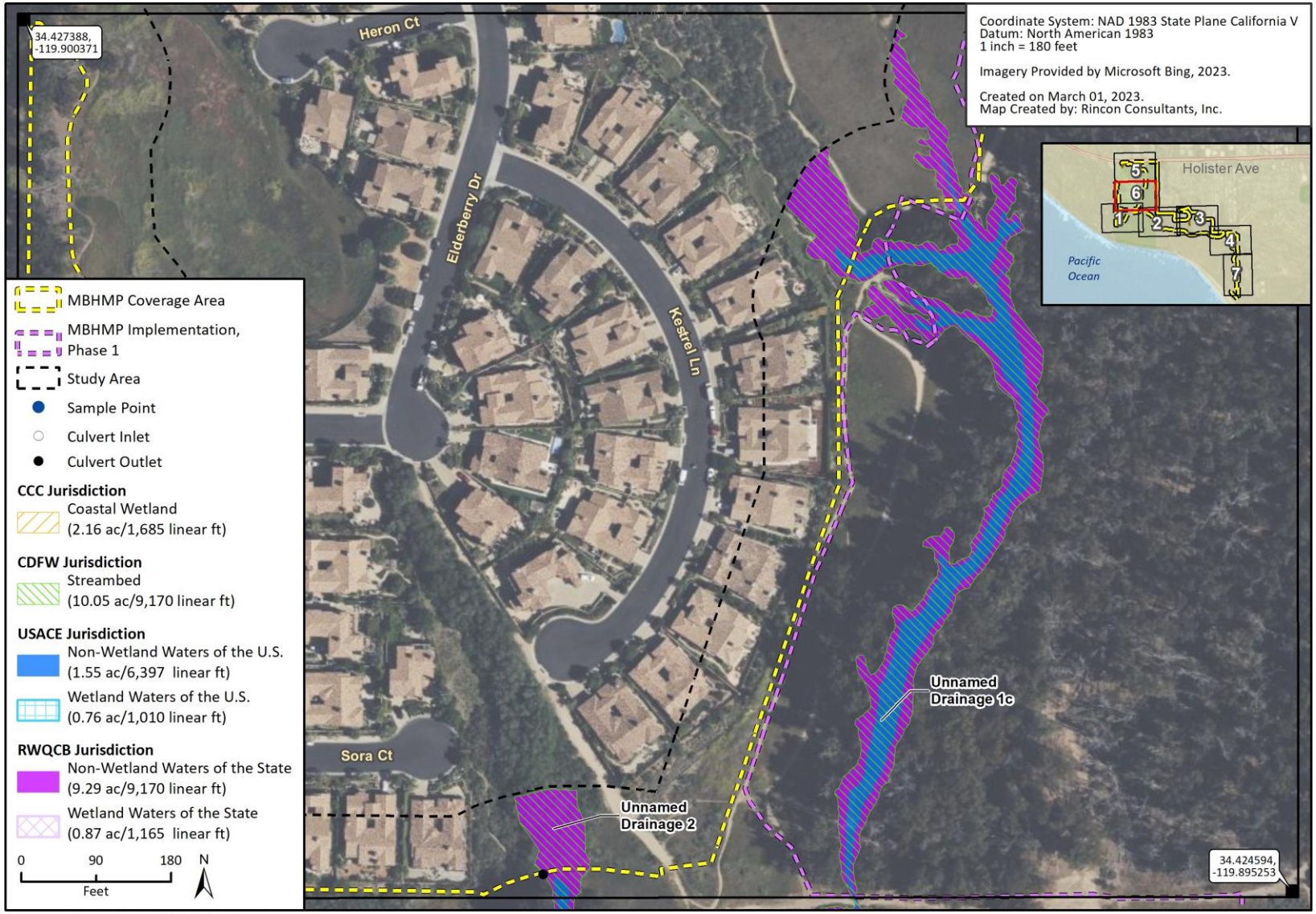
After exiting the southern boundary of the study area, Unnamed Drainage 1b transitions into overland sheet flow. Similar to Unnamed Drainage 1a, the banks flatten and water either infiltrates the soil or transitions to sheet flow with no hydrologic indicators or evidence of ordinary flow. During heavy rain events, water travels from Unnamed Drainage 1b as overland sheet flow outside the study area and south into Unnamed Drainage 1c.

Unnamed Drainage 1c

Unnamed Drainage 1c flows southward through the northwestern portion of the study area (Figure 8f). Outside the study area, Unnamed Drainages 1a and 1b contribute overland flow to this drainage. The upstream part of the drainage is characterized by a system of deeply incised branching channels which have highly disturbed, flat unvegetated bottoms (Photographs 21, 22). An OHWM was delineated based on the presence of a break in the bank slope and change in vegetation cover. These erosional channels range between 5 and 10 feet deep and 15 to 45 feet wide, and appear to have developed through rill and gully erosion. Several dirt footpaths cross the channels under the canopy of the eucalyptus groves (Photograph 6), resulting in highly compacted and unvegetated channel bottoms in the northern portion of the drainage. In some areas, the channels are characterized by coyote brush scrub and arroyo willow thickets, including a small patch of common spikerush (Photograph 24).

The channels combine into a single drainage which flows southward through the eucalyptus groves, characterized by banks which range between 35 to 65 feet in width and 2 to 6 feet in height (Photograph 9). The channel is generally unvegetated due to the dense layer of dead eucalyptus leaves. At the southern end of Unnamed Drainage 1c, the drainage crosses a dirt footpath and intersects with Devereux Creek (Photograph 27). No surface water was present in Unnamed Drainage 1c during the assessment. The drainage appears to receive flows during rain events and from urban runoff and based on the factors described above, was determined to be ephemeral.

Figure 8f Jurisdictional Delineation



4.3 Unnamed Drainage 2

Unnamed Drainage 2 flows southeastward from The Bluffs residential neighborhood into Devereux Creek in the western portion of the study area (Figure 8a). The drainage has very shallow sloping banks which are approximately 10 to 20 feet wide and one foot deep. The channel bottom contains an OHWM defined by a break in slope. Unnamed Drainage 2 flows through arroyo willow thickets and eucalyptus groves before crossing a dirt footpath and entering Devereux Creek. No surface water was present in Unnamed Drainage 2 during the field surveys. The drainage appears to receive flows during rain events and from urban runoff, including from a one-foot-wide pipe culvert outlet (Photograph 28) which conveys runoff from the residential neighborhood.

In the absence of urban runoff, this drainage would likely be ephemeral due to the topography and lack of natural water sources. However, the regular supply of urban runoff from the culvert outlet has contributed to the development of an intermittent feature.

4.4 Unnamed Drainage 3

Unnamed Drainage 3 is located in the central portion of the study area and flows southward from the gutter on the western side of Santa Barbara Shores Drive and the residential neighborhood at the northern boundary of the study area. This drainage flows south through the coyote brush scrub and eucalyptus groves communities, crosses under a dirt trail through an 18-inch corrugated pipe culvert, exits the culvert, and continues south to connect to Devereux Creek (Figure 8b, Photographs 8, 29). The drainage consists of a weakly defined, shallow two-foot-wide unvegetated channel with a substrate of dense leaf litter. The drainage Unnamed Drainage 3 does not exhibit indicators of an OHWM. No surface water was present in Unnamed Drainage 3. The drainage appears to receive flows during rain events and from urban runoff and is ephemeral.

4.5 Unnamed Drainage 4

Unnamed Drainage 4 is located in the central portion of the study area, just east of Unnamed Drainage 3 (Figure 8b). This drainage flows southward from the gutter on the eastern side of Santa Barbara Shores Drive and the residential neighborhood at the northern boundary of the study area into Devereux Creek. Unnamed Drainage 4 is characterized by a shallow but clearly defined one-foot-wide channel with banks that extend to 5 to 18 feet wide (Photograph 26). Within the northern portion of the channel, vegetation consists of wild oats. As it flows south, the drainage passes through a small patch of coyote brush, then enters the eucalyptus grove. Within the northern portion of the eucalyptus grove, the drainage has a dense herbaceous layer of iceplant (*Carpobrotus* spp.); as the drainage continues south, the herbaceous layer becomes sparse, with a dense layer of leaf litter. The drainage then crosses a dirt trail and converges with Devereux Creek. The drainage contained evidence of flow, including channel incision, scouring, and drift deposits. The drainage appears to receive flows during rain events and from urban runoff. No surface water was present in Unnamed Drainage 4.

4.6 Unnamed Drainage 5

Unnamed Drainage 5 travels through the Ellwood Main monarch aggregation site located in the central portion of the study area (Figure 8c, Photograph 31). The drainage consists of a branched channel that converges and flows in a northerly direction, and then transitions into a wide swale without evidence of bed, bank, or ordinary flow. During heavy rain events, water travels as overland sheet flow approximately 130 feet north into Devereux Creek. There is no channelized connection between the mouth of Unnamed Drainage 5 and Devereux Creek, and the area between the two features has been compacted by heavy foot traffic along the main route to the butterfly viewing area.

Within the southern, upstream extent of Unnamed Drainage 5, vegetation consists of dense coyote brush. As it flows north, vegetation transitions to an overstory of eucalyptus. The drainage is unvegetated beneath the eucalyptus grove canopy, with a dense layer of leaf litter. The banks of Unnamed Drainage 5 range from approximately 15 to 40 feet from bank to bank. Banks are steeply incised and eroded in the southern, upstream extent. Large pieces of concrete rubble were observed within this portion of the drainage. As it flows north the channel widens and bank slopes become more gentle, eventually broadening to a wide swale. Unnamed Drainage 5 does not exhibit indicators of an OHWM and no surface water was present during the field survey. Unnamed Drainage 5 appears to receive flows only during rain events and is ephemeral.

4.7 Unnamed Drainage 6

Unnamed Drainage 6 flows generally southeast from the Coronado Butterfly Preserve into the central portion of the study area, north of Devereux Creek (Figure 8c, Photograph 32). This drainage flows southeast through eucalyptus groves into Devereux Creek. Unnamed Drainage 6 is characterized by a shallow channel bottom defined by a three-foot-wide OHWM with banks that extend between 10 to 20 feet wide. The drainage is mostly unvegetated beneath the eucalyptus grove canopy, with a dense layer of leaf litter. Occasional patches of smilo grass are present. Human influences on the drainage include an informal wooden foot bridge (Photograph 33) and a series of ungrouted rip-rap check dams (Photograph 34). The drainage did not contain surface water during the field survey and appears to receive flows during rain events and from urban runoff. The channel is unvegetated and contains a dense layer of leaf litter.

4.8 Unnamed Drainage 7

Unnamed Drainage 7 consists of a deeply incised erosional ravine that conveys flows eastward into Devereux Creek, in the northeastern corner of the study area (Figure 8d, Photograph 35). This drainage has steep, highly eroded banks which range between 5 and 25 feet deep and 20 to 65 feet wide. The OHWM ranges from two to eight feet wide, and was clearly defined by scour marks. Vegetation consists of a sparse layer of coyote brush. The drainage appears to receive flows only during rain events and was determined to be ephemeral. No surface water was present in Unnamed Drainage 7 during the field survey. The drainage converges with Devereux Creek approximately 300 feet north of its transition to upper Devereux Slough.

4.9 Unnamed Drainage 8

Unnamed Drainage 8 consists of a single channel that conveys flows eastward into upper Devereux Slough in the northeastern corner of the study area (Figure 8d). The drainage originates in the purple needle grass grassland community as a shallow erosional feature with banks between 10 to 30 feet wide and a depth of approximately one foot (Photograph 19). Unnamed Drainage 8 then crosses a dirt trail and continues eastward into the adjacent eucalyptus groves. In the eucalyptus groves, the drainage transitions to a wide, flat channel with banks approximately 15 to 35 feet in width and 2 to 5 feet in depth (Photographs 36 and 37). The OHWM is approximately 8 feet wide and was discernable from a break in bank slope and drift deposits. The entire drainage is characterized by a combination of bare ground, leaf litter, and sparse upland vegetation consisting of ripgut brome, slender oats, and wild oats. No hydrophytic vegetation is present. No surface water was present during the field survey, and the drainage appears to receive flows only during rain events. Based on these factors, the drainage was determined to be ephemeral.

4.10 Coastal Wetland 1

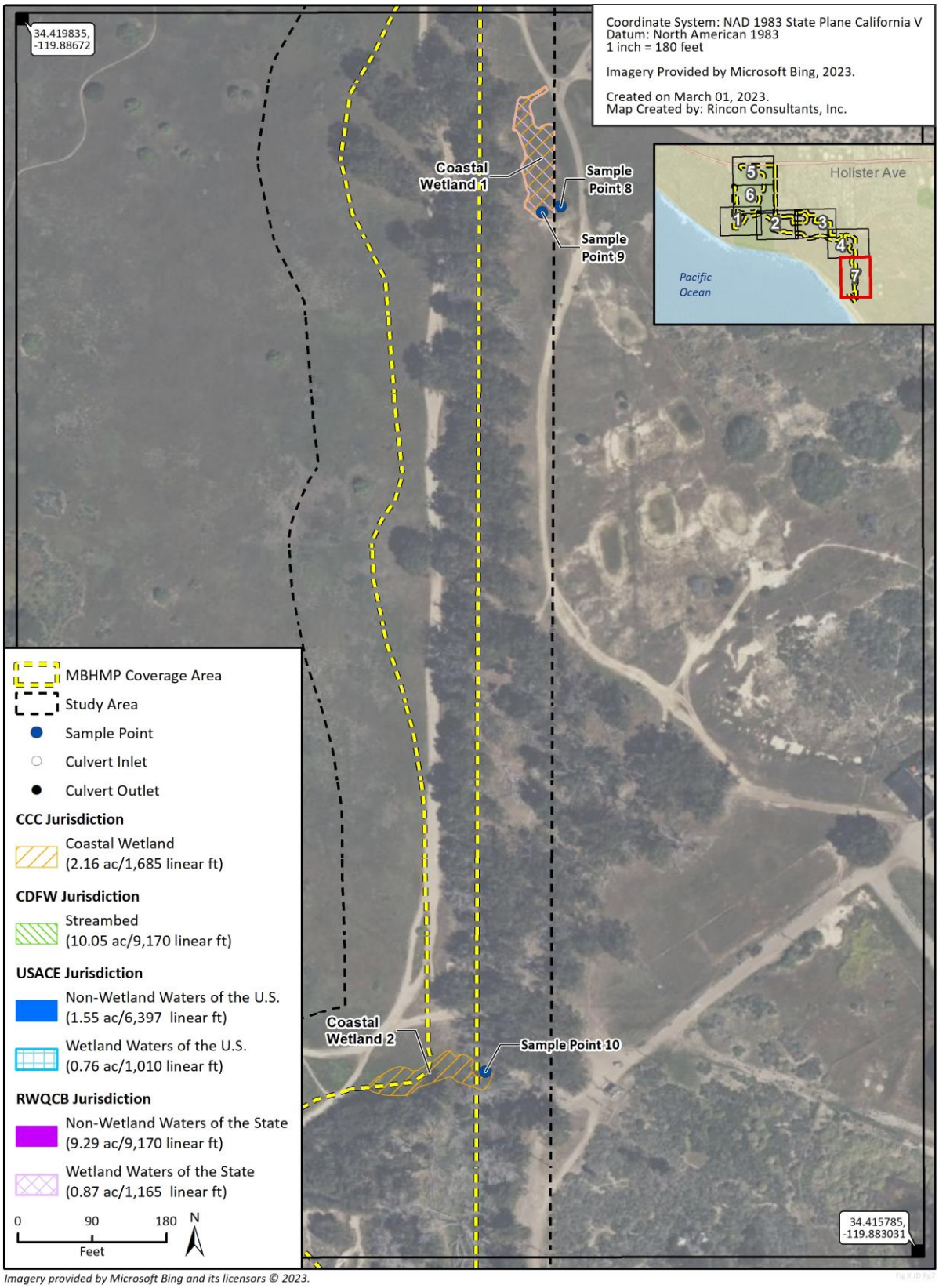
Coastal Wetland 1 is located along the eastern boundary of the study area, south of Devereux Creek within a relatively flat coastal terrace (Figure 8g). The feature consists of a shallow depression approximately 160 feet in length and 50 feet in width, is generally defined by the topography and limits of the iris-leaf rush seeps vegetation community (Photograph 38). The feature is mapped as a seasonally flooded emergent freshwater wetland by NWI. Coastal Wetland 1 appears to receive water from rainfall and overland surface flows from seasonal pools in the North Campus Open Space to the southeast. Ponded water and tadpoles were observed within this feature on February 7, 2022.The depression appears to be isolated, lacking a hydrologic connection to downgradient jurisdictional aquatic features. According to weather records, the most recent rainfall events were 41 days prior on December 28, 2021, which contributed approximately 0.5 inch of rain, and 20 days prior on January 18, 2022, which contributed 0.06 inch.

Sample Points 8 and 9

Sample Point 8 was taken within a low point within Coastal Wetland 1 (Figure 8d). The sample point is vegetated by brown headed rush, coyote thistle, and woolly marbles. Hydrophytic vegetation was dominant. A soil pit was not excavated due to the environmental sensitivity of the feature. Based on direct observation of inundation over 14 days within the growing season, soils were assumed hydric. Multiple wetland hydrology indicators were present, including surface water, saturation, and surface soil cracks. Therefore, wetland hydrology was present. Sample Point 8 meets the criteria for a three-parameter wetland.

Sample Point 9 is located upslope and west of Sample Point 8 (Figure 8d) in the understory of the blue gum eucalyptus vegetation community. The dominant plant species observed were blue gum eucalyptus, coyote brush, and wild oat. Hydrophytic vegetation was determined to be absent. Soils at Sample Point 9 were sandy loam and exhibited no hydric soil indicators. No hydrology indicators were observed at Sample Point 9. Based on these results, it was determined that the point is upland in nature and outside Coastal Wetland 1.

Figure 8g Jurisdictional Delineation



4.11 Coastal Wetland 2

Coastal Wetland 2 is located in the southeast corner of the study area, approximately 300 feet north of the Pacific Ocean (Figure 8g). The feature consists of a shallow depression approximately 150 feet in length and 30 feet in width, which is generally defined by the topography and limits of the perennial rye grass fields vegetation community (Photographs 39 and 40). The feature is mapped as a seasonally flooded emergent freshwater wetland by NWI. The feature appears to receive water from rainfall and overland surface flows from the north. A metal gate extends across Coastal Wetland 2. Surface water was not observed within this feature on February 7, 2022.

Sample Point 10

Sample Point 10 was taken within a low point within Coastal Wetland 2 (Figure 8g). The sample point is vegetated by Italian rye grass, foxtail barley, and curly dock and is situated adjacent to an overstory of blue gum eucalyptus. Hydrophytic vegetation was dominant. Soils at Sample Point 10 were sandy loam and exhibited no hydric soil indicators. No hydrology indicators were observed at Sample Point 10. Sample Point 10 meets the criteria for a one-parameter wetland, and the boundary of this wetland was mapped according to the extent of hydrophytic vegetation present.

4.12 Non-Jurisdictional Features

Sample Points 11 and 12 were collected to evaluate the presence of wetland indicators within two areas mapped by NWI as freshwater emergent freshwater wetlands. These features are situated south of the study area and blue gum eucalyptus groves, but within the study area (Figure 5). These features did not contain evidence of water flow, hydrophytic vegetation, hydric soils, or wetland hydrology. The sample points are discussed in greater detail below.

Sample Point 11

Sample Point 11 was taken in an area of low topography within the mapped feature (Figure 8b, Photograph 41). However, indicators of a freshwater wetland were not observed at this location. The dominant vegetation is ice plant and wild oat. Hydrophytic vegetation was determined to be absent. Soils at Sample Point 11 were sandy loam and exhibited no hydric soil indicators. No hydrology indicators were observed at Sample Point 11. Based on these results, it was determined that a wetland is not present.

Sample Point 12

Sample Point 12 was taken in an area of low topography within the mapped feature (Figure 8c, Photograph 42). The local topography appears to have been historically manipulated to create an artificial berm with a depression at the center. The dominant vegetation is upland mustards. Hydrophytic vegetation was determined to be absent. Soils at Sample Point 12 were sandy loam and exhibited no hydric soil indicators, and showed evidence of inhabitance by gophers. No hydrology indicators were observed at Sample Point 12. Based on these results, it was determined that a wetland is not present.

5 Discussion

Eleven potentially jurisdictional features are present within the study area, consisting of Devereux Creek, Unnamed Drainages 1-8, and Coastal Wetlands 1 and 2 (Table 2, Figure 8a-g).

Table 2 USACE, RWQCB, CCC/City, and CDFW Jurisdiction within the Study Area

	USACE Jurisdiction		RWQCB Jurisdiction		CCC/City Jurisdiction	CDFW Jurisdiction
Feature	Non-Wetland Waters of the U.S. (acres/ linear feet)	Wetland Waters of the U.S. (acres/ linear feet)	Non-Wetland Waters of the State (acres/ linear feet)	Wetland Waters of the State (acres/ linear feet)	Coastal Wetland (acres/ linear feet)	Streambed and Associated Riparian Habitat (acres/ linear feet)
Devereux Creek	0.88/3,634	0.76/1,010	6.34/4,635	0.76/1,010	1.96/1,387	7.10/4,635
Unnamed Drainage 1a	0/0	0/0	0.02/170	0/0	0/0	0.02/170
Unnamed Drainage 1b	0/0	0/0	0.24/456	0/0	0/0	0.24/456
Unnamed Drainage 1c	0.50/975	0/0	1.42/1,066	0/0	0/0	1.42/1,066
Unnamed Drainage 2	0.02/90	0/0	0.21/205	0/0	0/0	0.21/205
Unnamed Drainage 3	0/0	0/0	0.01/394	0/0	0/0	0.01/394
Unnamed Drainage 4	0.01/308	0/0	0.08/308	0/0	0/0	0.08/308
Unnamed Drainage 5	0/0	0/0	0.20/374	0/0	0/0	0.20/374
Unnamed Drainage 6	0.05/688	0/0	0.18/688	0/0	0/0	0.18/688
Unnamed Drainage 7	0.04/455	0/0	0.31/396	0/0	0/0	0.31/396
Unnamed Drainage 8	0.05/247	0/0	0.24/446	0/0	0/0	0.24/446
Coastal Wetland 1	0/0	0/0	0/0	0.11/155	0.11/155	0/0
Coastal Wetland 2	0/0	0/0	0.09/144	0/0	0.09/144	0/0
Total	1.55/6,397	0.76/1,010	9.34/9,281	0.87/1,165	2.16/1,685	10.01/9,138

5.1 USACE Jurisdiction

Devereux Creek

Jurisdictional waters that are not "relatively permanent" must have a significant nexus to navigable or interstate waters. Relatively Permanent Waters (RPWs) are those that flow perennially or seasonally (e.g. at least three months of the year). A significant nexus is defined as waterways that "either alone or in combination with similarly situated [waters] in the region, significantly affect the chemical, physical, or biological integrity of traditional navigable waters." In other words, if a waterway has potential to significantly affect biological, hydrological, or ecological attributes of a Traditionally Navigable Water (TNW) downstream, it can be regulated under the significant nexus standard. A significant nexus evaluation is required to determine USACE jurisdiction for any non-navigable tributaries to TNWs that are not RPWs (see Appendix A for additional details).

Devereux Creek is an intermittent tributary which provides surface flow to the Pacific Ocean. While Devereux Creek has an intermittent flow regime, it does not flow at least three months per year, so it is not an RPW. Devereux Creek transports sediment, pollutants, water flow, and seeds downstream to Devereux Slough and the Pacific Ocean, which is a TNW. These inputs have the potential to affect the water quality and biological attributes of Devereux Slough, which is a wetland adjacent to the territorial sea and Waters of the U.S. Given these factors, it is reasonable to conclude that Devereux Creek has a significant nexus with a TNW and thereby is subject to USACE jurisdiction as a tributary. USACE wetland waters of the U.S. are also present within Devereux Creek, in the central and eastern portions of the active channel where indicators of hydrophytic vegetation, hydric soils, and wetland hydrology were observed.

Unnamed Drainages 1-8

An Ordinary High Water Mark was not evident within Unnamed Drainages 1a, 1b, 3, and 5. Due to the absence of wetland indicators and an OHWM, these features do not meet the criteria for wetland or non-wetland waters of the U.S, respectively.

Unnamed Drainages 1c, 2, 4, 6, and 7 are tributaries with a direct hydrologic connection to Devereux Creek, and Unnamed Drainage 8 has a direct connection to Devereux Slough. These features transport sediment, pollutants, water flow, and seeds downstream to Devereux Slough and the Pacific Ocean. These inputs have the potential to affect the water quality and biological attributes of Devereux Slough, which is a tidal water of the U.S. Given these factors, it is reasonable to conclude that Unnamed Drainages 1c, 2, 4, and 6-8 have a significant nexus with a TNW and thereby are subject to USACE jurisdiction as non-wetland waters of the U.S; wetland waters of the U.S. are absent.

Coastal Wetlands 1 and 2

While Coastal Wetland 1 meets the criteria for a USACE three-parameter wetland, the feature is an isolated, intrastate water which does not possess a hydrologic connection or a significant nexus to any TNW. Coastal Wetland 2 is similarly an isolated feature, and additionally does not meet the criteria of a three-parameter USACE wetland. Accordingly, Coastal Wetlands 1 and 2 are not waters of the U.S.

Table 3 Summary of Hydrophytic Vegetation, Hydric Soils, and Wetlands Hydrology Indicator Status by Sample Point

Feature	Sample Point	Meets Hydrophytic Vegetation Criterion	Meets Hydric Soils Criterion	Meets Wetland Hydrology Criterion	Wetland Waters of the U.S.	Wetland Waters of the State	Coastal Wetland
Devereux Creek	1	Yes	Yes	Yes	Yes	Yes	Yes
	2	No	No	No	No	No	No
	3	Yes	Yes	Yes	Yes	Yes	Yes
	4	No	No	No	No	No	No
	5	No	No	Yes	No	No	Yes
	6	Yes	Yes	Yes	Yes	Yes	Yes
	7	Yes	No	No	No	No	Yes
Coastal Wetland 1	8	Yes	Yes	Yes	No	Yes	Yes
	9	No	No	No	No	No	No
Coastal Wetland 2	10	Yes	No	No	No	No	Yes
N/A	11	No	No	No	No	No	No
N/A	12	No	No	No	No	No	No

5.2 RWQCB Jurisdiction

Devereux Creek

Devereux Creek is potentially regulated by the Central Coast RWQCB under CWA Section 401 and the Porter-Cologne Water Quality Control Act. Potential non-wetland waters of the State were determined to be present and were determined to be coterminous with limits of CDFW jurisdiction per Central Coast RWQCB practice and as described further below. RWQCB wetland waters of the State were determined to be coterminous with USACE wetland waters of the U.S.

Unnamed Drainages 1-8

Due to the presumed presence of surface water within Unnamed Drainages 1-8 during the rainy season, these features are potentially regulated by Central Coast RWQCB under CWA Section 401 and the Porter-Cologne Water Quality Control Act. Potential non-wetland waters of the State were determined to be present and were determined to be coterminous with limits of CDFW jurisdiction.

Wetland waters of the State were not present in any of these drainages due to the lack of hydrology indicators, hydric soils, and limited presence of hydrophytic vegetation. Scattered hydrophytic vegetation is present in Unnamed Drainage 2 in the form of arroyo willow thickets, however it is not present in sufficient quantity or density to indicate a dominance of hydrophytic vegetation. No hydrophytic or riparian vegetation is present in Unnamed Drainages 1a, 1b, 1c, and 3-8.

Coastal Wetland 1

Coastal Wetland 1 contained evidence of wetland hydrology, hydrophytic vegetation and hydric soils. Accordingly, wetland waters of the State were determined to be present and were defined by the limits of the hydrophytic vegetation.

Coastal Wetland 2

Coastal Wetland 2 contains evidence of hydrophytic vegetation, but indicators of hydric soils and wetland hydrology were absent. Therefore, CCC wetlands were determined to be present and were defined by the limits of the hydrophytic vegetation.

5.3 CDFW Jurisdiction

Devereux Creek

Since Devereux Creek contains defined bed and banks as well as riparian vegetation, it is potentially subject to CDFW jurisdiction pursuant to CFGC Section 1600 et seq. In areas without riparian vegetation, the limits of CDFW jurisdiction were defined by the top of bank. Where riparian vegetation is present, the CDFW-jurisdictional streambed was largely defined by the riparian vegetation which extended past the top of bank.

Unnamed Drainages 1-8

Since Unnamed Drainages 1-8 contain defined bed and banks, these features are potentially subject to CDFW jurisdiction pursuant to CFGC Section 1600 et seq. The CDFW-jurisdictional streambed was defined by the extent of the top of bank in cases where no riparian vegetation is present (i.e., Unnamed Drainages 1a, 1b, 1c, and 3-8 and the southern portion of Unnamed Drainage 2). Riparian vegetation in the form of arroyo willow thickets is present in the northern portion of Unnamed Drainage 2, therefore in this area the extent of CDFW-jurisdictional streambed was defined by the extent of riparian vegetation. Potentially jurisdictional culverts are present in Unnamed Drainages 1a and 1b; in these cases, CDFW-jurisdictional streambed was defined by the width of the culvert. CDFW-jurisdictional streambed is conterminous with non-wetland waters of the State.

Coastal Wetland 1 and 2

Coastal Wetlands 1 and 2 do not exhibit bed, bank, or channel and are isolated from CDFW-jurisdictional streams. As such, these features would not fall under CDFW jurisdiction pursuant to CFGC Section 1600 et seq.

5.4 CCC/City Water Resource Considerations

Devereux Creek

Devereux Creek may be subject to CCC and City wetland policies, due to its location within the Coastal Zone and the presence of one-parameter wetlands as assessed at Sample Points 1, 3, and 5. The limits of coastal wetlands were determined based on the results of sample points and the presence of wetland hydrology such as surface water, or a predominance of hydrophytic vegetation (including the canopy of dense arroyo willow stands which extend past areas subject to regular inundation).

Unnamed Drainages 1-8

Unnamed Drainages 1a, 1b, 1c, and 3-8 do not exhibit any wetland indicators. Hydrophytic vegetation is extremely limited in the drainages, hydric soils were not observed, and no wetland hydrology indicators are present. Limited hydrophytic vegetation in the form of arroyo willow

thickets is present in the northern portion of Unnamed Drainage 2, however it is not present in sufficient quantity or density to indicate a dominance of hydrophytic vegetation. No hydric soils or wetland hydrology indicators are present at Unnamed Drainage 2. Therefore, although Unnamed Drainages 1-8 are in the Coastal Zone, no wetland parameters are present and coastal wetlands are absent.

Coastal Wetlands 1 and 2

Coastal Wetland 1 exhibited evidence of hydrophytic vegetation, hydric soils and wetland hydrology, and Coastal Wetland 2 contained hydrophytic vegetation. Therefore, Coastal Wetlands 1 and 2 may be regulated by CCC and City, due to their locations within the Coastal Zone and the presence of at least one wetland parameter. The limits of coastal wetlands were defined by the limits of hydrophytic vegetation.

6 Conclusion

As described above, the delineation identified jurisdictional features within the study area likely subject to regulation by the USACE, RWQCB, CDFW, CCC, and City. Where feasible, jurisdictional waters should be considered and avoided during project design. Impacts associated with project development would likely require the acquisition of permits from the USACE, RWQCB, CDFW, CCC, and City, as applicable.

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Appendix A

Regulatory Setting

Regulatory Setting

The following is a brief summary of the regulatory context under which biological resources are managed at the federal, State, and local levels. A number of federal and State statutes provide a regulatory structure which guide the protection of jurisdictional features. Agencies with the responsibility for protection of jurisdictional features within the project site include:

- United States Army Corps of Engineers (non-wetland waters and wetlands of the United States)
- Regional Water Quality Control Board (waters of the State)
- California Department Fish and Wildlife (riparian areas, streambeds, and lakes)
- California Coastal Commission (coastal wetlands)

United States Army Corps of Engineers Jurisdiction

The United States Army Corps of Engineers (USACE) is responsible for administering several federal programs related to ensuring the quality and navigability of the nation's waters.

Clean Water Act Section 404

Congress enacted the Clean Water Act (CWA) "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Section 404 of the CWA authorizes the Secretary of the Army, acting through the USACE, to issue permits regulating the discharge of dredged or fill materials into the "navigable waters at specified disposal sites."

Section 502 of the CWA further defines "navigable waters" as "waters of the United States, including the territorial seas." "Waters of the United States" are broadly defined at 33 CFR Part 328.3 to include navigable waters, perennial and intermittent streams, lakes, rivers, ponds, as well as wetlands, marshes, and wet meadows. In recent years the USACE and US Environmental Protection Agency (USEPA) have undertaken several efforts to modernize their regulations defining "waters of the United States" (e.g., the 2015 Clean Water Rule and 2020 Navigable Waters Protection Rule), but these efforts have been frustrated by legal challenges which have invalidated the updated regulations. Thus, the agencies' longstanding definition of "waters of the United States," which dates from 1986, remains in effect albeit with supplemental guidance interpreting applicable court decisions as described below.

Waters of the U.S.

In summary, USACE and USEPA regulations define "waters of the United States" as follows:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or

ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

iii. Which are used or could be used for industrial purpose by industries in interstate commerce;

4. All impoundments of waters otherwise defined as waters of the United States;
5. Tributaries of waters identified in paragraphs (a)(1)-(4) of this section;
6. The territorial sea;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in items 1-6 above.

Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with the USEPA.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA are not waters of the United States.

The lateral limits of USACE jurisdiction in non-tidal waters is defined by the "ordinary high-water mark" (OHWM) unless adjacent wetlands are present. The OHWM is a line on the shore or edge of a channel established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed upon the bank, shelving, changes in the character of soil, destruction of vegetation, or the presence of debris (33 CFR 328.3(e)). As such, waters are recognized in the field by the presence of a defined watercourse with appropriate physical and topographic features. If wetlands occur within, or adjacent to, waters of the United States, the lateral limits of USACE jurisdiction extend beyond the OHWM to the outer edge of the wetlands (33 CFR 328.4 (c)). The upstream limit of jurisdiction in the absence of adjacent wetlands is the point beyond which the OHWM is no longer perceptible (33 CFR 328.4; see also 51 FR 41217).

Wetlands

The USACE defines wetlands as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3). The USACE’s delineation procedures identify wetlands in the field based on indicators of three wetland parameters: hydrophytic vegetation, hydric soils, and wetland hydrology. The following is a discussion of each of these parameters.

Hydrophytic Vegetation

Hydrophytic vegetation dominates areas where frequency and duration of inundation or soil saturation exerts a controlling influence on the plant species present. Plant species are assigned wetland indicator status according to the probability of their occurring in wetlands. More than fifty percent of the dominant plant species must have a wetland indicator status to meet the hydrophytic vegetation criterion. The USACE published the National Wetland Plant List (USACE 2020), which separates vascular plants into the following four basic categories based on plant species frequency of occurrence in wetlands:

- **Obligate Wetland (OBL).** Almost always occur in wetlands
- **Facultative Wetland (FACW).** Usually occur in wetlands, but occasionally found in non-wetlands
- **Facultative (FAC).** Occur in wetlands or non-wetlands
- **Facultative Upland (FACU).** Usually occur in non-wetlands, but may occur in wetlands
- **Obligate Upland (UPL).** Almost never occur in wetlands

The USACE considers OBL, FACW and FAC species to be indicators of wetlands. An area is considered to have hydrophytic vegetation when greater than 50 percent of the dominant species in each vegetative stratum (tree, shrub, and herb) fall within these categories. Any species not appearing on the United States Fish and Wildlife Service's list is assumed to be an upland species, almost never occurring in wetlands. In addition, an area needs to contain at least 5% vegetative cover to be considered as a vegetated wetland.

Hydric Soils

Hydric soils are saturated or inundated for a sufficient duration during the growing season to develop anaerobic or reducing conditions that favor the growth and regeneration of hydrophytic vegetation. Field indicators of wetland soils include observations of ponding, inundation, saturation, dark (low chroma) soil colors, bright mottles (concentrations of oxidized minerals such as iron), gleying (indicates reducing conditions by a blue-grey color), or accumulation of organic material. Additional supporting information includes documentation of soil as hydric or reference to wet conditions in the local soils survey, both of which must be verified in the field.

Wetland Hydrology

Wetland hydrology is inundation or soil saturation with a frequency and duration long enough to cause the development of hydric soils and plant communities dominated by hydrophytic vegetation. If direct observation of wetland hydrology is not possible (as in seasonal wetlands), or records of wetland hydrology are not available (such as stream gauges), assessment of wetland hydrology is frequently supported by field indicators, such as water marks, drift lines, sediment deposits, or drainage patterns in wetlands.

Applicable Case Law and Agency Guidance

The USACE's regulations defining "waters of the United States" have been subject to legal interpretation, and two influential Supreme Court decisions have narrowed the definition to exclude certain classes of waters that bear an insufficient connection to navigable waters. In *Solid Waste Agency of Northern Cook County v. Army Corps of Engineers* (2001), the United States Supreme Court stated that the USACE's CWA jurisdiction does not extend to ponds that "are not adjacent to open water." In reaching its decision, the Court concluded that the "Migratory Bird Rule," which served as the basis for the USACE's asserted jurisdiction, was not supported by the CWA. The Migratory Bird Rule extended CWA jurisdiction to intrastate waters "which are or would be used as habitat by birds protected by Migratory Bird Treaties or which are or would be used as habitat by other migratory birds which cross state lines…" The Court was concerned that application of the Migratory Bird Rule resulted in "reading the term 'navigable waters' out of the statute. Highlighting the language of the CWA to determine the statute's jurisdictional reach, the Court stated, "the term 'navigable' has at least the import of showing us what Congress had in mind as its authority for enacting the CWA: its traditional jurisdiction over waters that were or had been navigable in fact or which could reasonably be so made." This decision stands for the proposition that non-navigable

isolated, intrastate waters are not waters of the United States and thus are not jurisdictional under the CWA.

In 2006 the United States Supreme Court decided *Rapanos v. United States* and *Carabell v. United States* (collectively "Rapanos"), which were consolidated cases determining the extent of CWA jurisdiction over waters that carry only an infrequent surface flow. The court issued no majority opinion in Rapanos. Instead, the justices authored five separate opinions including the "plurality" opinion, authored by Justice Scalia (joined by three other justices), and a concurring opinion by Justice Kennedy. To guide implementation of the decision, the USACE and USEPA issued a joint guidance memorandum ("Rapanos Guidance Memorandum") in 2008 stating that "regulatory jurisdiction under the CWA exists over a water body if either the plurality's or Justice Kennedy's standard is satisfied."

According to the plurality opinion in Rapanos, "the waters of the United States include only relatively permanent, standing or flowing bodies of water" and do not include "ordinarily dry channels through which water occasionally or intermittently flows." In addition, while all wetlands that meet the USACE definition are considered adjacent wetlands, only those adjacent wetlands that have a continuous surface connection because they directly about the tributary (e.g., they are not separated by uplands, a berm, dike, or similar feature) are considered jurisdictional under the plurality standard.

Under Justice Kennedy's opinion, "the USACE's jurisdiction over wetlands depends upon the existence of a significant nexus between the wetlands in question and navigable waters in the traditional sense. Wetlands possess the requisite nexus, and thus come within the statutory phrase 'navigable waters,' if the wetlands, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable.' When, in contrast, wetlands' effects on water quality are speculative or insubstantial, they fall outside the zone fairly encompassed by the statutory term 'navigable waters.'" Justice Kennedy identified "pollutant trapping, flood control, and runoff storage" as some of the critical functions wetlands can perform relative to other waters. He concluded that, given wetlands' ecological role, "mere adjacency" to a non-navigable tributary was insufficient to establish CWA jurisdiction, and that "a more specific inquiry, based on the significant nexus standard, is therefore necessary."

Interpreting these decisions, and according to the Rapanos Guidance Memorandum, the USACE and USEPA will assert jurisdiction over the following waters:

- Traditional navigable waters;
- Wetlands adjacent to traditional navigable waters;
- Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); and,
- Wetlands that directly abut such tributaries.

The USACE and USEPA will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water:

- Non-navigable tributaries that are not relatively permanent;
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent; and,

- Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

Where a significant nexus analysis is required, the USACE and USEPA will apply the significant nexus standard as follows:

- A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters; and,
- Significant nexus includes consideration of hydrologic and ecologic factors.

The USACE and USEPA generally will not assert jurisdiction over the following features:

- Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow); and,
- Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

Rivers and Harbors Act Section 10

Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the USACE for the construction of any structure in or over any navigable water of the United States. Structures or work outside the limits defined for navigable waters of the United States require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, re-channelization, or any other modification of a navigable water of the United States, and applies to all structures and work. It further includes, without limitation, any wharf, dolphin, weir, boom breakwater, jetty, groin, bank protection (e.g., riprap, revetment, bulkhead), mooring structures such as pilings, aerial or subaqueous power transmission lines, intake or outfall pipes, permanently moored floating vessel, tunnel, artificial canal, boat ramp, aids to navigation, and any other permanent, or semi-permanent obstacle or obstruction. It is important to note that Section 10 applies only to navigable waters, and thus does not apply to work in non-navigable wetlands or tributaries. In some cases, Section 10 authorization is issued by the USACE concurrently with CWA Section 404 authorization, such as when certain Nationwide Permits are used.

Regional Water Quality Control Board Jurisdiction

The State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs) have jurisdiction over “waters of the State,” which are defined as any surface water or groundwater, including saline waters, within the boundaries of the state (California Water Code sec. 13050(e)). These agencies also have responsibilities for administering portions of the CWA.

Clean Water Act Section 401

Section 401 of the CWA requires an applicant requesting a federal license or permit for an activity that may result in any discharge into navigable waters (such as a Section 404 Permit) to provide state certification that the proposed activity will not violate state and federal water quality

standards. In California, CWA Section 401 Water Quality Certification (Section 401 Certification) is issued by the RWQCBs and by the SWRCB for multi-region projects. The process begins when an applicant submits an application to the RWQCB and informs the USACE (or the applicable agency from which a license or permit was requested) that an application has been submitted. The USACE will then determine a "reasonable period of time" for the RWQCB to act on the application; this is typically 60 days for routine projects and longer for complex projects but may not exceed one year. When the period has elapsed, if the RWQCB has not either issued or denied the application for Section 401 Certification, the USACE may determine that Certification has been waived and issue the requested permit. If a Section 401 Certification is issued it may include binding conditions, imposed either through the Certification itself or through the requested federal license or permit.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is the principal law governing water quality regulation in California. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act applies to surface waters, wetlands, and ground water and to both point and nonpoint sources of pollution. Pursuant to the Porter-Cologne Act (California Water Code section 13000 et seq.), the policy of the State is as follows:

- The quality of all the waters of the State shall be protected
- All activities and factors affecting the quality of water shall be regulated to attain the highest water quality within reason
- The State must be prepared to exercise its full power and jurisdiction to protect the quality of water in the State from degradation

The Porter-Cologne Act established nine RWQCBs (based on watershed boundaries) and the SWRCB, which are charged with implementing its provisions and which have primary responsibility for protecting water quality in California. The SWRCB provides program guidance and oversight, allocates funds, and reviews RWQCB decisions. In addition, the SWRCB allocates rights to the use of surface water. The RWQCBs have primary responsibility for individual permitting, inspection, and enforcement actions within each of nine hydrologic regions. The SWRCB and RWQCBs have numerous nonpoint source related responsibilities, including monitoring and assessment, planning, financial assistance, and management.

Section 13260 of the Porter-Cologne Act requires any person discharging or proposing to discharge waste that could affect the quality of waters of the State to file a Report of Waste Discharge with the appropriate RWQCB. The RWQCB may then authorize the discharge, subject to conditions, by issuing Waste Discharge Requirements (WDRs). While this requirement was historically applied primarily to outfalls and similar point source discharges, the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*, effective May 2020, make it clear that the agency will apply the Porter-Cologne Act's requirements to discharges of dredge and fill material as well. The *Procedures* state that they are to be used in issuing CWA Section 401 Certifications and WDRs, and largely mirror the existing review requirements for CWA Section 404 Permits and Section 401 Certifications, incorporating most elements of the USEPA's *Section 404(b)(1) Guidelines*. Following issuance of the *Procedures*, the SWRCB produced a consolidated application form for dredge/fill discharges that can be used to obtain a CWA Section 401 Water Quality Certification, WDRs, or both.

Non-Wetland Waters of the State

The SWRCB and RWQCBs have not established regulations for field determinations of waters of the State except for wetlands currently. In many cases the RWQCBs interpret the limits of waters of the State to be bounded by the OHWM unless isolated conditions or ephemeral waters are present. However, in the absence of statewide guidance each RWQCB may interpret jurisdictional boundaries within their region and the SWRCB has encouraged applicants to confirm jurisdictional limits with their RWQCB before submitting applications. As determined by the RWQCB, waters of the State may include riparian areas or other locations outside the OHWM, leading to a larger jurisdictional area over a given water body compared to the USACE.

Wetland Waters of the State

Procedures for defining wetland waters of the State pursuant to the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* went into effect May 28, 2020. The SWRCB defines an area as wetland if, under normal circumstances:

(i) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both;

(i) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and

(ii) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.

The SWRCB's *Implementation Guidance for the Wetland Definition and Procedures for Discharges of Dredge and Fill Material to Waters of the State* (2020), states that waters of the U.S. and waters of the State should be delineated using the standard USACE delineation procedures, taking into consideration that the methods shall be modified only to allow for the fact that a lack of vegetation does not preclude an area from meeting the definition of a wetland.

California Department of Fish and Wildlife Jurisdiction

California Fish and Game Code Section 1602 states that it is unlawful for any person to "substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake" without first notifying the California Department of Fish and Wildlife (CDFW) of that activity. Thereafter, if CDFW determines and informs the entity that the activity will not substantially adversely affect any existing fish or wildlife resources, the entity may commence the activity. If, however, CDFG determines that the activity may substantially adversely affect an existing fish or wildlife resource, the entity may be required to obtain from CDFW a Streambed Alteration Agreement (SAA), which will include reasonable measures necessary to protect the affected resource(s), before the entity may conduct the activity described in the notification. Upon receiving a complete Notification of Lake/Streambed Alteration, CDFW has 60 days to present the entity with a Draft SAA. Upon review of the Draft SAA by the applicant, any problematic terms are negotiated with CDFW and a final SAA is executed.

The CDFW has not defined the term "stream" for the purposes of implementing its regulatory program under Section 1602, and the agency has not promulgated regulations directing how jurisdictional streambeds may be identified, or how their limits should be delineated. However, four relevant sources of information offer insight as to the appropriate limits of CDFW jurisdiction as discussed below.

- **The plain language of Section 1602 of CFGC** establishes the following general concepts:
  - References "river," "stream," and "lake"
  - References "natural flow"
  - References "bed," "bank," and "channel"

- **Applicable court decisions**, in particular *Rutherford v. State of California* (188 Cal App. 3d 1276 (1987), which interpreted Section 1602's use of "stream" to be as defined in common law. The Court indicated that a "stream" is commonly understood to:
  - Have a source and a terminus
  - Have banks and a channel
  - Convey flow at least periodically, but need not flow continuously and may at times appear outwardly dry
  - Represent the depression between the banks worn by the regular and usual flow of the water
  - Include the area between the opposing banks measured from the foot of the banks from the top of the water at its ordinary stage, including intervening sand bars
  - Include the land that is covered by the water in its ordinary low stage
  - Include lands below the OHWM

- **CDFW regulations** defining "stream" for other purposes, including sport fishing (14 CCR 1.72) and streambed alterations associated with cannabis production (14 CCR 722(c)(21)), which indicate that a stream:
  - Flows at least periodically or intermittently
  - Flows through a bed or channel having banks
  - Supports fish or aquatic life
  - Can be dry for a period of time
  - Includes watercourses where surface or subsurface flow supports or has supported riparian vegetation

- **Guidance documents**, *including A Field Guide to Lake and Streambed Alteration Agreements* (CDFG 1994) and *Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-Scale Solar Power Plants* (Brady and Vyverberg 2013), which suggest the following:
  - A stream may flow perennially or episodically
  - A stream is defined by the course in which water currently flows, or has flowed during the historic hydrologic course regime (approximately the last 200 years)
  - Width of a stream course can reasonably be identified by physical or biological indicators
  - A stream may have one or more channels (single thread vs. compound form)
  - Features such as braided channels, low-flow channels, active channels, banks associated with secondary channels, floodplains, islands, and stream-associated vegetation, are interconnected parts of the watercourse
  - Canals, aqueducts, irrigation ditches, and other means of water conveyance can be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife

- Biologic components of a stream may include aquatic and riparian vegetation, all aquatic animals including fish, amphibians, reptiles, invertebrates, and terrestrial species which derive benefits from the stream system
- The lateral extent of a stream can be measured in different ways depending on the particular situation and the type of fish or wildlife resource at risk

The tenets listed above, among others, are applied to establish the boundaries of streambeds in various environments. Importance of each factor may be weighted based on site-specific considerations and the applicability of the indicators to the streambed at hand.

California Coastal Commission Jurisdiction

In October 1972, the United States Congress passed Title 16 USC Sections 1451-1464, which established a federal coastal zone management policy and created a federal coastal zone. By that legislation, the Congress declared a national interest in the effective management, beneficial use, protection and development of the coastal zone in order to balance the nation's natural, environmental and aesthetic resource needs with commercial-economic growth. The Congress found and declared that it was a national policy "to encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone giving full consideration to ecological, cultural, historic, and aesthetic values as well as to the need for economic development (16 USC Section 1452b). As a result of that federal enactment, coastal states were provided a policy and source of funding for the implementation of federal goals.

The California Coastal Zone Conservation Act of 1972 (Proposition 20) was a temporary measure passed by the voters of the state as a ballot initiative. It set up temporary regional Coastal Commissions with permit authority and a directive to prepare a comprehensive coastal plan. The coastal commissions under Proposition 20 lacked the authority to implement the Coastal Plan but were required to submit the Plan to the legislature for "adoption and implementation."

The California Coastal Act (CCA) of 1976 is the permanent enacting law approved by the State legislature. The Coastal Act established a different set of policies, a different boundary line, and different permitting procedures than Proposition 20. Furthermore, it provides for the transfer of permitting authority, with certain limitations reserved for the State, to local governments through adoption and certification of LCPs by the California Coastal Commission (CCC).

In accordance with the CCA, the CCC defines coastal wetlands as generally extending seaward to the state's outer limit of jurisdiction (i.e., three nautical miles from the Mean Hight Tide Line (MHTL) and inland generally 1,000 yards from the MHTL (CCC 2011). In contrast to wetland waters of the U.S., potential coastal wetland features are defined by the presence of one of the three USACE wetland indicators (California Code of Regulations Title 14 (14 CCR)). The one parameter definition as follows:

> Wetland shall be defined as land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated

> substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deep-water habitats. (14 CCR Section 13577).

Local Jurisdiction

City of Goleta General Plan/Coastal Land Use Plan

This plan governs land use and physical development within the geographic area of the incorporated City of Goleta limits. As of January 1, 2006, this area included 5,075 acres, or approximately 7.9 square miles. The Goleta General Plan/Coastal Land Use Plan, which is required by California law, is the most important policy document that guides future physical changes and public decision making within a community. California law places the general plan atop the hierarchy of land use planning regulations; by analogy, it has been described as a "constitution" for decision making by a city for its future physical development and change. General plans are required to be comprehensive, long-range, and internally consistent. Every general plan must address seven specific topics, or elements: land use, housing, conservation, open space, transportation, safety, and noise. While state law establishes specific requirements for the contents of the plan, within that legal framework each community has latitude to design its own future. State law allows flexibility in how elements are organized and the additional topics that may be included. All elements have the same legal status, and no element, goal, or policy can supersede any other. The Goleta General Plan/Coastal Land Use Plan is the primary means for guiding future change in Goleta as it faces difficult choices on a daily basis about growth, housing, environmental protection, neighborhood compatibility and preservation, and transportation. The plan provides a guide for making these choices by relating day-to-day decisions to the goals, objectives, and policies of this document. The plan has four major purposes:

- To provide a unified and coherent framework and vision for the future of the community.
- To provide a basis for future decisions by the City on implementing ordinances such as zoning and subdivision codes, individual development project applications, and public investments in infrastructure and services, so as to achieve consistency with the framework.
- To inform the public of the City's policies and provide a means to invite public participation in the City's decision-making processes.
- To guide private landowners, developers, and other public agencies in formulating projects and designs that will be consistent with Goleta's policies.

Coastal Wetlands

The CCC coastal wetlands are determined in accordance with the CCA, which defines coastal wetlands as generally extending seaward to the state's outer limit of jurisdiction (i.e., three nautical miles from the MHTL) and inland generally 1,000 yards from the MHTL (CCC 2011). The CCA contains specific policies aimed at preserving biological resources, such as wetlands, riparian habitat, and marine habitat.

Potential coastal wetland features are evaluated for the presence of one of the three USACE wetland indicators (California Code of Regulations [CCR] Title 14). The one-parameter definition as follows:

> Wetland shall be defined as land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly

developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deep-water habitats. (14 CCR Section 13577).

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Appendix B

Floral Compendium

Plant Species Observed in Study Area (March 2020, September 2021, February 2022)

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced[1] Status	Wetland Indicator Status[2]	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping /Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Trees																			
Acacia spp.	acacia	Invasive Introduced	UPL						X								X		
Acer negundo	box elder	Native	FACW						X										
Ailanthus altissima	tree of heaven	Invasive Introduced	FACU				X												
Corymbia sp.	flowering gum	Introduced	-														X		
Cupressus sp.	cypress tree	-	UPL			X			X										
Eucalyptus camaldulensis	red gum	Introduced	FAC						X								X[d]		
Eucalyptus cladocalyx	sugar gum	Introduced	UPL						X										
Eucalyptus globulus	blue gum	Introduced	UPL			X	X		X*										X
Eucalyptus sideroxylon	red ironbark	Introduced	UPL						X										
Fraxinus sp.	ash	Introduced	-						X										
Fraxinus udhei	shamel ash	Introduced	UPL			X			X										
Juniperus communis	common juniper	Native	FACU						X										
Olea europaea	olive tree	Invasive Introduced	UPL						X							X			X
Pinus sp.	pine tree	-	-			X			X										
Prunus ilicifolia ssp. *lyonii*	Catalina cherry	Native	UPL						X										
Platanus racemosa	western sycamore	Native	FAC		X		X										X		
Phoenix canariensis	canary palm	Invasive Introduced	UPL						X										
Populus balsamifera ssp. *trichocarpa*	Black cottonwood	Native	FAC		X														
Populus fremontii	Fremont cottonwood	Native	FAC		X		X												
Quercus agrifolia	coast live oak	Native	UPL		X	X*	X		X					X					X
Quercus lobata	valley oak	Native	FACU											X					
Salix lasiolepis	arroyo willow	Native	FACW		X	X			X										

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced[1] Status	Wetland Indicator Status[2]	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping /Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Schinus terebinthifolius	Brazilian pepper	Introduced	FAC						X										
Washingtonia robusta	Mexican fan palm	Invasive Introduced	FACW						X								X		
Shrubs																			
Acacia longifolia	golden wattle	Introduced	UPL						X										
Acmispon glaber	deerweed	Native	UPL								X								
Artemisia californica	California sagebrush	Native	UPL		X		X		X		X								X
Atriplex lentiformis	quailbush	Native	FACU											X*					
Agave sp.	Ornamental agave	Introduced	UPL														X		
Baccharis pilularis	coyote brush	Native	UPL		X	X	X*		X							X	X	X	X
Baccharis plummerae ssp. Plummerae	Plummer's baccharis	Native (CRPR 4.3)	UPL						X										
Baccharis salicifolia	mulefat	Native	FAC		X														
Bougainvillea spectabilis	bougainvillea	Introduced	UPL														X		
Caesalpinia gilliesii	bird of paradise	Introduced	UPL														X		
Ceanothus sp.	ornamental ceanothus	-	UPL											-					
Cortaderia selloana	pampas grass	Invasive Introduced	FACU								X								
Crassula ovata	jade plant	Introduced	UPL						X										
Diplacus aurantiacus	sticky monkeyflower	Native	FACU						X										
Elymus condensatus	giant wild rye	Native	UPL		X	X	X		X					X	X				
Encelia californica	California sunflower	Native	UPL		X									X					
Eriogonum grande	island buckwheat	Native	UPL											X					
Eriogonum parvifolium	seacliff buckwheat	Native	UPL								X			X					

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced[1] Status	Wetland Indicator Status[2]	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping /Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Hazardia squarrosa	sawtooth goldenbush	Native	UPL						X										
Hedera helix	English ivy	Invasive Introduced	FACU						X								X		
Heteromeles arbutifolia	toyon	Native	UPL		X		X		X								X		X
Lonicera subspicata var. *subspicata*	Santa Barbara honeysuckle	Native (CRPR 1B.2)	UPL						X					X					
Opuntia ficus-indica	mission cactus	Introduced	UPL														X		
Myoporum laetum	myoporum	Invasive Introduced	FACU						X										
Nerium oleander	oleander	Introduced	UPL														X		
Phyllostachys bambusoides	Japanese timber bamboo	Introduced	UPL														X		
Pittosporum sp.	pittosporum	Introduced	-						X										
Polygala myrtifolia	myrtle leaf milkwort	Introduced	UPL																X
Pyracantha coccinea	scarlet firethorn	Introduced	UPL														X		
Pyracantha sp.	Pyracantha	Introduced	-						X										
Ribes speciosum	fuchsia flowered gooseberry	Native	UPL						X										
Rosa californica	California rose	Native	FAC											X					
Rhus integrifolia	lemonade berry	Native	UPL				X		X				X*	X					X
Rubus armeniacus	Himalayan blackberry	Introduced	FAC						X										
Rubus ursinus	California blackberry	Native	FAC		X		X		X										
Ruscus aculeatus	Butcher's broom	Introduced	UPL																X
Salvia mellifera	black sage	Native	UPL											X					
Sambucus nigra ssp. *caerulea*	blue elderberry	Native	FACU						X										
Tecoma capensis	cape honeysuckle	Introduced	UPL														X		

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced[1] Status	Wetland Indicator Status[2]	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping /Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Yucca sp.	ornamental yucca	Introduced	UPL						X								X		
Herbs																			
Agapanthus sp.	lily of the Nile	Introduced	-						X										X
Ambrosia psilostachya	western ragweed	Native	FACU		X				X		X								X
Araujia sericifera	bladder vine	Introduced	UPL																X
Artemisia douglasiana	mugwort	Native	FAC		X		X												
Asparagus asparagoides	African asparagus fern	Invasive Introduced	UPL				X		X										
Atriplex prostrata	basin saltbush	Introduced	FACW						X[d]										
Atriplex semibaccata	Australian saltbush	Invasive Introduced	FAC		X														X
Avena barbata	slender oat	Invasive Introduced	UPL				X[d]		X		X					X[d]		X	X*[d]
Avena fatua	common wild oats	Invasive Introduced	UPL				X[d]				X					X[d]		X	X*[d]
Brassica nigra	black mustard	Invasive Introduced	UPL	X	X	X	X[d]		X	X						X		X*	X
Brassica rapa	field mustard	Invasive Introduced	FACU								X								
Bromus sitchensis var. *carinatus*	California brome	Native	UPL						X										X
Bromus diandrus	ripgut brome	Invasive Introduced	UPL	X	X		X[d]		X		X				X	X		X	X[d]
Bromus hordeaceus	soft chess	Invasive Introduced	FACU		X		X[d]								X			X	X[d]
Bolboschoenus maritimus	alkali bulrush	Native	UPL						X										
Campsis radicans	trumpet creeper	Introduced	FACU														X		
Calystegia macrostegia	coast morning glory	Native	UPL				X		X					X					X
Carduus pycnocephalus	Italian thistle	Invasive Introduced	UPL				X[d]												X
Carex sp.	sedge	-	-																X

Scientific Name	Common Name	Native/ Introduced/ Invasive Introduced[1] Status	Wetland Indicator Status[2]	Alkali Heath Marsh	Arroyo Willow Thickets	Coast Live Oak Wood-land and Forest	Coyote Brush Scrub	Creeping Wildrye Turfs	Eucalyptus Groves	Hardstem Bulrush Marshes	Ice Plant Mats	Iris-leaf rush seeps	Lemonade Berry Scrub	Native Landscaping /Restoration	Perennial Rye Grass Fields	Purple Needle Grass Grassland	Undifferentiated Ornamental Shrubland	Upland Mustards	Wild Oats and Annual Brome Grasslands
Carex subfusca	brown sedge	Native	FAC	X	X				X										X
Carpobrotus edulis	ice plant	Invasive Introduced	UPL						X		X*						X		X
Claytonia parviflora	miner's lettuce	Native	FACU						X										
Clematis pauciflora	hill clematis	Native	UPL						X										
Cressa truxillensis	alkali weed	Native	FACW														X		
Cynodon dactylon	Bermuda grass	Invasive Introduced	FACU						X										
Cyperus eragrostis	umbrella sedge	Native	FACW	X					X										
Datura wrightii	jimsonweed	Native	UPL						X										
Delairea odorata	cape ivy	Invasive Introduced	FAC						X										
Dichelostemma capitatum	blue dicks	Native	FACU						X										
Distichlis spicata	salt grass	Native	FAC	X	X						X								
Echinochloa crus-galli	barnyard grass	Introduced	UPL						X										
Ehrharta erecta	upright veldt grass	Invasive Introduced	UPL						X										
Eleocharis macrostachya	common spikerush	Native	UPL	X	X				X			X*							
Eleocharis parishii	Parish's spike rush	Native	FACW		X														
Elymus triticoides	creeping wildrye	Native	UPL	X			X	X*	X										X
Erodium botrys	big heron bill	Introduced	FACU				X		X										X
Erodium cicutarium	red stemmed filaree	Invasive Introduced	UPL				X									X			X
Eryngium vaseyi	coyote thistle	Native	FACW									X							
Festuca perennis	Italian rye grass	Invasive Introduced	FAC	X			X									X			X
Foeniculum vulgare	sweet fennel	Invasive Introduced	UPL		X		X				X							X	X
Frankenia salina	alkali heath	Native	FACW	X	X				X	X									
Galium sp.	bedstraw	-	-						X										

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Geranium dissectum	cutleaf geranium	Invasive Introduced	UPL		X				X										
Geranium molle	crane's bill geranium	Introduced	UPL				X									X			X
Hedera canariensis	Algerian ivy	Invasive Introduced	UPL						X								X		
Helminthotheca echioides	bristly ox-tongue	Invasive Introduced	FAC	X	X		X								X				X
Hirschfeldia incana	summer mustard	Invasive Introduced	UPL								X								X
Hordeum murinum	foxtail barley	Invasive Introduced	FACU				X												X
Ipomoea indica	ornamental morning glory	Introduced	OBL														X		
Isocoma menziesii	Menzies' goldenbush	Native	FAC				X						X						X
Juncus bufonius	common toad rush	Native	FACW						X										
Juncus patens	common rush	Native	FACW	X	X				X			X							X
Juncus phaeocephalus	brown headed rush	Native	FACW		X							X*							
Juncus sp.	rush	Native	-						X										
Lythrum hyssopifolia	hyssop loosestrife	Invasive Introduced	OBL									X							
Malephora crocea	Coppery mesembryant hemum	Invasive Introduced	FACU						X										
Malvella leprosa	alkali mallow	Native	FACU						X										
Medicago polymorpha	California burclover	Invasive Introduced	FACU		X										X				X
Muhlenbergia rigens	deergrass	Native	FAC											X					
Narcissus papyraceus	paperwhite	Introduced	FACU																X
Narcissus sp.	daffodil	Introduced	-																X
Nasturtium officinale	watercress	Native	OBL																
Oxalis pes-caprae	sourgrass	Invasive Introduced	UPL		X		X		X	X					X				X

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Pennisetum clandestinum	kikuyu grass	Invasive Introduced	UPL						X										
Pentagramma triangularis ssp. *triangularis*	gold back fern	Native	UPL						X										
Phalaris aquatica	harding grass	Invasive Introduced	FACU						X										X
Plantago lanceolata	English plantain	Invasive Introduced	FAC		X		X		X						X			X	X
Pseudognaphalium bioletti	two-color rabbit-tobacco	Native	UPL								X								
Pseudognaphalium californicum	ladies' tobacco	Native	UPL						X										
Psilocarphus brevissimus	woolly marbles	Native	FACW									X							
Pteridium aquilinum var. *pubescens*	western bracken fern	Native	FACU						X										
Raphanus sativus	wild radish	Invasive Introduced	UPL	X	X				X	X									X
Rudbeckia hirta var. *pulcherrima*	black eyed susan	Introduced	FACU														X		
Rumex crispus	curly dock	Invasive Introduced	FAC	X	X		X			X					X			X	X
Salicornia pacifica	pickleweed	Native	OBL	X															
Salsola tragus	Russian thistle	Invasive Introduced	FACU				X												
Salvia leucophylla	purple sage	Native	UPL						X										
Sanicula sp.	sanicle	-	-						X										X
Schoenoplectus acutus var. *occidentalis*	tule	Native	OBL	X						X									
Scrophularia californica	California bee plant	Native	FAC											X					
Silybum marianum	milk thistle	Invasive Introduced	UPL																X
Sisyrinchium bellum	blue-eyed grass	Native	FACW						X							X			X

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Solanum xanti	purple nightshade	Native	UPL														X		X
Solidago californica	California goldenrod	Native	UPL						X										
Sonchus asper	spiny sowthistle	Introduced	FAC						X										X
Sonchus asper ssp. *asper*	sowthistle	Introduced	FAC		X				X										X
Sonchus oleaceus	common sow thistle	Introduced	UPL		X				X										X
Stellaria media	chickweed	Introduced	FACU												X				
Stipa miliacea var. *miliacea*	smilo grass	Invasive Introduced	UPL			X			X										X
Stipa pulchra	purple needle grass	Native	UPL													X*			X
Tetragonia tegragoniodes	New Zealand spinach	Introduced	UPL						X										
Toxicodendron diversilobum	poison oak	Native	FACU			X			X										
Tragopogon porrifolius	purple salsify	Introduced	UPL																X
Triteleia crocea	goldenstar	Native	UPL						X										
Tropaeolum majus	garden nasturtium	Introduced	UPL				X		X										X
Typha sp.	cattails	-	OBL		X														
Verbena lasiostachys	verbena	Native	FAC				X									X			X
Vicia sp.	common vetch	-	-																X
Vicia sativa ssp. *sativa*	spring vetch	Introduced	FACU	X	X		X		X	X						X			X
Vinca major	periwinkle	Invasive Introduced	UPL						X										
Xanthium strumarium	cocklebur	Native	FAC						X										
Zeltnera muehlenbergii	Muehlenberg centaury	Native										X							
Poaceae	Unidentifiable annual non-native grasses	Introduced	UPL		X	X	X		X	X	X	X	X	X		X	X	X	X

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[1] CDFW 2022, Jepson Flora Project 2022, and Cal-IPC 2022

Appendix C

Site Photographs

Appendix D

Wetland Determination Forms