

FINAL BIOLOGICAL BASELINE REPORT

OAK WOODLAND CONSERVATION AREA PROJECT

DECEMBER 2017



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1.0 INTRODUCTION

The County of Monterey (County) and City of Seaside (City) are engaged in meeting their Fort Ord Base Reuse Plan (Reuse Plan) policies and programs obligations related to oak woodland protection and conservation. The County is obligated to comply with Recreation Policy C-1, Biological Resources Policy B-2 and associated Programs B-2.1 and B-2.2, and Biological Resources Policy C-2 and associated Programs C-2.1 through C-2.5. The City is obligated to comply with Recreation Policy C-1, Biological Resources Policy B-2 and associated Programs B-2.1 and B-2.2, and Biological Resources Policy C-2 and associated Programs C-2.1 through C-2.6. These are identified in detail in **Section 2.2**, below. The Fort Ord Reuse Authority (FORA) is assisting these jurisdictions in funding and public outreach. Additionally, FORA is also assisting the County and City in coordinating their respective oak woodland management efforts with the University of California, Monterey Bay, Education, Science and Technology (UCMBEST); California State University, Monterey Bay (CSUMB); Monterey Peninsula College (MPC); Coordinated Resource Management Program (CRMP); City of Marina (Marina); and California Department of Veterans Affairs (CDVA).

Biological Resources Policy B-2 and Programs B-2.1 and B-2.2 require the County and City to designate an oak woodland conservation area within the polygons specified and manage and monitor the conservation area. FORA has contracted Denise Duffy & Associates, Inc. (DD&A) to identify a proposed oak woodland conservation area and prepare a draft management and monitoring plan (proposed project). This Biological Baseline Report presents the findings of a biological resources assessment conducted by DD&A for the project. The emphasis of this assessment is to establish a biological baseline for the identified polygons by reviewing recent biological and forestry reports, undertaking ground verification, and completing additional focused surveys, as determined necessary. Establishing the baseline conditions within the identified polygons will guide the selection of the proposed conservation area and future monitoring and management activities, including maintenance and monitoring activities and timing of activities, within the conservation area. As a component of establishing the baseline conditions, the County and City conducted public outreach with DD&A, to inform and engage community members and other stakeholders on the proposed project.

2.0 PROJECT DESCRIPTION

2.1 Project Description

The policies and programs related to the establishment of an oak woodland conservation area are requirements of the County and City. The County and City are to respectively designate, manage, and monitor conservation of oak woodlands within their jurisdictional property (i.e., the polygons identified in the Reuse Plan policies and programs) and coordinate this effort with neighboring jurisdictions. FORA has contracted DD&A to identify a proposed oak woodland conservation area, prepare a draft management and monitoring plan, and draft templates of an oak tree protection program and oak tree preservation ordinance (proposed project).

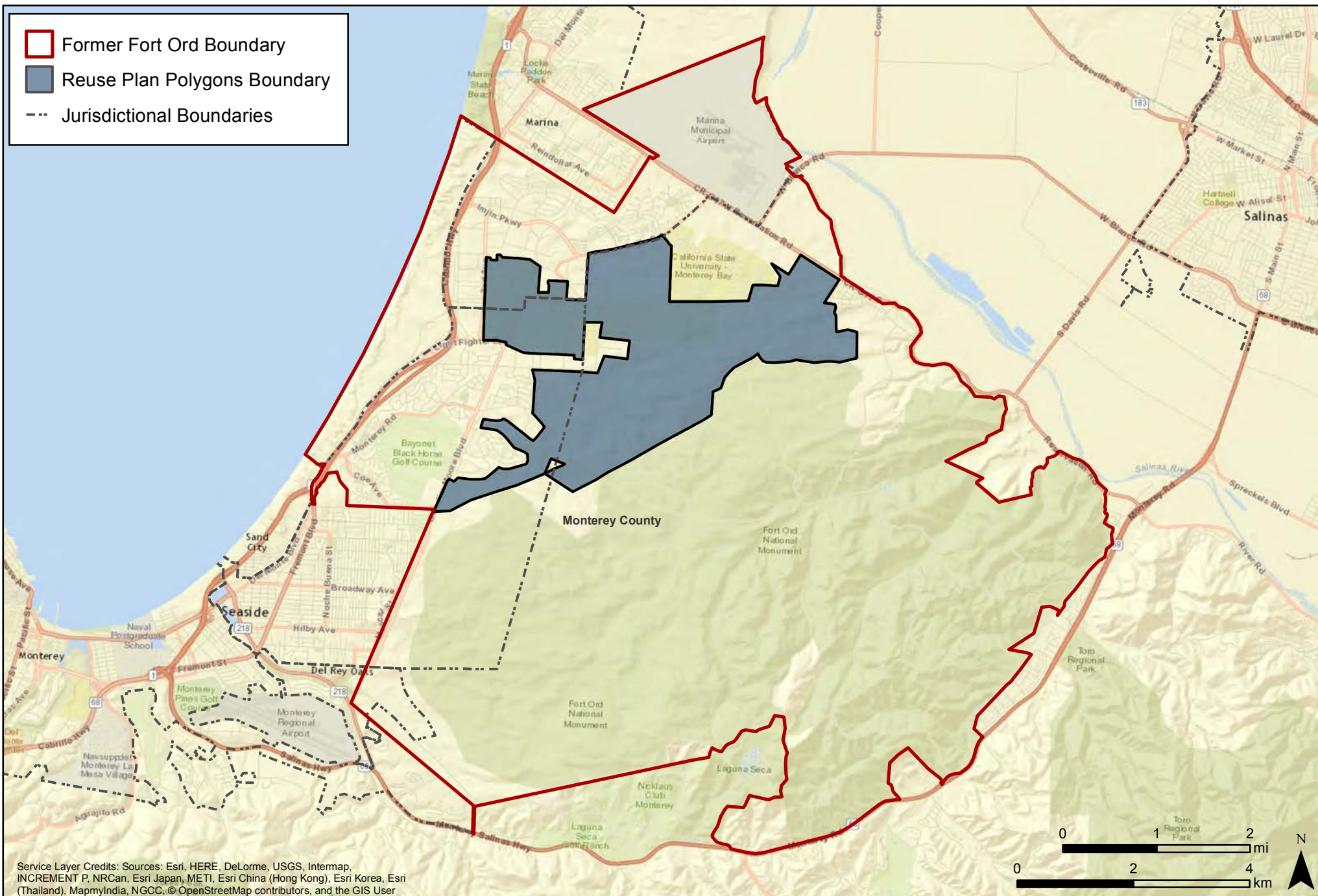
DD&A will utilize the data compiled in this Biological Baseline Report and input from the County and City input, public, and other jurisdictions to guide the selection of the proposed conservation area and future monitoring and management activities, including maintenance and monitoring activities and timing of activities, within the conservation area.

The goal of the proposed project is to fulfill the requirements of the Reuse Plan and Environmental Impact Report (EIR) by establishing an oak woodland conservation area and prepare a management and monitoring plan. The key conservation objectives identified in the County and City Reuse Plan policies and programs include:

- designate an oak woodland conservation area that connects the Habitat Management Areas (HMAs) to the south (Bureau of Land Management Fort Ord National Monument HMA), east (Habitat Corridor/Travel Camp HMAs), and north (Landfill HMA); and
- maintain large, contiguous block of oak woodland habitat.

2.2 Project Location and Area

The project site is located approximately 70 miles southwest of the City of San Jose and approximately eight miles southwest of the City of Salinas (**Figure 1**). The project site lies within former Fort Ord and includes the City of Seaside, City of Marina, and unincorporated Monterey County. **Figure 2** identifies the locations of the Reuse Plan polygons listed in the applicable Reuse Plan policies and programs. The project site, identified by the Reuse Plan Polygons Boundary on **Figure 3**, includes the Reuse Plan Development Polygons and several HMAs, and are referred to as “Evaluation Areas.” **Table 2-1** identifies the acreage of each Reuse Plan polygon and identifies the HMAs and Development designations within each polygon.



Title:

Vicinity Map

Date: 02/24/2017

Scale: 1 inch = 1.33 miles

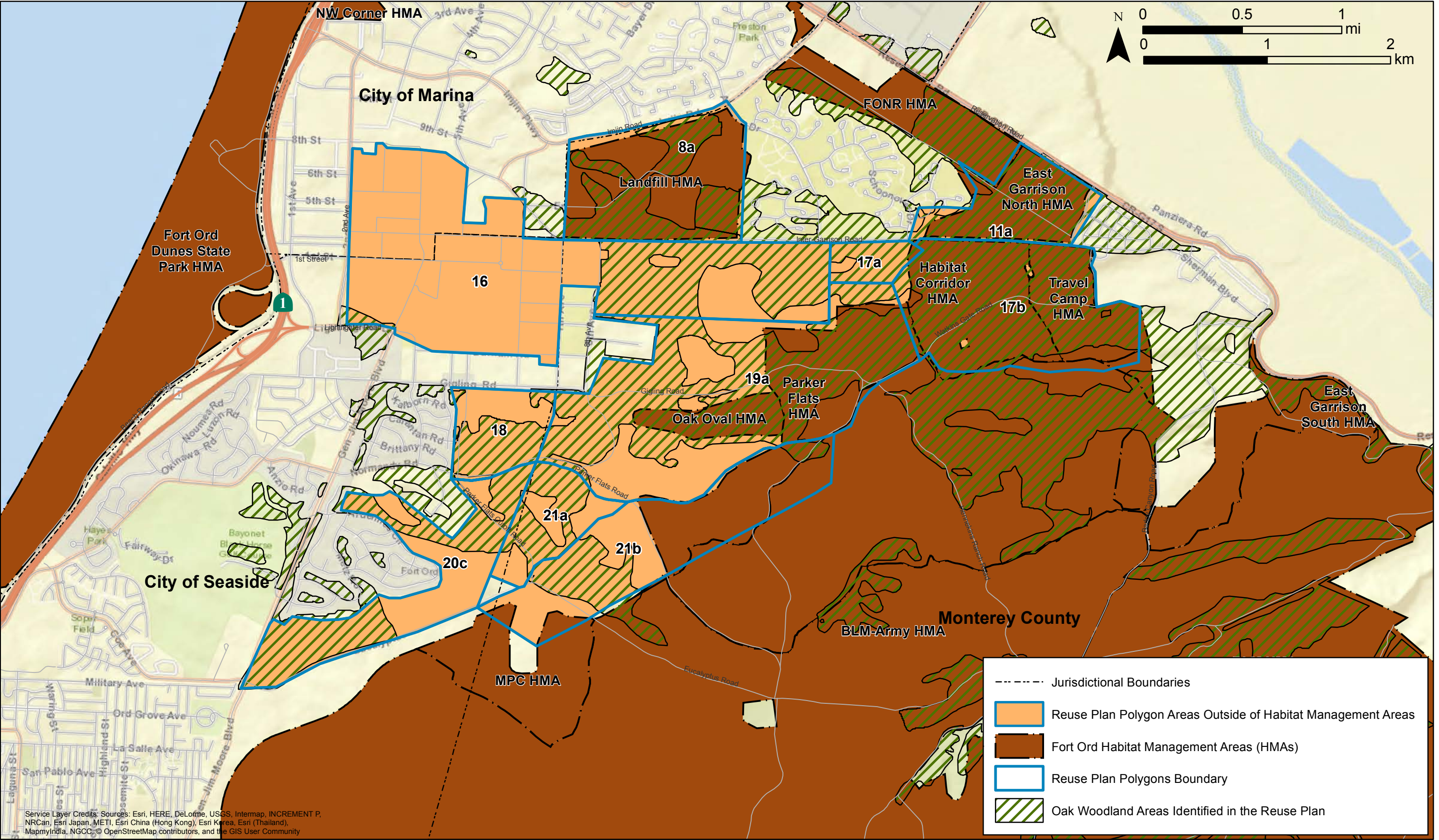
Project: 2016-29



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Figure

1

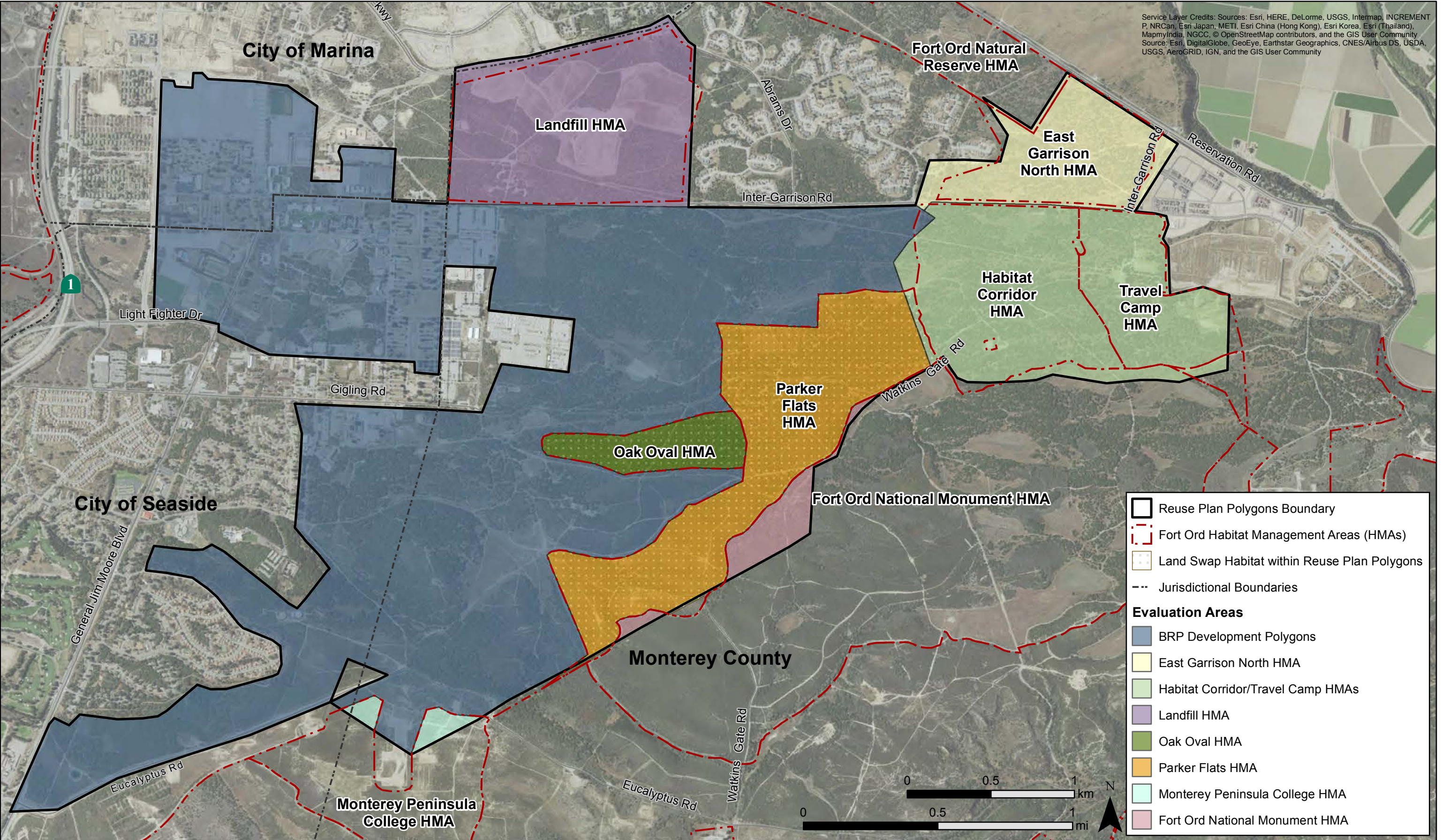


Title: **Reuse Plan Polygons**

Date: 02/24/2017
Scale: 1 in = 0.45 miles
Project: 2016-29

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Figure
2



Title: **Evaluation Areas Overview Map**

Date: 02/24/2017
Scale: 1 in = 0.33 miles
Project: 2016-29

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Figure
3

Table 2-1. Reuse Plan Polygons and Acreages

Reuse Plan Polygons	Acreage	Polygon Type
8a	341.2	Landfill HMA and Development
11a	173.2	East Garrison HMA and Development
16	881.8	Development
17a	52.0	Habitat Corridor HMA and Development
17b	431.7	Habitat Corridor HMA, Travel Camp HMA, and Development
18	126.7	Development
19a	766.3	Oak Oval HMA, Parker Flats HMA, and Development
20c	309.7	Development
21a	126.2	Development
21b	389.5	BLM FONM HMA, MPC HMA, and Development
Total	3,598.4	

2.3 Project Background

Fort Ord Base Reuse Plan

The former Fort Ord was downsized and realigned in 1991 pursuant to the Defense Base Closure and Realignment Act of 1990, commonly referred to as BRAC. Before the former Fort Ord property could be transferred from military to civilian use, the Reuse Plan and environmental review document on the Reuse Plan was required. The Reuse Plan was prepared and is the guiding policy document for the reuse and redevelopment of the former Fort Ord. An EIR was prepared to evaluate the potential impacts to the environment under the California Environmental Quality Act (CEQA) that may result from implementing the Reuse Plan, following the disposal of former Fort Ord lands by the Department of the Army (Army) (FORA, EMC, and EDAW, 1997). The Reuse Plan was adopted on June 13, 1997, and a republished version of the Reuse Plan in digital format was completed in September 2001, incorporating various corrections and errata. The EIR was certified on June 13, 1997, along with the adoption of the Reuse Plan. The Reuse Plan envisioned a long-range timeframe for redevelopment of the former Fort Ord, expecting the land supply to accommodate growth for 40 to 60 years. The reuse process has been underway for approximately 20 years of the anticipated timeframe.

Habitat Management Plan

The Army's decision to close and dispose of the Fort Ord military base was considered a major federal action that could affect listed species under the federal Endangered Species Act (ESA). The U.S. Fish and Wildlife Service (USFWS) issued a Final Biological Opinion (BO) on the disposal and reuse of former Fort Ord requiring that a Habitat Management Plan (HMP) be developed and implemented to reduce the incidental take of listed species and loss of habitat that supports these species (October 19, 1993). The HMP was prepared to assess impacts on vegetation and wildlife resources and provide mitigation for their loss associated with the disposal and reuse of former Fort Ord, so as not to jeopardize the long-term viability of special-status species, their populations, or sensitive habitats on former Fort Ord (U.S. Army Corps of Engineers [ACOE], 1997).

The HMP establishes guidelines for the conservation and management of species and habitats on former Fort Ord lands by identifying lands that are available for development, lands that have some restrictions with development, and habitat reserve areas. The intent of the plan is to establish large, contiguous habitat conservation areas and corridors to compensate for future development in other areas of the

former base. The HMP identifies what type of activities can occur on each parcel at former Fort Ord and designates parcels as “development with no restrictions,” “habitat reserves with management requirements,” or “habitat reserves with development restrictions.” The HMP has been approved by the USFWS; the HMP, deed restrictions, and Memoranda of Agreement between the Army and various land recipients provide the legal mechanism to assure HMP implementation. It is a legally binding document, and all recipients of former Fort Ord lands are required to abide by its management requirements and procedures.

The CRMP program is a multi-agency multi-jurisdictional land use planning effort developed under the sponsorship of the California CRMP Memorandum of Understanding (MOU) (FORA et.al., 2003). This MOU has been signed by 14 federal and state agencies, including the Bureau of Land Management (BLM), California Department of Fish and Wildlife (CDFW), USFWS, Monterey County, and University of California. The CRMP program provides a mechanism for public agencies to share resources to deliver the most efficient habitat protection and public services for the money expended.

Reuse Plan Policies and Programs

The Reuse Plan accommodated the HMP, incorporating the HMP’s habitat management requirements and identifying policies and programs to guide the implementation of the HMP. The Reuse Plan also identified additional policies and programs to protect natural resources within the former Fort Ord. These policies and programs are listed in Section 4.4.3-Biological Resources Section of the Conservation Element of the Reuse Plan.

Regarding oak woodland habitat, the EIR identified that the implementation of the Reuse Plan would result in the loss of oak trees within an area of approximately 1,584 acres, due to new construction and development. This represented approximately 34% of the oak woodland and savanna habitat on the former Fort Ord (i.e., total of 4,666 acres). The EIR found that this impact would potentially degrade important habitat values and visual qualities over large areas of former Fort Ord. Through implementation of the HMP, the EIR stated approximately 2,550 acres of this habitat would be preserved and the remainder would occur amidst land uses of varying density (approximately 2,450 acres). The largest contiguous areas of coast live oak woodland are currently within the central portion of the former Fort Ord between Reservation Road and Eucalyptus Road. Although implementation of the HMP would preserve some of this oak woodland within conservation areas, the Reuse Plan proposes to preserve an additional contiguous stand of oak woodland that connects to the areas preserved by the HMP. This would maintain the value of this habitat in the central portion of the former Fort Ord.

The Conservation Element of the Reuse Plan includes policies and programs that require the establishment of an oak woodland conservation area that connects the oak woodland in the central portion of the former Fort Ord to the open space lands of the habitat management areas (HMAs) established by the HMP. Specifically, these are the BLM Fort Ord National Monument on the south, the oak woodland in the County Habitat Corridor/Travel Camp and East Garrison area to the east, and the oak woodlands surrounding the Landfill on the north. The Conservation Element also includes policies and programs for the preservation and enhancement of oak woodland elements in the natural and built environments.

The EIR identified applicable policies and programs that would establish the oak woodland conservation area and preserve oak woodland elements. The EIR found that large contiguous areas of oak woodland

habitat would be retained through implementation of the Reuse Plan policies and programs that require the establishment of an oak woodland conservation area, and the preservation of oak woodland within the HMAs established by the HMP. The EIR further concluded that the BRP policies and programs would minimize loss of oak trees through careful site design in development areas and effectively requiring a 1:1 replacement for all trees removed (as called for in the Monterey County ordinance, see Biological Resources Policy C-2.2 below). Therefore, with the establishment of an oak woodland conservation area, preservation of oak woodlands within the HMAs, and implementation of the policies and programs related to site design and tree replacement, potential impacts to oak woodlands resulting from implementation of the Reuse Plan were found to be less-than-significant.

The specific policies and programs related to the establishment of an oak woodland conservation area (taken from the EIR except where noted) are listed below.

Monterey County Policies

Biological Resources Policy B-2: As site-specific planning proceeds for Polygons 8a, 16, 17a, 19a, 21a, and 21b, the County shall coordinate with the Cities of Seaside and Marina, California State University, FORA and other interested entities in the designation of an oak woodland conservation area connecting the open space lands of the habitat management areas on the south, the oak woodland corridor in Polygons 17b and 11a on the east, and the oak woodlands surrounding the former Fort Ord landfill in Polygon 8a on the north.

Program B-2.1: For lands within the jurisdictional limits of the County that are components of the designated oak woodland conservation area, the County shall ensure that those areas are managed to maintain or enhance habitat values existing at the time of base closure so that suitable habitat is available for the range of sensitive species known or expected to use those oak woodland environments. Management measures shall include, but not be limited to maintenance of a large, contiguous block of oak woodland habitat, access control, erosion control and non-native species eradication. Specific management measures should be coordinated through the CRMP.

Program B-2.2: For lands within the jurisdictional limits of the County that are components of the designated oak woodland conservation area, the County shall monitor, or cause to be monitored, those areas in conformance with the habitat management compliance monitoring protocol specified in the HMP Implementing/Management Agreement and shall submit annual monitoring reports to the CRMP.

Objective C: Promote the goals of the Habitat Management Plan through the sensitive siting and integration of recreation areas which enhance the natural community. (Reuse Plan)

Recreation Policy C-1: Monterey County shall establish an oak tree protection program to ensure conservation of existing coastal live oak woodlands in large corridors within a comprehensive open space system. Locate local and regional trail within this system. (Reuse Plan)

Biological Resources Policy C-2: The County shall preserve and enhance the oak woodland elements in the natural and built environments.

Program C-2.1: The County shall cluster development wherever possible so that contiguous stands of oak trees can be maintained in the non-developed natural land areas.

Program C-2.2: The County shall apply restrictions for the preservation of oak and other protected trees in accordance with Chapter 16.60 of Title 16 of the Monterey County Code (Ordinance No. 3420).

Program C-2.3: The County shall require the use of oaks and other native plant species for project landscaping. To that end, the County shall collect and propagate acorns and other plant material from former Fort Ord oak woodlands to be used for restoration areas or as landscape plants. However, this program does not exclude the use of non-native plant species.

Program C-2.4: The County shall provide the following standards for plantings that may occur under oak trees: 1) planting may occur within the dripline of mature trees, but only at a distance of five feet from the trunk; and 2) plantings under and around oaks should be selected from the list of approved species compiled by the California Oak Foundation (see *Compatible Plants Under and Around Oaks*).

Program C-2.5: The County shall require that paving within the dripline of preserved oak trees be avoided wherever possible. To minimize paving impacts, the surfaces around tree trunks shall be mulched, paving materials shall be used that are permeable to water, aeration vents shall be installed in impervious pavement, and root zone excavation shall be avoided.

City of Seaside Policies

Biological Resources Policy B-2: As site-specific development plans for a portion of the Reconfigured POM Annex Community (Polygon 20c) and the Community Park in the University Planning Area (Polygon 18) are formulated, the City shall coordinate with Monterey County, California State University, FORA and other interested entities in the designation of an oak woodland conservation area connecting the open space lands of the habitat management areas on the south to the landfill polygon (8a) in the north.

Program B-2.1: For lands within the jurisdictional limits of the City that are components of the designated oak woodland conservation area, the City shall ensure that those areas are managed to maintain or enhance habitat values existing at the time of base closure so that suitable habitat is available for the range of sensitive species known or expected to use these oak woodland environments. Management measures shall include, but not limited to maintenance of a large, contiguous block of oak woodland habitat, access control, erosion control and non-native species eradication. Specific management measures should be coordinated through the CRMP.

Program B-2.2: For lands within the jurisdictional limits of the City that are components of the designated oak woodland conservation area, the City shall monitor, or cause to be monitored, those areas in conformance with the habitat management compliance monitoring protocol specified in the HMP Implementing/Management Agreement and shall submit annual monitoring reports to the CRMP.

Objective C: Promote the goals of the Habitat Management Plan through the sensitive siting and integration of recreation areas which enhance the natural community. (Reuse Plan)

Recreation Policy C-1: The City of Seaside shall establish an oak tree protection program to ensure conservation of existing coastal live oak woodlands in large corridors within a comprehensive open space system. Locate local and regional trail within this system. (Reuse Plan)

Biological Resources Policy C-2: The City shall encourage the preservation and enhancement of oak woodland elements in the natural and built environments.

Program C-2.1: The City shall adopt an ordinance specifically addressing the preservation of oak trees. At a minimum, this ordinance shall include restrictions for the removal of oaks equal to or greater than six inches in diameter 2 feet off the ground, requirements for obtaining permits for removing oaks of the size defined, and specifications for relocation and/or replacement of oaks removed. During construction, trees, or groups of trees, that may be affected by construction activities shall be fenced off at the dripline.

Program C-2.2: When reviewing project plans for developments within oak woodlands, the City shall cluster development wherever possible so that contiguous stands of oak trees can be maintained in the non-developed natural land areas.

Program C-2.3: The City shall require project applicants to submit a plot plan of the proposed development which: 1) clearly shows all existing trees (noting location, species, age, health, and diameter; 2) notes whether existing trees will be retained, removed or relocated, and 3) notes the size, species, and location of any proposed replacement trees.

Program C-2.4: The City shall require the use of oaks and other native plant species for project landscaping. To that end, the City shall require collection and propagation of acorns and other plant material from Fort Ord oak woodlands to be used for restoration areas or as landscape material.

Program C-2.5: The City shall provide the following standards for plantings that may occur under oak trees; 1) plantings may occur within the dripline of mature trees, but only at a distance of five feet from the trunk and 2) plantings under and around oaks should be selected from the list of approved species compiled by the California Oak Foundation (see *Compatible Plants Under and Around Oaks*).

Program C-2.6: The City shall require that paving within the dripline of preserved oak trees be avoided wherever possible. To minimize paving impacts, the surfaces around tree trunks shall be mulched, paving materials shall be used that are permeable to water, aeration vents shall be installed in impervious pavement, and root zone excavation should be avoided.

HMP Amendment

FORA and County submitted modifications to the original 1997 HMP to the Army and USFWS for approval. The proposed modifications were described in the Land Swap Agreement (LSA) document prepared by Zander Associates and were submitted to the Army for review and consideration (Zander Associates, 2002). The Army determined that the goals and objectives of the HMP would be met through

implementation of the modifications and requested concurrence from the USFWS on that finding. The USFWS agreed that the proposed modifications were consistent with the resource protection goals of the HMP and concluded that the level of effects on HMP species would not exceed those already addressed in the BO 1-8-99-F/C-39R (USFWS, 2002).

The Army and USFWS approved the boundary changes and other HMP modifications, which allowed residential and commercial development at East Garrison on an additional 210 acres of oak woodland, maritime chaparral, and grassland communities that would have been preserved under the original HMP. In exchange, the amendments to the habitat reserve set aside over 450 acres of land to support biotic communities at Parker Flats, which was previously designated for development. Thus, some additional 240 acres of habitat were preserved under the amended HMP than under the original HMP. Among other biological benefits, the land swap resulted in approximately 60 acres of additional oak woodland in conservation in the central portion of the former Fort Ord, increasing the connection of habitat between the HMAs to the south with the HMAs to the east and north.

2.4 Public Participation Process

On February 9, 2016, FORA distributed a Request for Proposals (RFP) for Consultant Services to “Complete the Draft Oak Woodland Conservation Area Map and Draft Oak Woodland Area Management and Monitoring Plan” (OWCP or proposed project). DD&A was awarded the contract to perform the services outlined in the RFP. Within the RFP, Task 2: Public Participation Process, specified that the consultant shall develop and conduct two (2) community project initiation meetings: one (1) for the City of Seaside and one (1) for Monterey County to solicit discussion and public comment on Oak Woodland Conservation.

To fulfill the task requirement, two community project initiation meetings were held. The first was on Tuesday, November 15, 2016, from 6:00 to 8:00 PM, at the Seaside Community Center at Soper Field located at 220 Coe Avenue, Seaside, California. The second was held on Saturday, November 19, 2016, from 10:00 AM to 12:00 PM at the Trackview Pavilion at Laguna Seca Recreation Area, 1025 Monterey Hwy 68, Monterey, California. At these meetings, the County, City and DD&A presented the proposed project to the public for comment and input regarding oak woodland conservation. Public notices were placed in local newspapers and email notifications were sent informing the general public of the community meetings. In addition, a website has been created for the project.

To facilitate discussion and ensure everyone had a chance to provide input, comment cards were placed at the door and on all the discussion tables. Additionally, each table was provided a map as well as biological and other important values tables, and asked to identify areas or values that were important to their interest using stickers, post-it notes, and markers provided. A facilitator documented verbal comments on a poster board at each discussion table.

Below is a synthesis of the combined comments regarding biological resources, as well as other resources, received at the community project initiation meetings and also those submitted separately via email. For more detailed information, please see the project website, www.oakwoodlands.org, which includes all comments received to date.

Biological Resources

- Stresses protecting the environment while maintaining revenue to provide services on trails.
- Emphasizes preserving qualities of oak woodlands that are uniquely beautiful and natural.
- Prioritizes wildlife corridors and habitat connectivity.
- Supports that native plant resources be maintained.
- Concerns that appropriate parameters for dying oak are incorporated.
- Places priority on alternative habitat.
- Places priority on appropriate level of research and sharing of information.
- Concerns for the baseline from which oak woodlands are being measured.
- Concerns for new roads going through the oak woodland conservation areas and disrupting habitat and wildlife.
- Places priority on sandhill oak woodlands.
- Places high importance on connectivity between Seaside and Landfill parcel for high quality habitat.
- Encourages conservation in lieu of restoration for oak mitigation at high management levels.
- Suggests areas for off-trail use, comments this is key for stewardship/education/conservation.
- Suggests metrics be developed for oak woodland.
- Places high importance on maintaining diversity.

Other Important Resources

- Concerns with future proposed development in the Oak Oval and its effects on other users.
- Emphasizes trail quality important.
- Supports integrated trail management and regional connections.
- Recommends more facilities and bathrooms at trailheads.
- Supports campgrounds as a good type of development in oak woodlands.
- Prefers more signage, parking, and trail access at key hiking locations.
- Concerns for air quality in the area.
- Concerns for roads being too close to trails, must maintain buffers.
- Supports multiple use trails, however there needs to be a safety and respect maintained, such as right-of-way yield signs and bike speed limits.
- Highlights several important areas for conservation or use (hiking/walking, mountain biking, equestrian uses).
- Concerns with how development will affect walking areas and open space.
- Promotes uses for fitness and youth activities.
- Suggests bike pump tracks and service stations (cell phone chargers) and tools/service station
- Suggests ensuring equestrian trails meet National Equestrian Association standards for trails.
- Concerns for land identified in Reuse Plan for development will remain development parcels.

- Places importance on land surrounding CSUMB to be developed to serve students, such as restaurants and shops.
- Suggests specific areas for coffee shops, bike shops, hostels, trailheads, and parking.
- Suggests interpretive center close to trails.
- Suggests more garbage cans.
- Proposes more bus/transit access and ADA access.
- Proposes wayfinding for regional connections including FORTAG, from HWY 1, and CSUMB.
- Suggests separate horse trails and horse trailer parking.
- Proposes dog litter bags provided on trails.
- Promotes gentle uses, such as eco-tourism.
- Recognizes the value of oaks/trails for development.
- Concerns for about illegal dumping, suggests restricting access.
- Concerns for preservation of archeological Native American sacred sites.
- Concerns for maintaining utility easements and fire breaks, and potentially use for higher impacts trails such as mountain biking.
- Concerns for certain uses on trails were expressed, such as equestrian and mountain biking.
- Concerns for timing of developing oak woodland conservation areas and the requirements set forth in the Fort Ord Base Reuse Plan.
- Concerns for maintaining the balance between development and conservation.

3.0 METHODS

3.1 Background Data Collection

Background data evaluated included data collected during previous surveys conducted within portions of the Reuse Plan Polygons Boundary for several other projects. Data collected during these surveys were gathered and utilized to the greatest extent feasible within this analysis for efficiency and consistency. These projects are identified below in **Table 3-1** with the dates of relevant surveys.

Table 3-1. Biological Survey Dates from Previous Projects

Project	Survey Area	Survey Type	Date(s)	Acres
<i>Monterey Salinas Transit (MST) Facility/ Whispering Oaks Business Park</i>	MST Facility/ Whispering Oaks Business Park Project Site	Focused spring-flowering plant species, general and sensitive habitats, and reconnaissance-level wildlife surveys	2009: April 2 & 3; June 16 & 17; and July 10	Approximately 56
<i>MST Facility/Whispering Oaks Business Park</i>	Proposed offsite drainage system near 8 th and Inter-Garrison intersection	Focused spring-flowering plant species, general and sensitive habitats, and reconnaissance-level wildlife surveys	2010: April 2	Approximately 15
<i>MST Facility/Whispering Oaks Business Park</i>	Proposed gas regulator station north of Engineering Equipment Road	Focused summer-flowering plant species, general and sensitive habitats, and reconnaissance-level wildlife surveys	2010: June 15	Approximately 1.09
<i>California Central Coast Veterans Cemetery (CCCVC) and Eastside Parkway</i>	CCCVC Project site north of Parker Flats Cutoff and Eastside Parkway Project site	Focused spring- and summer-flowering plant species, general and sensitive habitats, and reconnaissance-level wildlife surveys	2010: July 20 & 29 2011: April 11-13, 15, & 18 and July 5	Approximately 197
<i>Monterey Downs</i>	Monterey Downs Project site	Focused spring- and summer-flowering plant species, general and sensitive habitats, wetland assessment, and reconnaissance-level wildlife surveys	2011: April 19-22 & 25-25; May 9; and July 5 & 14	Approximately 710 (including areas surveyed for CCCVC and Seaside Corp Yard as part of the same survey effort)
<i>CSUMB Transportation Demand Measure (TDM) Project</i>	CSUMB TDM Project site and soil lay down areas	Focused spring-flowering plant species, general and sensitive habitats, and reconnaissance-level wildlife surveys	2015: April 15 2016: April 11 & 12 and June 1	Approximately 16
<i>Munitions of Explosive Concern (MEC) Biological Monitoring</i>	“BLM Area B” and proposed “containment lines” (includes portions of Fort Ord National Monument HMA)	General habitat survey	2016: May 2-4	Approximately 1,440

In addition, multiple forestry surveys have been conducted for within portions of the Reuse Plan Polygons Boundary for several of the projects identified in **Table 3-1**. The forestry reports that were prepared for these projects and the dates are identified below, in **Table 3-2**.

Table 3-2. Forestry Reports from Previous Projects

Project	Surveyor	Date(s)	Acres Sampled or Assessed	# of Plots
<i>MST Facility/Whispering Oaks Business Park</i>	Bill Ruskin, Certified Professional Forester	August 2009	Approximately 26	0 (entire project site was walked)
<i>CCCVC</i>	Staub Forestry & Environmental Consulting	November 2010	Approximately 1.6	16
<i>Eastside Parkway</i>	Staub Forestry & Environmental Consulting	September 2011	Approximately 2.9	29
<i>Monterey Downs</i>	Staub Forestry & Environmental Consulting	August 2012	Approximately 3.2	32
Total			33.7	77

DD&A compiled and reviewed the data from previous projects, using the data to identify areas where biological surveys for the project should focus. Following review of the background data, DD&A surveyed the entire project site, as described below.

3.2 Data Sources

The primary literature and data sources reviewed included, but was not limited to, the following:

- *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord* (HMP) (ACOE, 1997);
- *Fort Ord Reuse Plan & Elements* EIR (FORA/EMC/EDAW, 1997);
- *Forest Resource Evaluation, Monterey Downs, Monterey, California* (Staub Forestry and Environmental Consulting, 2012);
- *Forest Resource Evaluation, California Central Coast Veteran's Cemetery, Monterey, California* (Staub Forestry and Environmental Consulting, 2010);
- *Forest Resource Evaluation, Whispering Oaks Business Park, Monterey, California* (Ruskin, 2009);
- *Master Plan California Central Coast Veterans Cemetery; Seaside, California* (Wood Rodgers, 2015);
- *Assessment East-Garrison – Parker Flats Land Use Modification Fort Ord, California* (Zander Associates, 2002);
- *Memorandum of Understanding Concerning the Proposed East Garrisons/Parker Flats Land-Use Modification*. (FORA, MPC, BLM, U.S. Army, 2003);
- *Flora and Fauna Baseline Study of Fort Ord, California* (ACOE, 1992); and
- *Soil Survey of Monterey County* (U.S. Department of Agriculture [USDA], 1978).

3.3 Baseline Report Survey Methods

As part of assessing existing baseline conditions DD&A conducted surveys of the project site, which is approximately 3,598 acres. DD&A reviewed recent aerial images of the project site and then walked, drove, and/or biked the accessible portions of the project site to ground truth and collect data.

Personnel and Survey Dates

Biological surveys were conducted within the project site by DD&A biologists, Josh Harwayne (Senior Environmental Scientist), Matthew Johnson (Senior Environmental Scientist), Jami Davis (Associate Environmental Scientist), Shaelyn Hession (Assistant Environmental Scientist), and Patric Krabacher (Assistant Environmental Scientist) from December 5-12, 2016. These surveys included mapping of vegetation types, invasive plant populations, and erosion features. Additionally, a forestry survey was conducted by certified arborist and forester, Frank Ono, with assistance by Patric Krabacher that included a tree inventory, tree conditions, forest health, oak regeneration, and landmark trees. The entire project site was surveyed and mapped as part of this effort. Details for each of these survey efforts are identified below.

Vegetation Type Mapping

The detailed vegetation data collected for the projects identified in **Table 3-1** above were used as a starting point for vegetation mapping within the project site. Vegetation types within these project sites were mapped using a combination of GPS and hand drawing on aerial maps, which were later digitized using ArcGIS software. Initial mapping of vegetation types in the remaining portions of the project site was conducted using the current natural communities data for the former Fort Ord prepared for the *Draft Fort Ord Multi-species Habitat Conservation Plan* and aerial maps provided by ESRI (please refer to the figures for aerial image credits) and Google Earth (imagery date: April 13, 2015). A field verification of all areas was then conducted and the mapping was modified based on current ground conditions.

The generalized vegetation classification schemes for California described by Holland (1986) and Sawyer et al. (2009) were consulted in classifying the vegetation of the project site. The final classification and characterization of the vegetation of the project site was based on field observations. A generalized nomenclature for vegetation types is used within this document for ease of reference; however, each vegetation type description also lists the *Manual of California Vegetation* (Sawyer et al., 2009) vegetation type(s) for cross-reference purposes. Scientific nomenclature for plants in this report follows Baldwin, et al., (2012) and the Jepson Online Interchange for California floristics (Jepson Flora Project, 2009), and common names follow Matthews and Mitchell (2015). A full botanical inventory was not recorded for the project site; however, the dominant species within each habitat were recorded. Dominant plant species are those which are more numerous than its competitors in an ecological community or makes up more of the biomass; generally, the species that are most abundant. Most ecological communities are defined by their dominant species. The entire project site was surveyed for vegetation types following the applicable guidelines outlined in: *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW, 2009) and *CNPS Botanical Survey Guidelines* (CNPS, 2001). Survey methods included compiling relevant botanical information for the general project area; systematic surveying of the entire project site by qualified personnel; producing a map of natural communities present; and describing vegetation communities present using vegetation types identified in *A Manual of California Vegetation* (Sawyer et al., 2009).

Invasive Plant Mapping

A survey of the project site was conducted to identify the approximate location of plant species identified as invasive in the *California Invasive Plant Inventory* (California Invasive Plant Council [Cal-IPC],

2006). The survey focused on species with a Cal-IPC rating of high or moderate, as well as non-native species known to be a particular issue on the Former Fort Ord, despite the Cal-IPC rating. The survey was conducted by first identifying areas on aerial images provided by ESRI and Google Earth that appeared disturbed or to have large populations of invasive plants (e.g., large ice plant [*Carpobrotus edulis*] and eucalyptus [*Eucalyptus* sp.] stands can be easily identified on high quality aerial maps). These areas, as well as other accessible areas (such as trails and roads) were then actively surveyed on foot or mountain bike to map the location and species of invasive plants using a combination of GPS and hand drawing on aerial maps. Invasive species were mapped on a large scale, often as part of a mosaic, and were later digitized using ArcGIS software.

Observations of eucalyptus and acacia (*Acacia* sp.) were included in field notes as an invasive; however, pine trees (*Pinus* sp.) present within the project site were not noted; pine trees are not native to the former Fort Ord and were likely planted there; however, they are not considered invasive. Other invasive species noted during the assessment included jubata grass (*Cortaderia jubata*) and French broom (*Genista monspessulana*). As the visual assessment was conducted in December, outside of the growing season for many species, the classification of “Highly Disturbed” was assigned to areas that supported or had the potential to support sizable populations of non-native/invasive herbaceous species, such as non-native thistles and poison hemlock (*Conium maculatum*), which were not identifiable at the time.

Erosion Feature Mapping

A survey of the project site was conducted to identify erosion features. Erosion features were defined as actively eroding areas that could expand over time and could adversely affect habitat function and value. The survey was conducted by first identifying open areas where erosion may be occurring on aerial images provided by ESRI and Google Earth. These areas, as well as other accessible areas (such as trails and roads), were then surveyed on foot or mountain bike to map the extent of current eroded soil and soil deposits using GPS, which was later digitized using ArcGIS software. Additionally, slope data was reviewed in ArcGIS software to assess identify areas with slopes 30% or greater.

Forestry Survey

A Forestry Report was prepared for the proposed project (**Appendix A**). Thirty-one one, stratified 1/10-acre sample plots for the tree inventory and conditions assessment were conducted within the coast live oak woodland utilizing the mapping for the project site provided by DD&A. Plot sampling and a reconnaissance-level survey for the sample areas were conducted in December 2016. Points for the plot sampling were selected haphazardly using ArcGIS within the oak woodland habitat (Figure 1 of the Forestry Report, **Appendix A**). However, if the points fell within woodland areas not easily accessible, the nearest accessible point was selected. The nearest point was selected by the arborist using professional judgement and experience to get the best representation of the total tree population and be indicative of the overall health of the woodland. The sampling method utilized was intended to approximate the average condition for the entire area as a whole.

Aerial photography, previous forest resource assessments, and inventory information conducted by Staub Forestry & Environmental Consulting were also reviewed along with field observations to prepare the forest resource evaluation (**Appendix A**). The routes utilized for random sampling traversed both areas of open canopy conditions subject to recreational uses (e.g., walking, biking, and horseback riding) along

with other areas farther away from used roadways and paths, which receive minimal human use due to the densely vegetated stands of closed canopy coast live oak and native understory.

Oak Tree Population by Size and Class Density

Oak classifications are listed by diameter size class 6-11", 12-23", and 24" or greater measured at two feet above ground level, per Title 21 Section 21.64.260 of the Monterey County Zoning Ordinance and City of Seaside Municipal Code Chapter 8.54, and is reported on a per acre basis. For the purpose of the inventory/assessment, an individual tree was judged to have a minimum of one foot of separation from any other adjacent stem at ground level. This approach is used because coast live oak trees, especially in this location and setting (see **Section 4.1, Vegetation Types**, below for more information), typically shows as a "cluster" or "grouped" growth form, making the definition of an individual tree difficult and impractical to distinguish. In many cases, these "clusters" of stems share a common root system, joined at the pith area just below the litter duff area giving an appearance of individual stems when they are in actuality one tree with codominant stems.

Landmark Trees

Landmark trees are defined as a tree measuring 24" in diameter or greater, measured at two feet above ground, or trees that are visually significant, historically significant, or exemplary of their species (per County Code).

Tree Health and Vigor

Tree health and condition is evaluated by visually inspecting from the root crown (where the trunk meets natural grade) to foliar canopy and recorded on a percent of stand basis as follows:

- Good: little appearance of rot or disease, good canopy development and color;
- Fair: thriving with minor evidence of disease or decay and less than 30% foliar dieback;
- Poor: declining with major evidence of foliar dieback, disease/decay, and/or poor foliage color; and
- Dead: in irreversible decline or dead and are counted as poor due to habitat value.

3.4 Level of Analysis and Survey Limitations

Due to the large size of the project site, surveys were limited primarily to open areas and areas accessible from trails and roads. While some of the survey effort was conducted away from these open areas, an effort was not made to enter into dense vegetation unless specific areas in need of surveying were identified using aerial maps. Other obstacles encountered during field work included large patches of poison oak (*Toxicodendron diversilobum*), which limited access or blocked the line-of-sight of the observer. In these cases, the assumption was made that the area contained a homogeneous habitat of poison oak.

The survey for vegetation types relied heavily on aerial photographs and vegetation types were mapped on a large scale using these aerials. While an effort was made to verify the vegetation types by surveying on foot, most vegetation type boundaries were not mapped using GPS and, therefore, the boundaries between vegetation types are only accurate at the scale at which they were mapped. Due to the time of

year, a complete list of dominant species within each vegetation type was not feasible, and, therefore, common dominant species are identified in the vegetation type descriptions.

The survey for invasive species was conducted outside of the growing season for many species, such as non-native grasses, non-native thistles, poison hemlock (*Conium maculatum*), Bermuda buttercup (*Oxalis pes-caprae*). As such, specific populations of these and other herbaceous invasive species could not be identified at the time of the surveys. An effort was made to identify highly disturbed areas that may potentially contain invasive herbaceous species; however, additional surveys would be necessary at the appropriate time of year to identify specific populations of these species.

This report estimates oak tree population (no other tree species were sampled) based on current forest metrics, which involves sampling subplots and extrapolating the results by the number of acres of oak woodland. As a result, not every oak tree was inventoried as part of this project.

Although there were limiting factors, the surveys conducted were adequate to evaluate the resources at the scale necessary for this project.

4.0 RESULTS

4.1 Vegetation Types

The survey results include mapping and quantification of the acreage of vegetation types within the project site (**Figure 4**). **Table 4-1** provides the acreages of the vegetation types within the project site. A brief description of each of vegetation type can be found below. In addition, each vegetation type description begins with listing the *Manual of California Vegetation* (Sawyer et al., 2009) classification for cross-reference purposes.

Coast Live Oak Woodland

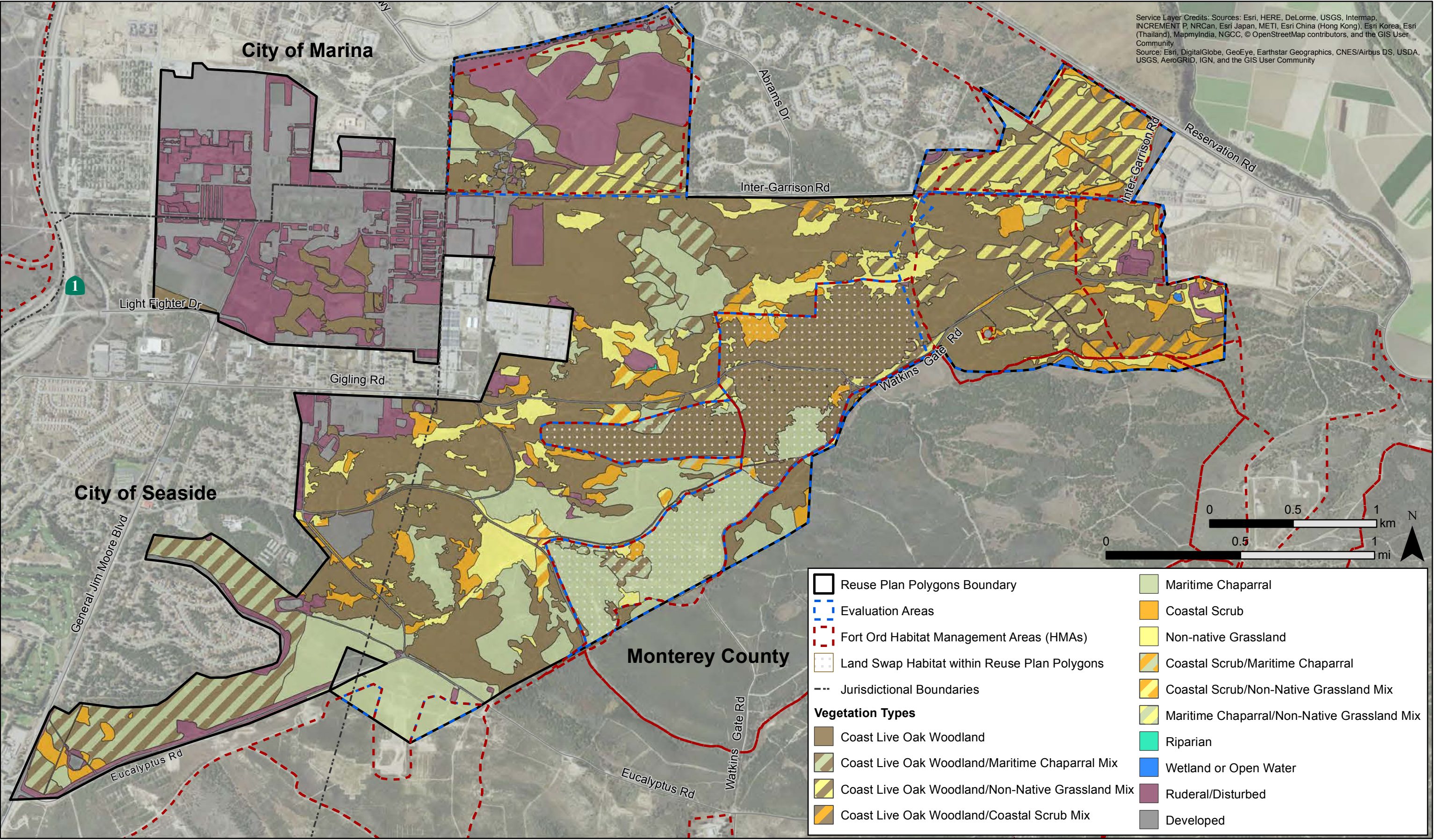
- **A Manual of California Vegetation classification:** coast live oak woodland (*Quercus agrifolia*/*Toxicodendron diversilobum*/grass association)

Coast live oak woodland is an open-canopied to nearly closed-canopied community with a grass or sparsely scattered shrub understory. Oak woodlands are generally defined as places where oaks cover more than 10% of the ground when seen from above (“canopy cover”) (Oak Woodlands Conservation Act [PRC 21083.4], Fish and Game Code 1361). Three coast live oak communities, each with different growth characteristics, understory associates, and canopy cover, have been recognized on the former Fort Ord: coastal coast live oak woodland, inland coast live oak woodland, and coast live oak savanna (ACOE, 1992). “Coastal” coast live oak woodland is the dominant vegetation type within the project site (**Figure 4**). The distinction of “coastal” is given based on the proximity of the coast live oak woodland to the coast. In coastal coast live oak woodland, coast live oaks grow in unprotected sites and are exposed to the combined stresses of strong winds, salt spray, and sterile, sandy soils, which are often referred to as “sand hills.” These environmental factors create an oak woodland characterized by short, wind-pruned trees that intergrades with the surrounding coastal scrub and maritime chaparral communities.

Oak woodlands within the project site are largely homogeneous, in species composition. Within the project site, the canopy is quite dense in many areas with an understory dominated by poison oak or, in some areas, invasive ice plant. Other plant species observed within the coast live oak woodland include hedge-nettle (*Stachys* sp.), slender wild oat (*Avena barbata*), sheep sorrel (*Rumex acetosella*), fiesta flower (*Pholistoma auritum*), and scattered shrubs such as fuchsia-flowered gooseberry (*Ribes speciosum*), California coffeeberry (*Frangula californica*), and sticky monkey flower (*Mimulus aurantiacus*).

As introduced above, coast live oak woodland intergrades with other vegetative communities. Within the project site, coast live oak woodland intergrades with maritime chaparral, coastal scrub, and non-native grassland. Where these vegetative communities comprise of approximately half of the dominant species, the areas have been mapped as coast live oak mixes (**Figure 4**). The dominant plant species and the common wildlife found in these mixed vegetation types are generally the same as those described for the individual vegetation types.

Coast live oak woodland is important habitat to many wildlife species. Oaks provide nesting sites for many avian species and cover for a variety of mammals, including mourning dove (*Zenaidura macroura*), American kestrel (*Falco sparverius*), California ground squirrel (*Spermophilus beecheyi*), and California pocket mouse (*Chaetodipus californicus*). Acorns provide an important food source for acorn



Title: **Vegetation Types**

File: C:\GIS\GIS_Projects\2016-29 OWCP\Maps\Baseline Report Maps\Habitat Map.mxd

Date: 02/24/2017
Scale: 1 in = 0.33 miles
Project: 2016-29

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Figure
4

Table 4-1. Vegetation Types within the Project Site

Habitat	Reuse Plan Development Polygons	Evaluation Area							Total
		<i>Oak Oval HMA</i>	<i>Parker Flats HMA</i>	<i>Habitat Corridor/Travel Camp HMAs</i>	<i>East Garrison North HMA</i>	<i>Landfill HMA</i>	<i>Fort Ord National Monument HMA</i>	<i>MPC HMA</i>	
<i>Coast Live Oak Woodland</i>	686.6	63.2	172.6	233.2	10.6	84.8	25.8	0.0	1,276.9
<i>Coast Live Oak Woodland/ Maritime Chaparral Mix</i>	194.2	5.7	10.8	0.0	0.0	16.1	0.0	0.0	226.8
<i>Coast Live Oak Woodland/ Coastal Scrub Mix</i>	12.1	0.0	0.0	24.9	11.4	0.0	0.0	0.0	48.4
<i>Coast Live Oak Woodland/ Non-Native Grassland Mix</i>	8.7	0.2	8.4	59.7	100.1	30.0	0.2	0.0	207.3
<i>Maritime Chaparral</i>	292.3	1.8	132.6	2.8	8.5	53.5	18.5	18.7	528.7
<i>Coastal Scrub</i>	72.4	0.001	15.3	36.1	10.9	0.0	4.3	0.0	139.0
<i>Non-Native Grassland</i>	131.5	0.8	12.7	47.2	15.9	4.1	0.7	0.0	212.9
<i>Coastal Scrub/ Maritime Chaparral Mix</i>	5.0	0.7	2.0	0.0	0.0	0.0	0.0	0.0	7.7
<i>Coastal Scrub/ Non-Native Grassland Mix</i>	24.2	0.004	0.3	1.2	0.0	0.0	0.0	0.0	25.6
<i>Maritime Chaparral/ Non-Native Grassland Mix</i>	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
<i>Riparian</i>	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
<i>Wetland or Open Water</i>	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	2.6
<i>Ruderal/Disturbed</i>	302.1	0.0	3.0	16.2	4.7	137.5	0.0	0.03	463.5
<i>Developed</i>	421.0	0.1	2.7	8.1	10.9	14.7	0.0	0.0	457.5
Total	2,151.5	72.5	360.4	431.9	173.0	340.8	49.6	18.7	3,598.5

woodpecker (*Melanerpes formicivorus*), western scrub jay (*Aphelocoma californica*), and black-tailed deer (*Odocoileus hemionus columbianus*). Other common wildlife species found in the coast live oak woodland are raccoon (*Procyon lotor*), Nuttall's woodpecker (*Picoides nuttallii*), northern flicker (*Colaptes auratus*), bobcat (*Lynx rufus*), and coyote (*Canis latrans*). Generally, red-tailed hawks (*Buteo jamaicensis*) and great-horned owls (*Bubo virginianus*) nest and roost in the coast live oaks.

Maritime Chaparral

- ***A Manual of California Vegetation* classifications:** brittle leaf–wooly leaf manzanita chaparral (*Arctostaphylos* [crustacea, tomentosa] shrubland alliance) and sandmat manzanita chaparral (*Arctostaphylos pumila* provisional shrubland alliance)

Maritime chaparral is the second most dominant vegetation type within the project site. Maritime chaparral habitat is characterized by woody, thick-leaved evergreen shrub species located within coastal areas of marine influence, where summer fog serves to mitigate summer heat, often on ancient dunes comprised of sand deposited by the wind on marine terraces adjacent to the coast and subsequently uplifted. On former Fort Ord, the underlying soil types and proximity to the coast result in various maritime chaparral alliances, such as the sandmat manzanita chaparral alliance that primarily occurs on Baywood sands (Barbour et al., 2016). The maritime chaparral within the project site is dominated by shaggy-barked manzanita (*Arctostaphylos tomentosa* ssp. *tomentosa*), sandmat manzanita, Monterey ceanothus (*Ceanothus rigidus*), dwarf ceanothus (*Ceanothus dentatus*), coyote brush (*Baccharis pilularis*), chamise (*Adenostoma fasciculata*), and sticky monkey flower. Additional species common within this vegetation type on the Former Fort Ord include California coffeeberry, fuchsia-flowered gooseberry, chaparral currant (*Ribes malvaceum*), poison oak, black sage (*Salvia mellifera*), sticky cinquefoil (*Drymocallis glandulosa*), and creeping snowberry (*Symphoricarpos mollis*).

Common wildlife species that occur within central maritime chaparral habitat include California quail (*Callipepla californica*), California towhee (*Melospiza crissalis*), California thrasher (*Toxostoma redivivum*), common poorwill (*Phalaenoptilus nuttallii*), Anna's hummingbird (*Calypte anna*), wrentit (*Chamaea fasciata*), western scrub jay, northern pacific rattlesnake (*Crotalus oreganus* ssp. *oreganus*), coast range fence lizard (*Sceloporus occidentalis bocourtii*), gopher snake (*Pituophis catenifer catenifer*), coast gartersnake (*Thamnophis elegans terrestris*), and brush rabbit (*Sylvilagus bachmani*).

Within the project site, there is one area where maritime chaparral shrub species are co-dominant with annual grass species (**Figure 4**). This may be the result of historical disturbance from Army activities that created open areas that were invaded by annual grasses or this may be a successional area that is transitioning from non-native annual grassland to maritime chaparral. The dominant plant species and the common wildlife found in this mixed vegetation types are generally the same as those described for the maritime chaparral and non-native grassland communities.

Coastal Scrub

- ***A Manual of California Vegetation* classifications:** coyote brush scrub (*Baccharis pilularis* shrubland alliance) and black sage scrub (*Salvia mellifera* shrubland alliance)

Coastal scrub habitats are areas with dense shrubs, approximately one to two meters tall, which lack grassy openings and are often integrated with other vegetation types (Holland, 1986). Species

composition within coastal scrub is largely dependent on proximity to the coast, soil texture, and disturbance regime (Barbour et al., 2016). Dominant shrub species in the coastal scrub habitat within the project site include black sage, coyote brush, poison oak, mock heather (*Ericameria ericoides*), sticky monkey flower, and coast sagebrush (*Artemisia californica*).

Coastal scrub habitats provide cover and food for a number of wildlife species, including songbirds, snakes, lizards, rodents, and other small mammals. Common species that may occur within the central coastal scrub habitat include California quail, blue-gray gnatcatcher (*Poliophtila caerulea*), Anna's hummingbird, coast range fence lizard, northern pacific rattlesnake, gopher snake, brush rabbit, and California ground squirrel.

Within the project site, coastal scrub intergrades with maritime chaparral and non-native grassland communities. These areas have been mapped as coastal scrub mixes where other vegetative communities comprise approximately half of the dominant species (**Figure 4**). The dominant plant species and the common wildlife found in these mixed vegetation types are generally the same as those described for the individual vegetation types.

Non-Native Grassland

- ***A Manual of California Vegetation classification:*** annual brome grasslands (*Bromus diandrus*-*Avena* spp. Association)

Throughout California, non-native grasslands typically occur in open areas of valleys and foothills, usually on fine-textured clay or loam soils that are somewhat poorly drained (Holland, 1986). Non-native grasslands are often dominated by non-native annual grasses and forbs along with scattered native grasses and wildflowers. The dominant species commonly observed within non-native grasslands on the Former Fort Ord include slender oat, ripgut grass (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), rat-tail fescue (*Festuca myuros*), and long-beaked filaree (*Erodium botrys*). Additionally, native species are also commonly found within this vegetation type, including needlegrass (*Stipa* sp.), sky lupine (*Lupinus nanus*), California poppy (*Eschscholzia californica*), checker bloom (*Sidalcea malviflora*), owl's clover (*Castilleja* sp.), tidy tips (*Layia platyglossa*), and telegraphweed (*Heterotheca grandiflora*).

Non-native grasslands provide habitat to a number of common wildlife species. Botta's pocket gopher (*Thomomys bottae*), California ground squirrel, American badger, and several rodent species use non-native grasslands for foraging and cover. Avian species that may be found within the non-native grassland habitat include grasshopper sparrow (*Ammodramus savannarum*), savannah sparrow (*Passerculus sandwichensis*), and western kingbird (*Tyrannus verticalis*). Raptors are also known to forage in this habitat, including red-tailed hawk. Reptiles, such as northern pacific rattlesnake, gopher snake, and coast range fence lizard, are also common non-native grassland wildlife species.

Wetlands or Open Water

- ***A Manual of California Vegetation classification:*** pale spike rush marshes (*Eleocharis macrostachya* Herbaceous Alliance)

Various types of wetlands and open water communities occur within California. These habitats are characterized by the presence of water and saturated soils for an extended periods. Some of these resources may be seasonal, such as vernal pools or ephemeral streams, while others are more permanent,

such as lakes or perennial streams. Four major types of wetland and open water communities are scattered throughout former Fort Ord: vernal pools, freshwater marshes, ephemeral drainages and artificial ponds. Within the project site, vernal pools and an artificial pond are present within the Habitat Corridor/Travel Camp HMA.

Vernal pools support plant and wildlife species specially adapted to live through winter and spring flooding and summer and fall drought. This community is most common on Antioch soils in isolated grassland patches within a matrix of maritime chaparral. Common plant species observed within this vegetation type on the Former Fort Ord include common spikerush (*Eleocharis macrostachya*), hyssop loosestrife (*Lythrum hyssopifolium*), and coast eryngo (*Eryngium armatum*). Common wildlife species within the vernal pools on former Fort Ord include Sierran treefrog (*Pseudacris sierra*), garter snake (*Thamnophis* sp.), and California toad (*Anaxyrus boreas halophilus*).

Artificial ponds have been constructed throughout the former Fort Ord to provide water for livestock and wildlife and also as a source for fishing and other recreational activities. The immediate edges of most of these ponds are typically devoid of vegetation because of widely fluctuating water levels. When ponds are full, mallards, cinnamon teal (*Anas cyanoptera*), canvasback (*Aythya valisineria*), pintail (*Anas acuta*), great egret (*Ardea alba*), and other waterfowl forage and rest in the open water. This habitat may also be used by amphibians including the sierra treefrog (*Pseudacris sierra*).

Riparian

- ***A Manual of California Vegetation* classifications:** Arroyo willow thickets (*Salix lasiolepis* shrubland alliance)

Riparian habitats are those plant communities supporting woody vegetation found along rivers, creeks, streams, canyon bottom drainages, and seeps. Arroyo willow thickets are typically found on moist to saturated sandy or gravelly soil, especially on bottomlands (Holland, 1986), often along stream banks and benches, slope seeps, and stringers along drainages (Sawyer et al., 2009). A very small area within the project site west of the Parker Flats HMA supports riparian habitat, dominated by Arroyo willow (*Salix lasiolepis*) and cottonwood (*Populus fremontii*) trees (**Figure 4**). Sick-leaved rush (*Juncus falcatus*) is also dominant in the understory and along the edges. This vegetation type is not associated with any aquatic features, but is present at the lowest topographical point in the immediate area. Water draining from the surrounding hills and/or a high water table are the likely sources for the moisture necessary to support this vegetation type, which may also support jurisdictional wetlands.

Riparian areas provide habitat for many wildlife species, particularly birds and herpetofauna. Common species that may be found within the riparian habitat in the project site includes Sierran treefrog, Monterey ensatina (*Ensatina eschscholtzii eschscholtzii*), tree swallow (*Tachycineta bicolor*), song sparrow (*Melospiza melodia*), and Pacific-slope flycatcher (*Empidonax difficilis*).

Ruderal/Disturbed

- ***A Manual of California Vegetation* classifications:** none

Ruderal areas are those areas which have been disturbed by human activities and are dominated by non-native annual grasses and other “weedy” species. Ruderal areas occur throughout the project site and are

generally associated with disturbance from historic military operations, such as dirt roads that are nearly or completely devoid of vegetation (**Figure 4**). Ruderal areas on former Fort Ord include vegetation dominated by ripgut grass, slender oat, cut-leaved plantain (*Plantago coronopus*), ice plant, English plantain (*P. lanceolata*), sand mat (*Cardionema ramosissimum*), long-beaked filaree, and telegraphweed. Monterey pine and eucalyptus trees planted by the Army also fall within this designation.

This vegetation type is considered to have low biological value, as it generally dominated by non-native plant species and consists of relatively low quality habitat from a wildlife perspective. However, common wildlife species which do well in urbanized and disturbed areas can utilize this habitat, such as the American crow (*Corvus brachyrhynchos*), California ground squirrel, raccoon, striped skunk (*Mephitis mephitis*), western scrub jay, European starling (*Sturnus vulgaris*), coast range fence lizard, and rock pigeon (*Columba livia*).

Developed

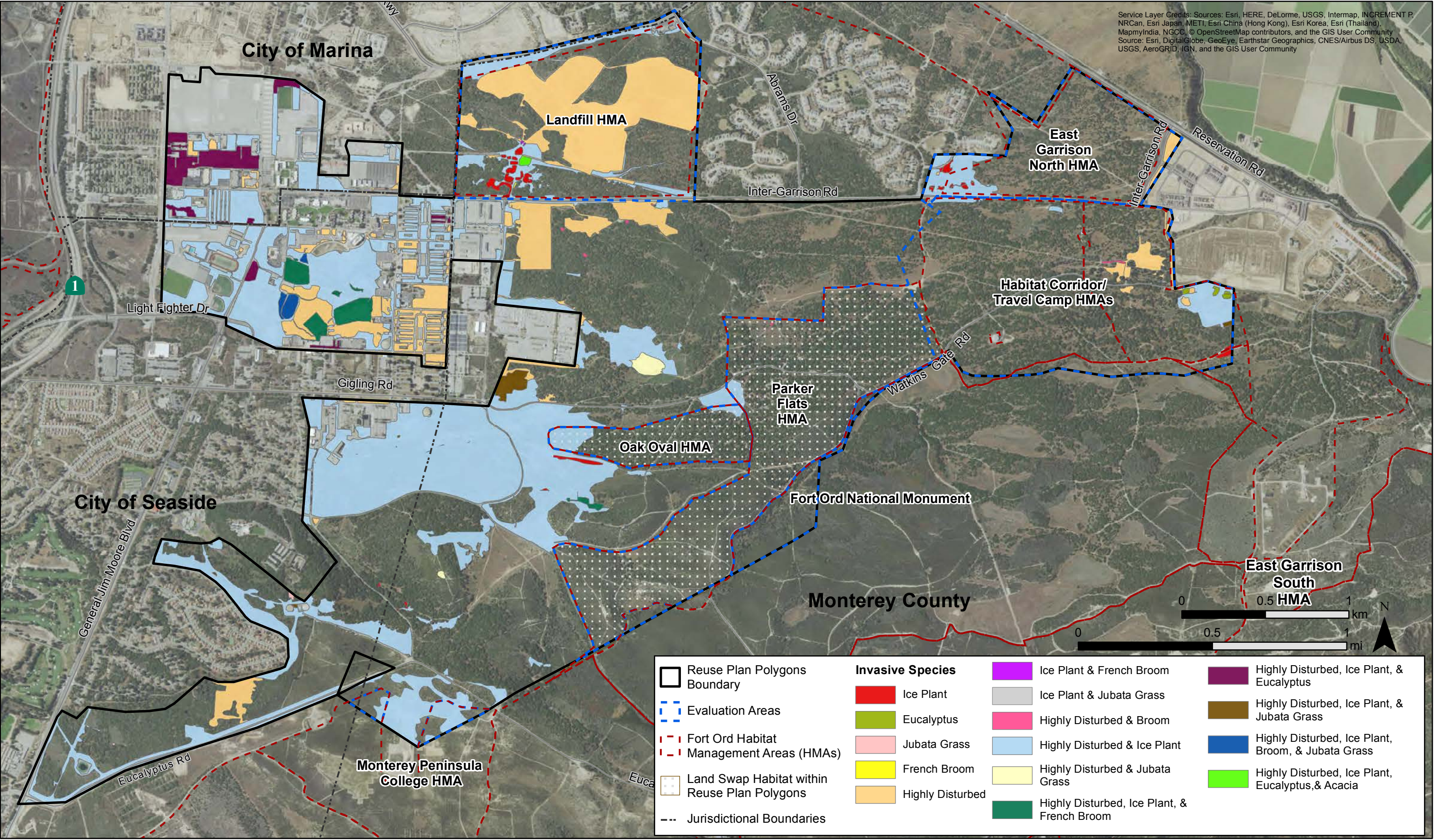
- *A Manual of California Vegetation* classifications: none

Developed areas are present throughout the project site, but primarily occur within the western portion of the site (**Figure 4**). These areas include paved roads and parking lots and various structures. No or minimal vegetation is present within these areas and they are considered to have little biological value. However, some common wildlife species that do well in urbanized areas may be found foraging within the developed areas, including American crow, California ground squirrel, raccoon, striped skunk, western scrub jay, European starling, and rock pigeon.

4.2 Invasive Species

Figure 5, Invasive Species Map, identifies the general areas in which invasive plants occur within the project site. Invasive species, such as ice plant, jubata grass, and French broom, were typically observed in areas where large and/or frequent disturbance has occurred, specifically in the western portion of the site, which consists primarily of ruderal/disturbed and developed areas. Non-native grasses were not mapped, but were observed throughout the project site where large and/or frequent disturbance has occurred, as well as within many of the vegetation types present¹. Non-native grasses and other potential invasive herbaceous species were frequently observed in the understory and open areas of coast live oak woodland and coast live oak woodland/non-native grassland mix, as well as in open areas or disturbed areas within coastal scrub, coastal scrub/non-native grassland mix, and along trails. Few invasive plant species were observed within the maritime chaparral vegetative community, with the exception of areas that had been largely disturbed. Few invasive species were observed within dense coastal scrub. Although there are some examples of monotypic stands of invasive species present within the project site, mosaics of invasive species and non-native and native vegetation types were most common.

¹ These areas are identified as “Highly Disturbed” on **Figure 5**; vegetation types are mapped in **Figure 4**.



Title: **Invasive Species Map**

Date: 12/17/2016
Scale: 1 in = 0.33 miles
Project: 2016-29

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Figure
5

In general, within the coast live oak woodland and coast live oak woodland/non-native grassland communities, the dominate understory species present at the time of the assessment included fiesta flower, poison oak, Bermuda buttercup, non-native grasses, or a combination of these species. Areas of non-native grasses/mixed herbaceous invasive species were frequently observed in open areas within coast live oak woodland and coast live oak woodland/non-native grassland communities. Areas of non-native grasses and other invasive species were less frequently observed in the coast live oak woodland/coastal scrub mix community.

4.3 Erosion Features

The Soil Survey of Monterey County (Soil Survey) identifies four soil types within the project site: Antioch Very Fine Sandy Loam (2-9% slopes), Arnold-Santa Ynez Complex, Baywood Sand (2-15% slopes), and Oceano Loamy Sand (2-15% slopes) (USDA, 1978). Erosion features within the project site were identified within two of these soil types: Oceano Loamy Sand and Arnold-Santa Ynez Complex (**Figure 6**). The following are brief descriptions from the Soil Survey (USDA, 1978) of the two soil types in which erosion features were identified.

The Oceano series consists of excessively drained soils that formed in Aeolian sands on old stabilized dunes with slopes of two to 15%. The Oceano series is described as sand and loamy sand to a depth of greater than 80 inches. Permeability of Oceano soils is rapid, and the available water capacity is about four inches; roots penetrate to a depth of more than 60 inches. Erosion hazard is considered slight to moderate. The soil is noted as being subject to wind erosion when exposed or otherwise disturbed.

The Arnold-Santa Ynez Complex is found on dissected terrace remnants, hilltops, and wide ridge tops. The mapping unit consists of approximately 40% Arnold soils and 25% Santa Ynez; the remainder consists of areas of Elkhorn soils. The Arnold series consists of somewhat excessively drained soils that formed on hills and uplands in old marine sand dunes or in materials weathered from soft sandstone. The Santa Ynez series consists of moderately well-drained soils that formed on terraces in alluvium derived from sandstone and granitic rock. Permeability is rapid, runoff is medium to rapid, and the erosion hazard is moderate to high for this soil complex.

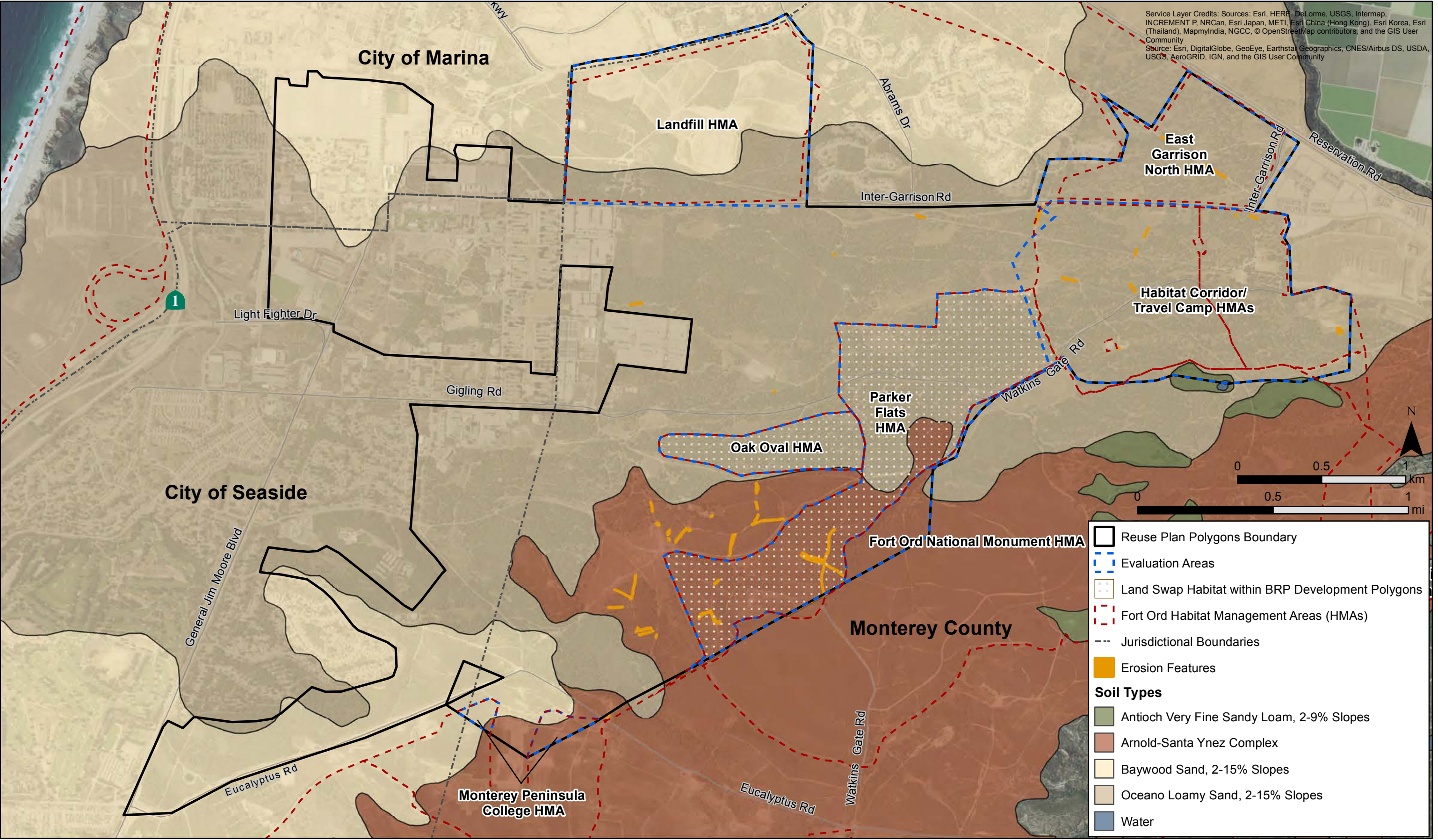
Approximately 35 erosion features were identified within the project site. The erosion features identified within the project site occur primarily in the southeastern portion of the site and within the Habitat Corridor/Travel Camp HMAs. These features occur in steep areas and are associated with roads and trails. Based on a review of GIS slope data, very few areas within the project site have slopes of 30% or greater.

4.4 Forestry Resources

Tree Stand Description

Vegetation within the project site has been mapped primarily as coast live oak woodland (1,759 acres). As stated previously, vegetation types where coast live oak was a major component varied within the project area and within the sampled plots; ranging from dense stands of pure coast live oak to less dense areas consisting of maritime chaparral, non-native grassland with minor amounts of coastal scrub.

Forest cover is comprised entirely of coast live oak woodland. There are a few maturing Monterey pine trees within the oak woodland. This tree species is not native to this site and appears to be introduced



Title:

Soils and Erosion Features Map

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Figure
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from off-site plantings during the last few decades and are not counted in this report. The forest understory is dominated by poison oak with coffee berry, manzanita, and interspersed non-native grasses. There are pockets of invasive species (primarily ice plant and non-native grasses) occurring in some of the portions of previously disturbed and less densely vegetated areas.

Variation in coast live oak density is reflected through the professional guidance of the plot sampling conducted on the site. The oak stands are mostly limited in height both by prevailing western wind pressure and competition for moisture and nutrients from excessive soil drainage. Larger and consequently taller trees occur where soils are deeper, retaining additional moisture (northern slope aspects or bottom of slopes protected from wind pressure). Average tree height is 25 feet or less. Many of the sampled stands consist of numerous shorter trees (10 to 12 feet) with multiple small stems (6-8" diameter). **Figure 7** identifies the landmark trees observed within the sample plots in addition to those identified in previous forestry reports.

Coast live oak stands appear to be variable in age and development. Most of the stands are fairly young and may have developed after the development and occupation of the former Fort Ord during the 20th century. Prior to that time, the area consisted of a number of rancheros and it is assumed that the property was grazed intensively and subject to periodic burning, which would have limited the extent of oak cover on the site. Numerous large, older trees were noted (see **Figure 7**) which appear to pre-date development within the former Fort Ord. A review of aerial photography from the early days of the former Fort Ord (1930s and 1940s) shows that the distribution and extent of oak stands have not changed much since that time. Stands have become denser, with individual trees getting larger with only a limited amount of new in-growth.

Tables 4-2 through 4-7 provide the results of the conditions by size class and total tree inventory. Total tree inventory estimates for the project site were estimated by expanding per acre stocking by the number of acres of oak woodland. In regard to tree condition, a typical forestry evaluation provides a rating for each tree in the context of the quality of the wood that could be harvested, with older trees being rated poor more often than younger trees. However, in the context of the evaluation of woodland habitat quality, age diversity is a good thing. Older trees and snags provide structural diversity and wildlife habitat and are an important component of a healthy mature woodland. Therefore, the purpose of the condition rating is to show the diversity of the oak woodland; for example, a poor rating does not suggest that those trees should not be considered for conservation.

Table 4-2. Coast Live Oak Tree Condition by Size Class (total sample plots of the project site)

Diameter Class	6-11"	12-23"	24+"
<i>Poor</i>	19	6	1
<i>Fair</i>	12	14	1
<i>Good</i>	234	146	8
Total	265	166	11

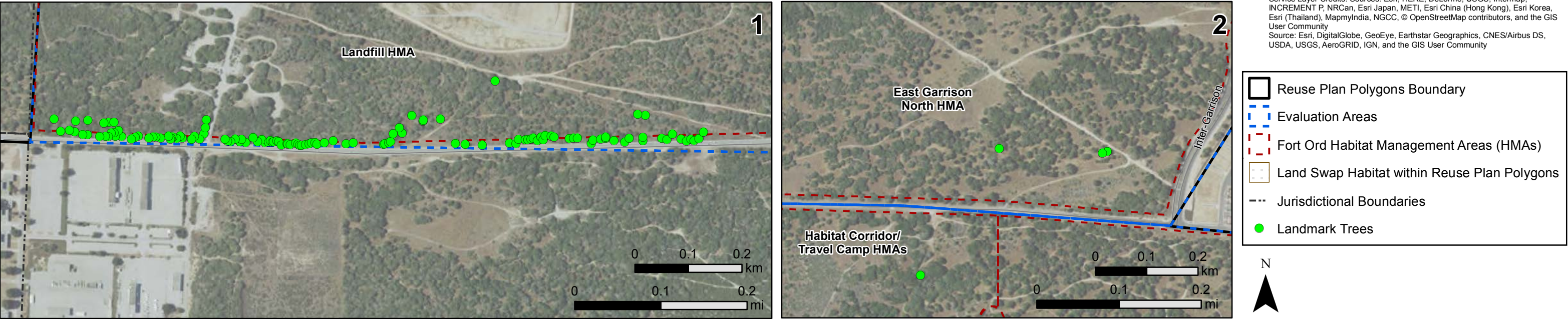


Table 4-3. Estimated per Acre and Total Coast Live Oak Tree Inventory of Project Site (1,759 ac)

Diameter Class:	6-11"	12-23"	24+"	Total
Plotted Trees:	265	166	11	442
Total Tree/Acre:	85	52	1	138
Total (Est.)	149,515	91,468	1759	242,742

Table 4-4. Coast Live Oak Tree Condition by Size Class within Reuse Plan Development Polygon Evaluation Area (trees within sample plots)

Diameter Class	6-11"	12-23"	24+"
Poor	10	3	0
Fair	5	8	0
Good	145	89	4
Total	160	100	4

Table 4-5. Estimated per Acre and total Coast Live Oak Tree Inventory within Reuse Plan Development Polygon Evaluation Area (901.5 Acres)

Diameter Class:	6-11"	12-23"	24+"	Total
Plotted Trees:	160	100	4	264
Total Tree/Acre:	94	59	<1	154
Total (Est.)	84,741	53,188	902	138,831

Table 4-6. Remaining Evaluation Areas Coast Live Oak Tree Condition by Size Class (trees within sample plots)

Diameter Class	6-11"	12-23"	24+"
Poor	9	3	1
Fair	7	6	1
Good	89	57	5
Total	105	66	7

Table 4-7. Estimated per Acre Remaining Evaluation Areas Tree Inventory (857.8 Acres)

Diameter Class:	6-11"	12-23"	24+"	Total
Plotted Trees:	105	66	7	178
Total Tree/Acre:	70	45	<1	116
Total (Est.)	60,060	38,610	858	99,528

The Forest Resource Evaluation Report² prepared for Monterey Downs (Staub report) indicated that 95% of the trees were in fair, poor, or dead health at the Monterey Downs project site. As the Monterey Downs project site is located within the Base Reuse Plan Development polygons, coast live oak trees present within this area were also assessed as part of this baseline evaluation. The forestry report prepared for this baseline assessment, using data collected at a later date and in different locations than the Staub report, identifies trees in plots within the Monterey Downs project site as being in fair

² The Forest Resources Evaluation Report for Monterey Downs was prepared by prepared by Staub Forestry and Environmental Consulting, 2012.

condition. The variation in condition of the trees identified in the Staub report and in the forestry report prepared for this baseline report may be due to different sampling plot locations and/or other conditions during the year in which sampling occurred. The Staub report study plots were located on the perimeters of the woodland, and the trees assessed may exhibit indicators of the “edge effect.” For example, oak trees on the edge of the woodland are subject to increased abiotic (wind), biotic (oak worms and beetles), and anthropogenic pressures in combinations that vary over time. Anthropogenic pressures in the area included scarification of the soil, significant limbing of trees, and clearing of understory vegetation. The Staub report noted that a significant outbreak of oak worm was present in the Monterey Downs project site, which would lessen the health of trees. Edge effect and anthropogenic pressures factor into the health of the woodland and can create have an impact on the condition of the trees that may be seen over several years. However, the plots measured and reported herein as fair condition and not suffering oak worm outbreak are only a portion of the Monterey Downs site and a different snapshot of time.

Woodrat nests were observed throughout the project site. The area has been documented to support a number of wildlife species, including deer, feral pigs, rabbits, rodents, turkeys, and raptors.

Forest Health

Insects and Disease

California Oak Worm. The trees show signs of prior California oak worm (*Phryganidia californica*) defoliation; however, many of the trees appear to be fully or partially recovered. Recovery from the defoliation is affected by minimal moisture on the site due to wind pressure and excessively drained sandy soils. The predominance of trees in fair or better condition is characteristic of native, unmanaged oak woodlands.

Oak Branch Canker. Oak Branch Canker (*Diplodia quercina*) is apparent in a few of the test plots but is minor in its presence. The canker kills small branches (usually those less than one inch, but up to four inches in diameter), causing leaves to turn brown, wilt, die, and remain attached in the canopy. Outbreaks of oak branch dieback often follow years of below-average rainfall. The disease is not a major problem in most years, and control is usually not needed.

Sudden Oak Death (SOD). No indicators or symptoms were observed for SOD (*Phytophthora ramorum*) on the sample plots or areas near them. According to the California Oak Mortality Task Force (a task force under the California Forest Pest Council) SOD website, the nearest mapped site is located in Carmel Valley somewhere in the Quail Meadows area.

Phytophthora Root/Crown Rot. Most of the oak dieback observed appears to be from the *Phytophthora* Root/Crown Rot in combination with bark beetles (described below). *Phytophthora* cause crown and root rot diseases of herbaceous and woody plants. The pathogen kills plants by growing from the roots up through the root crown and into the lower trunk, where it kills the inner bark and causes a browning of the outer layer of sapwood.

Oak Bark Beetles. Oak ambrosia beetles (*Monarthrum species*) and Oak bark beetles (*Pseudopityophthorus species*) are beetles that attack stressed trees. They burrow in and overwinter beneath bark, creating bleeding, frothy, bubbling holes with boring dust, which indicate damage to the

tree. It is suspected that these beetles in combination with crown rot is responsible for decline in many of the oaks.

Foamy Bark Canker. Foamy Bark Canker (*Geosmithia pallida*) is a new disease found on coast live oak, spread by Western oak bark beetle (*Pseudopityophthorus pubipennis*). No obvious signs of the disease was observed on any areas of the sample plots.

Oak Regeneration

The oak woodlands appear to be young but maturing. Unfortunately, there are few or no oak seedlings or saplings observed within the sample plots, though it appears there has been some planting of oaks along paths used to access the property. Small oak trees were also observed within other vegetation types, particularly along the margins of the oak woodland habitat. The low number of oak seedlings and saplings are likely due at least in part to the abundance of small rodents and other wildlife combined with the presence of non-native grasses and fairly dense shade in many areas of woodland. The absence of oak regeneration is a statewide problem due to a variety of factors such as grazing, wildlife browsing, avian and rodent predation, and competition for moisture with annual grasses.

5.0 CONSERVATION AREA RECOMMENDATIONS

5.1 Approach

As described in **Section 2, Project Description**, the key conservation objectives identified in the County and City Reuse Plan policies and programs include:

- designate an oak woodland conservation area that connects the Habitat Management Areas (HMAs) to the south (Bureau of Land Management Fort Ort National Monument HMA), east (Habitat Corridor/Travel Camp HMAs), and north (Landfill HMA); and
- maintain large, contiguous block of oak woodland habitat.

Oak Woodland Conservation Area Size

Neither the Reuse Plan nor EIR identify the required size of the oak woodland conservation area. The EIR estimated that 1,584 acres of oak woodland would be impacted due to new construction and development associated with the Reuse Plan, approximately 34% of the oak woodland and savanna habitat on the former Fort Ord (i.e., total of 4,666 acres basewide). The location of oak woodlands on former Fort Ord was presented in the Reuse Plan in **Figure 4.4-1, Oak Woodland Areas**.

The EIR found that with the establishment of an oak woodland conservation area, preservation of oak woodlands within the HMAs, and implementation of the Reuse Plan policies and programs related to site design and tree replacement at a 1:1 ratio, potential impacts to oak woodlands resulting from implementation of the Reuse Plan were less-than-significant. Based on the estimates in the Flora and Fauna Baseline Study (ACOE, 1993) and the EIR, it could be inferred that the EIR required a 3:1 mitigation ratio. With almost 2:1 met through preservation of 3,082 acres (4,666 acres total – 1,584 acres impacted) and 1:1 met through careful site design and tree replacement, to meet the 3:1 ratio, based on the numbers presented in the EIR and Base Reuse Plan, approximately 86 additional acres would be required to be preserved in an conservation area.

As conditions have changed since the completion of the EIR and Reuse Plan in 1997, DD&A mapped the oak woodland and oak woodland mixed habitats within the project site, as described above in **Section 3, Methods**, for the purpose of compiling biological baseline information to inform B-2 oak woodland policy recommendations. Approximately 1,759 acres of oak woodland are estimated to currently exist within the project site. DD&A digitized **Figure 4.4-1, Oak Woodland Areas** from the Reuse Plan in order to estimate the acreage of oak woodland outside of the project site.³ **Table 5-1** below identifies the acreages of these areas and further breaks them down into “Within HMAs (preserved)” and “Within Designated Development Areas (impacted)” to estimate the impacts and preservation that would occur under existing conditions.

Approximately 1,636 acres of oak woodland currently occurs within designated development areas on the former Fort Ord, based on the areas of oak woodland presented in the Reuse Plan and the above-

³ Ideally, a complete oak woodland area remapping would have generated one dataset. However, this was beyond the scope of this project. Therefore, the two spatial datasets are herein combined, and errors in precision are expected, but are less profound due to the generality of the sought 3:1 ratio.

mentioned updates to mapped oak woodlands within the project site (**Table 5-1**). Assuming all 1,636 acres of oak woodlands are impacted, a 3:1 mitigation ratio would require the conservation of 4,908 acres of oak woodland. With approximately 3,137 acres in preservation within the HMAs and assuming 1,636 acres would be mitigated through site design and replacement, the required oak woodland conservation area would be approximately 135 acres.

Table 5-1. Conservation Area Acreage Analysis

Oak Woodland Area	Acres of Oak Woodland
Reuse Plan Polygon Total*	1,759
Within HMAs (preserved)	833
Within Designated Development Areas (impacted)	926
Outside Reuse Plan Polygon Total**	3,014
Within HMAs (preserved)	2304
Within Designated Development Areas (impacted)	710
Total Oak Woodland within former Fort Ord	4,773
3:1 Mitigation Ratio Requirement	4,908
1:1 Mitigation Met through Site Design and Replacement	- 1,636
Total Preserved in HMAs	- 3,137
Remaining to be Preserved in Recommended Conservation Area	=135
*Based on DD&A mapping of oak woodlands (2016).	
**Based on oak woodland areas presented in the Reuse Plan (Figure 4.4-1) (1997).	

Wildlife Movement

Over 1,600 plant and animal species live in and among Monterey County's oaks; at least 15 of these species are rare. The overwhelming majority of animal species present depends directly or indirectly on the food or shelter that oaks provide. The diversity of fauna reflects the abundance and diversity of those resources: acorns, leaves, twigs, sap, leaf litter, and a complex physical structure including canopy, shaded and open branches, cavities, bark, and standing, dead, or downed logs. Acorns are a nutrient-rich food resource for many species. Many readily recognized and appreciated wildlife, including black-tailed deer, band-tailed pigeons, and squirrels, depend on acorns and oaks for much of their food. Most of the small mammals, including mice and woodrats, also depend on acorns, and in turn, provide abundant food for predators like bobcats, mountain lions, hawks, owls, and eagles. **Table 5-2** provides an approximate number of species of various life forms found in Monterey County oak woodlands.

Table 5-2. Approximate number of species of various life forms in Monterey County Oak Woodlands

Life Form	Estimated Number of Species
Vascular Plants	600
Mosses, Liverworts, and Lichens	175
Invertebrates (insects, etc.)	580
Birds	200
Mammals	50
Amphibians and reptiles	30
Total	1,635
Source: Stromberg, 2009	

The concept of a keystone species has been broadly applied and debated in the ecological literature. For the purposes of this document, the term refers to a species high in the food web that has large effects on the community that far exceed its abundance. Accordingly, the removal of such a species from the community is expected to have considerable impacts, such as reduced species diversity. In oak woodlands, large carnivores, such as mountain lions, may function as keystone predators by reducing herbivore populations that limit oak establishment. For example, deer have been found to limit oak sapling establishment, but their impacts are reduced where mountain lions are active. A review of large predators and trophic cascades in five national parks in the western United States supports the hypothesis of top-down control in oak woodlands (Davis et al., 2016). Davis et al. (2016) reported that where large predators have been displaced or locally extirpated, ungulates have had major impacts on dominant woody species and ecological processes. Similarly, medium-sized carnivores such as bobcat, American badger, and coyote may function as keystone predators by reducing populations of pocket gophers and ground squirrels – small mammal species that significantly limit oak establishment at the seedling stages (Davis et al., 2016).

The established standard for how large a wildlife corridor should be to support multiple species that include medium to large sized mammals is two kilometers (approximately 1.2 miles wide) (Corridor Ecology, 2006; Penrod et al., 2006; Critical Linkages, Bay Area and Beyond, 2013; Safe Passages, 2010; Continental Conservation, 1999; Metapopulations and Wildlife Conservation, 1996; Beier, 1995; Beier, 1993). However, applying a 2-km wide corridor would result in a wide, but very short, conservation area, which would not meet the Policy B-2 mandate of connectivity across the project site. Therefore, a minimum 328-foot (100-meter) wide corridor was established for the proposed conservation area, as recommended by Hennings and Soll (2010) based on species-specific consideration for small mammals, reptiles, amphibians, and birds. This minimum width will not prohibit large predator movement; a narrower corridor is not restrictive to their passage. The key goal should be to provide connectivity between populations and prevent reproductive isolation (Hennings and Soll, 2010). Using a minimum 328-foot (100-meter) wide corridor for the proposed conservation area would support this key goal by connecting HMAs and preventing habitat fragmentation and isolation.

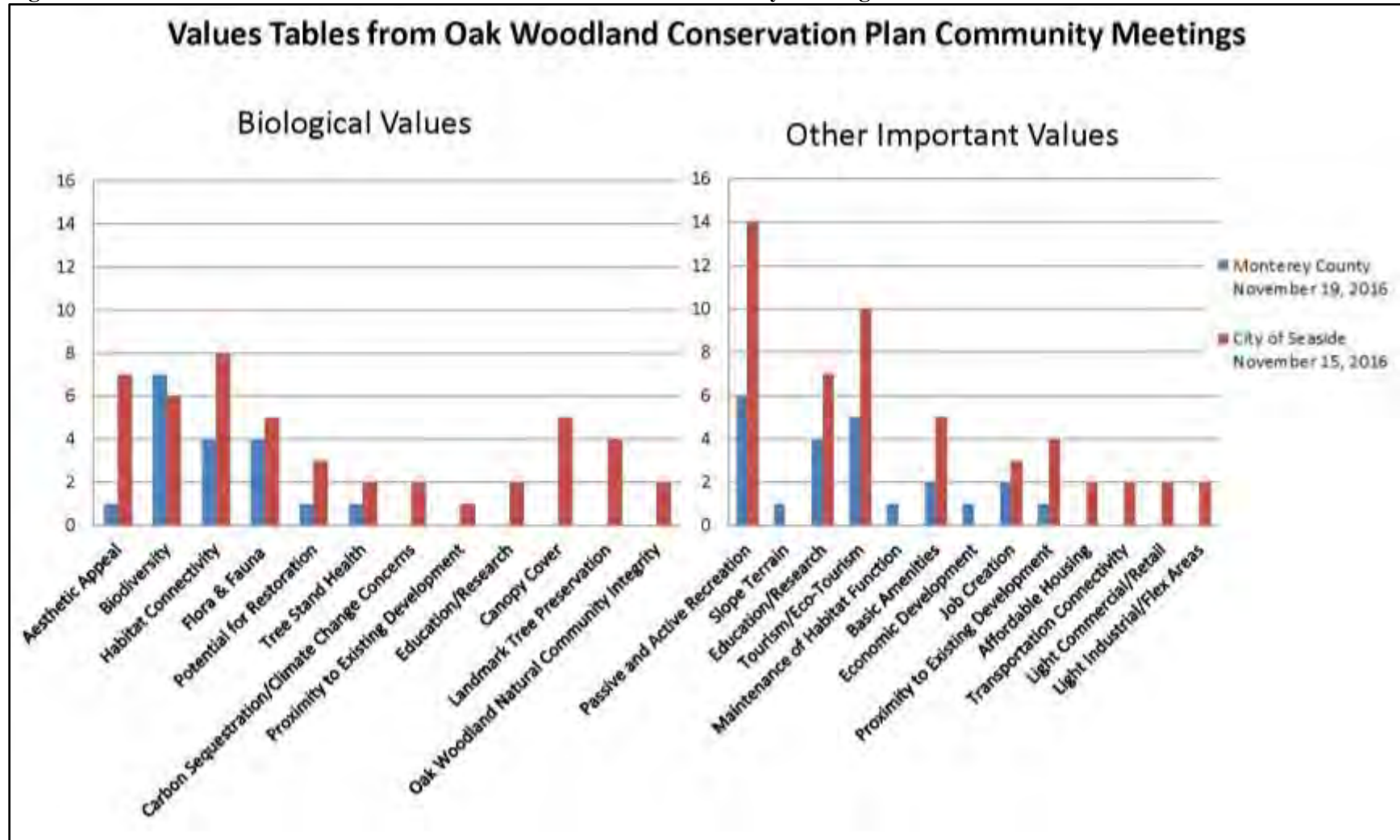
5.2 Evaluation Criteria

This section provides an overview of evaluation criteria that can assist the County and City, as well as willing landowners, public agencies, nonprofit organizations, and other partners, in identifying priority areas with the highest oak woodland resource values and the greatest practicality.

Initially, a broad range of biological and other important values (i.e., potential evaluation criteria) were identified and presented to the public for input during the community meetings (see **Section 2.4** above). At these meetings, members of the public were each provided three stickers to rank their top three most important values associated with oak woodland and the project site in general. A summary of these rankings is shown in **Figure 8**.

The top three biological values identified at the meetings were aesthetic appeal, biodiversity, and habitat connectivity; passive and active recreation, education/research, and tourism/eco-tourism were the top

Figure 8. Values Tables from Oak Woodland Conservation Plan Community Meetings



three other important values. Members of the public also submitted comments via comment cards and email, as well as on the maps provided at the community meetings. These comments were also reviewed and considered as potential evaluation criteria.

In addition, in order to obtain a statewide perspective on the conservation of oak woodlands, DD&A reviewed numerous Oak Woodland Management Plans prepared in satisfaction of the California Oak Woodland Conservation Program (COWCP) and conducted an extensive literature review. The COWCP is a voluntary program initiated in the early 2000s, implemented by the State Wildlife Conservation Board (WCB) designed to conserve the integrity and diversity of oak woodland across California working landscaped through incentives and education. Specifically, the WCB funds projects conducted by landowners, public agencies, and nonprofit organizations to conserve and restore oak woodlands, educate county residents about the values of oaks, and provide landowners with assistance in voluntary oak conservation. To participate in the program, each county in which the project occurs must first develop and adopt by resolution by the board of supervisors an Oak Woodlands Management Plan to promote oak woodland conservation and education. WCB funds have all been distributed at present, but the program structure is still in place in the event that it is granted a new funding stream.⁴

The Monterey County Voluntary Stewardship Guidelines (plan) (September 2009) has been prepared to participate in this program, but has not been adopted. The County's plan identifies criteria for easement acquisition, restoration, or long-term agreement projects in order to qualify for funding consideration by the WCB. As stated in the plan, "in order for a project to qualify for funding by the WCB, a restoration, enhancement, purchase of an oak conservation easement, or long-term agreement project must: 1) meet one or more of the criteria identified below; 2) must contain an appropriate management plan to assure project goals are maintained; and 3) the oak stand that is the subject of the proposal must have greater than 10 canopy (Monterey County, 2009, p. 14). Criteria include:

- The project is sufficient size to promote biological integrity and provide superior wildlife values.
- The project area contains a diverse size-class structure of oak woodland and/or a diversity of oak species that will promote the sustainability and perpetuation of oak woodlands.
- The property is adjacent to other protected areas or will contribute toward ease of wildlife movement across ownerships (wildlife corridors).
- The project contributes to regional and/or community goals, provides scenic open space, protects historic or archaeological values, or contains unique geologic features.
- The property is a working landscape. The landowners have implemented or agree to implement stewardship practices that recognize and incorporate the ecological requirements of oak woodland and associated habitats, thus promoting economic and resource sustainability of the farming and ranching operations.
- The property removes or reduces the threat of habitat conversion from oak woodlands to some other use.
- The project has the potential to serve as a stewardship model for other landowners."

⁴ WCB information available online at: <https://www.wcb.ca.gov/programs/oaks>

These criteria were considered in combination with the conservation criteria and methodologies identified in the Napa County Voluntary Oak Woodland Management Plan (October 2010), Yolo County Oak Woodland Conservation and Enhancement Plan (January 2007), Technical Report on Evaluation Criteria and Oak Woodland Categories for the El Dorado County Oak Woodland Management Plan (November 2006), and Identifying and Prioritizing Critical Hardwood Resources (Doak et al., 1991).

Additionally, DD&A considered project objectives, the variety of conservation area configurations that could meet the total estimated size (e.g., minimum 135 acres of oak woodland or oak woodland mix vegetation types and minimum 328 feet wide), public comments, data collected, staff-level landholder discussions, and literature reviewed in formulating a project-specific set of criteria.⁵ From this information, DD&A prepared three preliminary oak woodland conservation area concepts (**Figures 9 – 11**).

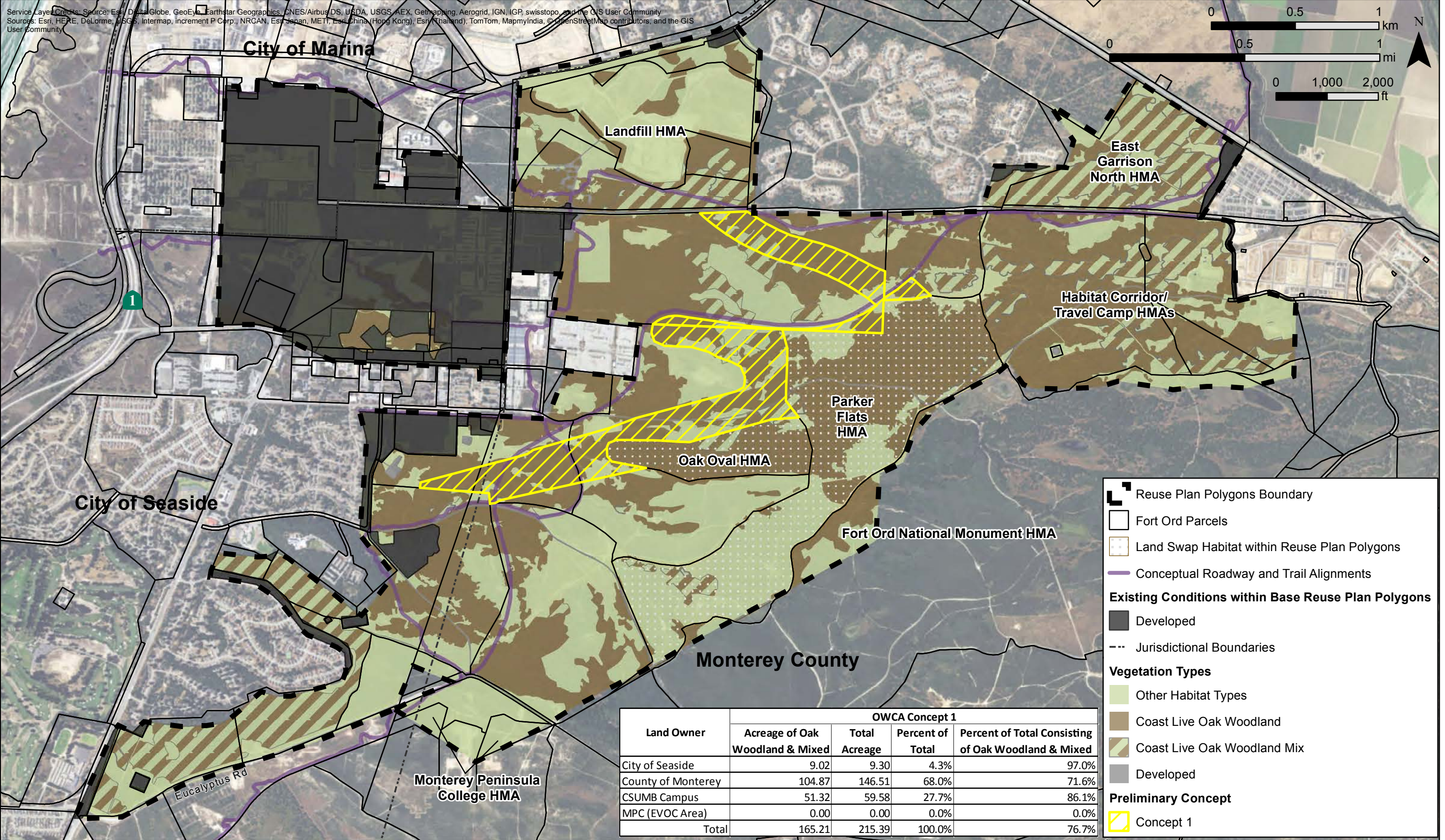
Based on the literature review, data collected, project objectives, and staff-level landholder discussions, DD&A established an array of 12 evaluation criteria to measure resource values within the three concept areas based on four main categories (**Table 5-3**):

- Stand Composition, Integrity, and Functionality
- Habitat for Native Species
- Human Interactions
- Management Considerations

The following sections describe the 12 evaluation criteria ranking in more detail, as well as the oak woodland management constraints considered (**Tables 5-4 through 5-14**). DD&A utilized a checklist consisting of the 12 evaluation criteria to rank the three preliminary conservation area concepts. The completed checklist follows the evaluation criteria descriptions (**Table 5-16**).

⁵ To ensure sufficient oak woodland acreage is conserved, a 20% contingency was added to the minimum acreage. All three preliminary concepts contain at least 162 acres of oak woodland habitat.

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Title:

Oak Woodland Conservation Area - Preliminary Concept 1

Date: 12/11/2017

Scale: 1 in = 0.33 mi

Project: 2016-29

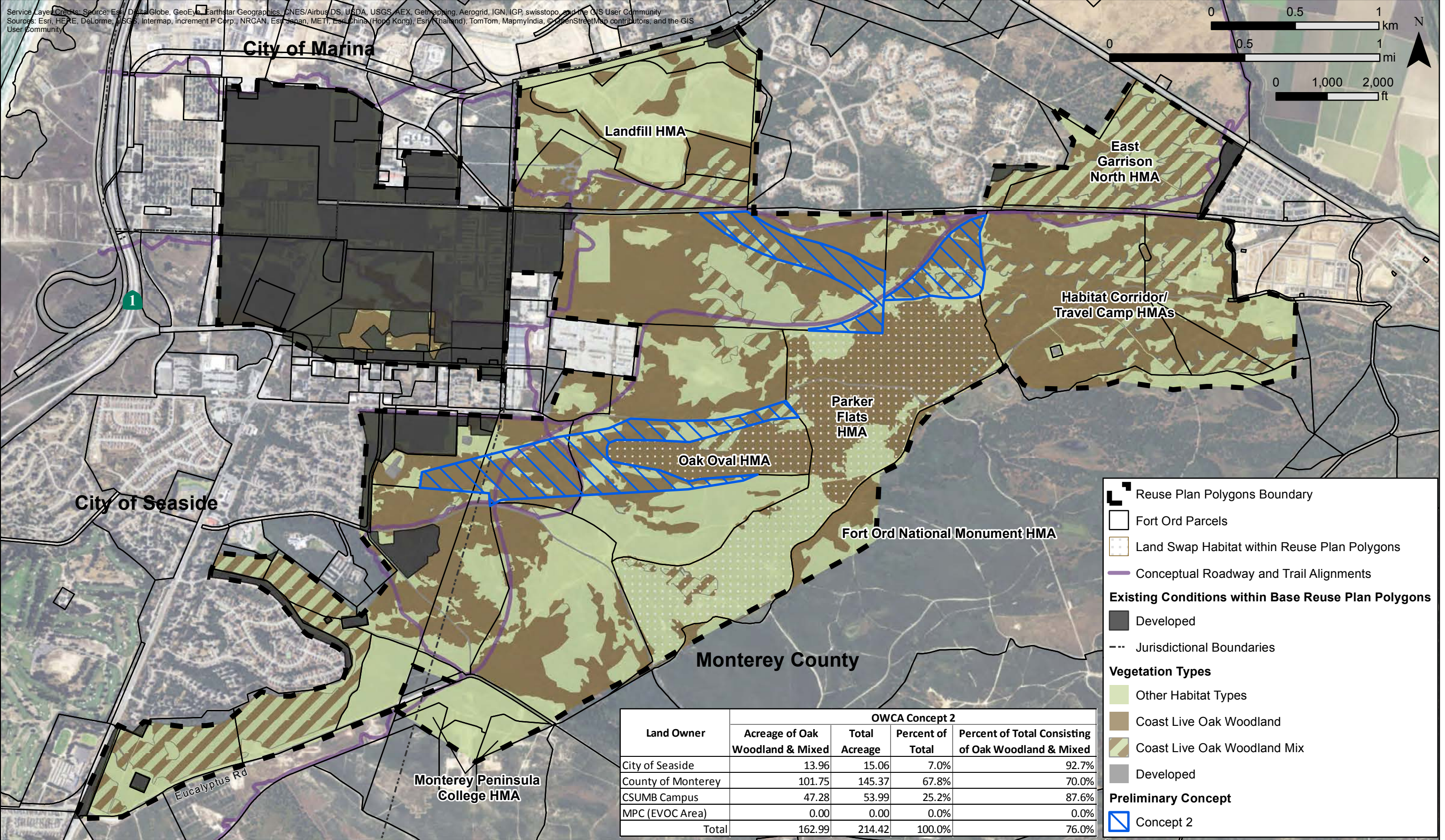


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Title:

Oak Woodland Conservation Area - Preliminary Concept 2

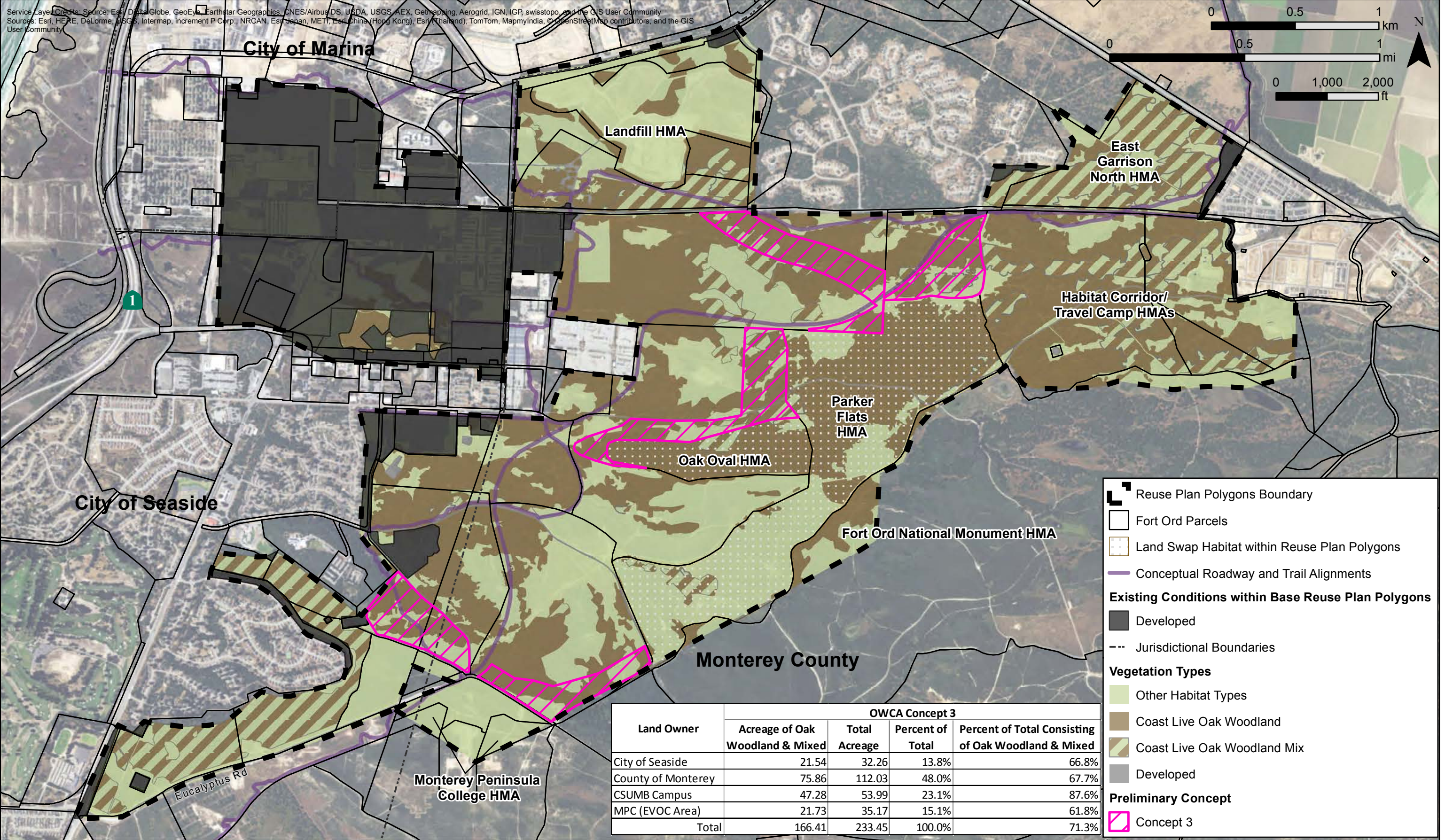
Date: 12/11/2017
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Project: 2016-29



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Figure
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Title: **Oak Woodland Conservation Area - Preliminary Concept 3**

Date: 12/11/2017
Scale: 1 in = 0.33 mi
Project: 2016-29

Monterey | San Jose
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Figure
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Table 5-3. Evaluation categories and criteria

Category	Criteria
Stand Composition, Integrity, and Functionality	Tree Canopy Cover and Density
	Stand Size and Connectivity
	Stand or Area Geometry
Habitat for Native Species	Presence of Native Species
	Special-Status Species
	Invasive Plant Species Presence and Abundance
Human Interactions	Historical and Cultural Significance
	Public Recreation
	Visual Impact
Management Considerations	Current Management Compatible with Sustained Resource Value
	Level of Management Input to Attain or Maintain Sustainability
	Influence of Adjacent Land Uses or Other External Factors

Stand Composition, Integrity, and Functionality (Criteria 1-3)**Criterion 1. Tree Canopy Cover and Density**

Many of the benefits and services provided by oak woodlands are directly related to the amount of tree canopy cover on the site. Most of the benefits related to air quality (such as carbon sequestration and particulate interception), for example, are directly proportional to total canopy cover. The amount of flood protection and erosion protection provided by oak woodlands are also directly related to canopy cover. The relationship between canopy cover and wildlife habitat is more complex. Some species prefer closed canopy woodlands, whereas others are more apt to utilize openings within the woodlands or edges between woodlands and other habitat types. As a result, sites with less than 100 percent canopy cover may support greater biodiversity overall. Therefore, while the goal is to create an oak woodland conservation area that may look to maximize the total amount of conserved oak woodland canopy cover, the importance of including a variety of canopy cover levels within conserved woodlands should be recognized.

Tree density (the number of trees per unit area) is related to total canopy cover, but a range of tree densities can give rise to a given level of canopy cover. At excessive tree densities (also known as “overstocked stands”), trees typically compete with each other for available water and light, so tree growth can be slow and tree condition may be poor. Through attrition of suppressed, the stand may eventually self-thin to a sustainable density, but this process can delay the transition of the woodlands to a desirable density. At opposite extreme, very low density stands, characterized by individual tree canopies separated by large distance (200-300 feet or more) may not be sustainable due to low rates of regeneration and may be appropriate targets for restoration or enhancement. Apart from these extremes, a relatively wide range of densities may be sustainable, depending on species composition and site characteristics.

The following approximate overall ranges of canopy cover could be used: high = 50 percent or more, intermediate = 20 to 50 percent, low = less than 20 percent. The definition of the priority for conservation levels for Criterion 1 are identified in **Table 5-4** below.

Table 5-4. Priority for conservation levels for Criterion 1 – Tree Canopy Cover and Density

Priority for Conservation	Tree Canopy Cover and Density
High	Relatively high levels of tree canopy cover at stand densities that are sustainable for the site.
Moderate	Intermediate levels of tree canopy. Portions of the site may have excessively high or low stand density.
Low	Tree canopy is low or very low. Alternatively, canopy cover levels are higher, but most or all of the stand has unsustainably high tree densities.

Criterion 2. Stand Size and Connectivity

An overarching goal in conserving oak woodlands is to maintain oak woodlands as functional ecosystems. The functionality of the oak woodland ecosystem is related to its size, its connectivity with other oak woodlands or other native habitats, and its interface with less compatible adjacent land uses. Larger oak woodland stands are more likely to provide the scale needed to allow for ecosystem processes to function, and, therefore, generally have greater conservation values than smaller areas (if all other factors are equal). The overall biodiversity of a stand tends to increase with size, since a larger variety of habitat features are more likely to exist in a larger area. Also, some species that require relatively large home ranges are likely to occur only in sufficiently large habitat areas. Small stands with a limited number of trees may not have sufficient genetic variation to provide for long term stability, and are more likely to be threatened by impacts such as fire, disease, or long-term climate variation.

In assessing the overall size of an oak woodland conservation area, the landscape context should be considered. The key conservation objectives identified in the County and City Reuse Plan policies and programs include:

- designate an oak woodland conservation area that connects the Habitat Management Areas (HMAs) to the south (Bureau of Land Management Fort Ort National Monument HMA), east (Habitat Corridor/Travel Camp HMAs), and north (Landfill HMA); and
- maintain large, contiguous block of oak woodland habitat.

Therefore, a relatively small oak woodland area can have a high conservation value if it is adjacent to other conserved lands, especially if it forms a link between conserved habitats creating a large, contiguous block of oak woodland habitat. The definition of the priority for conservation levels for Criterion 2 are identified in **Table 5-5** below.

Table 5-5. Priority for conservation levels for Criterion 2 – Stand Size and Connectivity

Priority for Conservation	Stand Size and Connectivity
High	The oak woodland area is relatively large, constitutes a high percentage of the resource, and/or is connected with a larger network of oak woodland and other native habitats which are conserved.
Moderate	The oak woodland area is fair in size with a moderate percentage of the resource, and/or has some connection to other native habitats which are conserved.
Low	The oak woodland area is too small to ensure a self-sustaining stand and is not connected with other native habitats.

Criterion 3. Stand or Area Geometry

The geometric shape of an area is another consideration in assessing its conservation value, especially if the area is adjacent to lands that have been converted from native plant communities to other uses. Land uses such as residential development and intensive agriculture may adversely affect the habitat value of adjacent oak woodland, and may also limit the options available for woodland management. Impacts generally increase as the amount of interface or edge between the woodlands and developed land uses increases. The definition of the priority for conservation levels for Criterion 3 are identified in **Table 5-6** below.

Table 5-6. Priority for conservation levels for Criterion 3 – Stand Geometry

Priority for Conservation	Stand or Area Geometry
High	Little or no interface between the stand and an incompatible adjacent land use such as urban/residential or intensive agricultural development.
Moderate	Moderate amount of interface with incompatible adjacent land use such as urban/residential or intensive agricultural development relative to the area of the stand or project area and/or adjacent land uses are only partially incompatible or incompatible uses are buffered at the interface.
Low	High ratio of developed interface length to the overall area. May be relatively narrow areas with incompatible uses on both side or areas with inholdings of incompatible land uses.

Habitat for Native Species (Criteria 4 – 6)

The quality of habitat and the number and types of species present in oak woodlands depend on a variety of factors, including:

- Oak density (trees per acre) and level of canopy cover. Different tree densities and levels of canopy cover create different habitat types (i.e., oak woodlands have higher tree density and higher canopy cover than oak savannas; however, oaks are an important feature in both habitat

types). Additionally, tree density and/or canopy cover can vary within a single habitat type. Wildlife species vary in the degree to which they utilize stands with varying amounts of canopy cover and/or levels of tree density: some prefer more open stands, whereas others are more likely to be found in dense stands. The level of shading in the understory, which depends on both stand density and species composition, also affects which native or exotic plant species are likely to be present.

- Distribution of tree sizes and ages. Various species that utilize cavities in large stems or prefer tall trees are more likely to occur in stands with larger, older trees. The presence of dead trees (snags) and large downed wood (coarse woody debris) improves habitat values for various wildlife species. This in turn is related to both the stand-age distribution and management of the stand, which affects how long downed wood remains on the ground. The presence of various plant species in the understory or in canopy gaps may also be related to soil types or features such as vernal pools or riparian areas.
- Spatial distribution on the landscape. The distribution of oak woodlands across the landscape has a large influence on habitat quality. The spatial relationship between patches of woodlands and other habitats can influence which species may be found in the oak woodlands and the quality of the habitat that the woodlands provide. Connectivity between oak woodlands to provide for wildlife movement is also important for many wildlife species. Some species use oak woodlands for sheltering or nesting but forage in adjacent habitats, such as agricultural fields, grasslands, or chaparral.
- Disturbance. A high level of disturbance within woodlands and the presence of various exotic plant species can reduce the abundance of native species and reduce the overall habitat value of oak woodlands. Habitat quality can also be degraded by the degree to which the habitat is fragmented by residential or agricultural development, particularly if it interrupts movement corridors.

Criterion 4. Presence of Native Species

Historic military use resulted in the degradation of natural habitats; however, it also facilitated the preservation of natural habitats by limiting public access and limiting the amount of development. As a result, in some locations, areas exist that still have a diverse array of native species. Even if the native species present are not rare, these areas of high native biodiversity constitute a valuable and relatively rare resource. The definition of the priority for conservation levels for Criterion 4 are identified in **Table 5-7** below.

Table 5-7. Priority for conservation levels for Criterion 4 – Presence of Native Species

Priority for Conservation	Presence of Native Species
High	Oak woodland includes areas with high levels of native species present.
Moderate	Oak woodland has moderate levels of native species present and/or is adjacent to woodlands with native species present.
Low	Few native species other than oaks are present in or near the woodlands.

Criterion 5. Special-Status Species

In the broad sense, special-status species include species listed by the federal and state government as threatened or endangered species, species that have been proposed for listing but have not been officially listed, as well as plant species designated as rare or endangered by the California Native Plant Society (CNPS). Since these species as a group are rare and may be threatened with extinction, conserving their habitat is important for their survival and for maintaining the integrity of the ecosystems in which they are found. Special-status species may utilize oak woodlands as an essential part of their habitat or more commonly, they may utilize oak woodland habitat in addition to other habitat areas. Furthermore, woodlands adjacent to a given habitat area, such as a stream, are important for maintaining the integrity of that habitat, for example, by reducing the amount of sediment that would enter the stream via erosion. Section 4.1, Coast Live Oak Woodland, identifies some of the special-status species that utilize the oak woodland habitat on the former Fort Ord. The definition of the priority for conservation levels for Criterion 5 are identified in **Table 5-8** below.

Table 5-8. Priority for conservation levels for Criterion 5 – Special-Status Species

Priority for Conservation	Special-Status Species
High	One or more special-status species utilize a woodland or part of it as essential or preferred habitats.
Moderation	Woodland are used somewhat by special-status species and/or habitat of one or more special-status species is adjacent to the woodland.
Low	No special-status species utilize the woodlands or its adjacent areas.

Criterion 6. Presence of Invasive Plant Species

Invasive exotic species can compete with or displace native species, reducing overall native species biodiversity. The entire project area contains some exotic species, especially non-native grasses and forbs in the oak understory. Oak woodlands in which exotics make up a low percentage of the overall species mix, however, have a higher conservation value. In addition, some invasive species are especially disruptive due to their high reproductive potential, competitive abilities, effects on the overall structure of the plant community, and/or tenacity once established. For example, ice plant, jubata grass, and French broom on the former Fort Ord are especially problematic in areas where the understory has been disturbed

and cleared as a result of military remediation activities. The definition of the priority for conservation levels for Criterion 6 are identified in **Table 5-9** below.

Table 5-9. Priority for conservation levels for Criterion 6 – Presence of Invasive Plant Species

Priority for Conservation	Presence of Invasive Species
High	Oak woodland has relatively low amounts of exotic species and especially disruptive exotic species are absent or very rare.
Moderate	Oak woodland has moderate amounts of exotic species and/or may have located infestations of especially disruptive exotic species.
Low	Oak woodland is dominated by exotic species and/or may have high populations of especially disruptive exotics.

Human Interactions (Criteria 7– 9)

Another basis for assessing woodland value is the relationship between people and oak woodlands. This relationship is implicit in some of the other ratings. For example, the importance of considering wildlife habitat, native biodiversity, and other factors is based in large part on the value that people see in maintaining healthy ecosystems. In addition to the ecosystem services people derive from oak woodlands (whether they value them or not), these areas may be valued for their aesthetic qualities, as a recreational resources, and for their cultural or historical significance. These values are typically dependent on where the woodlands are located. In addition, other factors such as historical uses and events and land ownership (public or private) also influence these values.

Criterion 7. Historic and Cultural Significance

Oak stands or individual trees may have historical significance due to past events or structures that were associated with the trees, historical accounts that mention the trees, the use of specific trees as landmarks or as boundary markers, or other factors. In addition, oak trees and the acorns they provide have been and continue to be important cultural resources for the Native American tribes that live in California. Individual oaks or stands of oaks may have cultural significance to tribes or individual families. Loss of traditionally-used trees or gathering areas may significantly impact the continuation of cultural practices that span many generations. The definition of the priority for conservation levels for Criterion 7 are identified in **Table 5-10** below.

Table 5-10. Priority for conservation levels for Criterion 7 – Historic and Cultural Significance

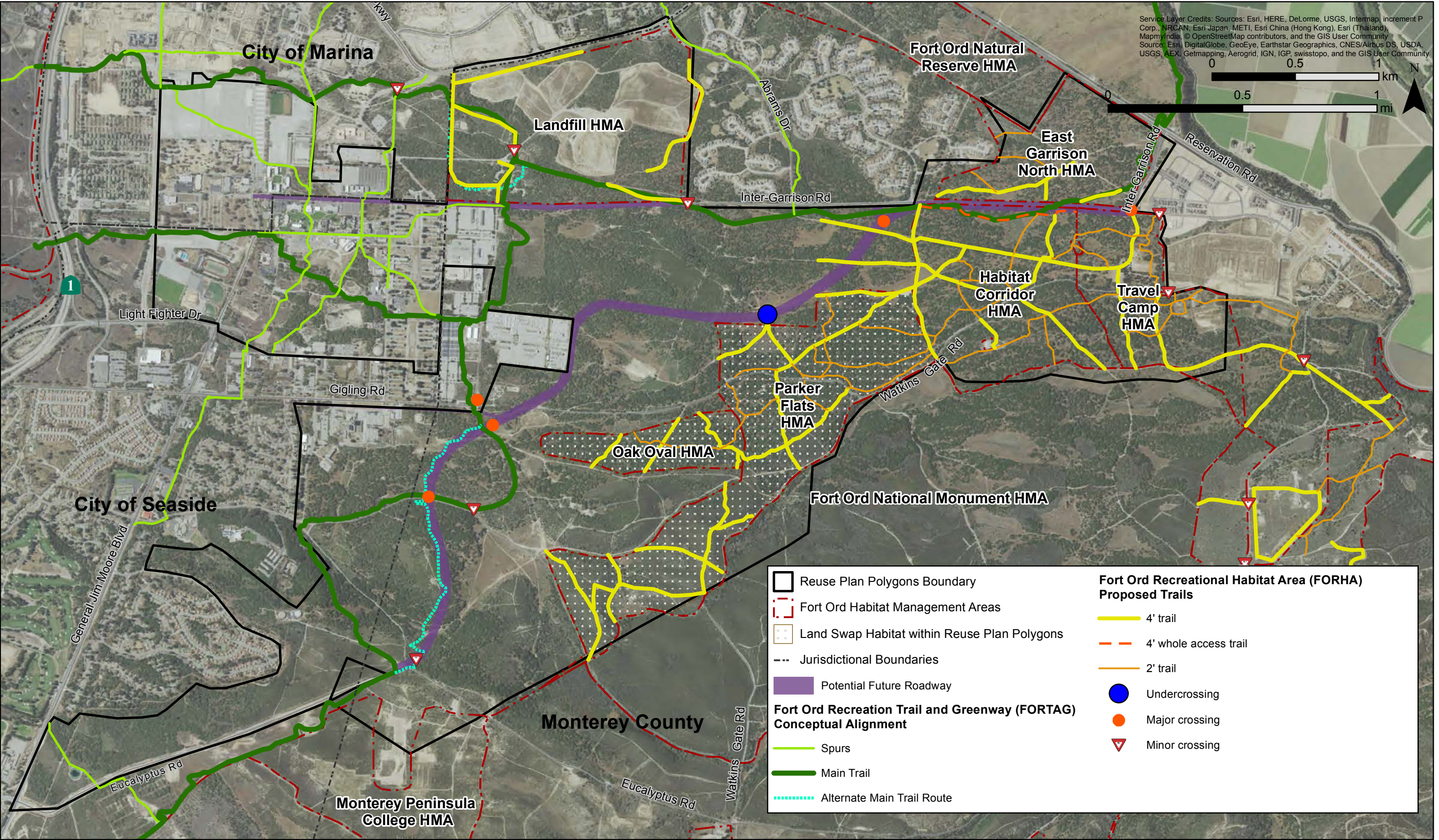
Priority for Conservation	Historic and Cultural Significance
High	Woodlands or trees have documented historical significant past and/or current use as a Native American cultural resource.
Moderate	Woodlands or trees have possible to likely historical significance and/or use as a Native American cultural resource, but documentary evidence is not conclusive.
Low	Woodlands to trees have no known or suspected historical significant and/or use as a Native American cultural resources.

Criterion 8. Public Recreation

Although this area was not historically available to the public for recreational use, the area is now a common place for passive and active recreation activities. Proposed trails were a focal point for several attendees at the first public meetings in November 2016. **Figure 12** identifies proposed trails within the project area. Passive and active recreation and tourism/eco-tourism ranked as the top two most important values, aside from biological values, in the output from a ranking exercise at the community meetings. Other recreation-related comments suggested trail access/availability, trail connectivity, types of trail use, amenities and services for trailheads, wayfinding, and regional recreational planning as important values in the project site. With adequate planning and monitoring, public access and use can be designed to be compatible with other conservation goals such as providing wildlife habitat. Therefore, to maximize the benefits associated with public access and use and minimize potential conflicts with biological goals, potential conservation areas should be connected to the degree possible with other lands with public access or use. The definition of the priority for conservation levels for criterion 8 are identified in **Table 5-11** below.

Table 5-11. Priority for conservation levels for Criterion 8 – Public Recreation

Priority for Conservation	Public Recreation
High	Oak woodlands that: <ul style="list-style-type: none"> provide low-impact public recreational opportunities compatible with conservation objectives, are connected with other parklands or public access areas, and pose a minimum conflicts with adjoining land uses.
Moderate	Oak woodlands that provide few opportunities for public recreation or areas where public recreation has impacts somewhat compatible with conservation objectives.
Low	Oak woodlands that do not provide opportunities for public recreation and use or do not connect with other parklands or public access areas.



Title:

Potential Roadway & Trails Map

Date: 02/27/2017

Scale: 1 in = 0.33 miles

Project: 2016-29

Monterey | San Jose

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Figure

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Criterion 9. Visual Impact

Prominent individual oaks and oak woodlands located in areas where they are commonly seen provide a strong positive visual impact and contribute to the “sense of place” associated with an area. Such woodlands typically provide a variety of other benefits as well, but may be more appreciated by the public at large due to their aesthetic qualities. The definition of the priority for conservation levels for Criterion 9 are identified in **Table 5-12** below.

Table 5-12. Priority for conservation levels for Criterion 9 – Visual Impact

Priority for Conservation	Visual impact
High	Oak woodlands with high visual impact, located within view of communities and major roadways.
Moderate	Oak woodlands with some visual impact, located partially within view of communities and major roadways.
Low	Oak woodlands located in areas where they are unlikely to be seen by most people.

Management Constraints (Criteria 10– 12)

Woodland management constraints may be considered as a factor that contributes to the risk of resource loss/degradation. In effect, management may be considered a separate criterion that interacts with the cost-effectiveness of conservation.

Reuse Plan Biological Resource Program B-2.1 for the County and City state that the jurisdictions “shall ensure that those areas are managed to maintain or enhance habitat values existing at the time of base closure so that suitable habitat is available for the range of sensitive species known or expected to use those oak woodland large, contiguous block of oak woodland habitat, access control, erosion control and non-native species eradication.” It is important to consider this factor in determining an appropriate conservation area(s).

Criterion 10. Current Management Compatible with Sustained Resource Value

Woodlands that are conserved need to be managed in a way that retains or improves their resource value if they are to continue to provide benefits and services. If properties are currently being managed in a sustainable fashion to protect or enhance resource values, no changes in management will be necessary. Future management savings will be greatest for sites where sustainability is achieved through few or no major management inputs. The definition of the priority for conservation levels for Criterion 10 are identified in **Table 5-13** below.

Table 5-13. Priority for conservation levels for Criterion 10 – Current Management Compatible with Sustained Resource Value

Priority for Conservation	Management Constraint
High	Current management is compatible with sustaining resource value.
Moderate	Current management is partially compatible with sustaining resource value.
Low	Current management is not compatible with sustaining resource value.

Criterion 11. Level of Management Input to Attain or Maintain Sustainability

Lands that require a major change in management to attain sustainability may be more expensive to maintain over the long term, particularly if the necessary management changes will be expensive or difficult to implement. For example, since the Reuse Plan policies require non-native species eradication, a conservation area with higher levels of non-native species would be more expensive to maintain than an area with smaller levels of non-native species. An area with higher levels of non-native species may also indicate the area is frequently disturbed and may be more difficult and expensive to maintain. The definition of the priority for conservation levels for Criterion 11 are identified in **Table 5-14** below.

Table 5-14. Priority for conservation levels for Criterion 11 – Level of Management Input to Attain or Maintain Sustainability

Priority for Conservation	Management Constraint
High	Little additional management input is required to attain or maintain sustainability.
Moderate	Some additional management input is required to attain or maintain sustainability.
Low	A considerable amount of additional management input is required to attain or maintain sustainability.

Criterion 12. Adjacent Land Uses or Other External Factors

Lands that have adjacent land uses or other external factors that have a strong influence on management practices may be more difficult to maintain over the long term and may require constant management to attain/maintain sustainability. For example, for the project site, if a proposed or existing adjacent land use is a habitat management area as compared to a residential area, the habitat management area would have a weak influence on the management practices. This is due to lower levels of use adjacent to the conservation area and less interaction with urban activities. The definition of the priority for conservation levels for Criterion 12 are identified in **Table 5-15** below.

Table 5-15. Priority for conservation levels for Criterion 12 – Adjacent Land Uses or Other External Factors

Priority for Conservation	Management Constraint
High	Adjacent land uses or other external factors have a weak influence on management practices.
Moderate	Adjacent land uses or other external factors have a partial influence on management practices.
Low	Adjacent land uses or other external factors have a strong influence on management practices.

Table 5-16 – Oak Woodland Evaluation Criteria Checklist and Ranking of Preliminary Conservation Concepts 1-3

Resource Values	Ranking for Conservation			Notes
	Concept 1	Concept 2	Concept 3	
Stand Composition, Integrity, and Functionality				
Tree canopy cover and density	High	High	High	All three concepts have varied levels of canopy cover to provide a range of habitats and include the minimum number of acres of oak woodland plus 20% contingency (minimum 162 acres).
Stand size and connectivity	High	High	High	All three concepts would connect to HMAs and create large contiguous blocks of habitat.
Stand or area geometry	Low	Moderate	Moderate	All three concepts have some interface with potential development parcels. Concept 1 has the greatest interface with potential development parcels (approximately 73.7% of the perimeter). Concept 2 (approximately 67.3% of the perimeter) and Concept 3 (approximately 72.5% of the perimeter) have less.
Habitat for Plant and Wildlife Species				
Presence of native species	Moderate	Moderate	High	Concepts 1 and 2 contain a higher acreage of invasive species, which reduces the amount of habitat available for native species. Approximate acreages of invasive species as identified in the Invasive Species Map provided in the Baseline Report: Concept 1: approximately 75.0 ac Concept 2: approximately 103.3 ac Concept 3: approximately 37.3 ac
Special-status species	Moderate	Moderate	High	All three concepts are utilized by special-status species. Due to higher acreage of invasive species in Concepts 1 and 2, Concept 3 would be more likely to be utilized by special-status species.
Presence of invasive plant species	Low	Low	High	Approximate acreages of invasive species as identified in the Invasive Species Map provided in the Baseline Report: Concept 1: approximately 75.0 ac Concept 2: approximately 103.3 ac Concept 3: approximately 37.3 ac
Human Interactions				
Historical and cultural significance	High	High	High	All three concept areas are assumed to be important to Native American tribes; however, no specific feedback has been received to date whether some areas are more important than others.
Public recreation	High	High	Moderate	All three concept areas are highly utilized and connect to other recreational areas. However, Concept 3’s southern connection (Seaside parcel and MPC parcel) are less utilized. Concepts 2 and 3 incorporates more

Resource Values	Ranking for Conservation			Notes
	Concept 1	Concept 2	Concept 3	
				of County parcel L5.7, which connects to the proposed FORHA trail network more.
Visual impact	High	High	High	All three concept areas are highly utilized by the public and provide sense of place.
Management considerations				
Current management compatible with sustained resource value	Moderate	Moderate	Moderate	All three concept areas are similarly managed in that they are not actively managed and each have had some level of remediation activity to support future land use (i.e., development). This hands-off management approach has indirectly protected the existing resources; however, the level of management would need to be increased in each area to protect resources.
Level of management input to attain or maintain sustainability	Low	Low	Moderate	Concepts 1 and 2 have higher levels of invasive species, and since the Reuse Plan requires non-native species eradication, management would be most expensive in these areas. However, all of the concepts have areas of invasive species that would require management efforts per the Reuse Plan requirements.
Influence of adjacent land uses or other external factors on management practices	Low	Moderate	Moderate	While all three concepts require various landowner approvals, Concept 1 has the greatest interface with potential development parcels which could result in greater management costs.

6.0 REFERENCES

- Baldwin, B. G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds.). 2012. The Jepson Manual – Vascular Plants of California, Second Edition, Thoroughly Revised and Expanded. University of California Press. Berkeley, CA. 1600 pp.
- Barbour, M.G., and J.M. Evens, T. Keeler-Wolf, and J.O. Sawyer. California's Botanical Landscapes, A Pictorial View of the State's Vegetation. California Native Plant Society, Sacramento, CA. 398 pp.
- California Department of Fish and Wildlife (CDFW). 2009. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. Available online at: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/Protocols_for_Surveying_and_Evaluating_Impacts.pdf
- California Invasive Plant Council (Cal-IPC). 2006. California Invasive Plant Inventory
- California Native Plant Society (CNPS). 2001. Botanical Survey Guidelines. Available Online at: http://www.cnps.org/cnps/rareplants/pdf/cnps_survey_guidelines.pdf
- Davis, F.W., D.D. Baldocchi, and C.M. Tyler. 2016. Oak Woodlands. In Mooney H., and E. Zavaleta (Eds.), Ecosystems of California. Oakland: University of California Press. (pp. 509-528)
- Fort Ord Reuse Authority (FORA)/ EMC/ EDAW. 1997. Fort Ord Reuse Plan & Elements EIR.
- FORA, Monterey Peninsula Community College (MPC), County of Monterey, U.S. Bureau of Land Management (BLM), and the U.S. Army. 2003. Memorandum of Understanding Concerning the Proposed East Garrison/Parker Flats Land-Use Modification. Available online at: http://docs.fortordcleanup.com/ar_pdfs/AR-BW-2180A/BW-2180A.pdf
- Hennings and Soll. 2010. Wildlife corridors and permeability. April 2010. Available online at: https://www.researchgate.net/publication/265085554_Wildlife_corridors_and_permeability_-_a_literature_review
- Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Nongame-Heritage Program, California Department of Fish and Wildlife, Sacramento, CA. 156 pp.
- Jepson Flora Project. 2009. Jepson Online Interchange for California floristics. Available online at: <http://ucjeps.berkeley.edu/interchange.html>
- Matthews, M.A. and M. Mitchell. 2015. The Plants of Monterey County, an Illustrated Field Key; Second Edition. California Native Plant Society Press, Sacramento, California. 446 pp.
- Monterey County 2009. Monterey County Voluntary Oak Woodland Stewardship Guidelines. September 2009. Available online at: http://www.co.monterey.ca.us/planning/major/Oak%20Woodlands%20Stewardship%20Guidelines/Mo_Co_Voluntary_Oak_Woodland_Stewardship_Guidelines_Sept_2009.pdf
- Ruskin, B. 2009. Forest Resource Evaluation, Whispering Oaks Business Park, Monterey California.
- Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A manual of California vegetation 2nd Edition. California Native Plant Society, Sacramento, CA. 1300 pp.

- Staub Forestry and Environmental Consulting. 2010. Forest Resource Evaluation, California Central Coast Veteran's Cemetery Project, Monterey, California.
- Staub Forestry and Environmental Consulting. 2012. Forest Resource Evaluation, Monterey Downs, Monterey, California.
- Stromberg, Mark R. March 2009. Oak Woodland in Monterey County.
- U.S. Army Corps of Engineers (ACOE), Sacramento District. 1992. Flora and Fauna Baseline Study of Fort Ord, California. With technical assistance from Jones and Stokes Associates, Inc. Sacramento, California.
- ACOE, Sacramento District. 1993. Fort Ord Disposal and Reuse Environmental Impact Statement. Final. Volumes I, II, and III. Sacramento, CA. Technical assistance from Jones & Stokes Associates, Inc. (JSA 90-214), Sacramento, CA.
- ACOE, Sacramento District. 1997. Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California. April 1997. Sacramento, CA.
- U.S. Department of Agriculture (USDA) – Soil Conservation Service. 1978. Soil Survey of Monterey County, California. In cooperation with the University of California Agricultural Experiment Station.
- U.S. Fish and Wildlife Service (Service). October 19, 1993. Biological Opinion for the Disposal and Reuse of Fort Ord, Monterey County, California (1-8-93-F-14).
- Service. May 28, 2002. Letter to Colonel Kevin M. Rice, Installation Commander, DLRFLC & POM, from Diane Noda.
- Wood Rodgers. 2015. Master Plan California Central Coast Veterans Cemetery; Seaside, California. September.
- Zander Associates. 2002. Assessment East-Garrison-Parker Land Use Modification Fort Ord, California. Prepared for the County of Monterey & Fort Ord Reuse Authority Monterey County, California. Available online at: http://docs.fortordcleanup.com/ar_pdfs/AR-BW-2180//BW-2180_text.pdf

APPENDIX A – Forestry Report

FORA

Forest Resource Evaluation

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February 27, 2017

SUMMARY

This report provides a description of the forest resources within the former Fort Ord development area as defined by the 1997 Fort Ord Base Reuse Plan (Reuse Plan) oak woodland policies and programs obligations. The total acreage of oak woodlands and oak woodland mix habitats is 1759 acres. The report provides an estimate of the total tree population (242,742 Oak trees) within the 1759 acres by size class and general condition rating using stratified random sampling as well as noting the presence of “Landmark” trees (estimated to be 1,759 Landmark trees).

INTRODUCTION

The City of Seaside (Seaside) and the County of Monterey (County) are working collaboratively to meet their Reuse Plan oak woodland policies and program obligations. The Fort Ord Reuse Authority (FORA) is funding the effort and providing contract management. FORA is also assisting Seaside and the County to coordinate their respective oak woodland management efforts with the University of California, Monterey Bay Education, Science, and Technology (UCMBEST), California State University Monterey Bay (CSUMB), and Monterey Peninsula College (MPC). A Draft Area Map and Draft Management Plan are to be developed to address oak woodland areas in the City of Seaside (Seaside) and County of Monterey (County).

ASSIGNMENT/SCOPE OF PROJECT

The scope of this project is to develop biological information to assist in Preparation of a Draft Oak Woodland Conservation Area Map (Draft Area Map) and Draft Oak Woodland Area Management and Monitoring Plan (Draft Management Plan) on the former Fort Ord property. This forest resource evaluation is an element of the biological evaluation intended for assistance in quantifying, review, and analyzing oak woodland area. This information is to be submitted for use in a background/data report in anticipation of the development of a Draft Area Map and Draft Management Plan.

The purpose of this forest resource evaluation is to:

- Provide a description of the forest resources within the project area.
- Provide an estimate of the total tree population by size class and general condition rating using stratified random sampling.
- Establish the presence of “Landmark” trees as well as any other notable forest resource occurrences and/or unique forest values.

LIMITATIONS OF REPORT

This assignment is limited to physical site visits and the review of documents submitted to F.O. Consulting by DD&A. Documents studied and incorporated into the analysis are of the December 15, 2016 Vegetation Types and Oak Woodland Project Area, prepared by DD&A and Previous forest management plan and forest resource assessments prepared by Staub Forestry & Environmental Consulting reviewed which include:

- August 2009 Forest Management Plan for Monterey Salinas Transit Bus Maintenance and Operations Facility Fort Ord, Monterey County,
- November 2010 Forest Resource Evaluation California Central Coast Veterans Cemetery, Monterey, California
- September 2011 Forest Resource Evaluation Eastside Parkway Project, Monterey CA
- August 2012 Forest Resource Evaluation Monterey Downs, Monterey CA

This report estimates Oak tree populations (no other tree species were sampled) based on current forest metrics. The data was collected by performing a randomized (or haphazard) blocked sample. The blocks were selected by the arborist using professional judgement and experience to get the best representation of the total tree population. Tree density was estimated by extrapolating per acre utilizing average stocking of sample plots and multiplying by the number of acres of oak woodland. It is also not the intent of this report to be a monetary valuation of the trees or provide risk assessment for any tree on this parcel, as any tree can fail at any time. No clinical diagnosis was performed on any pest or pathogen that may or may not be present. F.O. Consulting relied on information provided in the preparation of this report (such as, surveys, property boundaries, and property ownership) and must reasonably rely on the accuracy of the information provided. F.O. Consulting shall not be responsible for another's means, methods, techniques, schedules, sequence or procedures, for contractor safety or any other related programs; or for another's failure to complete the work in accordance with the plans and specifications. Construction, pedestrian, vehicular, or other impacts to individual trees are not evaluated in this report.

SITE DESCRIPTION

The area features a mix of vegetation types primarily composed of large stands of Coast live oak (*Quercus agrifolia*). There is an occasional Monterey pine (*Pinus radiata*). Groundcovers are poison oak (*Toxicodendron diversilobum*), coffee berry (*Rhamnus californica*), manzanita (*Arctostaphylos sp.*), and non-native grasses. These vegetation types are consistent as stated in previous reports reviewed of adjacent areas of biological resources prepared by Denise Duffy and Associates, Inc. The routes utilized for random sampling traversed both areas of open canopy conditions receiving recreational (walking, biking, and horseback riding) along with other areas further away from used roadways and paths. Other areas accessed for assessment are non-human use areas which are densely vegetated stands of closed canopy Coast live oak and native understory.

Soils on the majority of the parcel are mapped in the Soil Survey of Monterey County as Oceano loamy sand (2-15%) slope (USDA, 1978). The Oceano series consists of excessively drained soils that formed in Aeolian sands on old stabilized dunes. Oceano soils are used mostly for range. Vegetation associated with this soil type consists of annual grasses, forbs, and scattered scrub oak or brush, commonly chamise.

METHODOLOGY

Thirty-one one, stratified 1/10-acre sample plots for tree inventory and conditions assessment were conducted within the 1,759 acres of coast live oak woodland habitat utilizing the mapping for the project site (provided by DD&A). Plot sampling and a reconnaissance level survey for the sample areas were conducted in December of 2016. Points for the plot sampling were selected haphazardly using ArcGIS within the oak woodland habitat. However, if the points fell within woodland areas not easily accessible, the nearest accessible point was selected. The nearest point was selected by the arborist using professional judgement and experience to get the best representation of the total tree population and be indicative of the overall health of the woodland. The sampling method utilized was intended to approximate the average condition for the entire area as a whole. Aerial photography, previous forest resource assessments and inventory information conducted by Staub Forestry & Environmental Consulting were also reviewed along with field observations to prepare this forest resource evaluation. In the Staub report, it indicated that the tree inventory/condition evaluation for the Downs preserve area as 95% of the trees were in fair, poor, or dead health. This is most likely due to these areas as being on the perimeters of the woodland. Soils in these areas received scarification as well as significant limbing, and ground cleanup. These abiotic (wind and human presence) and biotic (oak worms and beetles) pressures, factor into the health of the woodland and can create discrepancies over several years. The Staub report noted that a significant outbreak of oak worm was present in this area which would lessen the quality of trees in that area. Currently the tree health of the Downs area is considered overall fair but is only a portion of the entire oak woodland population.

Oak Tree Population by Size and Class Density

Oak classifications are listed by diameter size class 6-11", 12-23", and 24" or greater measured at 2 feet above ground level as per Title 21 Section 21.64.260 of the Monterey County Zoning Ordinance and is reported on a per acre basis. For the purpose of this inventory/assessment, an individual tree was judged to have a minimum of 1 foot of separation from any other adjacent stem at ground level. This approach is used because Coast live oak, especially in this location and setting, typically shows as a "cluster" or "grouped" growth form, making the definition of an individual tree difficult and impractical to distinguish; in many cases these "clusters" of stems share a common root system, joined at the pith area just below the litter duff area giving an appearance of individual stems when they are in actuality one tree with codominant stems.

Landmark Trees

Landmark trees are defined as a tree measuring 24" in diameter or greater, measured at two feet above ground, or trees that are visually significant, historically significant, or exemplary of their species (per County code).

Tree Health and Vigor

Tree health and condition is evaluated by visually inspecting from the root crown (where the trunk meets natural grade) to foliar canopy and recorded on a percent of stand basis is as follows:

- Good: little appearance of decay or disease, good canopy development and color
- Fair: thriving with minor evidence of disease or decay and less than 30% foliar dieback
- Poor: declining with major evidence of foliar dieback, disease/decay, and/or poor foliage color
- Dead: in irreversible decline or dead and are counted as poor due to habitat value

A typical forestry evaluation provides a rating for each tree in the context of the quality of the wood that could be harvested with older trees being rated poor more often than younger trees. However, in the context of the evaluation of woodland habitat quality, age diversity is a good thing. Older trees and snags provide structural diversity, wildlife habitat, and are an important component of a healthy mature woodland.

Tree Inventory and Conditions

Location	Number of Sample Plots within Location	Total Acreage of Sample Plots within Location	Tree Condition	Tree Diameter Class		
				6-11"	12-23"	24+"
Evaluation Area Overall	31	3.1	Dead*			
			Poor	19	6	1
			Fair	12	14	1
			Good	234	146	8
	Total Trees Plotted in Sample Plots within Location, by Diameter Class			265	166	11
Reuse Plan Development Polygon Evaluation Area			Dead*			
			Poor	10	3	0
			Fair	5	8	0
			Good	145	89	4
	Total Trees Plotted in Sample Plots within Location, by Diameter Class			160	100	4
Remaining Evaluation Area			Dead*			
			Poor	9	3	1
			Fair	7	6	1
			Good	89	57	5
	Total Trees Plotted in Sample Plots within Location, by Diameter Class			105	66	7
*Presence of dead trees is not necessarily an indicator of poor tree health or poor habitat conditions as dead trees add structure/value to habitat.						

FOREST RESOURCES

Tree Stand Description

Vegetation within the area of study has been mapped primarily as coast live oak woodland (1759 acres). As stated previously, habitats where coast live oak was a component varied within the project area and within the sampled plots. These plots range from dense stands of pure Coast live oak to less dense areas consisting of Maritime Chaparral, non-native Grassland with minor amounts of Coastal Scrub. Vegetation types are described in previous Biological Reports prepared by Denise Duffy and Associates, Inc.

Forest cover is comprised entirely of coast live oak woodland (*Quercus agrifolia* and associated species). There are a few maturing Monterey pine (*Pinus radiata*) within the oak woodland. This tree species is not native to this site and appears to be introduced from off-site plantings during the last few decades and are not counted in this report. The forest understory is dominated by poison oak with coffee berry, manzanita, and interspersed non-native grasses. There are pockets of invasive species (primarily ice plant and non-native grasses) occurring in some of the portions of previously disturbed and less densely vegetated areas.

Coast live oak density variation is apparent in the plot data taken on the site. The oak stands are mostly limited in height both by prevailing western wind pressure and competition for moisture and nutrients from excessive soil drainage. Larger and consequently taller trees occur where soils are deeper retaining additional moisture (Northern slope aspects or bottom of slopes protected from wind pressure). Average tree height in general is 25 feet or less. Many of the sampled stands consist of numerous shorter trees (10 to 12 feet) with multiple small stems (6-8" diameter).

Insects and Disease

California Oak Worm

The trees show signs of prior California oak worm (*Phryganidia californica*) defoliation; however, many of the trees appear to be fully or partially recovered. Recovery from the defoliation is affected by minimal moisture on the site due to wind pressure and excessively drained sandy soils. The predominance of trees in fair or better condition is characteristic of native, unmanaged oak woodlands.

Oak Branch Canker

Oak Branch Canker (*Diplodia quercina*) is apparent in a few of the test plots but is minor in its presence. The canker kills small branches (usually those less than 1 inch, but up to 4 inches in diameter), causing leaves to turn brown, wilt, die, and remain attached in the canopy. Outbreaks of oak branch dieback often follow years of below-average rainfall. The disease is not a major problem in most years, and control is usually not needed.

Sudden Oak Death (SOD)

No indicators or symptoms were observed for SOD (*Phytophthora ramorum*) on the sample plots or areas near them. According to the California Oak Mortality Task Force (a task force under the California Forest Pest Council) SOD website, the nearest mapped site is located in Carmel Valley somewhere in the Quail Meadows area.

Phytophthora Root/ Crown Rot

Most of the oak dieback observed appears to be from Phytophthora Root/ Crown Rot in combination with bark beetles. Phytophthora cause crown and root rot diseases of herbaceous and woody plants. The pathogen kills plants by growing from the roots up through the root crown and into the lower trunk, where it kills the inner bark and causes a browning of the outer layer of sapwood.

Oak Bark Beetles

Oak ambrosia beetles (*Monarthrum species*) and Oak bark beetles (*Pseudopityophthorus species*) are beetles that attack stressed trees. They burrow in and overwinter beneath bark; creating bleeding, frothy, bubbling holes with boring dust which indicate damage to the tree. It is suspected that these beetles in combination with crown rot is responsible for decline in many of the oaks.

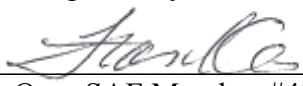
Foamy Bark Canker

Foamy Bark Canker (*Geosmithia pallida*) is a new disease found on coast live oak, spread by Western oak bark beetle (*Pseudopityophthorus pubipennis*). No obvious signs of the disease was observed on any areas of the sample plots.

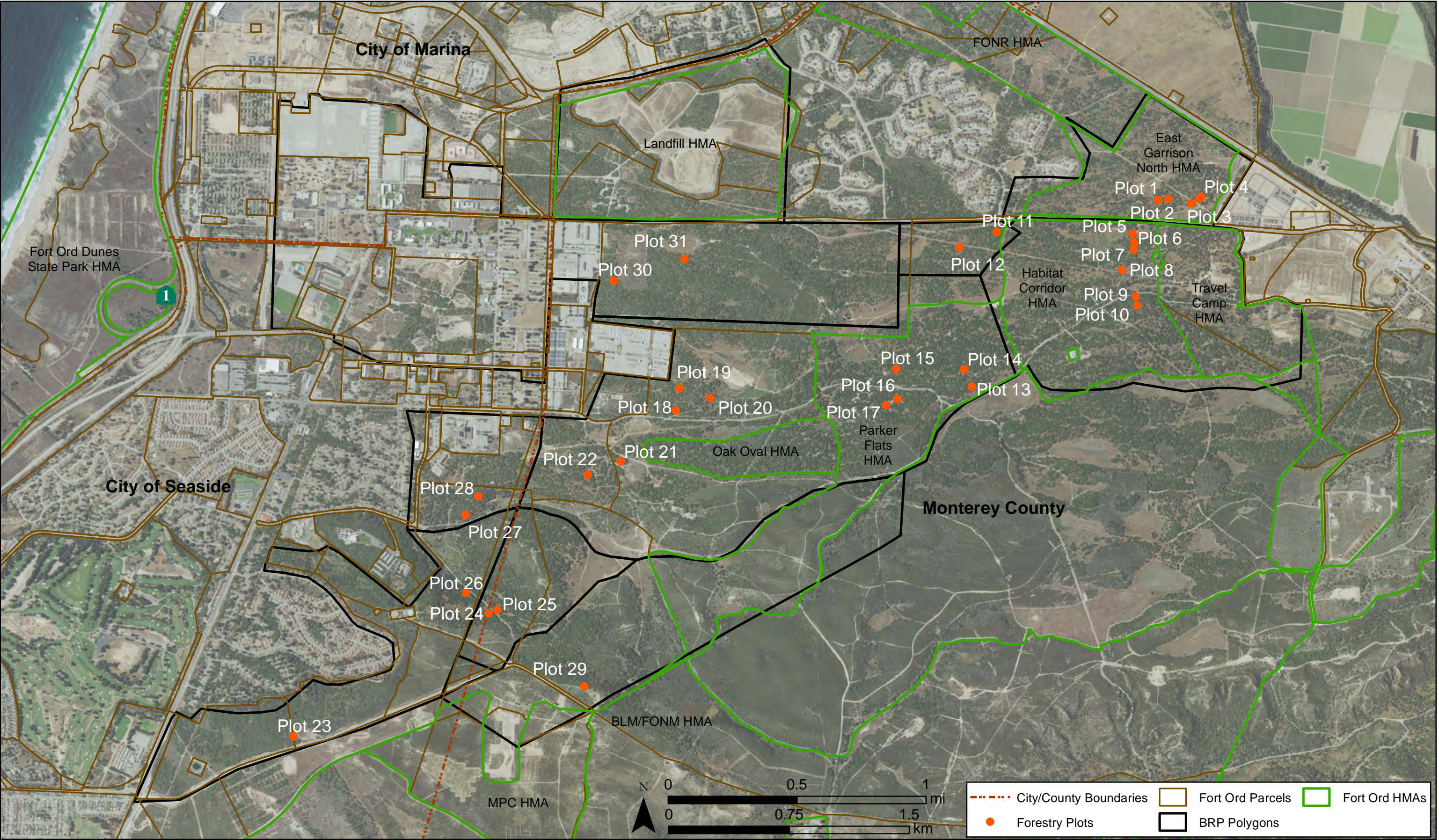
Oak Regeneration

The oak woodlands appear to be young but maturing. Unfortunately there are few or no oak seedlings or saplings observed, though it appears there has been some planting of oaks along paths used to access the property. The absence of Oak regeneration is a statewide problem due to a variety of factors such as grazing, wildlife browsing, avian and rodent predation, and competition for moisture with annual grasses.

Report Prepared By:


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February 27, 2017
Date



Title:	FORA Oak Woodlands Forest Density Plots
File:	

Date:	12/13/2016
Scale:	1 in = 1,839 ft
Project:	2016-29



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