

FMZ 10-11-20-21

Habitat Enhancement Plan Laguna
Beach, California

Prepared for Approval by:

The California Coastal Commission (CCC)

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Purpose and Introduction

The FMZ 10+11 Habitat Enhancement Plan provides direction for implementing enhancement efforts for use as mitigation for unavoidable impacts made during fuel modification activities in FMZ 10 and 11. A total of 2.9-acres will be enhanced including 1.31-acres of coastal sage scrub, and 1.59-acres of southern maritime scrub habitats.

The Habitat Enhancement Plan describes the details of existing biological conditions, proposed enhancement efforts including an implementation plan, and post-plant installation maintenance/monitoring plan and site-specific success criteria.

Project Description

Project Location and Summary

The enhancement area is located at USGS Laguna Beach 7.5' Quadrangle [dated 1968, photo revised in 1981] NW¼ of the SE¼ of Section 31, Township 7 South, Range 8 West 33°31'03.5"N 117°45'12.9"W (Appendix 1 and 2 – regional and vicinity maps). The property is bordered by low-density residential development to the south and west and open space including Aliso and Wood Canyons Wilderness Park and the OCTA Pacific Horizon Preserve to the north and east. The topography consists of largely north facing moderately sloping hillsides that support coastal sage scrub and southern maritime chaparral vegetation intermixed with non-native vegetation. Dominant native species on site include California buckwheat (*Erigonum fasciculatum*), deerweed (*Acmispon glaber*), laurel sumac (*Malosma laurina*) and black sage (*Salvia melifera*). Dominant non-native species on site include non-native brome grasses (*Bromus spp.*), fountain grass (*Pennisetum setaceum*) and garland daisy (*Glebionis coronaria*).

Individual enhancement polygons were identified and mapped within the enhancement area (Appendix 3 – project map). Field surveys were conducted to evaluate existing native vegetation cover to quantify potential establishment acreage and determine the intensity of enhancement efforts needed (Appendix 4). Polygons with 0-15% native cover are categorized as needing active enhancement efforts including container plant and seed installation. Polygons with 16-30% native cover are categorized as needing partial enhancement efforts including container plant installation. Polygons with 31-99% native cover are categorized as needing passive enhancement efforts including targeted weed control.

A photo album of site photos can be found in Appendix 5. The EcoAtlas Landscape Profile Report can be found in Appendix 6.

Project Objectives

- Remove invasive, non-native species from the entire 2.9-acre project site.
- Significantly reduce the cover of non-invasive, non-native weeds.
- Remove trash and debris (including thatch from non-native plant litter) from the project area as necessary.
- Increase the structural complexity and diversity of native vegetation through the installation of native container plants, trees, and seed to establish a mosaic of native coastal sage scrub, and southern maritime chaparral habitats over approximately 2.9 acres.
- Maintain installed plants (including hand-watering as necessary) and manage non-native weeds until installed plants are established.

- Limit access to VESHA and ESHA areas through the installation of symbolic fencing and signage
- Increase carbon sequestration on the site by replacing short-lived, non-native grasses and forbs with longer-lived perennial shrubs, trees, and grasses.

Ownership and Responsible Parties

The party responsible for property maintenance and management of the site is:

Party Responsible:

City of Laguna Beach
505 Forest Avenue
Laguna Beach, CA 92651

Implementation of the Mitigation Plan

Rationale for Expecting Implementation Success

The project will be managed by a Project Manager with a Bachelor of Science degree in Biological Sciences and over twelve years of habitat restoration experience. The project will incorporate the latest natural resource management and science-based ecological methods for landscape-level habitat restoration. This project will use a conceptual framework for restoration ecology that works to (1) identify the leading causes of degradation on the project site; (2) determine goals and objectives that are specific, measurable, achievable, realistic and time-sensitive; (3) develop effective methods for restoration and monitoring implementation with the end goal of helping to incorporate these methods into long-term conservation strategies and planning in accordance with the NCCP/HCP region goals; and (4) utilize an adaptive management approach that relies heavily on regularly evaluating restoration and monitoring methods.

The primary focus of this project is to use the best available science to enhance degraded habitat that thus increasing available habitat for sensitive wildlife species such as the California Gnatcatcher. To most effectively restore the disturbed upland habitats associated with this project, the Project Manager will implement an integrated approach of adaptive weed management combined with the installation of diverse plant materials including seed, and container plants. Initially, a twofold approach will be used: 1) remove non-native vegetation through mowing to increase light availability for native species recruitment and to reduce the propagule pressure of weedy species; and 2) implement multiple grow-kill weed cycles to reduce the non-native annual forb and grass seed bank. Once initial non-native vegetation removal and treatment is complete, restoration work will establish early successional habitat comprised of structurally complex and diverse vegetation. This habitat will include a diverse composition of native plant species comprised of various functional groups, including grasses, perennial shrubs, forbs, and late-blooming species. Installation and consistent maintenance of container plants, including removal of non-native vegetation and irrigation, is an effective strategy for outcompeting aggressive non-native annual grass and forb species. This approach will transform the currently degraded pockets of habitat into a healthily functioning ecosystem that will increase resource availability and improve nesting and breeding conditions for sensitive wildlife species.

Restoration Landscape Contractor

Native plant restoration efforts require specialized knowledge during both implementation and maintenance procedures, including the ability to distinguish native and non-native plants, the ability to apply herbicide and knowledge of the planting and watering requirements of native plants. Initial weed removal, plant installation and maintenance of this project shall be performed by qualified Restoration Landscape Contractors who will be required to demonstrate experience in these areas and, for contractors applying herbicide, show proof of being a licensed Pesticide Applicator to the Project Manager prior to implementation.

Education Program

All workers employed on the Project will complete an Education Program lead by a Designated Biologist prior to performing any work on the site. Interpretation will be provided for non-English speaking workers, as needed.

The Education Program will consist of a presentation that includes:

- a discussion of the biology of the habitats and species currently present or having the potential to be present in the project area.
- detailed information about the distribution and habitat needs of any Protected Species that may be present, legal protections for those species, penalties for violations, and project-specific protective measures.
- a discussion of the invasive species currently present within the project site as well as those that may pose a threat to, or have the potential to, invade the project site. The discussion will include a physical description of each species and information regarding their habitat preferences, local and statewide distribution, modes of dispersal, and impacts. The program will also include a discussion of Best Management Practices to be implemented at the project site to avoid the introduction and spread of invasive species into and out of the project site.

Upon completion of the education program, employees will sign a form stating they attended the program and understand all protection measures. These forms will be filed at the worksite offices and be available for review upon request. The Education Program will be repeated annually for part of the project extending more than one (1) year. Copies of program materials will be maintained at the project site for workers to reference as needed.

Nesting and Breeding Birds

Proposed project activities (including, but not limited to, staging and disturbances to native and non-native vegetation, structures, and substrates) should occur outside of the avian breeding season, defined as March 15 – August 15, to avoid disturbance to breeding birds or destruction of the nest or eggs. Depending on the avian species present, a qualified avian biologist may determine that a change in the breeding season dates is warranted. No mechanized vegetation removal will take place during the breeding season. Only passive maintenance activities will be implemented.

If avoidance of the avian breeding season is not feasible and a protected bird species is present, a qualified avian biologist will conduct a minimum of 3 focused, pre-disturbance surveys on separate days within a week prior to the initiation of activities with the final survey conducted the day immediately prior to initiation. The surveys will include the footprint of the disturbance, suitable protected species

habitat, and a 500-foot buffer of protected species habitat. If a protected species is present during project activities, a biologist will survey daily for nesting within 500 feet of the project area. If an active nest is located, a 500 foot no-activity buffer zone will be established where no project activities will take place until the nest has fledged or is no longer active.

If avoidance of the avian breeding season is not feasible and no protected bird species are present, no more than 2 days prior to the initiation of project activities, a qualified avian biologist will conduct a nesting bird survey in suitable nesting habitat that is to be directly or indirectly disturbed. Should a nest be found, the biologist will recommend appropriate buffers given the species, surrounding vegetation, and restoration activity type. For low-moderate impact level restoration activities, the minimum avoidance buffer will be 100 feet (200 feet for raptors). For high impact level restoration activities, the minimum avoidance buffer will be 150 feet (300 feet for raptors). Alternatively, a biologist could be directed to observe the nest and bird behavior during restoration activities. Should the bird show signs of distress, the activity would be halted.

If an active bird nest is found, the following steps will be implemented to avoid and minimize impacts to the nest:

- a.) When the biologist finds the nest, an assessment of the nest-specific buffer based on topography, vegetation, species, and individual bird behavior will be evaluated to ensure the minimum buffers established above are adequate. If a larger avoidance buffer is required, it would be established based on biological criteria. If a smaller buffer would be adequate, the qualified avian biologist will identify the appropriate buffer distances for raptors and non-raptors and provide the Wildlife Agencies a site-specific Nesting Bird Protection Plan prior to implementation.
- b.) Establishment of the minimum avoidance buffer where it overlaps active restoration work areas with stakes or flagging tape. This area shall not be disturbed until the nest becomes inactive or the young have fully fledged (independent of the nest and adults).
- c.) A survey and nest tracking log shall be maintained for each nest whose buffer intersects an active work area. The log shall include surveyor, date, time, weather, species, dates, nest substrate, nest height, nest stage, nest outcome, GPS coordinates, and other pertinent observations.
- d.) Restoration personnel, including all contractors and/or volunteers working on site, should be instructed on the meaning of the staked and flagged areas, and how this is ensuring compliance with applicable state and federal laws pertaining to the protection of native bird nests.
- e.) The restoration task leader will ensure that all restoration activities occur outside the demarcated buffer and that the flagging/stakes are readily visible and maintained. The nest status should be checked approximately weekly unless the nest is readily visible from a distance away and can be updated without approach.

Protected Bird Species with Potential to Occur On-Site and Defined Suitable Habitat (via CDFW CNDDDB and USFW IPaC)

Common Name	Habitats
Coastal California gnatcatcher	Coastal bluff scrub, Coastal scrub
Cooper's hawk	Cismontane woodland, Riparian forest, Riparian woodland, Upper montane coniferous forest
Least Bell's vireo	Riparian forest, Riparian scrub, Riparian woodland
Northern harrier	Coastal scrub, Great Basin grassland, Marsh & swamp, Riparian scrub, Valley & foothill grassland, Wetland
Southwestern Willow Flycatcher	Riparian forest, Riparian scrub, Riparian woodland
Tricolored blackbird	Freshwater marsh, Marsh & swamp, Swamp, Wetland

Implementation Schedule

Enhancement Task	Proposed Schedule
Site Preparation	Fall 2022
Plant Material Installation	November – December 2022
5-Year Monitoring and Maintenance	November – December 2022 through November – December 2027

Site Preparation

Non-native Vegetation Removal and Treatment

The project site shall be subject to weed management including manual, mechanical and chemical treatment. Planned treatment activities include mechanical cutting with a mower, hand pulling and/or manual removal of weeds using hand tools, herbicide treatment using spray application and cut-stump herbicide application. No heavy equipment will be used on site. The goals of weed management activities will be to minimize competition that could inhibit the establishment of native species and to eliminate species considered invasive from the site. All personnel will be trained to distinguish weed species from native vegetation. Weeds will be removed or treated before they go to seed. When herbicide is deemed necessary, an appropriate pesticide will be chosen and applied by a qualified applicator according to the label in the minimum amount and concentration needed for effective control.

Planting Plan

Plant Palette

Plant Palette for Container-Grown Plants			
Scientific Name	Common Name	Functional Group	Stock Type
<i>Achillea millefolium</i>	Common yarrow	Perennial forb	2" rosepot
<i>Artemisia californica</i>	California sagebrush	Shrub	2" rosepot
<i>Asclepias fascicularis</i>	Narrow leaf milkweed	Perennial forb	2" rosepot
<i>Asclepias speciosa</i>	Showy milkweed	Perennial forb	2" rosepot
<i>Dudleya lanceolata</i>	Lance-leaved dudleya	Perennial forb	1-gallon
<i>Elymus condensatus</i>	Giant wild rye	Grass	2" rosepot
<i>Encelia californica</i>	California bush sunflower	Shrub	2" rosepot
<i>Ericameria pinifolia</i>	Pine bush	Shrub	1-gallon
<i>Eriogonum fasciculatum</i>	California buckwheat	Shrub	2" rosepot
<i>Eriophyllum confertiflorum</i>	Golden yarrow	Shrub	2" rosepot
<i>Heteromeles arbutifolia</i>	Toyon	Large shrub	1-gallon
<i>Malacothamnus fasciculatus</i>	Bush mallow	Shrub	1-gallon
<i>Malosma laurina</i>	Laurel sumac	Large shrub	1-gallon
<i>Melica imperfecta</i>	Coast range melic	Grass	2" rosepot
<i>Mimulus aurantiacus</i>	Sticky monkeyflower	Shrub	2" rosepot
<i>Mirabilis laevis</i>	Wishbone bush	Perennial forb	2" rosepot
<i>Opuntia littoralis</i>	Prickly pear cactus	Shrub	1-gallon
<i>Peritoma arboria</i>	Bladderpod	Shrub	2" rosepot
<i>Rhamnus crocea</i>	Red berry	Shrub	1-gallon
<i>Rhus integrifolia</i>	Lemonade berry	Large shrub	1-gallon
<i>Salvia apiana</i>	White sage	Shrub	2" rosepot
<i>Salvia mellifera</i>	Black sage	Shrub	2" rosepot
<i>Sambucus nigra</i>	Blue elderberry	Large shrub	1-gallon
<i>Sisyrinchium bellum</i>	Blue-eyed grass	Perennial forb	2" rosepot
<i>Stipa lepida</i>	Foothill needlegrass	Grass	2" rosepot

Plant Palette for Seed Mix		
Scientific Name	Common Name	Functional Group
<i>Achillea millefolium</i>	Common yarrow	Perennial forb
<i>Amsinckia menziesii</i>	Common fiddleneck	Annual forb
<i>Cryptantha intermedia</i>	Common cryptantha	Annual forb
<i>Deinandra fasciculata</i>	Tarweed	Annual forb
<i>Eucrypta chrysanthemifolia</i>	Common eucrypta	Annual forb

<i>Lasthenia californica</i>	California goldfields	Annual forb
<i>Layia platyglossa</i>	Common tidy-tips	Annual forb
<i>Lupinus bicolor</i>	Bicolored lupine	Annual forb
<i>Lupinus succulentus</i>	Arroyo lupine	Annual forb
<i>Plantago erecta</i>	California plantain	Annual forb
<i>Phacelia parryi</i>	Parry's phacelia	Annual forb
<i>Phacelia ramosissima</i>	Branching phacelia	Perennial forb
<i>Pseudognaphalium californicum</i>	California everlasting	Annual forb

Source of Plant Material

Ideally, all plant materials will originate from local, wild sources within 30 miles of the project site to maximize the chance of long-term success of the restoration plantings and to preserve regional genetic integrity. When a local plant material source is not available, use of non-local material will be considered on a case-by-case basis, considering the importance of the species to the plant palette and available information on genetic variability for that species.

If locally sourced propagules are not available, the Project Manager will consider the possibility of using alternatively sourced seed. All container stock will be inspected and approved by the Project Manager as healthy, disease-free and of proper size prior to planting. Overgrown, root-bound stock will be rejected.

Contract growing of all container plants will be by a local experienced native plant nursery specializing in native plant propagation and holding a “License to sell Nursery Stock” in the State of California subject to inspections by their County’s Agricultural Commissioner to ensure health and vigor of the nursery stock and prevention against pests and pathogens. As much as is feasible, containers will be grown from seed harvested from the Laguna Canyon watershed, as close as possible to the project site. The number of container plants installed on this project will not exceed 1500.

Seed will be obtained from a reputable supplier specializing in California native plants. As much as is feasible, seed will be from local sources—ideally within the Laguna Canyon watershed, or at most within 50 miles of the project site. When a local seed source is not available, use of non-local seed will be considered on a case-by-case basis, considering the importance of the species to the plant palette and available information on genetic variability for that species.

Plant Placement

Planting areas will be established in areas currently devoid of native vegetation. Container plants and seed will be distributed in a manner mimicking natural plant distribution within analogous areas in the Laguna Canyon Creek watershed. Tree plantings and container plantings will be clustered together to allow for more efficient weed management between plantings. Special care will be given to increase the diversity and complexity of the vegetation structure to support the maximum amount of wildlife. All seed will be hand-broadcast, raked in by hand and imprinted using a hand-operated, weighted seed roller.

Seed may be added to container-planted areas once container plants are becoming established to increase species, functional group, and structural diversity in these areas.

Mycorrhizal Fungi

Mycorrhizae are specialized fungi found on plant roots. A symbiotic relationship exists between mycorrhizae and plant roots wherein plants benefit from an increased ability to take up nutrients and withstand drought when mycorrhizae are present. This relationship is essential to growth rate, well-being, and longevity of native plant communities. Plant use of mycorrhizal fungi markedly increases success of revegetation occurring on disturbed or degraded lands. Container plants will be sourced from a nursery that inoculates its container stock with appropriately sourced arbuscular mycorrhizae. Mycorrhizal inoculants will also be mixed in to seed before sowing.

Planting Techniques for Container-Grown Plants

All container stock will be thoroughly watered prior to planting. Holes will be dug at least two times the diameter of the plant container and two times the container depth. Holes will be filled with water and allowed to drain immediately before planting is to occur. If used, slow-release fertilizer packets will be placed in the hole with 2 to 3 inches of soil between the fertilizer packet and the bottom of the root ball. Holes will be backfilled with tamped native soil so that no air pockets remain and so that the top of the root ball is set one half inch above finish grade. On sloped areas, a level watering basin with a 3-inch hand-packed earth berm approximately 36 inches in diameter will be constructed around each plant. Each plant will be thoroughly watered-in immediately after planting.

Planting Techniques for Seeding

Seed will be pre-mixed, hand-sown and imprinted using a hand-operated weighted seed roller, following the seed provider's recommendations for application rate. Application rates will be calculated based on pure live seed per acre.

Irrigation Plan

A temporary irrigation system will be installed to provide supplemental water to newly installed plant material. The goal is to encourage the survival and growth of installed container plants with the least amount of irrigation, as frequent irrigation encourages weed invasion and depletes nutrients from soil. Supplemental irrigation is to be used solely for the establishment of plants within the planted areas and should be applied judiciously to minimize container plant mortality while preventing excess weed growth. Care shall be taken to avoid watering already-established native vegetation. New plantings shall be irrigated for as long as is necessary to establish root systems in the native soil, likely for the first 2 dry seasons. If normal rainfall does not materialize in the wet seasons, supplemental irrigation may be used to mimic the average rainfall for the season. As plants become established, watering events should become longer and farther apart (e.g., once every 2-3 weeks) to encourage deeper root growth.

Maintenance Activities during the Monitoring Period

The Project Biologist is responsible for ensuring that management activities during the plant establishment period are conducted and for ensuring that personnel working on the Project are advised of and understand management requirements as well as the restoration objectives. To ensure successful enhancement of native habitat through revegetation and non-native vegetation management, the following maintenance activities will be conducted.

Plant Inspection

Plants will be inspected regularly by the Project Biologist to ensure that they are healthy and any problems (e.g., over- or under-watering, disease, herbivory, vandalism, etc.) are addressed promptly.

Weed Management

The Project Site shall be subject to weed management throughout the plant establishment period. The goals of weed management activities will be to minimize competition that could inhibit the establishment of native species and to eliminate species considered invasive from the site. All personnel will be trained to distinguish weed species from native vegetation. Weeds will be removed or treated before they go to seed. When herbicide is deemed necessary, an appropriate pesticide will be chosen and applied by a qualified applicator according to the label in the minimum amount and concentration needed for effective control.

Irrigation

Supplemental irrigation will be accomplished by a temporary irrigation system. Frequency and amount of water being applied will be adjusted as needed with changing conditions to minimize the mortality of installed plants and simultaneously prevent excess weed germination and growth. Irrigation system maintenance will include repairing and replacing damaged parts.

Trash and Debris Removal

Any weeds, litter, trash, or debris shall be manually removed from the site and disposed of as permitted by law. Transient encampments or materials deemed to be hazardous to remove will be reported directly to the CLB Police Department for removal.

Remedial Planting and Seeding

All terminally diseased, dead, or declining container plants will be replaced during the appropriate planting season as recommended by the Project Biologist. Replacement plants shall conform to the species, size requirements and spacing as specified for the plants being replaced. Since the successful establishment of plants from seed will be entirely dependent on natural rainfall, remedial seeding may be necessary depending on the conditions experienced on the site during the first growing season.

Monitoring Plan for the Enhancement Site

Laguna Canyon Foundation (LCF) staff have extensive experience preparing comprehensive monitoring plans for habitat restoration sites, as well as conducting qualitative and quantitative monitoring in a wilderness setting. Staff are trained to conduct vegetation and wildlife surveys to assess and prioritize the needs of a project site and to make recommendations for adaptive management of habitat restoration activities.

Ecological monitoring is a critical component to documenting whether a habitat has been successfully restored, how ecosystem functions and services have changed, and whether landscape-level resilience to disturbance has increased. Biological monitoring is necessary for the enduring success and sustainability of an ecosystem, particularly in highly urbanized areas such as Laguna Canyon. The monitoring plan for this project will provide monitoring and assessment of resources using a watershed

and/or landscape level approach. Monitoring objectives and goals will meet SMART criteria (Specific, Measurable, Achievable, Results-oriented, and Time-fixed).

The following monitoring methods will be utilized:

- Baseline monitoring: assess and inventory existing biological conditions
- Project effectiveness monitoring: assess whether project implementation is fulfilling stated objectives, including performance standards
- Adaptive management monitoring: assess weaknesses in project planning and implementation to allow for changes to restoration procedures and protocols
- Focused monitoring: assess presence or absence of specific species within the site and record changes over time
- Regional monitoring: assess regional trends and threats that could impact the project

The Wetland and Riparian Area Monitoring Plan (WRAMP) framework of assessment and analysis will be employed, including landscape level, qualitative field measurements on the project site level and quantitative field measurements of selected aspects of the health or stress of the landscape. WRAMP includes three levels of assessment and analysis, while providing the framework for evaluating these three levels of assessment collectively in the analysis of the overall condition of resources within a landscape.

WRAMP Level 1 data, including baseline biological conditions, will be derived from remotely sensed data and maps. Prior to project construction, these assessments will allow better understanding of the abundance and diversity of resources across the landscape. This knowledge is instrumental to restoration ecologists during the design and planning phase of a project.

For this project, a Landscape Profile Report that includes a California Aquatic Resource Inventory (CARI) report and CALVEG Habitat Type report will be created using EcoAtlas. All project details will be uploaded to the Project Tracker on EcoAtlas and updated upon completion of project construction.

WRAMP Level 2 data, including detailed baseline vegetation community composition, will be derived from standardized rapid field assessment of overall condition or present stressors within the project area.

Results from WRAMP Level 1 and 2 data will be used to plan restoration activities decisions.

WRAMP Level 3 data consists of quantitative field measurements of selected aspects of the health or stress of the landscape. Level 3 data serves to track changes at both a landscape and a plant community scale and will include regular vegetation monitoring and wildlife surveys.

Focused monitoring efforts for the proposed project include:

- Annual targeted invasive weed control survey
- Annual wildlife surveys
- Annual breeding and nesting bird surveys in and around enhancement areas

Regional trends and threats will be monitored in coordination with local land managers within and adjacent to the NCCP/HCP areas as well as with regulatory agencies. Whenever possible, comparable data will be collected and shared with the larger scientific community to answer shared management questions and streamline the acquisition of project funding. Wetland and riparian restoration project data will be uploaded to EcoAtlas Project Tracker. CRAM results will be uploaded the CRAM Wetland website. Species observation data of any covered species will be reported to the California Natural Diversity Database (CNDDDB). Targeted invasive weed control data will be uploaded to Calflora for any high priority species. Emergent weed species data will be shared with the Orange County CNPS Invasive Committee and the California Invasive Plant Council.

Task-specific reports and progress reports will be prepared and submitted beginning from the project start date until the Maintenance and Monitoring Period ends. An annual progress report will be prepared by LCF staff, beginning the first year after installation and continuing until the Maintenance and Monitoring Period ends.

Ecological Performance Standards

The aim of enhancement efforts is to create landscape-scale resilience to protect the area against disturbance from the potential threats of climate change, wildfire, and the introduction of invasive, non-native plant species. These efforts do not involve the eradication of all non-native vegetation on-site but instead strive towards ecosystem recovery through the improvement of ecosystem functions and services by increasing native plant cover, decreasing non-native plant cover, and increasing the structural complexity and diversity of native vegetation.

Diversity and Structural Complexity of Vegetation

To avoid limited species diversity and low structural complexity of vegetation within active enhancement polygons, number of functional groups present and number of co-dominants (species that make up 5%) will be considered.

Functionality as Wildlife Habitat

As the diversity and complexity of native vegetation increases, an increase in the diversity of wildlife is expected. Wildlife observations within the enhancement area will be recorded by the Project Biologist during qualitative surveys as well as incidental observations when work is being conducted on-site.

Native Plant Recruitment

Evidence of native plant recruitment during the maintenance and monitoring phase is an additional example of successful creation of a functional, self-sustaining habitat. Noted recruitment shall be considered a satisfying success criterion. However, the lack of natural recruitment shall not detract from the more significant criteria listed above.

Probability of Continued Habitat Establishment

Qualitative monitoring conducted by the Project Biologist will help in the determination of project success by providing input into the status of ecosystem recovery and completion of ecological performance standards. If several of the above criteria have not been met but the site is approaching

fulfillment of success criteria, the Project Biologist may suggest that the regulatory agencies accept the mitigation as complete.

Monitoring Methods

Qualitative Monitoring

Adaptive management monitoring will include qualitative monitoring surveys once per month for the first 18 months and once quarterly thereafter until the Monitoring and Maintenance period ends, to ensure that maintenance tasks are being performed as required.

LCF staff will note general observations such as plant fitness and health, presence of weeds and sufficiency of weed management, pest problems, plant mortality rates, irrigation or erosion control issues, and wildlife observations. Staff will determine any remedial measures necessary to enable the success of the project.

Quantitative Monitoring

Quantitative vegetation monitoring will be conducted using several methods to track plant community change, changes in trophic complexity, and changes in native and non-native cover. Staff will collect relative and absolute native and non-native cover data annually using point intercept sampling along fixed transects. To better understand the native plant composition of the site, vegetation data will be analyzed to determine species richness, the number of co-dominant species, and the relative cover of vegetation layers at each transect.

The USDA's publication "Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems" and Dr. Douglas Deutschman's protocol found in "Improving Statistical Sampling and Vegetation Monitoring in the San Diego MSCP" will be used as reference.

Monitoring Schedule

It is anticipated that all plant material installation activities will occur at the same time and that quantitative monitoring will occur simultaneously in year 1, 3 and 5. First-Year monitoring will occur between March 1st-June 30th after container-grown plants and seed installation is completed and every year thereafter until all five-year success criteria have been met and agency confirmation has been received.

Monitoring Reports

Progress reports will include:

- A summary of previous reports
- Assessment of progress towards meeting project goals and objectives
- Photo point monitoring album
- Quantitative estimates of survival/replacement of container stock, percent cover of native and non-native species, and diversity of native species for each habitat type
- A narrative of project progress over the past year, including details of maintenance and remedial tasks recommended and accomplished.

Appendices

1. Regional Map
2. Vicinity Map
3. Enhancement Polygon Map
4. Enhancement Polygon Table
5. Baseline Photo Album
6. EcoAtlas Report



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

FMZ10+11 ENHANCEMENT PROJECT AREA

Regional Map





FMZ10+11 ENHANCEMENT PROJECT AREA

Vicinity Map





FMZ10+11 ENHANCEMENT PROJECT AREA

Project Area



Appendix 4: Enhancement Polygon Table

Polygon #	Enhancement Type	Habitat Type	Total Acreage	Percent Native Cover	Enhancement Acreage
1	Partial	Maritime Chaparral	0.01	25%	0.01
2	Partial	Coastal Scrub	0.21	5%	0.20
3	Active	Maritime Chaparral	0.22	3%	0.21
4	Active	Maritime Chaparral	0.33	5%	0.31
5	Active	Maritime Chaparral	0.29	10%	0.26
6	Active	Maritime Chaparral	0.27	8%	0.25
7	Passive	Coastal Scrub	0.17	20%	0.14
8	Active	Coastal Scrub	0.36	8%	0.33
9	Active	Maritime Chaparral	0.30	5%	0.28
10	Active	Maritime Chaparral	0.15	10%	0.14
11	Passive	Maritime Chaparral	0.03	35%	0.02
12	Active	Maritime Chaparral	0.01	1%	0.01
13	Passive	Coastal Scrub	0.07	75%	0.02
14	Passive	Maritime Chaparral	0.02	50%	0.01
15	Active	Coastal Scrub	0.15	10%	0.13
16	Active	Coastal Scrub	0.02	5%	0.02
17	Partial	Coastal Scrub	0.08	25%	0.06
18	Partial	Coastal Scrub	0.13	15%	0.11
19	Active	Maritime Chaparral	0.02	3%	0.02
20	Partial	Coastal Scrub	0.03	25%	0.02
21	Passive	Coastal Scrub	0.11	40%	0.07
22	Active	Coastal Scrub	0.03	10%	0.03
23	Partial	Coastal Scrub	0.05	25%	0.04
24	Active	Coastal Scrub	0.08	10%	0.07
25	Trail Decomission	Maritime Chaparral	0.07	0%	0.07
26	Trail Decomission	Coastal Scrub	0.08	0%	0.08

Appendix 5: Baseline Photo Album



This Landscape Profile is a compilation of information from EcoAtlas about the abundance, diversity, and condition of aquatic resources for a selected area of California. It also includes information about factors affecting the profile, such as ecological restoration projects, the presence of endangered or threatened wildlife, the diversity and extent of land covers, and the abundance of people. Sources of this information are documented on the [EcoAtlas data page](#).

The purpose of the Profile is to support public policies and programs that protect aquatic resources. Additional information will be incorporated into future versions of the Landscape Profile Tool, based on advice from its user community.

The computational time required to generate a Landscape Profile Report increases with the size of the profile area and the complexity of its aquatic resources.

Detailed location



Area of Interest:

- FMZ 10 11 generated by user-defined delineation
- Area: 14.5 acres / 0.023 miles²
- Estimated Population: 22 persons

Regional location



Basemap data provided by © [OpenStreetMap](#)

- CA Climate Regions: South Coast
- Congressional Districts: 48
- Counties: Orange
- Ecoregions: South Coast
- Hydrologic Regions (HUC8): Aliso-San Onofre
- Water Board Regions: San Diego

Abundance and Diversity of Existing Aquatic Resources based on California Aquatic Resources Inventory (CARI)

The Landscape Profile Report includes information about the historical and existing abundance and diversity of California state surface waters, including marine waters, estuaries, river and streams, lakes, and wetlands. The historical information is derived from local and regional historical ecology studies and is not available statewide. The information for existing surface waters is derived from the California Aquatic Resource Inventory (CARI), which serves as the default layer for EcoAtlas. CARI consists of the latest public versions of the National Hydrography Dataset (NHD) of the US Geological Survey (USGS) and National Wetlands Inventory (NWI) of the US Fish and Wildlife Service, as well as maps from regional and local agencies. Future versions of CARI will incorporate regional augmentations of these datasets based on the CARI Standard Operating Procedures (CARI SOP). These regional augmentations increase the detail and accuracy of the federal datasets to better support local environmental education, planning, management, and regulation. The CARI SOP is consistent with the mapping standards of the Federal Geographic Data Committee (FGDC), except with regard to wetland classification. While NWI employs the Cowardin classification system, CARI incorporates the statewide classification system of the California Rapid Assessment Method (CRAM), plus regional classification systems adopted by regional environmental policies and programs. CARI is subject to ongoing improvements based on local and regional mapping efforts and will also incorporate the Cowardin system in the future. To learn how to become a local or regional steward of CARI, email CARImapping@sfei.org.

Riparian extent has been estimated for some state waters based on the Riparian Zone Estimator Tool (RipZET). The Landscape Profile Tool of EcoAtlas does not incorporate information about riparian extent unless it has been estimated for all state surface waters within the area of the profile.

No CARI features found in the profiled area.

Historical Aquatic Resources

Since the 1990s, the San Francisco Estuary Institute-Aquatic Science Center (SFEI-ASC) has been mapping California's historical aquatic and terrestrial resources. This dataset combines the historical mapping efforts from 12 separate Historical Ecology research projects spanning from 1998 to 2013. Extensive supporting information including bibliographic references, analyses, and research methods, can be found in the individual published reports which are available online. For more information, please visit SFEI-ASC's Historical Ecology Page (<https://www.sfei.org/he>).

No historical aquatic resources found in the profiled area.

Eelgrass Aquatic Resources

Eelgrass (*Zostera marina*) aquatic resource areas are recognized as important ecological communities in nearshore open coast areas, shallow bays and estuaries throughout coastal California. The regional survey maps contained within EcoAtlas represent the best available data about eelgrass distribution in surveyed coastal embayments and estuaries during 1993-2013. Please note that data on open coast eelgrass, including the Channel Islands, is not presently included in this database. In addition, no eelgrass was found in surveys for the San Gabriel River estuary; polygons for this area represent other aquatic and benthic habitat features that were mapped for this system.

This information is intended only for regional planning purposes and not for site-specific impact assessment. These data represent results from annual surveys and not the maximum possible extent of eelgrass in the given system.

No eelgrass data in the profiled area.

CALVEG Habitat Types



CALVEG is a USDA Forest Service product providing a comprehensive spatial dataset of existing vegetation cover over California. The data were created using a combination of automated systematic procedures, remote sensing classification, photo editing, field based observations.

Analyses are based on a crosswalk of the CALVEG classifications to the California Wildlife Habitat Relationships (CWHR). CWHR is a state-of-the art information system for California's wildlife developed upon the life history, geographic range, habitat relationships, and management information on species of amphibians, reptiles, birds, and mammals known to occur in the state. CWHR products aid in understanding, conserving, and managing California's wildlife.

For more information on CALVEG: <http://www.fs.usda.gov/detail/r5/landmanagement/resourcemanagement/?cid=stelprdb5347192>

For more information on CWHR: <https://www.wildlife.ca.gov/Data/CWHR>

Total area classified: 5.9 ha / 14.5 acres / 0.023 m²

Table of CALVEG Habitats in the Profiled Region.

*of area classified

Habitat Type	Area (ha)	Area (acres)	Area (%*)
Coastal Scrub	4.8	12.0	82.3%
Urban	1.0	2.6	17.7%

Ecological Restoration Based on Habitat Projects

The Landscape Profile includes information about the number and status of on-the-ground restoration and mitigation projects having a Waste Discharge Requirements (WDR) and/or a Section 401 Water Quality Certification from the State Water Resources Control Board or one of its Regional Water Quality Control Boards. Projects for which a WDR or Section 401 Certification is pending are not currently included in the Landscape Profile. The amount of information that is available about a project depends in part on how much information the project sponsors have submitted. It is anticipated that this information will be derived from the Online 401 Application Tool in the future. For more information about Online 401, visit <http://app.californiawetlands.net/>.

Acres displayed are from reported values and not calculated from project geometries. Lake Tahoe Environmental Improvement Program (EIP) projects are not included in the Summary Statistics.

Elgrass projects under construction are within the monitoring phase of mitigation.

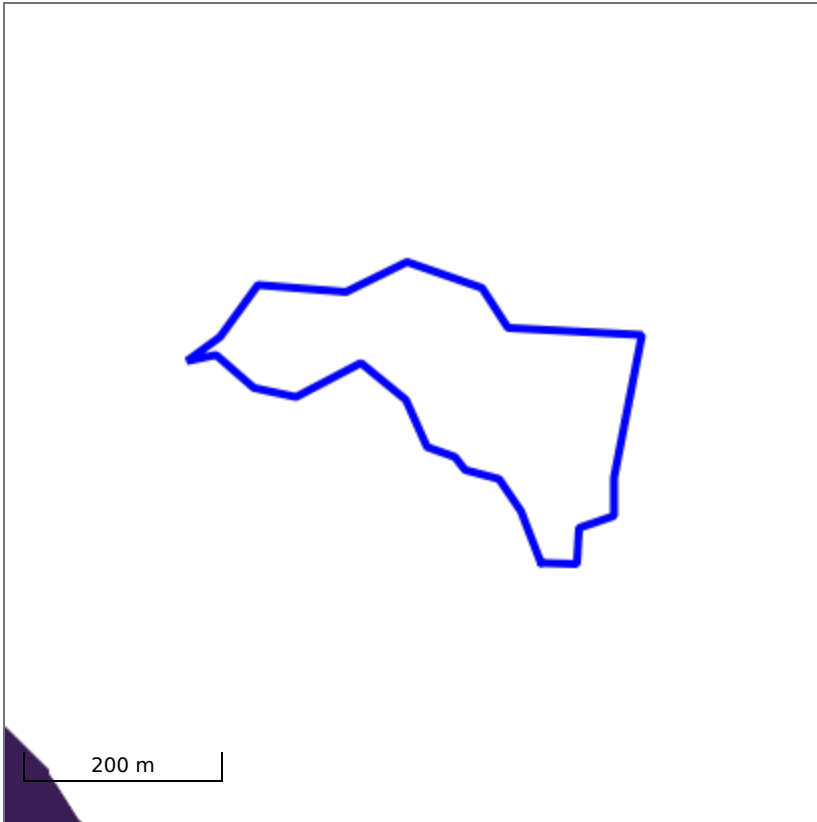
No Habitat Projects found in the profiled area.

Soil Survey Geographic Database (SSURGO) Hydric Soils

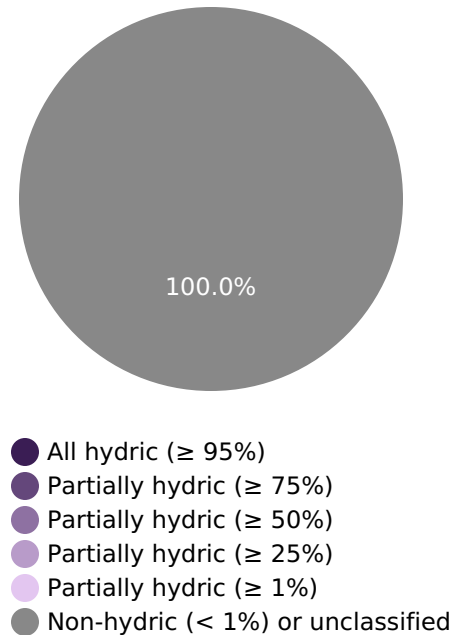
SSURGO depicts information about the kinds and distribution of soils on the landscape. The soil map and data used were prepared by soil scientists as part of the Natural Resources Conservation Service's National Cooperative Soil Survey. EcoAtlas displays the percent of [hydric soils](#) and the soil taxonomies present at a location.

Hydric soils are defined as those soils that form under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil. Under natural conditions, hydric soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of wetland vegetation. This information can be used to help identify places that have been or likely will be wetlands, and determine what types of vegetation will be supported by the soils.

For more information visit https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_053627.



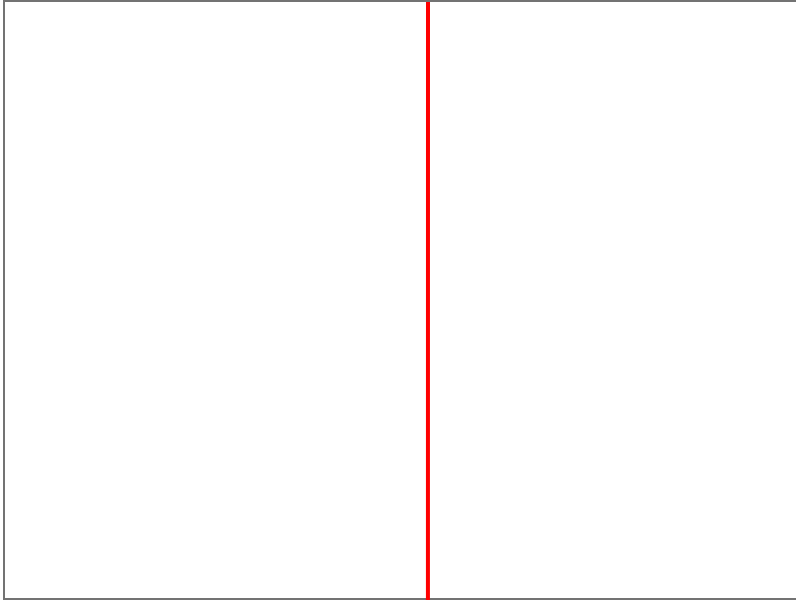
Profile area represented by Hydric Soils:
0.0 acres / 0.0 mi² out of a total of 14.5 acres.



Hydric Type	Area (acres)	Percent area
All hydric (≥ 95%)	0.0	0.0%
Partially hydric (≥ 75%)	0.0	0.0%
Partially hydric (≥ 50%)	0.0	0.0%
Partially hydric (≥ 25%)	0.0	0.0%
Partially hydric (≥ 1%)	0.0	0.0%
Non-hydric (< 1%) or unclassified	14.5	100%

Species of Special Status based on CNDDDB Species Information

The Landscape Profile includes publicly available data provided by the California Natural Diversity Database (CNDDDB) relating to the status and approximate locations of special status species of plants and animals in California. CNDDDB is a collection of certified sightings of special status species that represents the most complete set of information available on the state's declining and/or vulnerable plant and animal species. These species are rare, threatened, or endangered. All special status species from quadrangles that overlap any part of the area demarcated in the Landscape Profile are reported in this report, although the species reported may not necessarily inhabit all or any part of the demarcated area.



Your area of interest may contain the following state and federally protected species. This data summary is based on coarse scale data (7.5 quad scale). For more information visit the [CNDDDB website](#).

BLUE=your area, RED=CNDDDB quads

Table of First 4 Federally Listed Species of Special Status. See Appendix A at end of report for the complete list and quad information.

Common Name	Scientific Name	Taxa	Listing
California red-legged frog	Rana draytonii	Vertebrate animal	Threatened
western snowy plover	Charadrius nivosus nivosus	Vertebrate animal	Threatened
coastal California gnatcatcher	Polioptila californica californica	Vertebrate animal	Threatened
southwestern willow flycatcher	Empidonax traillii extimus	Vertebrate animal	Endangered

Table of First 4 California Listed Species of Special Status. See Appendix B at end of report for the complete list and quad information.

Common Name	Scientific Name	Taxa	Listing
tricolored blackbird	Agelaius tricolor	Vertebrate animal	Threatened
Belding's savannah sparrow	Passerculus sandwichensis beldingi	Vertebrate animal	Endangered
southwestern willow flycatcher	Empidonax traillii extimus	Vertebrate animal	Endangered
least Bell's vireo	Vireo bellii pusillus	Vertebrate animal	Endangered

Human Population Based on 2010 Census

The Landscape Profile includes information about the population of people residing in the Profile area based on the latest census by the U.S. Census Bureau. The census aggregates data for census blocks that do not exactly match the boundaries of a Profile area. The Landscape Profile therefore adjusts the census data based on the proportions of census blocks within the Profile area. Information about languages spoken within the Profile area is included to support environmental outreach and education.

Population:	22 persons
Population Density:	980 persons per sq mile
Housing Units	13 units
Housing Units Density	563 units per sq mile

Language Spoken at Home based on the 2008-2012 American Community Survey	% Population out of 15 Total*
English	88%
Spanish or Spanish Creole	3%
German	1%
Persian	1%
Japanese	1%

**Note languages under 1% not reported.*

Developed Landcover based on NLCD 2011 Category

The Landscape Profile includes information about selected types of natural and unnatural land covers excluding surface waters. The information is derived from the National Land Cover Database 2011 (NLCD 2011). NLCD 2011 is the most recent product created by the Multi-Resolution Land Characteristics (MRLC) Consortium. NLCD 2011 uses a 16-class land cover classification scheme that has been applied consistently across the United States at a spatial resolution of 30 meters. At this time, the Profile summarizes information for six land cover classes. For more information about NLCD 2011 and MRLC, go to: <http://www.mrlc.gov/nlcd2011.php>

Approximately 9.5 acres / 0.015 miles² out of a total of 14.5 acres

Land Cover Class	Percent of Profile Data
Low Intensity Development	44%
Medium Intensity Development	42%
Developed Open Space	9%
High Intensity Development	5%

Appendices

This report was generated by the Landscape Profile Tool in EcoAtlas at www.ecoatlas.org. The report and the data found here within should be used for planning purposes only and is not intended to be survey or engineering quality. For more information about EcoAtlas data quality visit: <https://www.ecoatlas.org/data>.

Appendix A: Federally Listed Species of Special Status

Common Name	Scientific Name	Taxa	Status
California red-legged frog	<i>Rana draytonii</i>	Vertebrate animal	Threatened
western snowy plover	<i>Charadrius nivosus nivosus</i>	Vertebrate animal	Threatened
coastal California gnatcatcher	<i>Polioptila californica californica</i>	Vertebrate animal	Threatened
southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Vertebrate animal	Endangered
least Bell's vireo	<i>Vireo bellii pusillus</i>	Vertebrate animal	Endangered
tidewater goby	<i>Eucyclogobius newberryi</i>	Vertebrate animal	Endangered
steelhead - southern California DPS	<i>Oncorhynchus mykiss irideus</i> pop. 10	Vertebrate animal	Endangered
monarch - California overwintering population	<i>Danaus plexippus</i> pop. 1	Invertebrate animal	Candidate
quino checkerspot butterfly	<i>Euphydryas editha quino</i>	Invertebrate animal	Endangered
Pacific pocket mouse	<i>Perognathus longimembris pacificus</i>	Vertebrate animal	Endangered
southern sea otter	<i>Enhydra lutris nereis</i>	Vertebrate animal	Threatened
big-leaved crownbeard	<i>Verbesina dissita</i>	Vascular plant	Threatened
Laguna Beach dudleya	<i>Dudleya stolonifera</i>	Vascular plant	Threatened

Appendix B: California Listed Species of Special Status

Common Name	Scientific Name	Taxa	Status
tricolored blackbird	<i>Agelaius tricolor</i>	Vertebrate animal	Threatened
Belding's savannah sparrow	<i>Passerculus sandwichensis beldingi</i>	Vertebrate animal	Endangered
southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Vertebrate animal	Endangered
least Bell's vireo	<i>Vireo bellii pusillus</i>	Vertebrate animal	Endangered
Crotch bumble bee	<i>Bombus crotchii</i>	Invertebrate animal	Candidate Endangered
big-leaved crownbeard	<i>Verbesina dissita</i>	Vascular plant	Threatened
Laguna Beach dudleya	<i>Dudleya stolonifera</i>	Vascular plant	Threatened