

FORA ESCA REMEDIATION PROGRAM

2009 Annual Natural Resource Monitoring, Mitigation, and Management Report

Covering Activities Conducted from January 1 through
October 15 in County North, CSUMB Off-Campus, Future
East Garrison, Interim Action Ranges, Laguna Seca Parking,
Parker Flats, and Seaside Munitions Response Areas

Former Fort Ord
Monterey County, California

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ACRONYMS AND ABBREVIATIONS

AOC	Administrative Order on Consent
Army	U.S. Department of the Army
BLM	Bureau of Land Management
BO	Biological Opinion
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSUMB	California State University Monterey Bay
CTS	California tiger salamander
DBH	diameter at breast height
DGM	digital geophysical mapping
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
ESCA	Environmental Services Cooperative Agreement
ESCA RP	Environmental Services Cooperative Agreement Remediation Program
ESL	Explosives Storage Location
FFA	Federal Facility Agreement
FORA	Fort Ord Reuse Authority
FOSET	Finding of Suitability for Early Transfer
GIS	Geographic Information System
HMP	Habitat Management Plan
km	kilometer
LFR	LFR Inc.
m	meter
MEC	munitions and explosives of concern
MRA	Munitions Response Area
MRS	Munitions Response Site
msl	mean sea level
NRMA	Natural Resources Management Area
OE	ordnance and explosives

QB	Qualified Biologist
RQA	Residential Quality Assurance
RWQCB	Regional Water Quality Control Board
SCA	Special Case Area
SEDR	Summary of Existing Data Report
SQB	Senior Qualified Biologist
SSWP	Site-Specific Work Plan
TCRA	Time-Critical Removal Action
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
UXO	unexploded ordnance

GLOSSARY

Limb Up

Pruning of lower branches back to the main trunk or to major branches, usually to provide MEC clearance personnel access underneath large trees. The purpose of this procedure is to enable MEC clearance while allowing larger trees (generally trees that are 6 inches in diameter at breast height) to remain viable and in place.

Seral

Stages (e.g., initial, early, intermediate, mature, sub-climax, climax, etc.) of a plant community demonstrated or presumed to be associated with succession (see also succession).

Succession

A natural temporal progression of plant community development from a disturbed to a “climax” state. Modern understanding of the climax state is that of a dynamic steady-state condition (see also seral, trajectory).

Trajectory

The trend of temporal progression of a habitat from a disturbed (typically a restored or created habitat) to a “climax” (or predicted) condition. Although similar to “succession,” this term is more often employed in ecological restoration projects when physical features of the habitat (in addition to plant communities) are altered by the disturbance and which also exhibit progression to some equilibrium condition (see also succession).

Vegetation clearance

Vegetation clearance in this report refers to: 1) a prescribed burn or 2) manual and/or mechanical removal to a maximum 6-inch height except for large trees, which are pruned to a height that allows human access below the tree canopies (see “limb up”). Vegetation clearance is performed for the purpose of providing accessibility to the local ground surface for munitions and explosives of concern (MEC) clearance activities.

1.0 INTRODUCTION

1.1 Purpose and Scope

This second Annual Natural Resource Monitoring, Mitigation, and Management Report summarizes natural resource-related activities performed by the Fort Ord Reuse Authority (FORA) Environmental Services Cooperative Agreement Remediation Program (ESCA RP) Team during the period from January 1 through October 15, 2009. Most of the requirements addressed herein are described in relevant Biological Opinions (BOs) issued by U.S. Fish and Wildlife Service (USFWS) and the Habitat Management Plan (HMP; USACE 1997; see Section 2).

The ESCA RP Team implemented these requirements in coordination with the U.S. Department of the Army (Army) as the ESCA RP investigation and remediation activities for munitions and explosives of concern (MEC) proceeded at the former Fort Ord.

1.2 Environmental Services Cooperative Agreement

The former Fort Ord was placed on the National Priorities List in 1990, primarily because of chemical contamination in soil and groundwater that resulted from past Army operations. To oversee the cleanup of the base, the Army, the Department of Toxic Substances Control (DTSC), the Central Coast Regional Water Quality Control Board (RWQCB), and the U.S. Environmental Protection Agency (EPA) entered into a Federal Facility Agreement (FFA). One of the purposes of the FFA was to ensure that the environmental impacts associated with past and present activities at the former Fort Ord were thoroughly investigated and appropriate remedial action taken as necessary to protect public health and the environment. In accordance with the FFA, the Army was designated as the lead agency under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for conducting environmental investigations, making cleanup decisions, and taking cleanup actions at the former Fort Ord. The EPA was designated as the lead regulatory agency for the cleanup while the DTSC and RWQCB are supporting agencies.

On March 31, 2007, the Army and FORA entered into an Environmental Services Cooperative Agreement (ESCA) with the Army for MEC remediation services, thereby allowing the Army to transfer approximately 3,380 acres of property to FORA as an Economic Development Conveyance under a Finding of Suitability for Early Transfer (FOSET). In accordance with the ESCA, FORA is responsible for addressing MEC response actions for the ESCA property except for those responsibilities retained by the Army. To accomplish this effort, FORA entered into an agreement with LFR Inc. (LFR), teamed with Weston Solutions, Inc., and Westcliffe Engineers, Inc. (collectively “the ESCA RP Team”), to assist in the completion of the MEC remediation activities on the 3,380 acres in accordance with the ESCA and an Administrative Order on Consent (AOC).

The AOC was entered into voluntarily by FORA, the EPA, the DTSC, and the U.S. Department of Justice Environment and Natural Resources Division on December 20, 2006 (U.S. EPA Region 9 CERCLA Docket No. R9-2007-03). The AOC was issued under the

authority vested in the President of the United States by Sections 104, 106, and 122 of the CERCLA, as amended, 42 United States Code §§ 9604, 9606, and 9622.

FORA, through the ESCA RP Team, will complete the Army's MEC response actions, in a program hereinafter identified as the FORA ESCA RP.

1.3 Site Location and Description

During 2009, ESCA habitat monitoring, mitigation, and management activities associated with natural resources requirements included fieldwork that was performed in the County North, California State University Monterey Bay (CSUMB) Off-Campus, Future East Garrison, Interim Action Ranges, Laguna Seca Parking, Parker Flats, and Seaside Munitions Response Areas (MRAs; Figure 1). The following sections provide summaries of surroundings, terrain, soil, vegetation, and past activities (i.e., activities that occurred prior to ESCA RP activities) for each of these MRAs.

The line where development parcels abut the Natural Resources Management Area (NRMA) is referred to as the "borderland boundary" or "borderland interface" in the HMP. A number of management requirements are associated with development parcels where they adjoin the NRMA. These requirements are referred to as the "borderland boundary condition" and are described on pages 1-6, 4-3, and 4-57 of the HMP. This boundary was depicted on Figure 4-1 of the HMP; however, the location of this boundary has changed owing to changes in the future uses of some parcels. The current borderland boundary (Army 2009) is shown on Figure 1. Borderland boundary condition requirements that are relevant to the ESCA RP are associated with erosion control (see Section 4.5) and weed management (see Section 4.6).

1.3.1 County North MRA

The County North MRA (previously known as BLM North or Development North MRA) is located in the north-central portion of the former Fort Ord, bordered by Inter-Garrison Road to the north, the CSUMB Off-Campus MRA to the west, Gigling Road and the Parker Flats MRA to the southwest, and a portion of Watkins Gate Road and additional former Fort Ord property to the south and east (Figure 2). The County North MRA is wholly contained within the jurisdictional boundaries of Monterey County. The County North MRA encompasses approximately 506 acres and fully contains U.S. Army Corps of Engineers (USACE) parcels L5.7 and L20.2.1 and portions of USACE parcels E19a.3 and E19a.4. The remaining portions of USACE parcels E19a.3 and E19a.4 are contained in the Parker Flats MRA. Of the 506 acres within this MRA, one 134 acre parcel is designated as a habitat reserve. The line where the two development parcels abut the habitat reserve parcel in the middle of the County North MRA is referred to as the borderland interface and is subject to the requirements identified as borderland boundary condition.

The terrain of the County North MRA is primarily rolling hills. The elevation ranges from approximately 210 to approximately 370 feet mean sea level (msl) with 2 to 15 percent slopes. The surface soils are characterized as eolian (sand dune) and terrace (river deposits), which consist of unconsolidated materials of the Aromas and Old Dune Sand formations. The

primary soil type present in the County North MRA is Oceano Loamy Sand. Soil conditions at the MRA consist predominantly of weathered dune sand.

Vegetation in the County North MRA consists primarily of coastal coast live oak woodland with smaller areas of maritime chaparral and grassland (USACE/Jones & Stokes 1992). Vegetation varies from sparsely vegetated areas to heavy brush. Parcels in the eastern portion of the MRA are designated as critical habitat for Monterey spineflower.

De minimis ESCA RP activity (signage installation) was performed in 2008 in the County North MRA as described in the 2008 Annual Natural Resource Monitoring, Mitigation, and Management Report (ESCA RP 2009).

1.3.2 CSUMB Off-Campus MRA

The CSUMB Off-Campus MRA (previously named CSUMB MRA) is located in the north-central portion of the former Fort Ord, bordered by Inter-Garrison Road to the north, the County North MRA to the east and southeast, Parker Flats MRA to the south, and CSUMB campus property to the west and southwest (Figure 3). The CSUMB Off-Campus MRA is wholly contained within the jurisdictional boundaries of Monterey County. The CSUMB Off-Campus MRA encompasses approximately 333 acres and contains USACE parcel S1.3.2. Of the 333 acres within this MRA, 283 acres are designated as non-residential – open space park. The line where the development parcel abuts the habitat reserve parcel at the southeastern corner of the CSUMB Off-Campus MRA is referred to as the borderland interface and is subject to the requirements identified as borderland boundary condition.

The terrain of the CSUMB Off-Campus MRA is primarily rolling hills. The elevation ranges from approximately 240 to approximately 375 feet msl with 2 to 15 percent slopes. The surface soils are characterized as eolian (sand dune) and terrace (river deposits), which consist of unconsolidated materials of the Aromas and Old Dune Sand formations. The primary soil type present in the CSUMB Off-Campus MRA is Oceano Loamy Sand. Soil conditions at the MRA consist predominantly of weathered dune sand.

Similar to the County North MRA, vegetation in the CSUMB Off-Campus MRA consists primarily of coastal coast live oak woodland with smaller areas of maritime chaparral and grassland (USACE/Jones & Stokes 1992). Vegetation varies from sparsely vegetated areas to heavy brush.

De minimis ESCA RP activity (signage installation) was performed in 2008 in the CSUMB Off-Campus MRA as described in the 2008 Annual Natural Resource Monitoring, Mitigation, and Management Report (ESCA RP 2009).

1.3.3 Future East Garrison

The Future East Garrison MRA (formerly known as the East Garrison MRA) is located in the northeastern portion of the former Fort Ord (Figure 4), and is wholly contained within the jurisdictional boundaries of Monterey County. This MRA encompasses approximately 244

acres and contains the following four USACE parcels: E11b.6.1, E11b.7.1.1, E11b.8, and L20.19 1.1. Of the 244 acres within this MRA, 170 are designated as habitat reserve. The line where development parcels abut the habitat reserve parcels is referred to as the borderland interface and is subject to the requirements identified as borderland boundary condition.

The terrain of the Future East Garrison MRA varies from gently sloping in the south and west to steep canyon-like walls in the north and east. The elevation ranges from approximately 170 to approximately 480 feet msl. Three ravines exist within the MRA; one ravine extends to the east in the southern portion of the MRA, and two converging ravines extend to the northeast in the northern portion of the MRA. The slope of the terrain in the MRA ranges from relatively flat (3 to 5 percent) within an area formerly used as an Ammunition Supply Point, to steep (up to 50 percent) along the ravines. The MRA is underlain by several hundred feet of eolian deposits (Aromas Eolian Facies) consisting mostly of weathered dune sand. Surface soil conditions in the Future East Garrison MRA are predominantly weathered dune sand.

The East Garrison MRA primarily consists of maritime chaparral with small areas of oak woodland and grassland (USACE/Jones & Stokes 1992). Vegetation varies from sparsely vegetated areas to dense areas of overgrowth. The western parcel of the MRA is designated as critical habitat for Monterey spineflower.

1.3.4 Interim Action Ranges MRA

The Interim Action Ranges MRA is located in the north-central portion of the former Fort Ord, within the boundary of the former impact area. The Interim Action Ranges MRA is bordered by the Parker Flats MRA to the north, the Seaside MRA to the east, and the former impact area to the southeast, south, and southwest (Figure 5). The Interim Action Ranges MRA is contained within the jurisdictional boundaries of the City of Seaside and Monterey County. The Interim Action Ranges MRA encompasses approximately 231 acres and fully contains the following five USACE parcels: E38, E39, E40, E41, and E42. Of the 231 acres within this MRA, 206 acres are designated as habitat reserve. The line where development parcels in the north portion of the MRA abut the NRMA is referred to as the borderland interface and is subject to the requirements identified as borderland boundary condition.

The terrain of the Interim Action Ranges MRA is relatively flat. The elevation ranges from approximately 370 to approximately 530 feet msl with 2 to 15 percent slopes. The surface soils are characterized as eolian (sand dune) and terrace (river deposits), which consist of unconsolidated materials of the Aromas and Old Dune Sand formations. The primary soil type present in the Interim Action Ranges MRA is Arnold-Santa Ynez Complex with Baywood Sand in the northwestern portion of the MRA. Soil conditions at the MRA consist predominantly of weathered dune sand.

Vegetation in the Interim Action Ranges MRA consists primarily of maritime chaparral (USACE/Jones & Stokes 1992). Prior to 2003 much of the Interim Action Ranges MRA was inhabited by dense maritime chaparral with stands of varying maturity (or seral stage) ranging from very young to mature, the latter with shrub canopy up to 15 feet tall. The MRA was subjected to a prescribed burn in 2003. In early 2008, prior to initiation of ESCA RP

vegetation monitoring activities in the MRA, the majority of vegetation was under 4 feet tall and much less dense than it was prior to 2003. Patches of annual grassland habitats existed in 2008 along the western and southern boundaries of the MRA. There were areas within the MRA where poison oak occurred in dense stands. Except for a small parcel on the northern edge of the area, most of the MRA is designated as critical habitat for Monterey spineflower.

ESCA RP conducted vegetation monitoring in the Interim Action Ranges MRA in 2008 as described in the 2008 Annual Natural Resource Monitoring, Mitigation, and Management Report (ESCA RP 2009).

1.3.5 Laguna Seca Parking MRA

The Laguna Seca Parking MRA is located in the southeastern portion of the former Fort Ord adjacent to the Laguna Seca Raceway (Figure 6). The MRA is bordered by Barloy Canyon Road and the former impact area to the west, South Boundary Road and Laguna Seca Raceway to the south, and additional former Fort Ord property to the east and north. The Laguna Seca Parking MRA is wholly contained within the jurisdictional boundaries of Monterey County. The MRA encompasses approximately 276 acres and contains the following six USACE property transfer parcels: L20.3.1, L20.3.2, L20.5.1, L20.5.2, L20.5.3, and L20.5.4. Access into Laguna Seca Parking MRA is currently restricted by fencing, barricades, gates, and warning signs. Locked gates and barricades across South Boundary Road restrict access to the MRA from the south. Barricades across Barloy Canyon Road at the intersection with Eucalyptus Road restrict access into the MRA from the north. The western side of the Laguna Seca Parking MRA, along Barloy Canyon Road, is bounded by barbed-wire fencing. The eastern boundary of the MRA is not restricted by fencing. Warning and no trespassing signs are posted on the gates, barriers, and fencing.

The terrain of the Laguna Seca Parking MRA varies from flat to very steep terrain with slopes ranging from 15 to 50 percent. The elevation ranges from approximately 470 feet msl in the northern portion of the MRA to approximately 950 feet msl in the southern portion of the MRA. The geology includes deposits from the Paso Robles Formation and sand and gravel deposits of Aromas Sandstone. Surface soil conditions in the Laguna Seca Parking MRA are predominantly weathered dune sand, which provides a relatively good environment for conducting geophysical surveys, including electromagnetic and magnetic surveys.

The vegetation of the Laguna Seca Parking MRA consists primarily of grassland and maritime chaparral. Smaller areas of coast live oak woodland, coast live oak savanna, and coastal scrub are also present (USACE/Jones & Stokes 1992). The MRA is characterized as open grassland and dense vegetation. A number of sampling and removal actions have been performed by the Army at the Laguna Seca Parking MRA, which required vegetation removal. Vegetation removal has been performed with burning and both manual and mechanical methods. The western portion of the MRA is designated as critical habitat for Monterey spineflower.

1.3.6 Parker Flats MRA

The Parker Flats MRA is located in the central portion of the former Fort Ord, bordered by the CSUMB Off-Campus MRA and the County North MRA to the north, the Interim Action Ranges MRA to the south, CSUMB campus property to the west, and additional former Fort Ord property to the east and southeast (Figure 7). The Parker Flats MRA is contained within the jurisdictional boundaries of the City of Seaside and Monterey County. The Parker Flats MRA (Phase I and Phase II areas) encompasses approximately 1,180 acres and fully contains USACE parcels E18.1.1, E18.1.2, E18.1.3, E18.4, E19a.1, E19a.2, E19a.5, E20c.2, E21b.3, L20.18, L23.2, and L32.1, and portions of USACE parcels E19a.3 and E19a.4. The remaining portions of USACE parcels E19a.3 and E19a.4 are contained in the County North MRA. The area completed under the Phase I activities was approximately 698 acres; the remaining approximately 482 acres were included under the Phase II activities. Of the 698 acres within the Phase I portion of this MRA, 143.8 acres are designated as habitat reserve. Of the 482 acres within the Phase II portion of this MRA, 167.2 acres are designated as habitat reserve. The line where the development parcel abuts the NRMA in the middle of the Phase II portion of the Parker Flats MRA is referred to as the borderland interface and is subject to the requirements referred to as borderland boundary condition.

ESCA RP fieldwork in the Parker Flats MRA is primarily associated with the Phase II area where additional MEC investigation and remediation effort is needed. Limited construction support activities have been conducted by the ESCA RP Team in the Phase I area.

The terrain of the Parker Flats MRA is primarily rolling hills with moderate to steep slopes. The elevation ranges from approximately 280 to approximately 490 feet msl with 2 to 15 percent slopes. The surface soils are characterized as eolian (sand dune) and terrace (river deposits), which consist of unconsolidated materials of the Aromas and Old Dune Sand formations. The primary soil type present in the Parker Flats MRA is Oceano Loamy Sand with smaller areas of Arnold-Santa Ynez complex and Baywood Sand. Soil conditions at the MRA consist predominantly of weathered dune sand.

Vegetation in the Parker Flats MRA consists primarily of coastal coast live oak woodland with smaller areas of maritime chaparral, grassland, and coastal scrub (USACE/Jones & Stokes 1992). Vegetation varies from sparsely vegetated areas to heavy brush. Past field activities have noted the presence of poison oak in the area. As part of the Army's removal actions for MEC, manual and mechanical vegetation clearance was conducted to make the ground surface safe and accessible for MEC field crews. Manual and mechanical vegetation clearance in this report refers to manual and/or mechanical removal to a maximum 6-inch height except for trees, which are pruned to a height sufficient to allow human access below the tree canopies. In 2005, FORA, under the supervision of the Army, performed a prescribed burn on 147 acres in the Phase I area of the Parker Flats MRA.

ESCA RP conducted vegetation monitoring and, at the end of 2008, had begun vegetation clearance in the Parker Flats MRA as described in the 2008 Annual Natural Resource Monitoring, Mitigation, and Management Report (ESCA RP 2009).

1.3.7 Seaside MRA

The Seaside MRA is located in the southwestern portion of the former Fort Ord, bordered by the City of Seaside to the west and the impact area to the east (Figure 8). The Seaside MRA runs along General Jim Moore Boulevard south of Eucalyptus Road and is wholly contained within the jurisdictional boundaries of the City of Seaside.

The Seaside MRA includes the USACE reuse parcels E24, E34, E23.1, and E23.2, which are roughly coincident with (and include all of) four Munitions Response Sites (MRSs), MRS-15SEA.1, MRS-15SEA.2, MRS-15SEA.3, and MRS-15SEA.4, respectively. The MRS-15SEA.1–4 nomenclature will be used in this document to refer to the four MRSs within the Seaside MRA. This MRA does not include habitat reserve parcels. The eastern edge of the Seaside MRA abuts the NRMA and this boundary is referred to as the borderland interface. Development parcels such as those comprising the Seaside MRA that abut the borderland interface are subject to the requirements referred to as the borderland boundary condition.

The terrain of the Seaside MRA varies from flat to moderately rolling hills. The elevation ranges from approximately 210 to approximately 520 feet msl with 2 to 15 percent slopes. Old dune deposits up to 250 feet thick cover most of the area. Surface soil conditions at the MRA are predominantly weathered dune sand.

Prior to 2008, vegetation consisted primarily of maritime chaparral with patches of non-native grassland and scattered stands of coastal and inland coast live oak woodlands (USACE/Jones & Stokes 1992). In 2003, as part of the Army's Time-Critical Removal Action (TCRA) for MEC, vegetation clearance was conducted on 398 acres of the Seaside MRA so that it would be accessible for MEC removal actions. Additional vegetation clearance occurred in support of the Non-Time-Critical Removal Action.

ESCA RP activities in the Seaside MRA in 2008 are described in the 2008 Annual Natural Resource Monitoring, Mitigation, and Management Report (ESCA RP 2009) and included vegetation and MEC removal actions.

1.4 Overview of ESCA RP Activities

The 2008 Annual Natural Resource Monitoring, Mitigation, and Management Report prepared by the ESCA RP Team identified the habitat monitoring, vegetation clearance and cutting, and other field activities completed during that year. This section includes an overview of the ESCA RP activities performed from January 1 through October 15, 2009. Table 1 presents an overview of acreages affected by field activities conducted by the ESCA RP Team from January 1 through October 15, 2009.

1.4.1 County North MRA

A de minimis amount of vegetation clearance was performed in the County North MRA for emergency vehicle access corridors (see Section 3.1 for details). Based on the results of the site walk and other considerations, no further MEC clearance work was planned for this

MRA and therefore no additional vegetation clearance was deemed necessary for the ESCA RP.

A minor amount of MEC fieldwork (i.e., site walk and limited analog investigation) was performed in the County North MRA. A site walk was conducted in a portion of MRS-45 on April 8, 2009. The site walk was conducted at the request of the EPA and DTSC to provide supplemental data to help the regulatory agencies evaluate the proposed Track 1 status of the County North MRA. To investigate the area, the team conducted a site walk mostly along existing trails. The site walk was conducted by a team led by two unexploded ordnance-(UXO-) technicians.

Approximately 50 locations were identified during the instrument aided site walk that required intrusive investigation. At these 50 locations UXO technicians used hand tools to dig small holes to determine if the location contained MEC. Historical (USACE 1992) surveys indicated that HMP annuals were present in the MRA but recent surveys had not been conducted. The locations where intrusive work was to be conducted were inspected by a Qualified Biologist prior to the intrusive activities and no HMP annuals were observed. Nevertheless, as the inspections were not performed within the peak flowering period for the annuals, as a precautionary mitigation measure, the top 6 inches of soil removed from each dig location was segregated and replaced on the surface after the investigation was completed.

HMP annual surveys and vegetation monitoring were planned in anticipation of the need for additional subsurface MEC removal later in the year. After the surveys for Monterey spineflower, coast wallflower, and sand gilia were completed, (shortly after the above described inspections), it was determined that the site walk provided support for the Track 1 designation for the MRA and no additional MEC investigation or remediation is recommended. Consequently, the remaining HMP annual surveys and vegetation monitoring on the MRA were cancelled. A summary of the surveys that were completed is included in Section 5 of this report. The full report is included in Appendix C.

Other minor fieldwork included installing sign posts and trail markers, localized limbing up of trees along the access corridor to allow for emergency vehicle access and conducting brief surveys for erosion and invasive plants.

1.4.2 CSUMB Off-Campus MRA

In response to regulatory agency concerns, a Residential Quality Assurance (RQA) Pilot Study was designed to provide quality assurance information related to previous MEC investigation and removal action operations in residential parcels by conducting a pilot test in portions of certain areas of the CSUMB Off-Campus MRA designated for residential use. To implement this study, approximately 17.4 acres of parcel S1.3.2 was first subjected to total aboveground removal of vegetation (including removal of all trees) and structures, to allow a clear ground surface to increase the capabilities of MEC detection instruments. The second step, following the collection of a baseline digital geophysical mapping (DGM) survey and subsequent target investigation over the entire footprint, involved removal of the upper 6 to

12 inches of soil in selected portions of the RQA pilot study area (approximately 4.7 acres). This activity involved removing encountered root structures present within the upper soil level. Following the soil lift an additional DGM survey and anomaly excavation was completed. Pursuant to this Pilot Study, the first step of the RQA pilot study (i.e., total aboveground removal of vegetation) began in the CSUMB Off-Campus MRA at the end of 2008. The majority of the vegetation removal and the soil lift was conducted in 2009. The soil lift was placed at an existing nearby clearing on CSUMB, which covered approximately 2 acres.

Other fieldwork was minor and included the installation of sign posts and trail markers, brief surveys for erosion, and installation of erosion control waddles.

1.4.3 Future East Garrison MRA

No vegetation clearance activities were conducted in the Future East Garrison MRA.

Site reconnaissance visits were conducted by ESCA RP and FORA staff to assess the site for presence of HMP shrub species and to assist in planning for MEC investigation and remediation.

Other minor fieldwork included the installation of sign posts and trail markers.

1.4.4 Interim Action Ranges MRA

No vegetation clearance activities were conducted in the Interim Action Ranges MRA.

No MEC-related work was conducted in the Interim Action Ranges MRA in 2009. However, the area was visited periodically throughout the vegetation monitoring effort in the County North MRA to verify that the HMP annual plant species being surveyed for in County North were still in flower. The Interim Action Ranges MRA was used for this purpose because the locations of known populations had been mapped in 2008, and this allowed for use of these populations as reference sites. No other fieldwork took place in this MRA.

1.4.5 Laguna Seca Parking MRA

No vegetation clearance activities were conducted in the Laguna Seca Parking MRA.

No MEC-related work was conducted in the Laguna Seca MRA in 2009. Only minor fieldwork including the installation of sign posts and trail markers was performed in the Laguna Seca Parking MRA.

1.4.6 Parker Flats MRA

The majority of MEC-related field activities in 2009 were conducted in the Parker Flats MRA. Site preparation activities for surface removal within the habitat areas began in 2008

and continued through 2009. Preparatory work included manual limbing of trees greater than 6 inches diameter at breast height (DBH) and mechanical vegetation cutting of manzanita and undergrowth. Site preparation in development areas included limited vegetation clearance, manual limbing of trees greater than 6 inches DBH, and mechanical vegetation cutting.

As described in the field variance form PFMRA FVF#1 (Appendix A), approximately (i.e., a maximum of) 10.6 acres of low brush was cleared from the western and southern portion of the Phase II area of parcel E19a.3 to support DGM activities in the development area. This work was suspended on Wednesday January 21, 2009. An alternative method, which included the use of a rotary brush cutter, was implemented in the remaining area with the approval of the ESCA RP Team's Senior Qualified Biologist (SQB). The remaining 94 acres in development areas received a near-surface brush cut using a rotary brush cutter and trees were limbed up to allow for access by UXO field teams.

Instrument-aided surface MEC investigation within the habitat area was initiated in December 2008 and continued until July 2009. DGM data collection and associated target investigation operations on the habitat area trails and in the development area began in June 2009 and continued through October 15 (Figure 7). DR™ Trimmer mowers were occasionally used in support of the UXO Teams to minimize contact with poison oak. Digging of anomalies included both near-surface digs using hand tools in the majority of the habitat area and subsurface removal using either hand tools or backhoes in the habitat area trails and in the development area.

Other minor fieldwork included installing sign posts and trail markers, conducting brief surveys for erosion, removing trash and debris piles, and installing erosion control waddles.

1.4.7 Seaside MRA

In response to regulatory agency concerns, an RQA Pilot Study was designed to provide quality assurance information related to previous MEC investigation and removal action operations in residential parcels by conducting a pilot test in portions of certain areas of the Seaside MRA designated for residential use. To implement this study, the affected portions of parcel E23.2 (approximately 18.6 acres) were first subjected to total aboveground removal of vegetation (including removal of all trees) to allow a clear ground surface to increase the capabilities of MEC detection instruments. This activity was completed in December 2008. Following collection of a baseline DGM survey and subsequent target investigation over the entire footprint, the upper 6 to 12 inches of soil was removed in selected portions of the RQA pilot study area footprint (approximately 5.5 acres in Seaside). This activity included removing encountered root structures present within the upper soil level. Following the soil lift an additional DGM survey and anomaly excavation was completed. The soil lift was completed in March 2009 and the excavated soil was placed in a 1.2-acre stockpile along the borderland interface.

Other field activities within Seaside MRA included installing erosion control measures consisting of check dams, channels, and waddles along the borderland interface, and grading the access road referred to as 'blue line road' to allow access to the inland range gates and

site access within the MRA. Additional field activities addressed the remaining oversized debris piles from the 2008 soil sifting operations. Debris piles were mechanically processed and resultant materials were stockpiled adjacent to 'blue line road.'

1.4.8 Cumulative Vegetation Clearance in Habitat Parcels

Annual and cumulative to date (i.e., as of October 15, 2009) acreages of habitat parcels affected by vegetation clearance by the ESCA RP are shown in Table 2.

2.0 NATURAL RESOURCE MONITORING AND MITIGATION MEASURES

Primary requirements for natural resource monitoring and mitigation associated with the ESCA RP are described in the HMP (USACE 1997; see Section 2.1) and BOs issued by the USFWS (see Section 2.2).

2.1 Habitat Management Plan

Most of the natural resource monitoring and mitigation requirements associated with the ESCA RP are described in HMP Chapter 3, "Ordnance and Explosives Removal." Details of vegetation monitoring procedures are presented in Sections 2.1.1 and 2.1.2 of this report.

Over the entire footprint of former Fort Ord (including the ESCA parcels as well as other areas not included in the ESCA agreement), removal of MEC (formerly referred to as ordnance and explosives [OE]) was anticipated to require removal of vegetation (possibly by burning to clear the ground surface), location by visual and electromagnetic means, and then either surface and/or subsurface removal. Surface-only removal areas are subjected to minimal disturbance of the soil and root systems of pre-existing vegetation. Subsurface removal areas are anticipated to range in size from a single cubic foot to several cubic feet, depending on the type, location, and position of MEC. The spatial extent of soil and root system disturbance in these areas is a function of the spatial extent of excavations required to complete subsurface removal. A potential method of disposal of MEC is in situ detonation, which would increase the amount of soil disturbed according to the HMP. Subsurface investigation removal/remediation activities were planned for areas where historical record reviews and interviews indicate the possible presence of buried MEC or in impact areas where MEC may have penetrated the ground surface. In some cases, Army MEC subsurface removal efforts involved substantial excavation and occasionally exceeded depths of 10 feet bgs (USACE 1997).

Under the ESCA RP, the majority of MEC subsurface removal activities in habitat parcels through October 15, 2009, required relatively minor soil excavation (i.e., small footprint and shallow "mag and dig" recovery).

Effects on sensitive species were anticipated in the HMP. Sensitive species and their habitats could be subjected to vegetation burning and cutting, whole plant excavation, crushing or trampling from movement of excavation equipment and removal team foot traffic, and on-site

MEC detonation. Removal of MEC “could occur in areas supporting approximately 75% of the occupied habitat of sand gilia (*Gilia tenuiflora* ssp. *arenaria*) and Monterey spineflower (*Chorizanthe pungens* var. *pungens*) at former Fort Ord” (USACE 1997). The number of individuals and amount of habitat affected was undetermined because the locations and amount of MEC had not been quantified, but it was estimated that “approximately 50-70% of the entire range of sand gilia and about 75-95% of the entire range of Monterey spineflower are located on former Fort Ord” (USACE 1997). It was also known, however, that vegetation burning and cutting may temporarily benefit sand gilia and Monterey spineflower recruitment by removing overstory vegetation and loosening surface soil (i.e., by temporarily increasing the spatial extent of suitable microhabitat for the two species).

The HMP also anticipated effects to the black legless lizard (*Anniella pulchra*), the California red-legged frog (*Rana aurora draytonii*), California tiger salamander (CTS; *Ambystoma californiense*), the California linderiella (*Linderiella occidentalis*), and other species. Other sensitive plants anticipated to be affected included seaside bird's-beak (*Cordylanthus rigidus* ssp. *littoralis*), Eastwood's ericameria (*Ericameria fasciculata*), coast wallflower (*Erysimum ammophilum*), Toro manzanita (*Arctostaphylos montereyensis*), sandmat manzanita (*Arctostaphylos pumilla*), and Monterey ceanothus (*Ceanothus cuneatus* var. *rigidus*), but the geographic distributions of these species are more widespread than those of Monterey spineflower and sand gilia. Therefore, the potential effects of MEC clearance at the former Fort Ord were considered likely to have proportionately less overall effect on the other sensitive plant species' populations than they would on Monterey spineflower and sand gilia.

The main objective of the HMP's mitigation efforts for MEC removal was to reestablish healthy, high-diversity maritime chaparral habitat (including HMP species) that has a variety of seral stages and age classes and that includes microhabitat for sand gilia, Monterey spineflower, seaside bird's-beak, and black legless lizard. These measures included an overall effort to minimize disturbance associated with MEC removal including avoidance where feasible of known sensitive plant populations, a vegetation burning and restoration program planned to coordinate with ordnance cleanup activities, an employee education program, and a series of measures to minimize impacts to the black legless lizard, California linderiella, CTS, and California red-legged frog.

Restoration to occur after MEC removal was expected to bring the disturbed areas back to a naturally regenerating maritime chaparral habitat that is managed using controlled burning and other techniques that maximize the habitat value for HMP species. Restoration for sand gilia, Monterey spineflower, and seaside bird's beak would be considered successful if, five years after disturbance, self-sustaining populations were observed in a mosaic of maritime chaparral habitat in different stages of succession, and the amount of occupied habitat was measured to be comparable to 1992 levels, and population sizes were measured to be comparable to 1992 levels (USACE 1997). Details on the past and current monitoring protocols used to evaluate these criteria are presented in Sections 2.1.1, 2.1.2, and 2.1.3.

Past experience with MEC removal on the former Fort Ord reveals that plant communities generally recovered naturally and exhibited early stages of community development within a short timeframe (several years; W. Collins of the Army personal communication to P.

Lebednik of LFR 2008). Per the BO for CTS, wetlands used by CTS, if disturbed, are required to be restored (USFWS 2005).

According to the HMP, after each year's monitoring, the management of restored maritime chaparral habitat will be modified to reflect the changing conditions and continued progression toward the success criteria. Corrective measures for chaparral habitat and the sensitive species that occur there included supplemental weeding, planting, or seeding. Corrective measures for vernal pool and pond restoration were planned to be evaluated on a case-by-case basis.

Species of concern in the HMP are listed in Tables 2-1 and 2-2 in Chapter 2 of the HMP.

The period between transfer of the ESCA property from the Army to FORA and final approval by the regulatory agencies of the MEC remediation activities conducted by the ESCA RP Team is expected to be relatively short. During this period, caretaker (i.e., "interim") management requirements described in Chapter 4 of the HMP will be implemented by the ESCA RP Team in areas that are disturbed as a result of the ESCA RP field activities. These measures will prevent or minimize degradation of natural resources within such parcels (beyond what was required to complete MEC clearance) as a result of ESCA RP field activities. Such caretaker requirements include maintenance of fire breaks, limiting public access, providing for emergency vehicle access along the borderland boundary, and erosion and weed control, as needed, in all areas disturbed by the ESCA RP field activities. Management requirements associated with long-term management of the ESCA parcels will be implemented when the parcels transfer to the intended owners or, if transfer is substantially delayed, by FORA, as appropriate.

Chapter 4 of the HMP defines the intended purpose and designations of each parcel of the former Fort Ord. Parcels are intended to promote economic recovery and will be developed without restrictions or guidelines. Parcels designated primarily for development require recipients of the land to follow guidelines or preserve certain areas. Other parcels are set aside as habitat reserves or corridors, and have specific management guidelines and restrictions on their development and uses. The ESCA MRAs are made up of several entire or partial parcels as defined by the HMP, and thus have multiple intended uses.

The County North MRA is designated for residential and nonresidential development, habitat reserve, and habitat corridor. The CSUMB Off-Campus MRA is designated for nonresidential development with a small portion for residential development. The Interim Action Ranges MRA is designated for habitat reserve and a small portion for nonresidential development. The Parker Flats MRA is designated for residential and nonresidential development, and a portion for habitat reserve. The Seaside MRA is designated for residential and nonresidential development. Detailed maps of these MRAs, including the various parcel numbers of each portion of each MRA, can be found in the Summary of Existing Data Report (SEDR; ESCA RP Team 2008).

Descriptions of past monitoring protocols are included in this section because they were employed in past surveys conducted in some of the ESCA RP parcels.

2.1.1 1995 Monitoring Protocol

Prior to 2006, vegetation monitoring of habitat reserve parcels that were disturbed as a result of cleanup activities at the former Fort Ord was conducted in accordance with the “Protocol for Conducting Vegetation Sampling at Fort Ord in Compliance with the Installation-Wide Multispecies Habitat Management Plan” prepared by Jones & Stokes Associates, Inc. (Jones & Stokes 1995). The protocol described requirements for a baseline vegetation survey to be conducted prior to MEC clearance work in the parcel and follow-up monitoring to be conducted every year thereafter for a period of five years.

2.1.2 2006 Draft Monitoring Protocol

In 2006, the “Draft Protocol for Conducting Vegetation Monitoring in Compliance with the Installation-Wide Multispecies Habitat Management Plan at Former Fort Ord” (“the 2006 protocol”; Burlison 2006) was issued. This document updated and superseded the 1995 protocol issued by Jones & Stokes.

As with the 1995 protocol, the 2006 protocol described a requirement to perform a pre-disturbance (i.e., “baseline”) survey. In contrast to the 1995 protocol, the 2006 protocol indicates that post-disturbance (i.e., “recovery”) surveys are to be performed two, five, eight, and 13 years after disturbance activity is completed in each MRA. Note that, depending on the timing of the baseline monitoring effort and completion of the activities in the MRA, post-disturbance surveys may begin more than two years after the baseline survey.

2.1.3 2009 Monitoring Protocol

In 2009, the “Protocol for Conducting Vegetation Monitoring in Compliance with the Installation-Wide Multispecies Habitat Management Plan at Former Fort Ord” (“the 2009 protocol”; Burlison 2009) was issued. This document updated and superseded the 2006 protocol. The ESCA RP Team’s 2009 vegetation monitoring efforts described in this report were conducted in the habitat reserve parcel of the County North MRA, in accordance with the 2009 protocol, per the request of the Fort Ord Army Base Realignment and Closure (BRAC) office.

As with the 1995 protocol, the 2009 protocol described a requirement to perform a pre-disturbance (i.e., “baseline”) survey. In contrast to the 1995 protocol, the 2009 protocol indicates that post-disturbance (i.e., “recovery”) surveys are to be performed three, five, eight, and 13 years after disturbance activity is completed in each MRA. Note that, depending on the timing of the baseline monitoring effort and completion of the activities in the MRA, post-disturbance surveys may begin more than three years after the baseline survey.

Vegetation monitoring methods include:

1) chaparral vegetation surveys comprised of line-intercept and quadrat sampling along transects and

2) focused surveys for certain herbaceous plant species targeting their respective suitable habitats.

The chaparral vegetation surveys may be conducted at any time in the growing season and are intended to document recovery of the chaparral community after MEC removal activities. The focused surveys generally are conducted during the flowering period (April through September, depending on the species) and are intended to document both spatial extent and population changes of the species after MEC removal activities.

2.2 Biological Opinions

USFWS has written three BOs for the former Fort Ord that apply to the project. The BOs were issued by the USFWS to the Army, and the ESCA RP Team (particularly the Qualified Biologists [QBs]) act as the Army's agent to implement relevant requirements of the BOs while conducting fieldwork within ESCA RP MRAs.

The first of these BOs was dated March 30, 1999, and titled "Biological and Conference Opinion on the Closure and Reuse of Fort Ord, Monterey County, California (1-8-99-F/C-39R)" (USFWS 1999). This BO addresses the impacts that the closure and reuse of Fort Ord may have on nine species, which were at the time federally listed or proposed to be listed. Army Geographic Information System (GIS) data indicate that of the species included in this BO, only sand gilia (*Gilia tenuiflora ssp. arenaria*) is currently listed and known to occur in the ESCA RP MRAs.

The October 22, 2002 "Biological and Conference Opinion on the Closure and Reuse of Fort Ord, Monterey County, California as it affects Monterey Spineflower Critical Habitat (1-8-01-F-70R)" (USFWS 2002) addresses the impacts that the closure and reuse of Fort Ord may have on the Monterey spineflower (*Chorizanthe pungens var pungens*) and its critical habitat. Army GIS data indicate that this critical habitat exists in certain ESCA RP MRAs (Figure 9).

The March 30, 2005 BO titled "Cleanup and Reuse of Former Fort Ord, Monterey County, California, as it affects California Tiger Salamander and Critical Habitat for Contra Costa Goldfields (1-8-04-F-25R)" (USFWS 2005) addresses the impacts that the closure and reuse of Fort Ord may have on CTS and critical habitat for Contra Costa goldfields. Army GIS data indicate that CTS occurs or is likely to occur within ESCA RP MRAs (Figure 10), but that critical habitat for Contra Costa goldfields does not occur within any ESCA RP MRAs.

2.3 Weed Management

ESCA RP is responsible for monitoring and managing weed infestations that occur as a result of surface soil disturbances that are a consequence of MEC removal activities in the ESCA parcels.

The focus and level of effort of the ESCA RP invasive weed monitoring, management, and abatement activities are intended to be consistent with those conducted by the Army. The primary species to be monitored and abated are:

- 1) pampas grass [*Cortaderia selloana* (Schultes) Asch. & Graebner]
- 2) French broom [*Genista monspessulana* (L.) L. Johnson]
- 3) hottentot fig or iceplant (*Carpobrotus* spp., especially *C. edulis*)

The goal of the weed abatement effort is to avoid degradation of ecological communities and especially sensitive species populations (as a result of weed invasion) in parcels not designated for development. (Note: The reference to Scotch broom control in the HMP [pp. 4-57] was intended to refer to French broom according to Mr. William Collins, BRAC Wildlife Biologist [U.S. Army 2009].)

3.0 SUMMARY OF ESCA RP VEGETATION AND MEC CLEARANCE ACTIVITIES

The 2009 ESCA RP Team MEC investigation and Pilot Study activities were conducted to fill data gaps to complete the evaluation of the nature and extent of MEC potentially present in the MRAs prior to conducting a risk assessment and proposing a preferred remedial alternative as part of a remedial investigation/feasibility study pursuant to CERCLA. Work in the remaining MRAs was conducted in support of an RQA pilot study process (in the case of CSUMB) or to support a Track 1 designation (in the case of County North).

3.1 County North MRA

A de minimis amount of vegetation clearance was performed in the County North MRA for emergency vehicle access corridors as shown in Table 1. As identified in Section 1.4.1, a site walk was conducted and approximately 50 locations were identified that required intrusive investigation including the usage of hand tools to dig small holes to determine if the location contained MEC. This effort included the segregation of the top 6 inches of soil. The dig locations were filled with the removed soil and the top 6 inches of soil was replaced at the top of the dig location. The areas of the MRA affected by MEC clearance are shown on Figure 11.

3.2 CSUMB Off-Campus MRA

The RQA Pilot Study effort within the CSUMB Off-Campus MRA (described in Section 1.4.2) required that approximately 17.4 acres of parcel S1.3.2 (Table 1, Figure 12) were first subjected to total removal of aboveground vegetation (including removal of all trees and near-surface root structures) and structures. The second step involved the removal of the upper 6 to 12 inches of soil in selected portions of the RQA Pilot Study area footprints, totaling approximately 4.7 acres. The soil lift was stockpiled at an existing nearby clearing within CSUMB MRA, which covered approximately 2 acres.

3.3 Parker Flats MRA

Instrument-aided surface MEC clearance within the habitat area was initiated in December 2008 and continued until July 2009. DGM data collection and associated removal operations on the habitat area trails and in the development area began in June 2009 and were still occurring as of October 15. DR™ Trimmer mowers were occasionally used in support of the UXO Teams to minimize contact with poison oak. Digging of anomalies included both near-surface digs using hand tools in the majority of the habitat area and subsurface excavations using either hand tools or backhoes along the habitat area trails and in development areas. The areas of the MRA affected by MEC remediation are shown on Figure 13 and involved 87 acres of habitat and 105 acres of development parcels (Table 1).

3.4 Seaside MRA

The RQA Pilot Study effort within the Seaside MRA (described in Section 1.4.7) required that approximately 18.6 acres of parcel E23.2 (Figure 14) were first subjected to total removal of aboveground vegetation (including removal of all trees). The second step involved the removal of the upper 6 to 12 inches of soil in selected portions of the RQA Pilot Study area footprints. This activity included removing encountered root structures present within the upper soil level over approximately 5.5 acres - separated into 4 non-contiguous areas. The excavated soil was stockpiled in a 0.2-acre impoundment west of access road along the borderland interface.

3.5 Cumulative Areas of Vegetation Clearance in Habitat Parcels

Table 2 presents a summary of habitat parcel areas affected (in acres) by vegetation clearance performed by ESCA RP. ESCA RP vegetation clearance in habitat parcels began in 2008. Areas cleared in 2008, 2009, and cumulative totals as of October 15, 2009 are shown in the table. De minimis vegetation clearance (i.e., minor vegetation removal to facilitate sign installation, vehicle access on trails, etc.) is not quantified but indicated as “DM” in the table. As of October 15, 2009, three MRAs had experienced vegetation clearance. There had been a de minimis amount of clearance in the County North and Interim Action Ranges MRAs. A total of 168 acres of vegetation had been cleared in the Parker Flats MRA to facilitate MEC clearance activity.

4.0 SUMMARY OF MONITORING AND MITIGATION MEASURES

Habitat monitoring, management, and mitigation activities performed by the ESCA RP Team during late 2007 and 2008 were documented in the 2008 Annual Natural Resource Monitoring, Mitigation, and Management Report (ESCA 2009).

This section summarizes the habitat monitoring, management, and mitigation activities performed by the ESCA RP Team during the period January 1 through October 15, 2009. Activities conducted after October 15 will be documented in the 2010 Annual Report.

Whenever feasible, since the beginning of the ESCA agreement, the ESCA RP Team implemented additional mitigation measures beyond those required in the HMP and BOs. Typically, these measures were implemented for situations: 1) that did not meet threshold criteria but which could have resulted in permitted take, and 2) when field crews were available to implement the measures at little additional cost (e.g., silt fencing of pits within CTS habitat but which were smaller than the threshold for requirements associated with “open excavations”).

4.1 Qualified Biologist Memoranda

Some of the monitoring and mitigation activities identified in the HMP and BOs require evaluations to determine their applicability. There is no requirement for these evaluations to be documented; however, beginning in 2008, the ESCA RP Team has documented such evaluations via a series of technical memoranda developed by the SQB. Those Qualified Biologist Memoranda prepared for activities in 2009 are summarized in this section and the memoranda are included in Appendix A.

4.1.1 ESCA RP-Wide

Two ESCA RP-wide memoranda were developed in 2009. The first memorandum established a new procedure to be followed whenever a new field activity begins or when a field activity is initiated in a new area, to formalize relations between the SQB and the Field Operations Manager. This memorandum is included in Appendix A. The second memorandum focused on procedures and methods for handling rattlesnakes encountered in the field.

4.1.2 Parker Flats MRA

One QB memorandum for the Parker Flats MRA was drafted and implemented in 2008, but was not finalized until 2009. It was written to address restoration requirements for CTS within the 0.5-km-radius buffer zone within the Parker Flats MRA.

A second QB memorandum for the Parker Flats MRA addressed erosion monitoring and mitigation (see Section 4.5).

4.1.3 CSUMB Off-Campus MRA

In late 2008, three memoranda were drafted and implemented for the CSUMB Off-Campus MRA. These memoranda were later finalized in early 2009, and are included in this report (see Appendix A). The memoranda addressed signage installation to inform the public of operations in the MRA, the stockpiling of soils in an area within the 2-km-radius CTS buffer zone, and potential for Monterey spineflower to occur in the stockpile area.

4.1.4 County North MRA

In late 2008, one memorandum was drafted for the County North MRA. This memorandum was finalized in early January 2009, and thus is included in this report (see Appendix A). The memorandum addressed the installation of signage to inform the public of operations in the MRA.

4.2 CTS Mitigation Measures Implemented

Along with the general impact minimization practices such as employee training, limiting ingress and egress to a work area to established roads and paths, and limiting soil disturbances to work areas only, further CTS-specific mitigation measures were implemented by the ESCA RP Team. In early October, at the beginning of the nominal wet season, a Qualified Biologist performed re-training of field personnel regarding CTS awareness, requirements and mitigation measures. This re-training was not required but was performed as an additional protective measure in advance of the period when CTS are most likely to be encountered. Fieldwork supervisors also frequently coordinated with the QBs on the status of field operations so that the QBs were aware of where work was occurring, which enabled the QBs to notify the supervisors of any additional mitigation measures. Field personnel were requested to notify a QB if trapped CTS were encountered in any open pit. They were also instructed to cover the pit to prevent desiccation of the animal and to call the SQB immediately. No such encounters occurred during the period covered by this report.

Safe containment and transport of amphibians (including CTS) for rescue and relocation included procurement of a small plastic case modified to function as a temporary habitat. Use of the habitat minimizes handling. Numerous small perforations in the lid allow air exchange while sphagnum moss, moistened with drinking water during use but kept dry while in storage, provides a humid environment and prevents desiccation. CTS are held in the habitat for the minimum period needed to transport them to a safe location.

4.3 Other Wildlife

Several other encounters with wildlife were recorded by the ESCA RP Team in 2009, including gopher snakes, rattlesnakes, non-HMP lizards [including the coast horned lizard (*Phrynosoma coronatum*)] and a rosy boa. Most of these encounters were rescue and release events, and they are recorded in the Animal Rescue Reports maintained by the site safety officer.

Rattlesnakes have been encountered by ESCA RP personnel. Safety precautions for encounters with rattlesnakes have included the use of snakebite resistant chaps, snake tongs, and the conversion of a cooler into a snake transport device. Modifications to the cooler included attaching a rope to the lid so it could be opened from a safe distance and installing a wood-covered metal floor to weigh it down enough that it could be opened or closed using the snake tongs without tipping or allowing the metal to possibly injure the snake.

On May 21, 2009, a legless lizard was encountered in the Parker Flats MRA during a MEC investigation. The legless lizard is an HMP species, but has no federal status. The individual encountered was uninjured, was not handled, and returned to the soil unassisted immediately after the observation. The Field Observation Form and associated location map for this event are located in Appendix B.

4.4 Vegetation Mitigation Measures

Per the HMP and BOs, a number of impact minimization practices have been employed during field operations. These practices include employee environmental awareness training, limiting ingress and egress to a work area to established roads and paths, limiting vegetation clearance to the extent required to conduct MEC clearance, and limiting soil disturbance. As discussed in detail in Section 5 and in Appendix C, surveys for three HMP species were conducted in the habitat reserve area of the County North MRA in spring 2009.

4.5 Erosion Control

During the Seaside MRA RQA Pilot Study field activities, erosion control measures were implemented so that soil erosion across the NRMA interface was minimized. The measures implemented included cross-grading of steeply sloped areas to minimize off-site surface runoff, construction of berms, channels, and swales to direct runoff away from the NRMA, and installation of waddles and silt fencing in areas where the local surface slopes towards the NRMA boundary.

Brush clearing and subsurface MEC investigation occurred in the Parker Flats MRA. To prevent erosion in the habitat portion of the MRA, construction roadways were graded with a cross slope and channels were installed to divert water away from the NRMA boundary. Qualified Biologist monitoring detected minor deposition of sediments that had eroded late in the 2009 wet season across the borderland interface from adjacent areas where ESCA RP activities had disturbed surface soils. Corrective measures included installation of BMPs that prevented additional sediment transport across the interface. The sediment deposition affected only a small portion of the habitat area and the plant communities were not observably affected. A memorandum documenting this activity is included in Appendix A.

Erosion control waddles were installed on the slope face within the CSUMB Off-Campus RQA Pilot Study area and adjoining construction roads.

To date, no soil disturbance activities have been conducted in the Interim Action Ranges or County North MRAs.

4.6 Weed Management

Weed monitoring was conducted from January 1 through October 15 to document pre-existing weed populations (i.e., weed populations occurring prior to the onset of ESCA RP field activities) and at locations where surface soil had been disturbed by ESCA RP activities

in the County North, Parker Flats, and Seaside MRAs. No weed infestations were identified in areas that had been disturbed by ESCA RP activities.

4.6.1 Areas of Soil Disturbance

ESCA RP activities that substantially disturb surface soils (i.e., subsurface MEC clearance, grading, and/or removal of surface soils) create potential sites for weed recruitment and population establishment. In development parcels with a borderland condition, locations where such activities occur need to be documented so that they can be monitored for weeds.

Areas of soil were disturbed in the CSUMB Off-Campus and Seaside MRAs where the RQA Pilot Study activities occurred (see “Area of RQA Pilot Study Activities” on Figures 12 and 14). Additional disturbance took place in the Parker Flats MRA within the “Area of MEC Investigation” shown on Figure 13; however, only a small fraction of the area shown on the figure was affected by subsurface MEC investigation

4.6.2 Monitoring Activities

Monitoring activities included mapping efforts conducted in Seaside and Parker Flats MRAs, with a focus on the NRMA boundary areas and pre-disturbance conditions. Site visits were conducted to obtain qualitative broad-scale mapping of areas of pre-existing (i.e., not attributable to ESCA RP activities) weed populations in portions of Parker Flats, Seaside, and County North MRAs. In the Seaside MRA, large areas of iceplant were observed. Limited populations of French broom were also observed in this MRA. In the Parker Flats MRA, large areas of iceplant were observed, though this weed was not as widespread as in the Seaside MRA, and it was notably rare in the Habitat Reserve parcel at Parker Flats. In the County North MRA only isolated small patches of iceplant and French broom were observed.

Monitoring of ESCA RP-disturbed areas for invading weeds was conducted in spring and summer in the Seaside MRA primarily along the borderland interface. Weed recruitment was not observed and therefore no abatement activities were conducted in these areas.

4.6.3 Abatement Activities

As part of the vegetation clearance activities in 2009, pre-existing populations of weeds were abated. These weed populations were physically removed, segregated from non-weed vegetation, and disposed of off site in landfills. Approximately 10 pampas grass plants were removed from the CSUMB Off-Campus MRA and quantities of iceplant were removed from the Parker Flats and CSUMB Off-Campus MRAs. Approximately 20 cubic yards of weed material was removed from the CSUMB Off-Campus MRA, ice plant removed from Parker Flats was not quantified.

4.7 Pre MEC Investigation and/or Remediation Efforts

Planning for additional field efforts to fill data gaps for the Future East Garrison MRA was initiated in 2009. In support of this data collection effort, two QBs conducted a site visit to the parcels in August 2009. On this site walk, the presence and general location of HMP shrub species populations (especially fire adapted species) were observed, and the site's topography and shrub ecology were examined in the context of brush removal requirements. As of October 15, planning for additional fieldwork was underway.

5.0 VEGETATION MONITORING IN THE COUNTY NORTH MRA HABITAT RESERVE AREA

The 2009 monitoring effort in the County North MRA habitat reserve area was conducted in anticipation of vegetation and MEC investigation and remediation activities, which were anticipated to begin in late 2009. The full report on the vegetation monitoring in the County North MRA habitat reserve area is included in Appendix C.

5.1 Summary of Results

The County North MRA habitat reserve area surveys for sand gilia, coast wallflower, and Monterey spineflower were performed from May 11 through 13, 2009. Areas of potentially suitable habitat were surveyed, as well as a representative sample of marginal, or potentially adequate, habitat areas.

An additional planned survey for seaside bird's-beak and line-intercept shrub vegetation monitoring in the MRA was cancelled shortly after the surveys for the three species were completed, when the MRA was designated as a potential Track 1 parcel. This designation meant that subsurface clearance would not be conducted in the MRA, removing the need for monitoring of HMP species and vegetation.

5.2 Findings

Focused surveys of three plant species (coast wallflower, Monterey spineflower, and sand gilia) were conducted in 2009 as the initial (baseline) monitoring effort in anticipation of ESCA RP MEC-related activity in the habitat parcel of the County North MRA. Because the MEC-related work scheduled for the MRA was cancelled, additional planned surveys were not conducted.

Disturbance of the survey area was observed to be minor and there was no evidence of recent burn events.

Coast wallflower and sand gilia were not observed in the survey area in 1992 or 2009.

Twelve populations of Monterey spineflower were detected in three locations within the survey area. The locations where Monterey spineflower was recorded in 2009 were within the area where the species was reported in 1992. The density value computed from the 2009 data appears to be substantially lower than the value that was approximated in 1992, but this difference could be explained by the fact that different methods were employed in the two surveys. Wet season conditions in 1992 were nearly identical to those in 2009, supporting the likelihood that populations were comparable in 1992 and 2009.

The presence/absence and spatial distribution results from 2009 are consistent with those of the 1992 survey and may indicate that major spatial changes in vegetation have not occurred in the area over the 17-year intervening period.

For more details, see the report in Appendix C.

6.0 STATUS OF ESCA RP VEGETATION MONITORING SINCE INCEPTION

The overall status of vegetation monitoring activities initiated by the ESCA RP to date is shown in Table 3. Per the 2009 protocol, “HMP annuals” are to be surveyed in years 1, 3, 5, and 8 post-remediation. Note that not all of the species included in the “HMP annual” category are annuals; therefore, these activities are referred to in this report as “focused sampling.” HMP shrubs and associated flora are to be surveyed in years 3, 5, 8, and 13 post-remediation. These activities are referred to in this report as “transect sampling.”

7.0 REFERENCES

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- . 2009. Protocol for Conducting Vegetation Monitoring in Compliance with the Installation-Wide Multispecies Habitat Management Plan at Former Fort Ord. March.
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- . 2002. Biological Opinion on the Closure and Reuse of Fort Ord, Monterey County, California, as it affects Monterey Spineflower Critical Habitat (1-8-01-F-70R). October 22.
- . 2005. Cleanup and Reuse of Former Fort Ord, Monterey County, California as it affects California Tiger Salamander and Critical Habitat for Costa Contra Goldfields (1-8-04-F-25R). March 14.

Table 1
Approximate Areas Affected (in Acres) by Field Activities Conducted by ESCA RP in 2009
2009 Annual Habitat Monitoring Report
FORA/ESCA

MRA	Activity	Habitat Parcels	Development Parcels
County North	Minor	DM	DM
	Vegetation clearance	DM	0
	MEC clearance	0	0
	Vegetation monitoring	134	0
CSUMB Off-Campus	Minor	NP	0
	Vegetation clearance	NP	19
	MEC clearance	NP	0
	RQA	NP	17
	Soil Stockpile	NP	2
Interim Action Ranges	Minor	DM	0
	Vegetation clearance	0	0
	MEC clearance	0	0
	Vegetation monitoring	0	0
Parker Flats (Phase I)	Minor	0	1
	Vegetation clearance	0	0
	MEC clearance	0	0
	RQA	0	0
Parker Flats (Phase II)	Vegetation clearance	87	105
	MEC clearance	168	72
	Vegetation monitoring	0	0
	Minor	NP	0
Seaside ^a	Vegetation clearance	NP	0
	MEC clearance	NP	0
	RQA	NP	18
	Soil Stockpile	0	5
Future East Garrison ^b	Vegetation clearance	0	0
	MEC clearance	0	0
	RQA	0	0

Notes:

CSUMB = California State University Monterey Bay

DM = de minimis

MEC = munitions and explosives of concern

Minor = maintenance activity or construction support activity such as posting signage, staging, etc.

MRA = Munitions Response Area

NA = not applicable

NP = not present in MRA

RQA = total vegetation clearance within Residential Quality Assurance pilot test area

^a Seaside acreages do not include the footprint of General Jim Moore Boulevard except for MEC clearance

^b Only visual reconnaissance activities were conducted in this MRA as of October 15, 2009; therefore, no areas were affected by ESCA RP activities.

Table 2
Cumulative Areas of Habitat Parcels (in Acres) Affected
by Vegetation Clearance Performed by ESCA RP
2009 Annual Habitat Monitoring Report
FORA/ESCA

MRA	2008	2009 ^a	Cumulative Total
County North	0	DM	DM
Interim Action Ranges	0	DM	DM
Parker Flats (Phase II)	81	87	168

Notes:

DM = de minimis

MRA = Munitions Response Area

^a As of October 15, 2009

Table 3
 Status of ESCA RP Vegetation Monitoring Activities
 2009 Annual Habitat Monitoring Report
 FORA/ESCA

MRA ^a	2008	2009	2010	2011	2012	2013	2014
County North ^b		F					
Interim Action Ranges ^c	F,T			F,T			
Parker Flats (Phase II)	F,T		F		F,T		F,T

Notes:

^a Vegetation monitoring is required only in habitat parcels. The table reports only on monitoring activities that have been initiated by the ESCA RP Team to date.

^b Vegetation monitoring in the County North MRA was discontinued after focused sampling was completed in 2009 because no further MEC investigation was deemed necessary. No parcel-wide vegetation clearance was performed in this MRA.

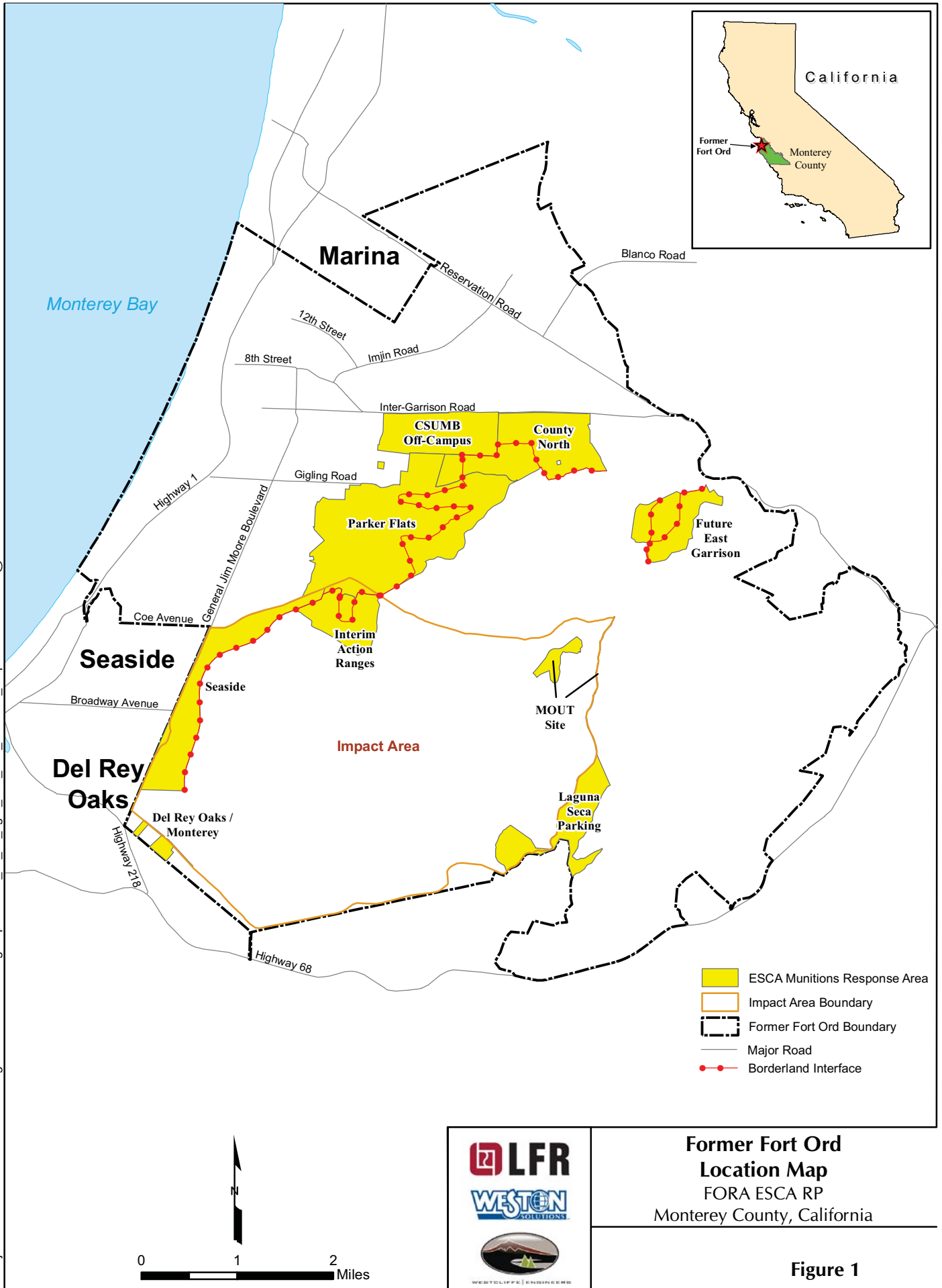
^c ESCA RP's monitoring in the Interim Action Ranges MRA is a continuation of vegetation monitoring that was initiated by the U.S. Army within the Ranges 43-48 MRA prior to the initiation of ESCA RP fieldwork. The ESCA RP portion of the Ranges 43-48 MRA is denominated the Interim Action Ranges MRA.

F = focused sampling

T = transect sampling

MRA = Munitions Response Area

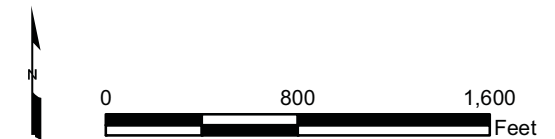
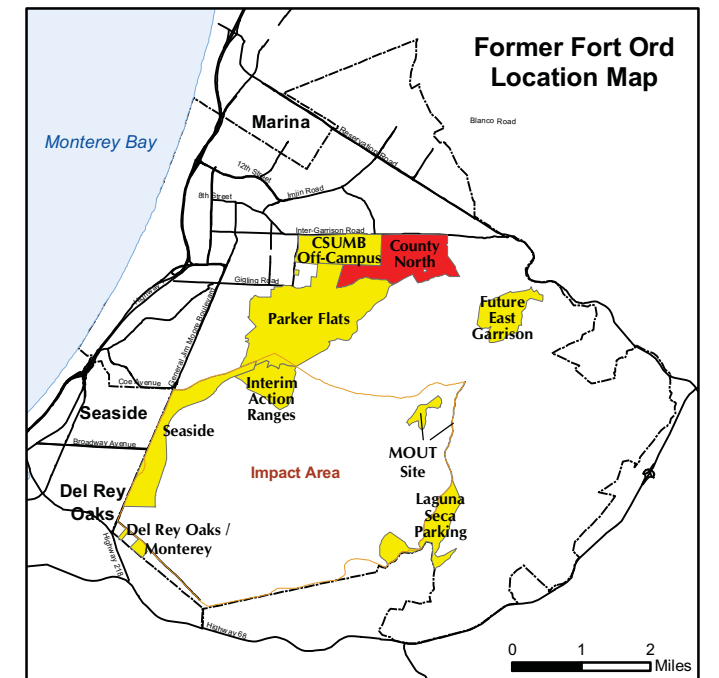
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T:\Projects\ALL MRAs\Habitat Monitoring\2009 Bio Monitoring Report\2009_11_05_fig-2_County_North_MRA.mxd - 2/5/2010 @ 12:49:57 PM



- ### Legend
- Munitions Response Area
 - Major Road
 - L20.2.1 USACE Parcel

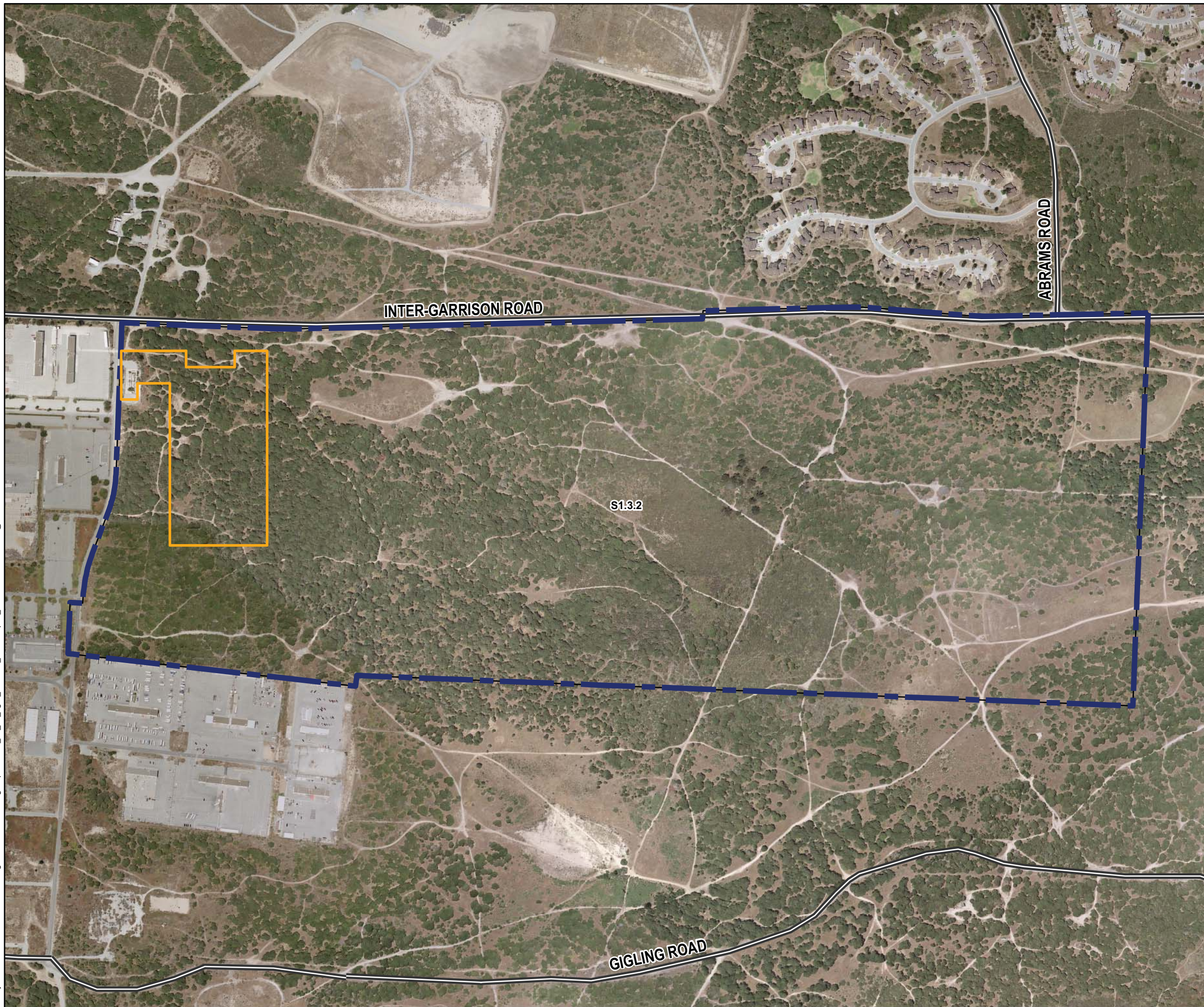




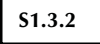

County North MRA

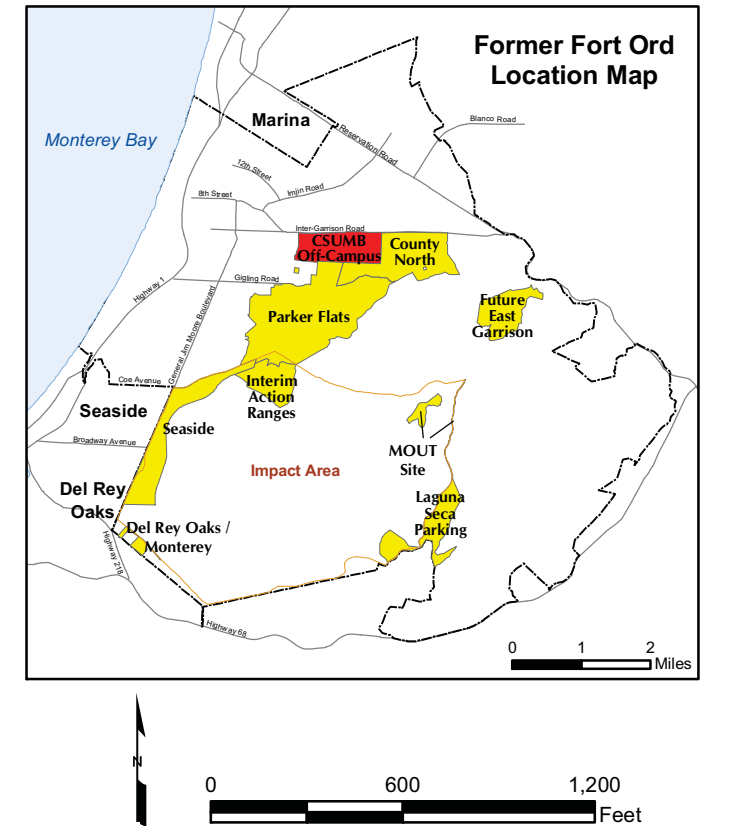
FORA ESCA RP
Monterey County, California

Figure 2

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- ### Legend
-  Munitions Response Area
 -  Major Road
 -  S1.3.2 USACE Parcel
 -  RQA Pilot Study - CSUMB Boundary



CSUMB Off-Campus MRA

FORA ESCA RP
Monterey County, California

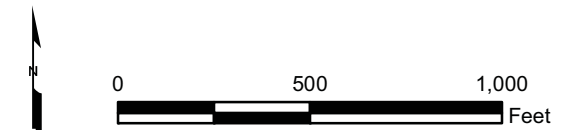
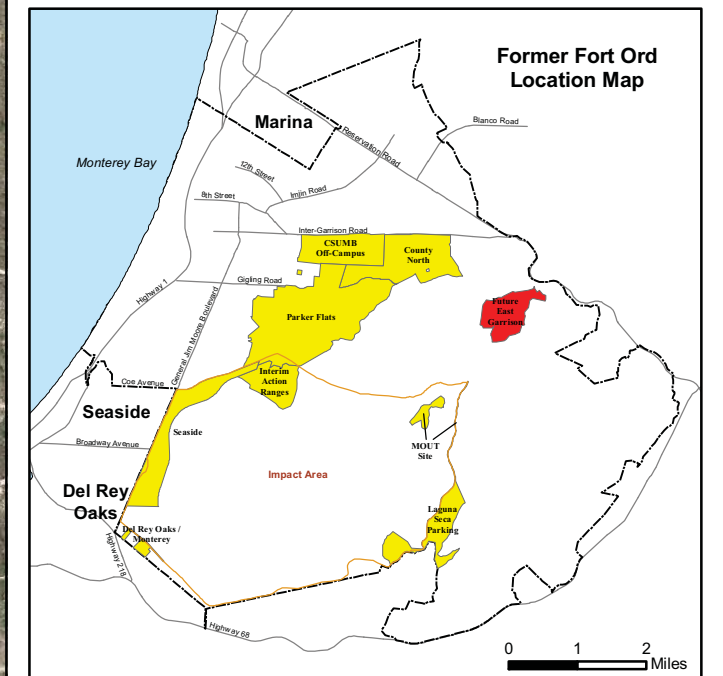
Figure 3

T:\Projects\ALL\MRA\Habitat Monitoring\2009 Bio Monitoring Report\2009_11_05_fig-4_Future_East_Garrison_MRA.mxd - 2/5/2010 @ 12:55:41 PM



Legend

- Munitions Response Area
- Major Road
- Electrical Line
- Fence
- Gas Line
- Storm Line
- Telephone Line
- Water Line
- Sewer Line
- R9211 Structure
- E23.1 USACE Parcel

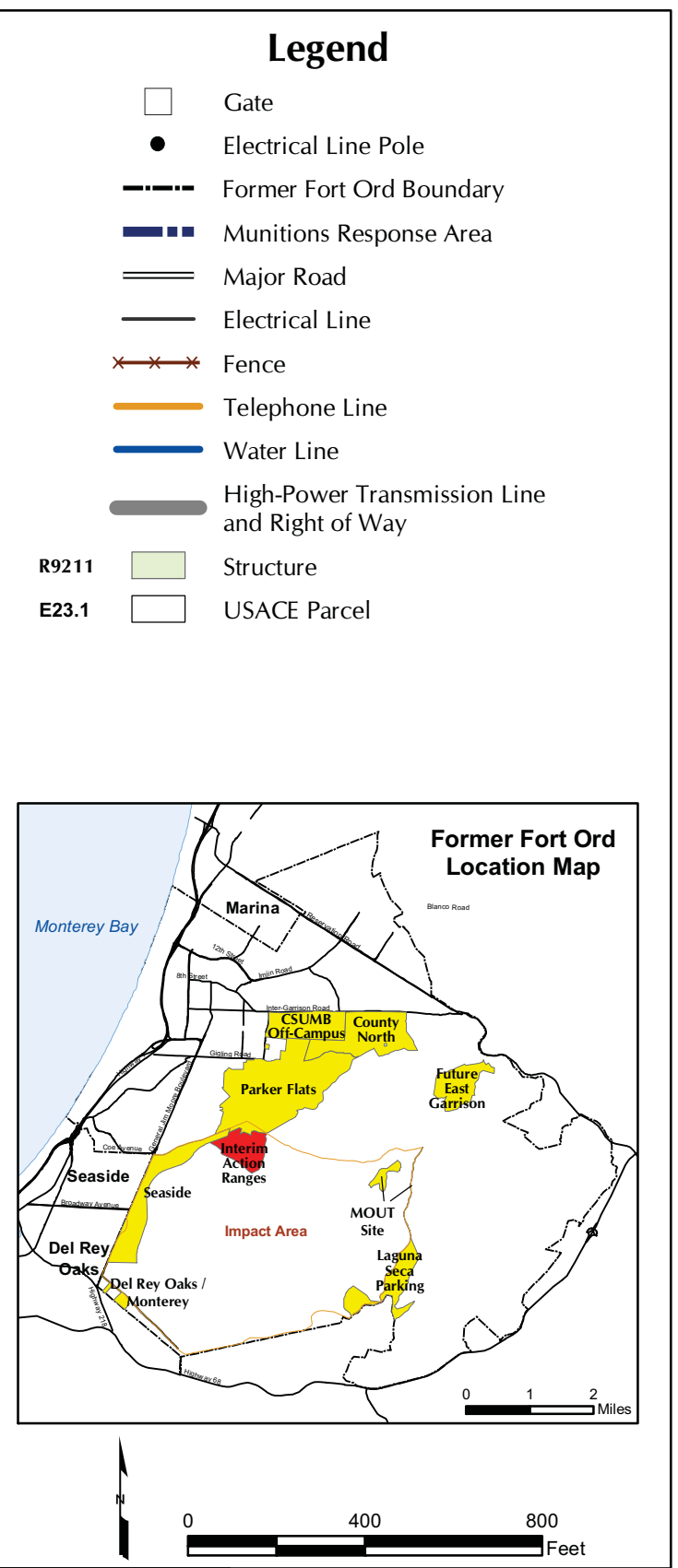


Future East Garrison MRA

FORA ESCA RP
Monterey County, California

Figure 4

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Interim Action Ranges MRA

FORA ESCA RP
Monterey County, California

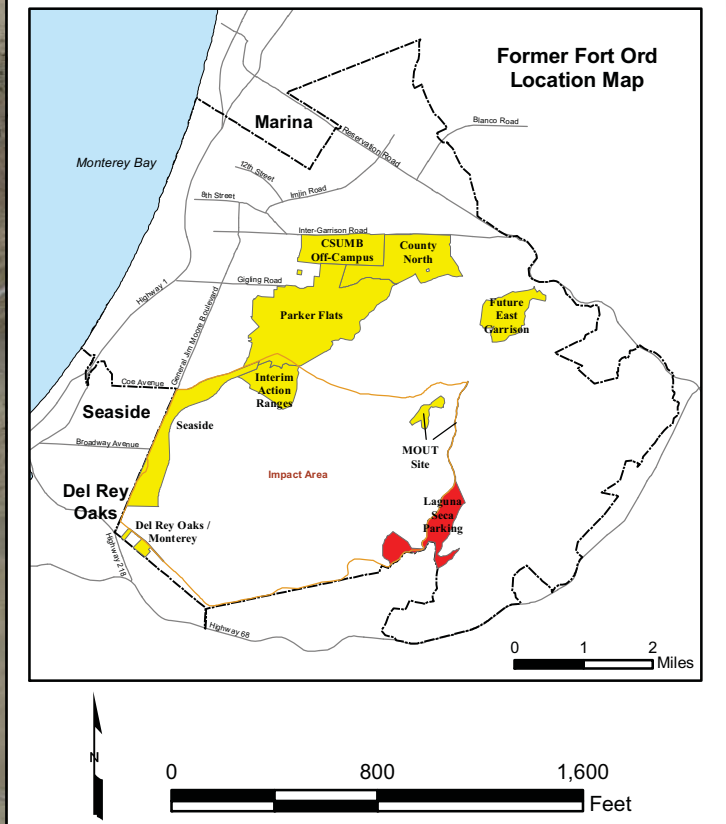
Figure 5

T:\Projects\ALL\MRA\Habitat Monitoring\2009 Bio Monitoring Report\2009_11_05_fig-6_Laguna_Seca_Parking_MRA.mxd - 2/5/2010 @ 12:54:13 PM



Legend

- Gate
- Entry Forbidden Sign
- Sign
- Former Fort Ord Boundary
- Munitions Response Area
- Major Road
- Electrical Line
- Fence
- R9211 Structure
- E23.1 USACE Parcel

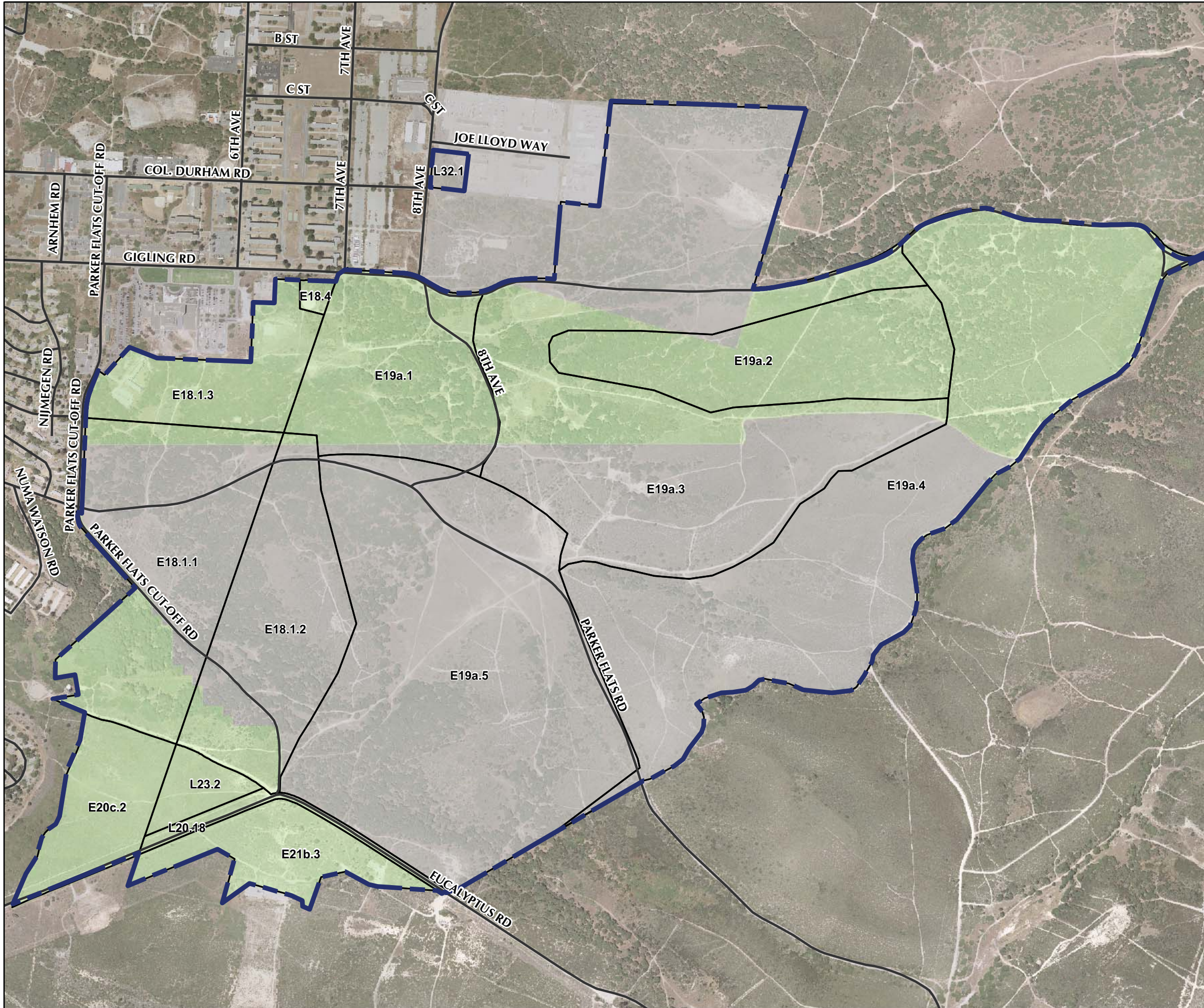


Laguna Seca Parking MRA






FORA ESCA RP
Monterey County, California

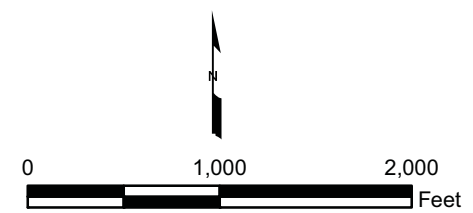
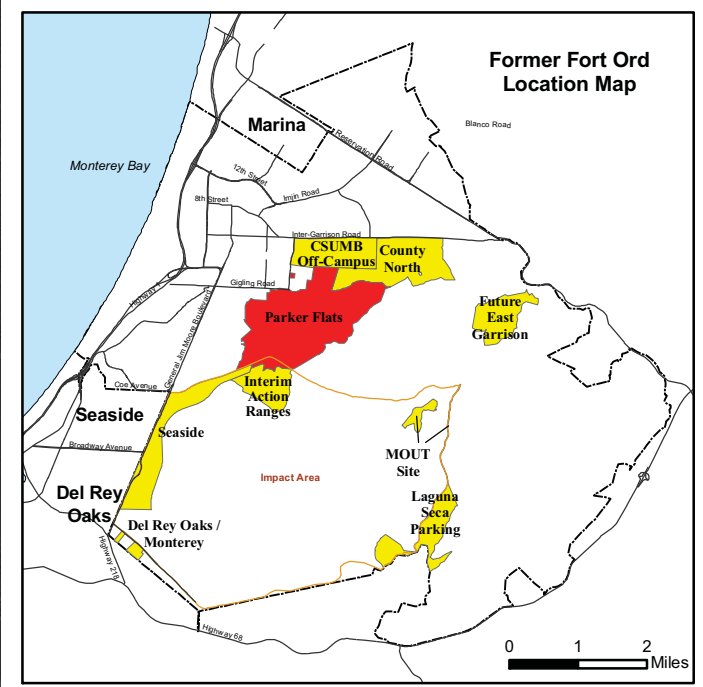
Figure 6

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Legend

-  Parker Flats MRA
-  Major Road
-  USACE Parcel
-  Phase I Remedial Investigation Area
-  Phase II Remedial Investigation Area



Parker Flats MRA







FORA ESCA RP
Monterey County, California

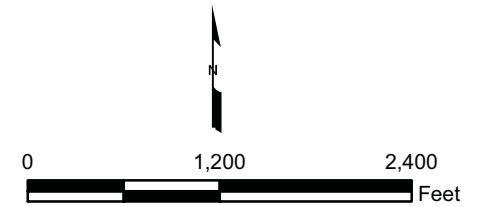
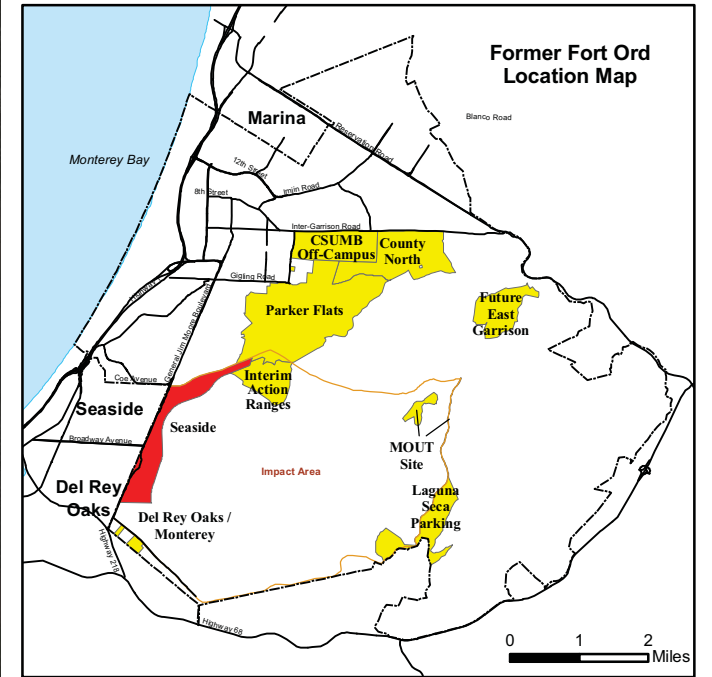
Figure 7

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Legend

-  Seaside MRA
-  Major Road
-  E23.1 USACE Parcel
-  Special Case Area Point
-  Special Case Area
-  RQA Pilot Study - Seaside Boundary

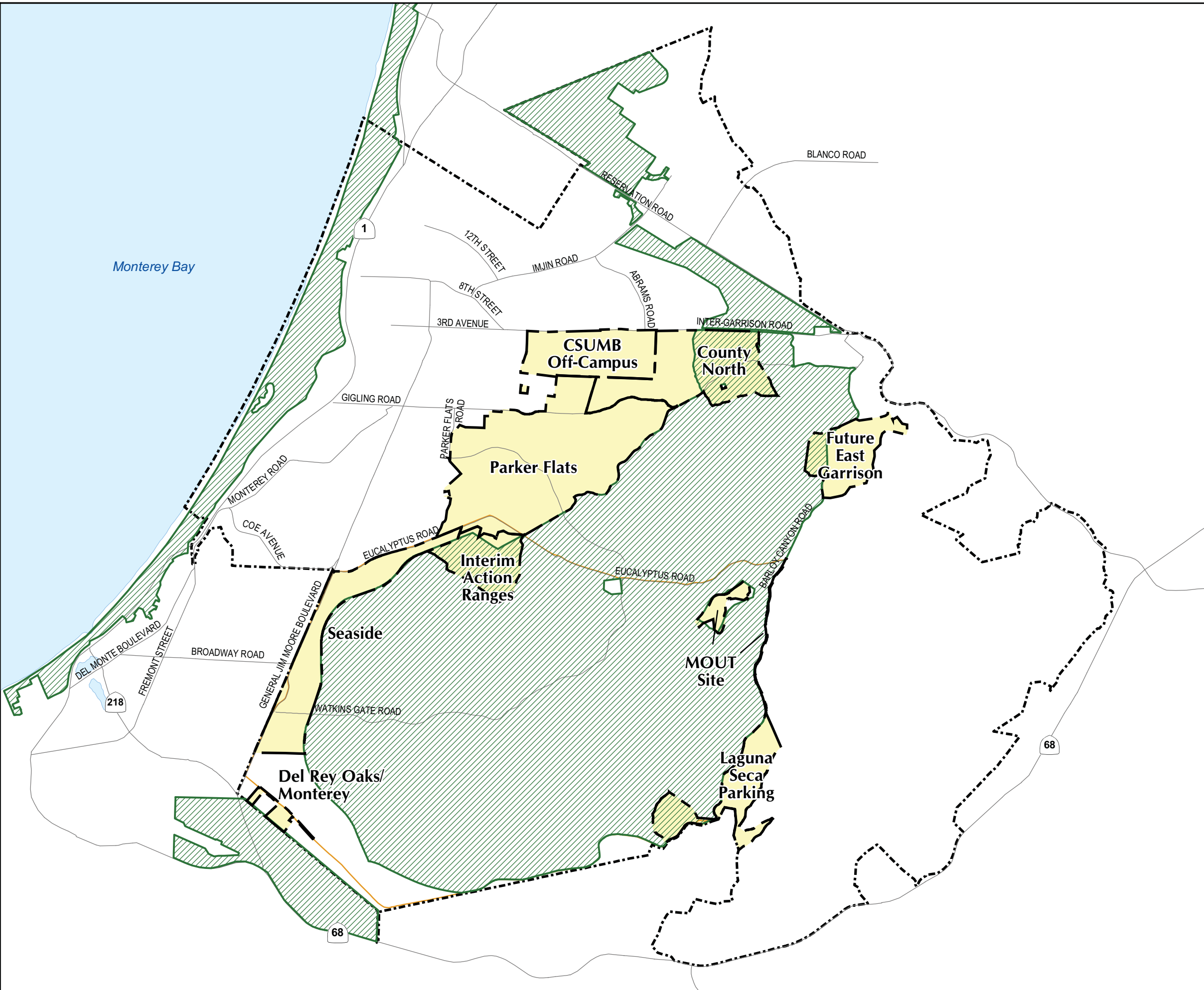


Seaside MRA

FORA ESCA RP
Monterey County, California

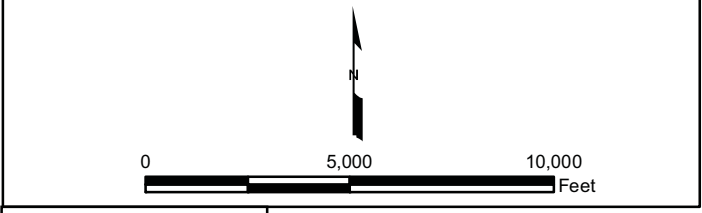
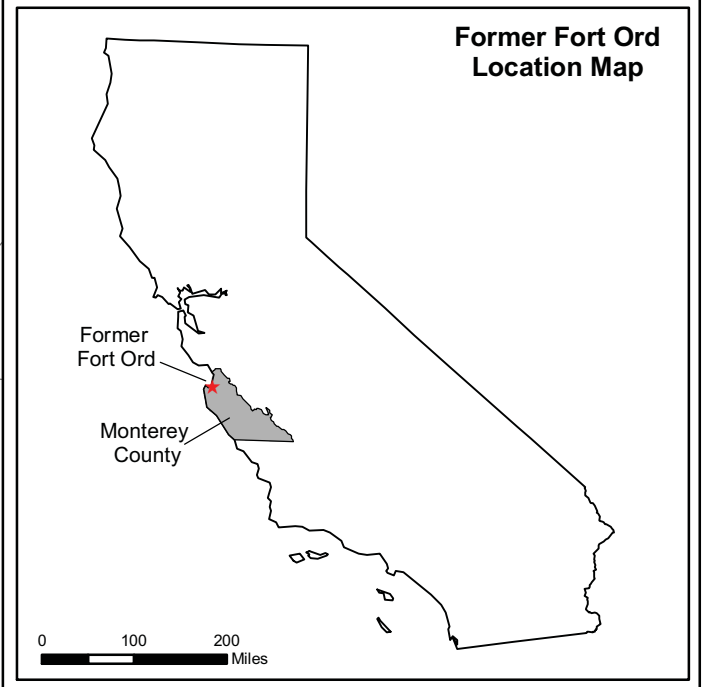
Figure 8

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Legend

- Major Roads
- Former Fort Ord Boundary
- Impact Area Boundary
- U.S. Fish and Wildlife Designated Monterey Spineflower Critical Habitat
- ESCA Munitions Response Areas



**Former Fort Ord
Monterey Spineflower
Critical Habitat**

FORA ESCA RP
Monterey County, California

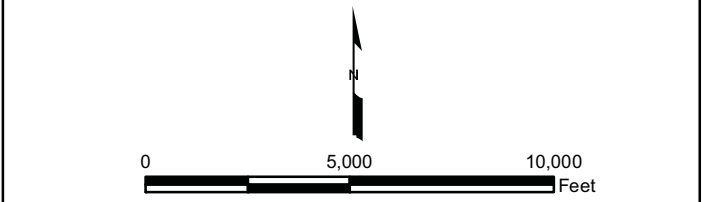
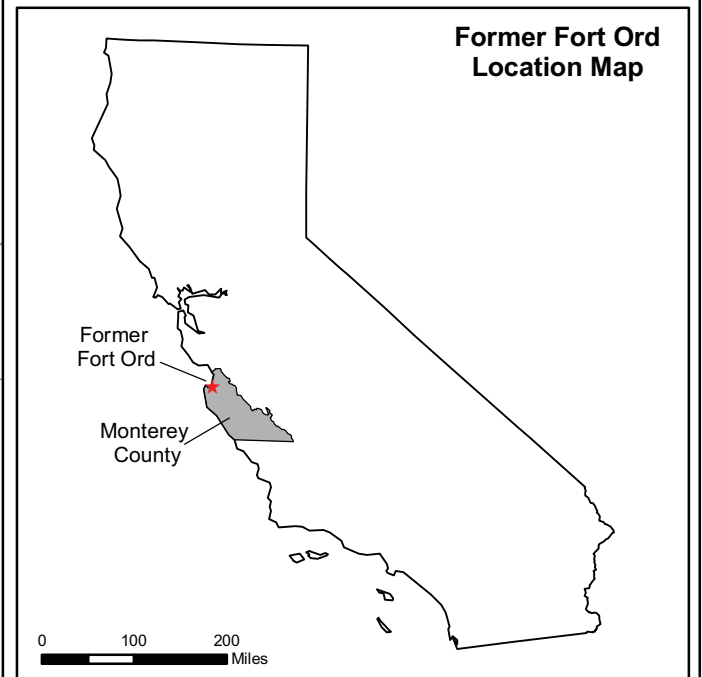
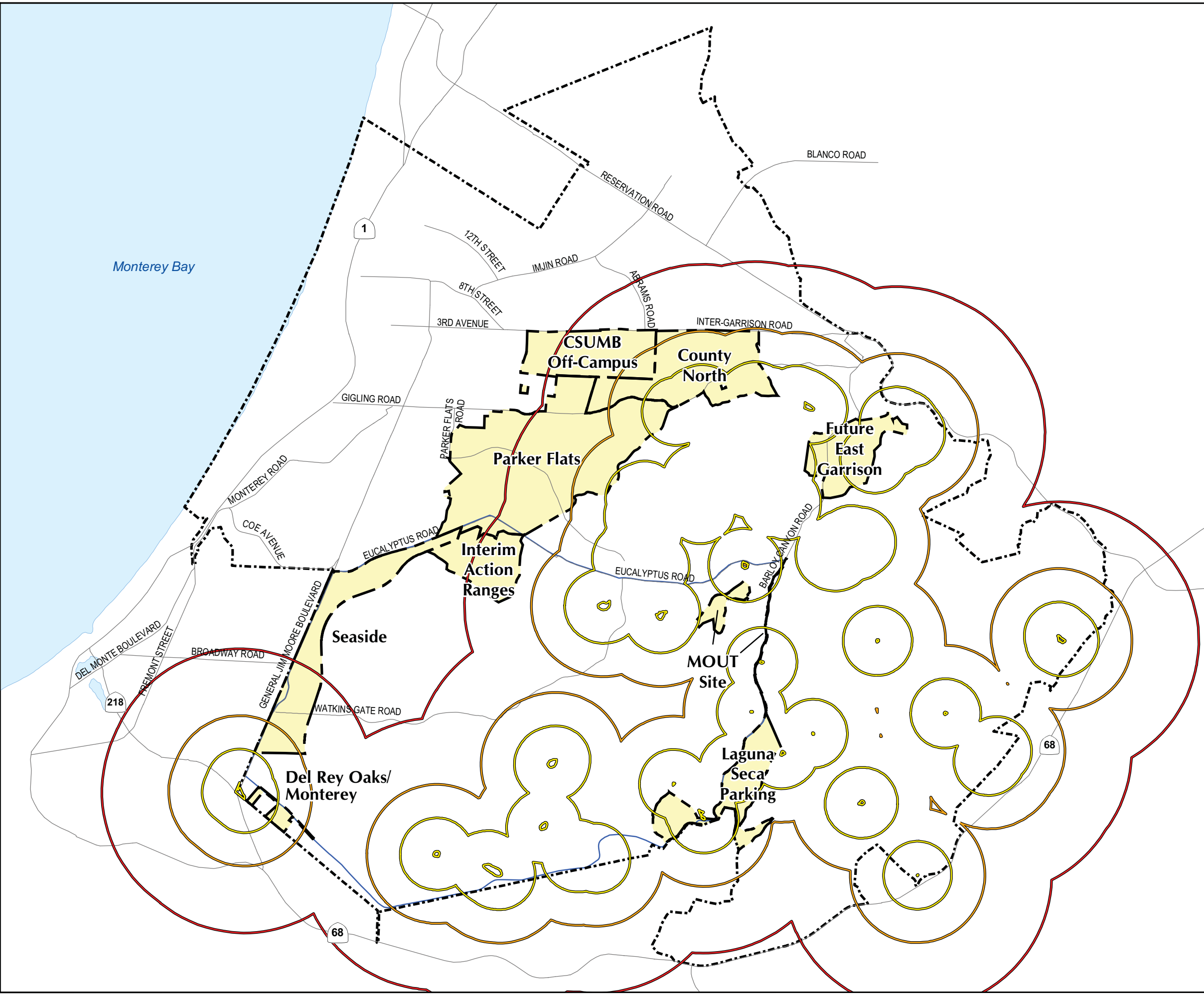
Figure 9

Legend

- Major Roads
- - - Former Fort Ord Boundary
- Impact Area Boundary

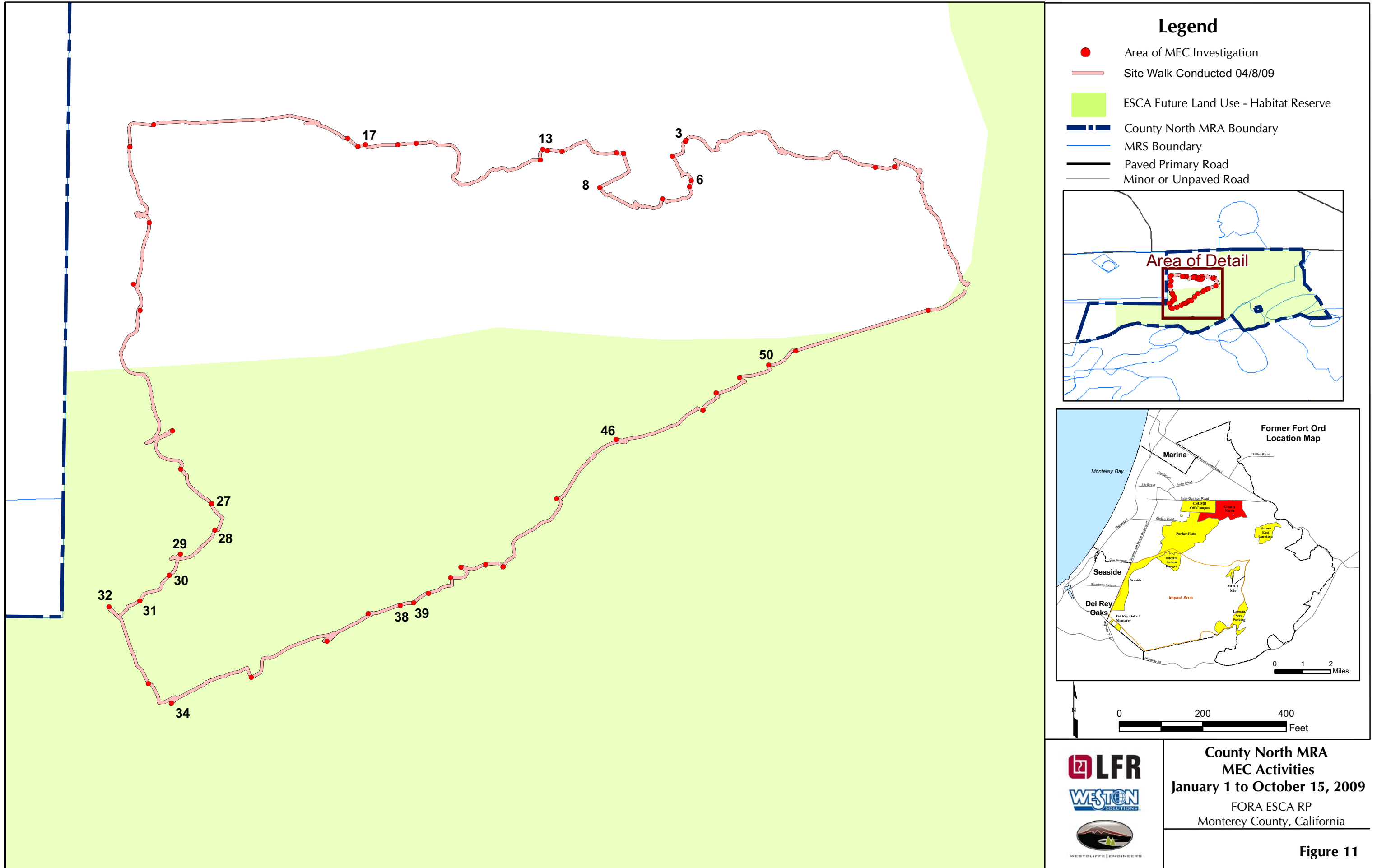
- U.S. Fish and Wildlife Designated California Tiger Salamander Habitat Zones
- 500 M
- 1 KM
- 2 KM

- Munitions Response Areas

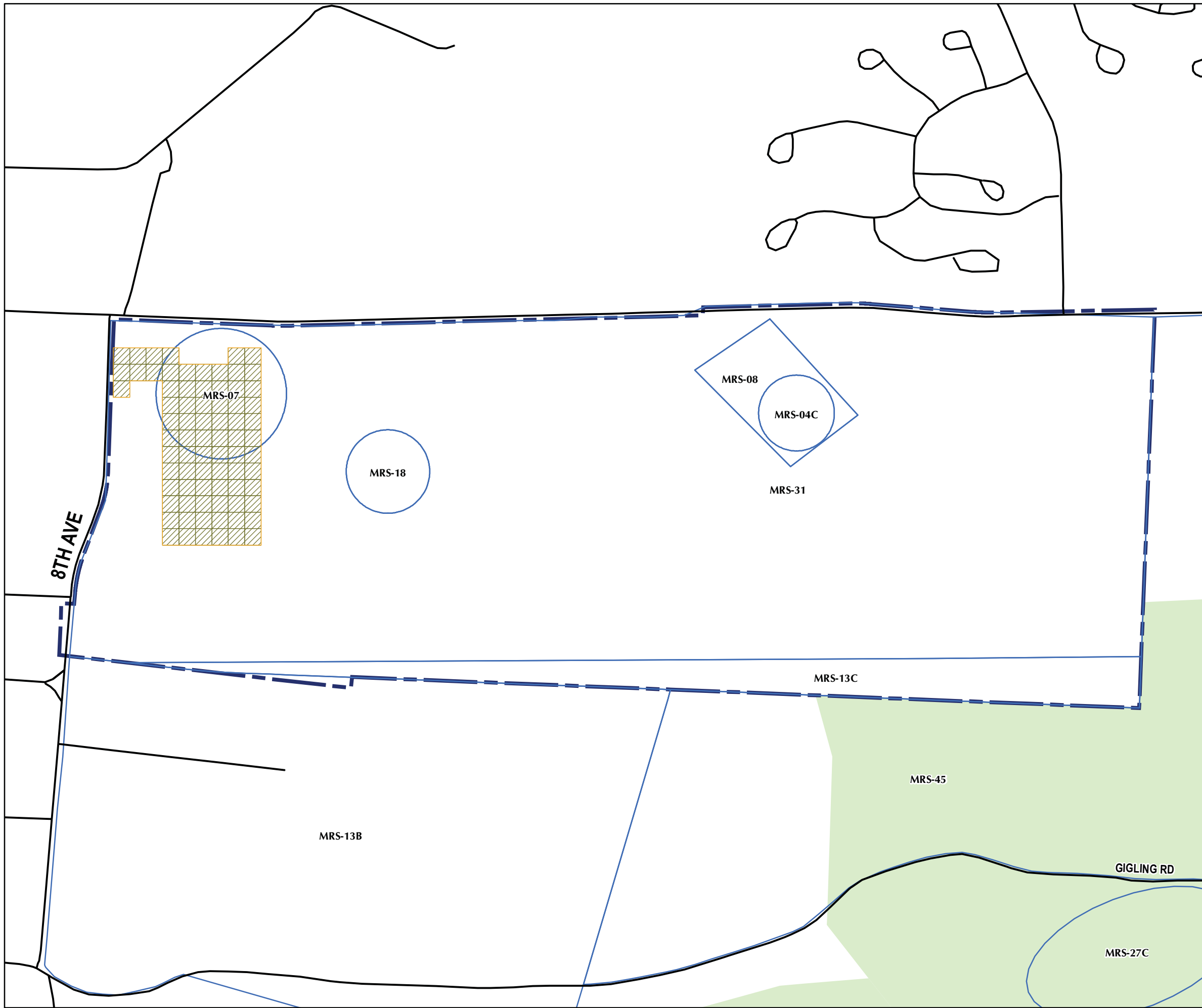









Former Fort Ord California Tiger Salamander Habitat
 FORA ESCA RP
 Monterey County, California

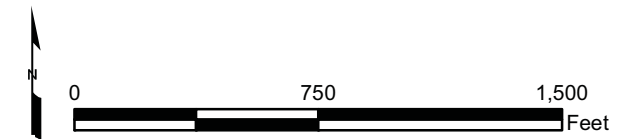
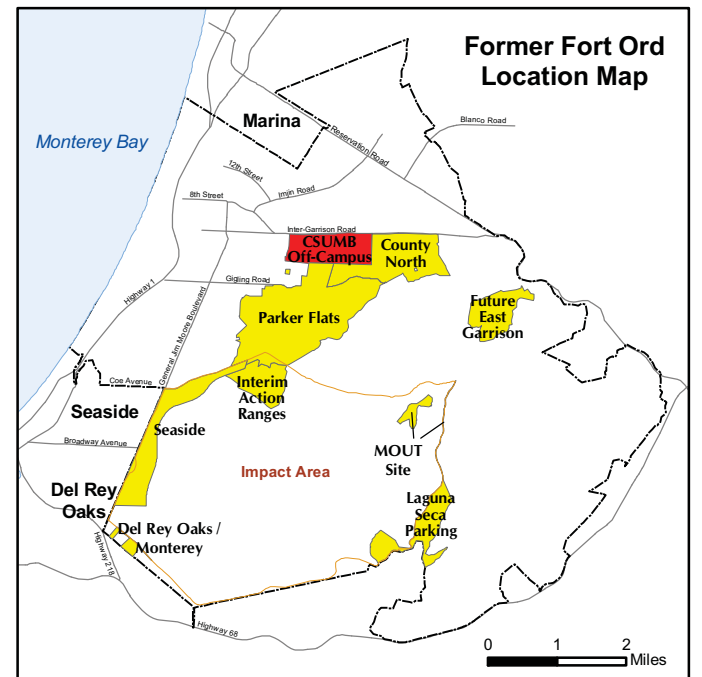
Figure 10



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- ### Legend
-  Area of CSUMB RQA Pilot Study
 -  ESCA Future Land Use - Habitat Reserve
 -  CSUMB Off-Campus MRA Boundary
 -  MRS Boundary
 -  Paved Primary Road
 -  Minor or Unpaved Road
 -  RQA Pilot Study - CSUMB Boundary

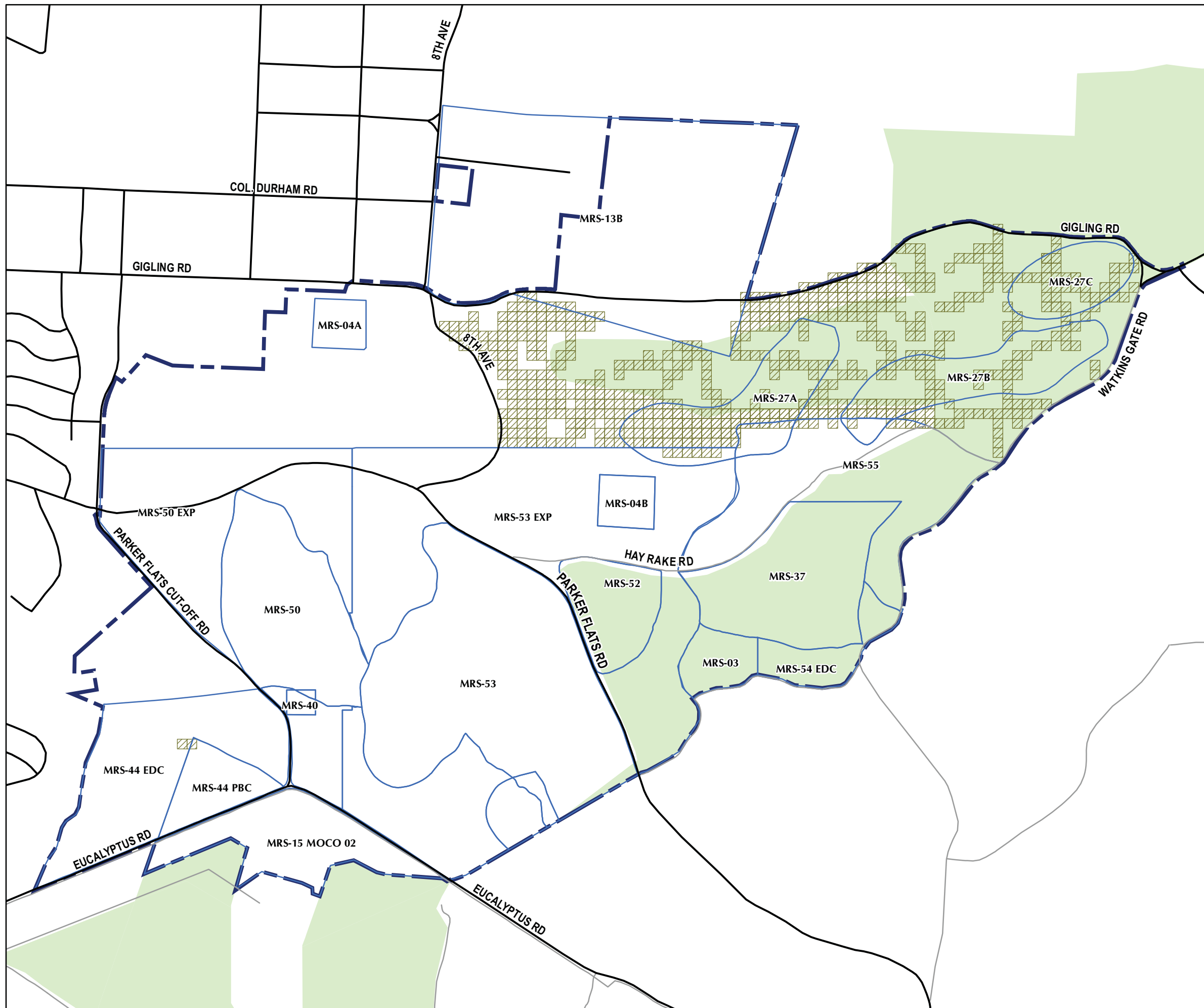


**CSUMB Off-Campus MRA
MEC Activities
January 1 to October 15, 2009**







FORA ESCA RP
Monterey County, California

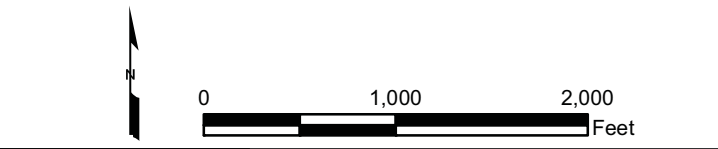
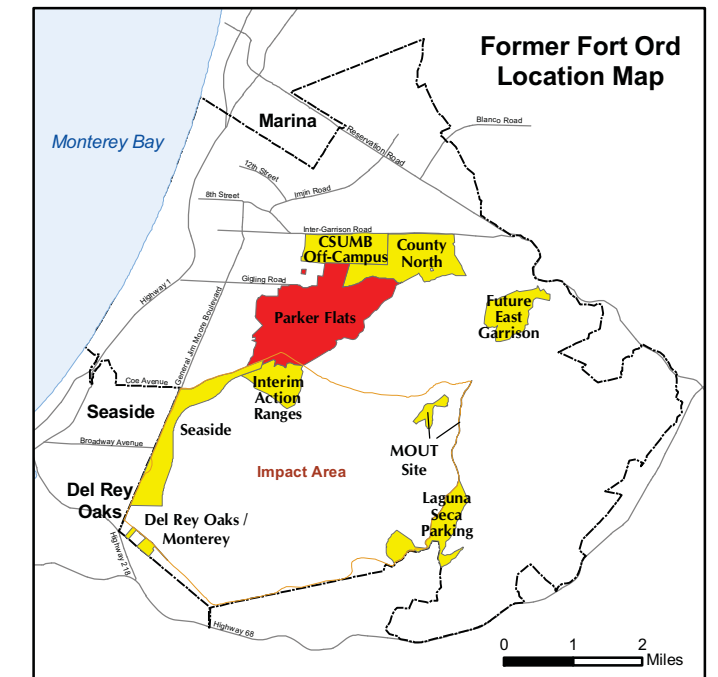
Figure 12

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Legend

-  Area of MEC Investigation
-  ESCA Future Land Use - Habitat Reserve
-  Parker Flats MRA Boundary
-  MRS Boundary
-  Paved Primary Road
-  Minor or Unpaved Road

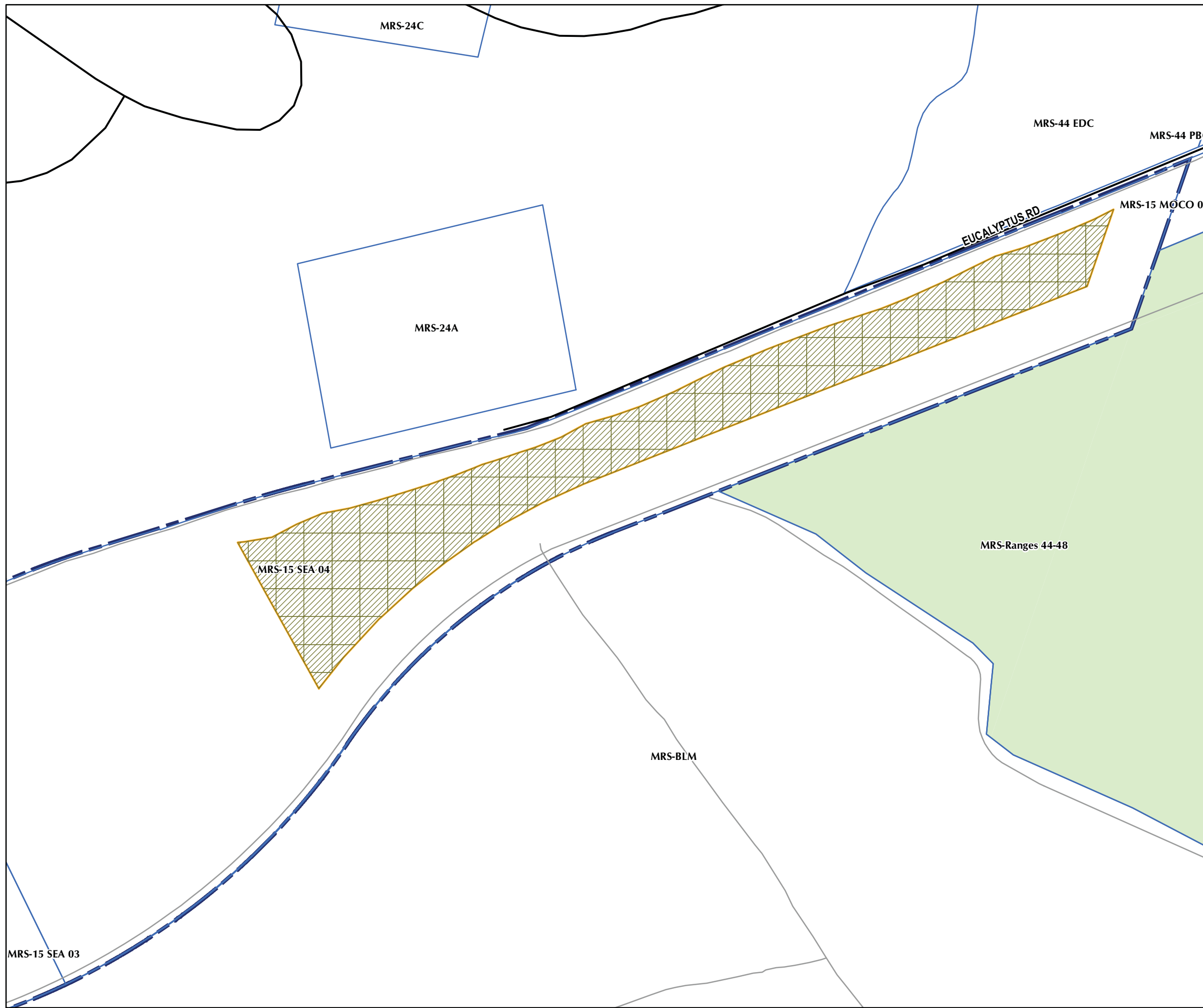


**Parker Flats MRA
MEC Activities
January 1 to October 15, 2009**








FORA ESCA RP
Monterey County, California

Figure 13

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Legend

-  Area of Seaside 4 RQA Pilot Study
-  ESCA Future Land Use - Habitat Reserve
-  Seaside MRA Boundary
-  MRS Boundary
-  Paved Primary Road
-  Minor or Unpaved Road
-  RQA Pilot Study - Seaside 4 Boundary

Former Fort Ord Location Map

This location map shows the site's position within the Former Fort Ord area. Key locations include Marina, CSUMB Off-Campus, County North, Parker Flats, Interim Action Ranges, Seaside, Del Rey Oaks, MOUT Site, Laguna Seca Parking, and Future East Garrison. A scale bar indicates distances up to 2 miles.

A north arrow and a scale bar showing 0, 400, and 800 feet.



**Seaside MRA
MEC Activities
January 1 to October 15, 2009**

FORA ESCA RP
Monterey County, California

Figure 14

APPENDIX A

2009 QB Memoranda

PROGRAM MEMORANDUM

Date: March 5, 2009 County North MRA-QB-1
To: Mr. William Collins, U.S. Army
From: Phil Lebednik Senior Qualified Biologist, LFR Inc.
Subject: County North MRA - Signage Installation

FORA requested that the ESCA Program install signage at trailheads along a portion of InterGarrison Road. This activity would have ESCA personnel conducting field work in the County North MRA. The County North MRA does not contain any habitat parcels.

The relatively minor work effort involves installation of several posts by digging postholes and backfilling after post installation. All vehicles will remain on existing roads/trails.

Per requirement of the Biological Opinions and the HMP, all field personnel and their supervisors must receive training regarding environmental issues. This requirement has been implemented in the ESCA Program through the Environmental Awareness Training (EAT) modules that are prepared for each MRA. Upon review, I determined that the Parker Flats MRA EAT can serve as an interim training module and for this activity in the Development North MRA. Therefore, I authorized Mike to conduct the activity with personnel who had received the Parker Flats EAT training.

The substance of the discussions and my authorization are documented in my Daily Log Book No. 32 (October 29, 2008).

I conclude that the above described activity coordination measures satisfy the requirements of the HMP and relevant Biological Opinions for those activities with the goal of minimizing impacts to rare, threatened, and endangered species on the County North MRA.

PROGRAM MEMORANDUM

Date: March 5, 2009 CSUMB MRA-QB-1
To: Mr. William Collins, U.S. Army
From: Phil Lebednik - ESCA RP Team Senior Qualified Biologist, LFR Inc.
Subject: CSUMB MRA - Signage Installation

FORA requested that the ESCA Program install signage at trailheads along a portion of InterGarrison Road. This activity would have ESCA personnel conducting field work in the CSUMB MRA. The CSUMB MRA does not contain any habitat parcels.

The relatively minor work effort involves installation of several posts by digging postholes and backfilling after post installation. All vehicles will remain on existing roads/trails.

Per requirement of the Biological Opinions and the HMP, all field personnel and their supervisors must receive training regarding environmental issues. This requirement has been implemented in the ESCA Program through the Environmental Awareness Training (EAT) modules that are prepared for each MRA. Upon review, I determined that the Parker Flats MRA EAT can serve as an interim training module and for this activity in the CSUMB MRA. Therefore, I authorized Mike to conduct the activity with personnel who had received the Parker Flats EAT training.

The substance of the discussions and my authorization are documented in my Daily Log Book No. 32 (October 29, 2008).

I conclude that the above described activity coordination measures satisfy the requirements of the HMP and relevant Biological Opinions for those activities with the goal of minimizing impacts to rare, threatened, and endangered species on the CSUMB MRA.

PROGRAM MEMORANDUM

Date: March 5, 2009 CSUMB MRA-QB-2
To: Mr. William Collins, U.S. Army
From: Phil Lebednik - ESCA RP Team Senior Qualified Biologist, LFR Inc.
Subject: CSUMB MRA - RQA Soil Stockpile Evaluation

This memorandum documents an evaluation performed by me together with Pablo Martos on December 2-3, 2008.

As part of the requirements associated with the RQA Pilot Test activity, the ESCA RP team proposes to perform a 6-12 inch surface soil lift in an area in the eastern portion of the MRA and to stockpile the removed soil in an area in the western portion of the MRA. There are no habitat parcels within this MRA.

Both the lift and soil stockpile areas are outside the 1 km CTS zone where conservation measures are required by the CTS BO. The 2 km radius, where the US Army requests that we implement the conservation measures, does not extend into the lift or the soil stockpile areas.

The RQA Pilot Areas are located in development parcels and not within the 2 km CTS zones and therefore the work is consistent with the CTS BO (USFWS, 2005).

Mike Doherty has agreed to stake the 2 km CTS line so that workers will know the area that is off limits for the soil stockpile. The CSUMB Environmental Awareness Training module will include a map showing the location of the line and workers will be informed that the line will be staked, designating where CTS could be encountered.

I conclude that the above described evaluation satisfies the requirements of the HMP and relevant Biological Opinions for the activities with the goal of minimizing impacts to rare, threatened, and endangered species on the CSUMB MRA.

PROGRAM MEMORANDUM

Date: January 30, 2009 CSUMB MRA-QB-3
To: Mr. William Collins, U.S. Army
From: Phil Lebednik – ESCA Remediation Program (RP) Team - Senior Qualified Biologist, - LFR Inc.
Subject: CSUMB MRA - Laydown (soil stockpile) Area: Mitigation of Potential Monterey Spineflower Population Impacts

The DRAFT Residential Quality Assurance Pilot Study Soil Management Field Implementation Plan (ESCA, 2008) describes field activities to be performed as part of the Residential Quality Assurance (RQA) task within the CSUMB MRA. Two associated field activities are removal of surface soil and stockpiling of the removed soil in a “laydown” area east of the RQA soil removal activity. CSUMB QB Memo 2 addressed issues associated with California tiger salamander (CTS) in both the removal and stockpile areas.

There are no habitat reserve parcels within the CSUMB MRA and therefore habitat or special status species mitigation measures are not required per the HMP (1997).

The map included as Figure F-3 in the Flora and Fauna Baseline Study of Fort Ord (USACE, 1992) indicates the potential for Monterey spineflower (*Chorizanthe pungens* var. *pungens*) populations to be present at various locations within the CSUMB MRA and some of these mapped areas overlap with the laydown area footprint. This species is an annual and populations can only be identified reliably during the flowering season in April-May. Stockpiling of soil in the laydown area could smother any underlying Monterey spineflower seed bank. If the seed bank were able to survive covering by overlying soil, it could be disturbed or dispersed when the soil is eventually removed from the area.

The Biological Opinion on the Closure and Reuse of Fort Ord, Monterey County (USFWS, 2002) cited a source indicating that the information presented in the 1992 report may, in some areas, substantially overestimate populations of this species (*i.e.*, the species was not detected in many of these areas during recent surveys). Even though mitigation measures are not required for this species in the CSUMB MRA and notwithstanding the uncertainty identified by USFWS regarding the 1992 results, the ESCA Qualified Biologists (QBs) performed an evaluation to determine if potential impacts in the soil laydown could be avoided.

On December 30, 2008 QB Pablo Martos, who conducted the 2008 ESCA field surveys for Monterey spineflower in the habitat parcels of the IAR and Parker Flats MRAs, visited the CSUMB laydown area with Michael Doherty, ESCA RP Team Field Operations Manager. Mr. Martos determined, based on habitat characteristics where the species was observed during the IAR and Parker Flats surveys, that a few relatively small areas on the eastern side of the laydown footprint were potential habitat for Monterey spineflower. The remainder of the footprint area was occupied by dense grass

FORA ESCA Remediation Program Team

populations and not likely to support Monterey spineflower populations. Following this field investigation, the potential habitat areas have been marked in the field. These marked areas will be avoided by the field crews to the extent feasible. A comment regarding this avoidance measure will be incorporated into the relevant Natural Resource Impact Mitigation Checklist.

I conclude that the above described avoidance measures provide additional protection to Monterey spineflower beyond the requirements of the HMP and relevant Biological Opinions for those activities with the goal of minimizing impacts to rare, threatened, and endangered species on the CSUMB MRA.

References

- ESCA 2008. DRAFT Residential Quality Assurance Pilot Study Soil Management Field Implementation Plan. Seaside and California State University of Monterey Bay Munitions Response Areas. Former Fort Ord, Monterey County, California. November 25.
- HMP 1997. Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, CA, U.S. Army Corps of Engineers, Sacramento District. April.
- USACE 1992. Flora and Fauna Baseline Study of Fort Ord, California. U.S. Army Corps of Engineers Sacramento District. Sacramento, CA. December.
- USFWS 2002. Biological Opinion on the Closure and Reuse of Fort Ord, Monterey County, California, as it affects Monterey Spineflower Critical Habitat (1-8-01-F-70R), United States Fish and Wildlife Service, October 22.

PROGRAM MEMORANDUM

Date: January 29, 2009 ESCA-Wide-QB-1, rev. 1
To: Mr. William Collins, U.S. Army
From: Phil Lebednik, Senior Qualified Biologist, LFR Inc.
Subject: Site Activity Coordination Procedure

This procedure will be followed whenever a new field activity begins or when a field activity is initiated in a new area.

1. In advance of an activity, the ESCA RP Team Field Operations Manager (OM) will contact the ESCA RP Team Senior Qualified Biologist (SQB) to notify him regarding the type of activity, location of work effort, section in the relevant Work Plan and the current start date.
2. The SQB will obtain copies of the Work Plan section, the applicable Definable Features of Work Checklist and applicable Natural Resources Impact Mitigation Checklist (Mitigation Checklist).
3. The SQB will notify the BRAC Biologist regarding the coordination meeting date, location and work activity. Mr. Collins will be invited to attend if he desires.
4. A coordination meeting will be held at the site, typically at the beginning of the first field day and in advance of any work in the area. The SQB and OM (or if either is unable to attend, their designated representative) will attend this meeting.
5. The SQB will ask the OM and field supervisors to describe the work activities.
6. The SQB will compare the discussion with the relevant sections of the Work Plan (including relevant responses to comments) and Mitigation Checklist.
7. If all activities are deemed by the SQB as being consistent with the documents, he will give his approval for the work to proceed.
8. If there are any discrepancies, the attendees will work to resolve them to the satisfaction of the SQB.
9. If the SQB is unable to confirm consistency or otherwise unable to approve start of work, he will contact the BRAC Biologist for assistance.
10. If the BRAC Biologist does not attend the coordination meeting, the SQB will contact him the day of the meeting or the next day to provide a summary of the results of the meeting.

11. The SQB will communicate the relevant information regarding approved activities to the other QBs and will establish a schedule for monitoring of the activity for the duration of the work effort.
12. The OM will immediately notify the SQB if there is any proposed change to the work activity once it has begun.
13. The proposed change to the work activity will not be implemented until approval is received from the SQB.

I conclude that the above described site activity coordination procedure satisfies the requirements of the HMP and relevant Biological Opinions for those activities with the goal of minimizing impacts to rare, threatened, and endangered species on the ESCA RP MRAs.

PROGRAM MEMORANDUM

Date: July 24, 2009 ESCA-Wide-QB-2
To: Mr. Stan Cook, FORA, Mr. William Collins, U.S. Army
From: Phil Lebednik, Senior Qualified Biologist, LFR Inc.
Subject: Rattlesnake Handling Procedure

This memorandum documents the rattlesnake handling procedure for Qualified Biologists (QBs) for the ESCA Remediation Project (RP).

A subspecies of the western rattlesnake, the northern Pacific rattlesnake (*C. viridis* ssp. *oreganus*) is common in former Fort Ord habitats. Although this animal is shy and avoids humans unless threatened, this is a venomous snake and extreme caution should be exercised when conducting field activities to avoid snake bites and/or harm to the animals. This QB Memo provides guidance to Qualified Biologists when working in potential rattlesnake habitat or when a rattlesnake is detected. In this memorandum, the words *snake* and *animal* refer to this subspecies.

******* Special Precaution! *******

An animal may appear to be dead because of its apparent condition, severe injury and/or lack of movement. Such animals (including dead animals) can strike via active or reflexive movement. Therefore, all animals that are encountered should be considered equally dangerous and treated as if they are fully active.

ESCA RP field work by QBs that occurs beyond sight of vehicles, in areas where rattlesnakes may occur, and involves activities in areas where the surface to be contacted (i.e., ground surface to be walked, handholds, etc.) is not visible in advance should be conducted using the “buddy” system [i.e., a minimum of two persons must be present and within (unaided) voice communication distance]. When using the buddy system, if one person is bitten by a rattlesnake, the victim can alert the buddy and the buddy should immediately care for the victim, as needed, and initiate the relevant safety measures described in the Site Safety and Health Plan (SSHP) section of the relevant Site Specific Work Plan (SSWP). If a SSHP for the MRA in which the field work is conducted has not been prepared, follow the measures described in the Seaside MRA SSWP SSHP.

Occurrence

Western rattlesnakes may occur anywhere in the field and must be anticipated to be present when conducting biological monitoring, surveys and other QB field activities. They commonly are found on rocks, in debris piles and on pipelines; accordingly, personnel should never reach toward unseen surfaces. Before doing so, orient yourself without closely approaching so that the surface to be touched is clearly visible. If a snake is present, it can be detected and avoided. Note that these animals usually become adaptively camouflaged to natural settings and may not be noticed

FORA ESCA Remediation Program Team

without careful scrutiny of an area, particularly vegetation and soil. More information on the biology of this species may be obtained from Stebbins (2003).

Immediate Actions Following Detection

If a rattlesnake is detected, the following actions should be performed:

1. Move personnel out of an exclusion zone and away from the animal (minimum of 10 feet away from the animal)
2. Alert other nearby personnel
3. Keep animal under observation and personnel outside exclusion zone
4. Notify Safety Officer
5. Coordinate with Safety Officer and appropriate onsite supervisor(s) to determine course of action

Capture/release Procedure

Qualified Biologists may be contacted by field personnel who encounter rattlesnakes in the active work zone. Such animals should be hazed away from work sites or (preferably) captured and released in a safe (for the snake) habitat if the QB can safely do so. The preferred method of handling rattlesnakes for the ESCA RP is to use snake tongs and the snake box (aka the Rattlesnake Rickshaw). The handler should also wear snake chaps if needed. See the following section for a detailed description of this equipment. Upon notification of the need for snake handling, obtain the needed equipment at the project office and proceed to the field location.

Snake tongs need to be used carefully so that the snake can be appropriately handled and to avoid injury to the snake. The proper placement of the tong jaws along the animal's body and the correct pressure applied to the jaws of the tongs are critical to avoiding injury to the animal. Excessive pressure may cause pain and increase aggressiveness of the animal as well as cause injury. Lifting of the animal for extended periods is to be avoided because many crotalids have poorly anchored internal organs which can be forcefully displaced by too much pressure exerted midbody (Snakegetters 2008, Venomous Reptiles 2008).

The following procedure should be used for capture and removal of rattlesnakes from work areas:

1. Maintain extreme caution when using this procedure as this is a venomous snake
2. If the animal is thought to be dead, follow this procedure as if it were alive, as newly dead animals can bite through reflex actions – never handle a dead rattlesnake without tongs
3. Identify the location of the animal with the assistance of the site workers
4. Carefully assess the area around the animal to plan how to approach it and where to place the box so that both handler and snake will be protected during the activity: mitigate potential slip/trip/fall conditions within the ingress/egress pathway

5. Make sure that a clear path is available and mentally envisioned in the event that capture fails and it becomes necessary to retreat rapidly away from the animal
6. Locate a weight for the lid rope
7. Carefully and slowly place the snake box and rope weight close to the animal but avoid annoying it
8. Open the lid of the box with the attached rope – the lid opening should be facing the direction of the snake – and secure the rope with the weight so that the lid does not inadvertently close (especially if it's windy)
9. Grasp the tongs, approach the animal and slowly insert the lower jaw under its body by sliding it along the ground surface
10. The jaws should be placed about one-third of the body length behind the head
11. Close the jaws by applying light to moderate pressure – avoid excessive pressure
12. If the animal needs to be moved closer to the box, do not lift it, but slide it along the ground while held with the tongs so that its body is supported by the ground surface
13. When ready to place the animal into the box, lift smoothly and quickly into the box and release the animal
14. Quickly grab the lid rope and lower the lid while making sure the animal does not come between the lid and the top of the box – exercise caution!
15. After closing the lid, approach the hinged side of the box and press the lid down firmly
16. Apply a piece of strong cloth adhesive tape across the lid/box to secure the lid
17. Take a GPS reading of the capture location and record it in the field notes
18. Search for an appropriate release location away from the work area
19. Take a GPS reading of the release location and record it in the field notes
20. Notify the site supervisor and site personnel that the exclusion zone is canceled and work can resume when the box is removed - note the time of this notification in the field log
21. Carry the box, tongs and rope weight to the release site
22. Carefully position the box after planning the release activities as well as a retreat path
23. Remove the tape from the lid while holding the lid down so that it is not lifted
24. Grab the lid rope and gently open the lid – caution! the snake may strike
25. Secure the lid rope with a weight to prevent the lid from closing inadvertently
26. Grasp the tongs and grip the snake in the same manner as described above – exercise caution while positioning to grip the snake!
27. Lift the snake out of the box and quickly place it on the ground next to the box
28. Maintain grip on the snake if it needs to be moved laterally along the ground to its release location

29. Release the animal and pull the box away using the lid rope
30. Briefly observe the animal to determine that it is uninjured
31. Record appropriate information in the field log
32. Check out with the site supervisor and exit the site
33. Clean the equipment as needed and return it to the project office.

Snake Handling Equipment

Safe handling of rattlesnakes generally should involve use of the following equipment:

- 1) Snake Box (aka the Rattlesnake Rickshaw). The snake box was specifically constructed to serve as a safe (for handler and snake) means of holding and transporting a rattlesnake. The box is a medium-size insulated cooler with a hinged lid (see photolog Figure 1, top). A rope affixed to the lid allows the handler to open and close the lid while maintaining a safe distance from the animal inside the box. The false floor of the box covers a weight that keeps the box stable during high wind conditions and when opening and closing the lid (see photolog Figures 1, bottom, and 2, top). The false floor may be removed for cleaning by pulling on the recessed handle.
- 2) Snake Tongs. A 5 ft snake tong is employed to grasp and move the snake (see photolog Figure 2, bottom). Refer to proper handling instructions provided elsewhere in this memorandum.
- 3) Snake Chaps. A pair of snake chaps is available for use when handling a snake and as needed when conducting field activities where snakes may be present (see photolog Figure 3).

Other equipment needed are cloth adhesive tape to seal the lid and a weight to hold the snake box lid rope (usually available in the field).

References Cited

- Snakegetters 2008. <http://www.snakegetters.com/class/handling-tools.html> (accessed 1/14/08).
- Stebbins, R. C. 2003. Western reptiles and amphibians. 3rd ed. Peterson Field Guides, Houghton Mifflin Co., Boston. xiii + 533 pp.
- Venomous Reptiles 2008. <http://www.venomousreptiles.org/reviews/detail/25> (accessed 1/14/08).



Snake Box or Rattlesnake Rickshaw Showing Lid Rope.



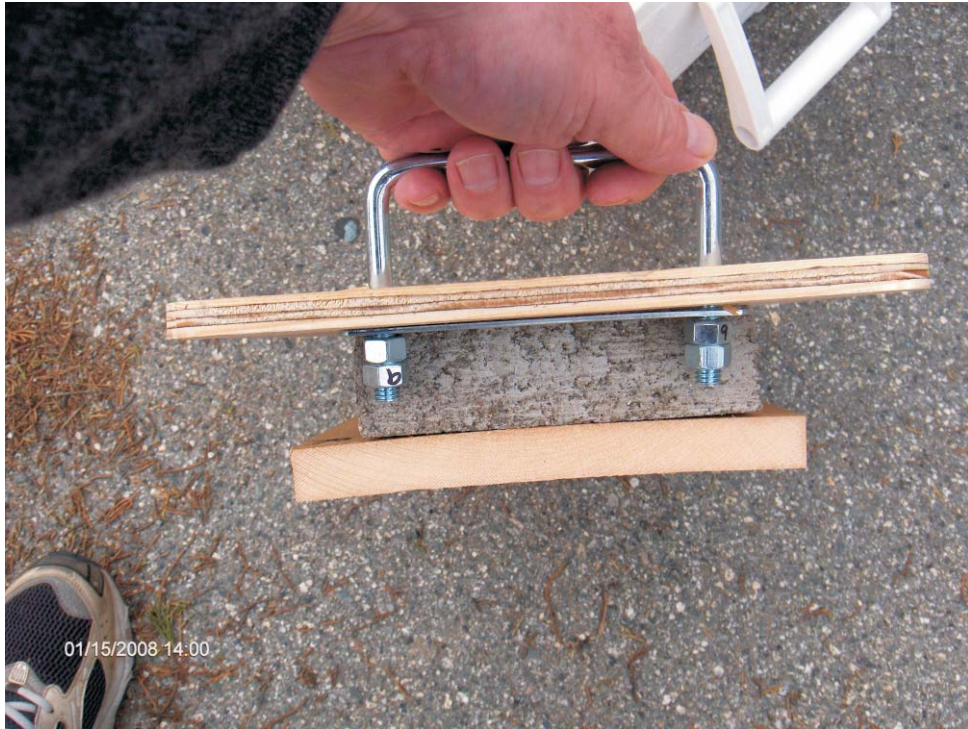
Snake Box Interior Showing False Bottom.

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Photolog
ESCA-wide QB memo no. 2
FORA ESCA RP
Monterey County, California

Photolog Figure 1



False Bottom in End Profile View.



Snake Tongs.

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Photolog
ESCA-wide QB memo no. 2
FORA ESCA RP
Monterey County, California

Photolog Figure 2



Snake Chaps. (IMG 0198)

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Photolog
ESCA-wide QB memo no. 2
FORA ESCA RP
Monterey County, California

Photolog Figure 3

PROGRAM MEMORANDUM

Date: 06-Mar-09 Parker Flats Phase II MRA-QB-2
To: Mr. William Collins, U.S. Army
From: Phil Lebednik – ESCA RP Team Senior Qualified Biologist, LFR Inc.
Subject: Parker Flats Phase II Munitions Response Area - CTS Mitigation Measures

California tiger salamander (CTS) habitat occurs in the Parker Flats Phase II Munitions Response Area (MRA). The 0.5 km radius (from nearest aquatic feature, *i.e.*, known or potential breeding site) crosses the far eastern portion of the MRA and the 1 and 2 km lines also extend across the MRA farther west. Work is scheduled during the current wet season and therefore certain mitigation measures may need to be implemented.

The following mitigation measures described in the CTS Biological Opinion (BO) (USFWS 2005) were determined to be potentially relevant to activities being conducted in the Parker Flats Phase II MRA and in need of advance evaluation:

- 1) T&C (Terms and Conditions) 1c - certain mitigation measures are required if more than ten percent of the upland habitat within the 0.5 km radius is to be excavated.
- 2) T&C 1d - monitoring, silt fencing or covering of excavations that are 0.05 acre or larger and greater than 6 inches depth within the 1 km radius
- 3) T&C 6 - handling of CTS encountered during MEC clearance work

Evaluations of these activities are presented below.

Excavation Within the 0.5 km Radius

The ESCA Remediation Program (RP) Parker Flats work plan indicates that the extent of excavations, if any, are unknown until UXO technicians perform detection work. However, MEC subsurface clearance will be limited to existing trails, trail buffers and other accessible areas. Discussion with ESCA RP Team personnel indicated that any subsurface work is likely to be “mag and dig,” *i.e.*, shallow excavation to locate a detected target, and that based on prior information of the area and experience in similar areas of former Fort Ord, MEC occurrence may be infrequent.

The BO indicates certain mitigation requirements when excavations exceed certain parameters as cited above. According to Bill Collins (pers. com. 2009) the term “excavation” in the BO is intended to apply to large-scale soil removal, and not to spatially limited “mag and dig” operations; therefore, subsurface clearance activities in Parker Flats Phase II MRA should not trigger T&C 1c.

As an additional measure, I performed an evaluation to determine the maximum area that may be subject to soil disturbance as a result of mag and dig operations within the 0.5 km radius within the Parker Flats Phase II MRA. A maximum reasonable estimate of the area disturbed would assume that subsurface removal would be required across all of the features where subsurface clearance detection is to be carried out. I requested that Program personnel perform a calculation of the maximum reasonable estimate and a calculation of what percentage this area is of the total area encompassed by the 0.5 km radius. In response to this request, Mr. Mike Doherty prepared the attached memorandum (ESCA RP Team, 2009). The area of a 0.5 km diameter circle is 194 ac (acre) and ten percent of this area is 19.4 ac. The maximum reasonable estimate presented in Mr. Doherty's memorandum indicates that subsurface excavation would not reach or exceed the ten percent value. Therefore, even if mag and dig operations were considered to be "excavation" per the BO, T&C 1c mitigation measures do not need to be implemented in the Parker Flats Phase II MRA.

Excavation Within the 1 km Radius

As described above, Program personnel indicated that any subsurface work is likely to be "mag and dig," *i.e.*, shallow excavation to locate a detected target, and that based on prior information of the area and experience in similar areas of former Fort Ord, MEC occurrence may be infrequent in the Parker Flats MRA. It was the strong consensus of the ESCA RP Team UXO staff that, given the shape of the areas where detection work is to be performed, it was not anticipated that any single subsurface investigation would approach 0.05 acre in size. Therefore, it was determined that T&C 1d mitigation measures would not need to be implemented in the Parker Flats Phase II MRA even if mag and dig operations were considered to be "excavation" per the BO. However, it was agreed that if during the UXO work it became evident that there is need for a large subsurface removal, the Qualified Biologists (QB) would be notified immediately, prior to such removal taking place.

CTS Encounters and Handling

Encounters with CTS are possible when MEC field activities are being conducted during the wet season and within the radii as far out as the 2 km radius (pers. com. Bill Collins, U.S. Army). The ESCA RP Team QB have been approved by USFWS to perform CTS rescue activities when needed.

The BO requires that field personnel and supervisors receive information on CTS biology and the requirement to immediately contact a QB if a possible CTS is encountered. This information was incorporated into the Environmental Awareness Training (EAT) module for the Parker Flats MRA as prepared and implemented by the ESCA RP Team QBs. All ESCA RP Team field personnel and their supervisors have/will receive EAT training prior to working in the field.

To further reduce the risk of CTS take, ESCA RP Team personnel agreed to the following mitigation measures that are in addition to those listed in the BO:

- all field work will be performed during normal daytime work hours and thus avoid the nocturnal period when CTS are most active
- mechanized equipment, including personnel transport vehicles, will operate on existing roads and trails except when overland work is required for MEC detection and removal
- the 2 km CTS radius will be surveyed and staked in the field so that all workers will know when they are within possible CTS habitat

I conclude that the above evaluations and mitigation measures satisfy the requirements of the HMP and the 2005 Biological Opinion for MEC clearance activities with the goal of minimizing take of CTS within the Parker Flats MRA.

References

ESCA RP Team, 2009. Potential excavations within 500-m CTS boundary in Parker Flats. Internal Team Communication, Doherty, M., January 28, 2009

USFWS 2005. Cleanup and Reuse of Former Fort Ord, Monterey County, California as it affects California Tiger Salamander and Critical Habitat for Costa Contra Goldfields (1-8-04-F-25R), United States Fish and Wildlife Service. March 14.

MEMORANDUM

Date: January 28, 2009

To: Phil Lebednik- ESCA RP Team Senior Qualified Biologist - LFR

From: Mike Doherty- ESCA RP Team Field Operations Manager - LFR

Cc: Kristie Reimer-FORA ESCA RP Team Program Manager

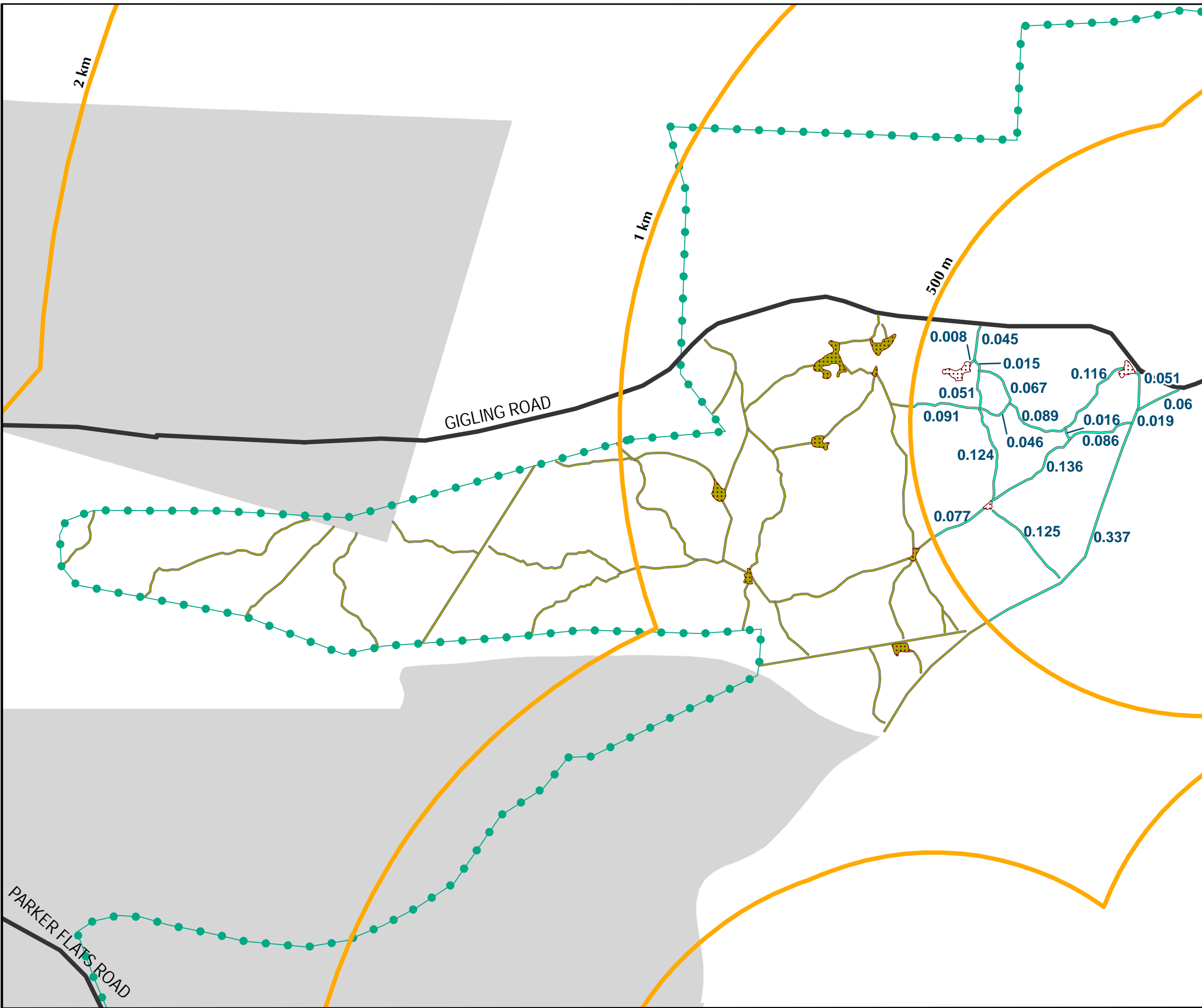
Subject: Potential excavations within 500-m CTS boundary in Parker Flats

Per your request, I have evaluated the acreages that potentially could be affected by subsurface investigation activities within the 500-m California Tiger Salamander (CTS) buffer in the Parker Flats MRA. The ESCA RP work to be performed in the Parker Flats MRA will affect only that portion of the MRA referred to as the "Parker Flats Phase II area." There is only one CTS 500-m buffer that extends into the Phase II portion of the Parker Flats MRA which lies within the Habitat Reserve Area. Within this area, subsurface detection activities will be limited to the trail convergence areas, trails and roadways. Resulting subsurface investigation activities are expected to be accomplished by relatively shallow hand-tool excavations, often referred to as "mag and dig."

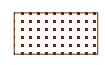

The reasonable maximum estimate of acreage affected by ESCA RP activities in the Phase II area assumes that 100 % of the area to be subjected to subsurface detection will require subsurface investigation. The reasonable maximum estimate calculation was performed using the ESCA RP GIS database and resulted in calculations for each trail, convergence area and roadway segment within the 500-m buffer are shown on Figure 1.

The reasonable maximum estimate of acreage was calculated to be approximately 1.86 acres. The total acreage within a 500-m buffer is approximately 194 acres. Therefore, the reasonable maximum estimate of acreage equals approximately 1 % of the total acreage within the 500-m buffer.

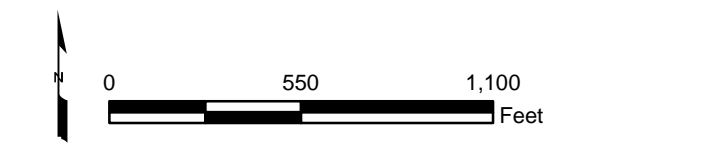
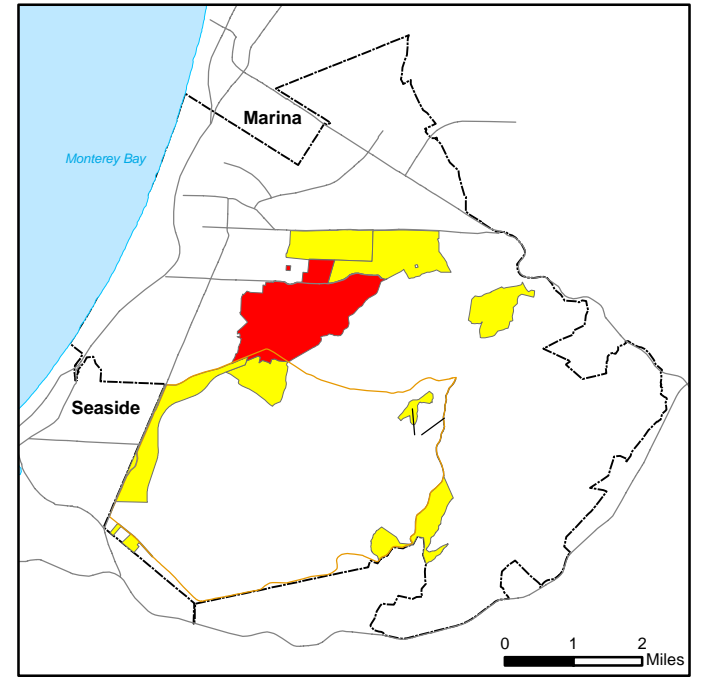
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Legend

-  Parker Flats MRA
-  Major Road
-  Trail Segment Buffer Area (in acres) within 500 m California Tiger Salamander Buffer (total of 1.56 AC)
-  Trail Convergence Areas within 500 m California Tiger Salamander Buffer (total of 0.3 AC)
-  Borderland Interface
-  Phase I Remedial Investigation Area
-  Other Trail Segment Buffers
-  Other Trail Convergence Areas

Source: Aerial Photo 2003



Trail Buffer and Trail Convergence Area Acreage within CTS 500-m Boundary

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Monterey County, California

Figure 1

PROGRAM MEMORANDUM

Date: July 16, 2009 Parker Flats MRA Phase II – Habitat Reserve
To: Mr. Stan Cook, FORA, Mr. William Collins, U.S. Army
From: Phil Lebednik, ESCA Remediation Program (RP) Team - Senior Qualified Biologist
Subject: Parker Flats MRA Phase II – Erosion Across Borderland Interface into Habitat Reserve Lands

This memorandum documents observations reported by Mr. Pablo Martos, ESCA RP Team Qualified Biologist, in the Parker Flats Munitions Response Area (MRA) Phase II.

The Parker Flats Munitions Response Area (MRA) Phase II includes a Habitat Reserve parcel, as designated in the Installation-Wide Habitat Management Plan (HMP) prepared by USACE (USACE 1997). The Parker Flats MRA Phase II is located in the central portion of the former Fort Ord, bordered by a portion of the Parker Flats MRA Phase I and the County North MRA (formerly referred to as the Development North MRA) to the north, the Interim Action Ranges MRA to the south, additional CSUMB campus property to the west, and additional former Fort Ord property to the east and southeast (see Figure 1). The Parker Flats MRA Phase II is contained within the jurisdictional boundaries of the City of Seaside and the County of Monterey, however the habitat reserve parcel in the Parker Flats MRA Phase II is located solely in Monterey County. The Parker Flats MRA Phase II consists of approximately 482 acres, approximately 167 of which is designated as habitat reserve (herein referred to as the “habitat reserve parcel”). The habitat reserve parcel boundary is referred to as the Borderland Interface. The habitat reserve parcel is commonly recognized as having two portions: a western portion that is narrow and aligned in an east-west orientation and an eastern portion that is broader and approximately circular in shape.

The habitat reserve area supports plant and animal species that require implementation of mitigation measures identified in the HMP to ensure compliance with the relevant Biological Opinions (BOs) issued by the U.S. Fish and Wildlife Service that avoid or minimize impacts to listed and other sensitive species. The HMP also requires that measures are taken to reduce potential erosion in the borderland development areas so as not to degrade Habitat Reserve lands through soil erosion or invasive weed problems that may originate on the development parcels. Additionally, the Parker Flats MRA Stormwater Management and Erosion Control Plan (LFR 2009) states that the ESCA RP Team Qualified Biologist will assess the need for site vegetation/erosion management (e.g., weed control measures, straw application, straw crimping, etc.).

Following the late-season rains of early 2009, Mr. Martos conducted reconnaissance monitoring on March 26, 2009 to determine if erosion had occurred across the Borderland Interface. Driving around the perimeter of the habitat reserve parcel, he documented instances of erosion from Parker Flats MRA Phase II across the Borderland Interface. Two locations were observed, recorded as PF-BLI-1 and PF-BLI-2, located on the south side of the narrow east-west oriented portion and on the south of the approximately circular eastern portion, respectively (see Figure 1).

FORA ESCA Remediation Program Team



*Westcliffe
Engineers, Inc.*

Both PF-BLI-1 and PF-BLI-2 are entirely restricted to within relatively shallowly-sloped pre-existing trails. Given the physical and topographic conditions found at both areas, it is very likely that these are seasonal recurrences of erosion that began long before any ESCA field clearance activities took place (see Photolog Figures 1 and 2, respectively). Both are minimal washes of sediments down slope along their trails, forming minimal scours on the surface. In neither of these two areas did he observe any visual detrimental effects on the existing plant communities (i.e., there were no recently dead or dying plant parts, no exposed root masses, no washed out plants or broken branches). Based on the small areas affected and the shallow depths of deposited soil, it is unlikely that there will be future detrimental effects on the plants in the depositional areas.

Nonetheless, to prevent future impacts to the habitat reserve parcel as a result of erosion at these locations, installation of BMPs was recommended.

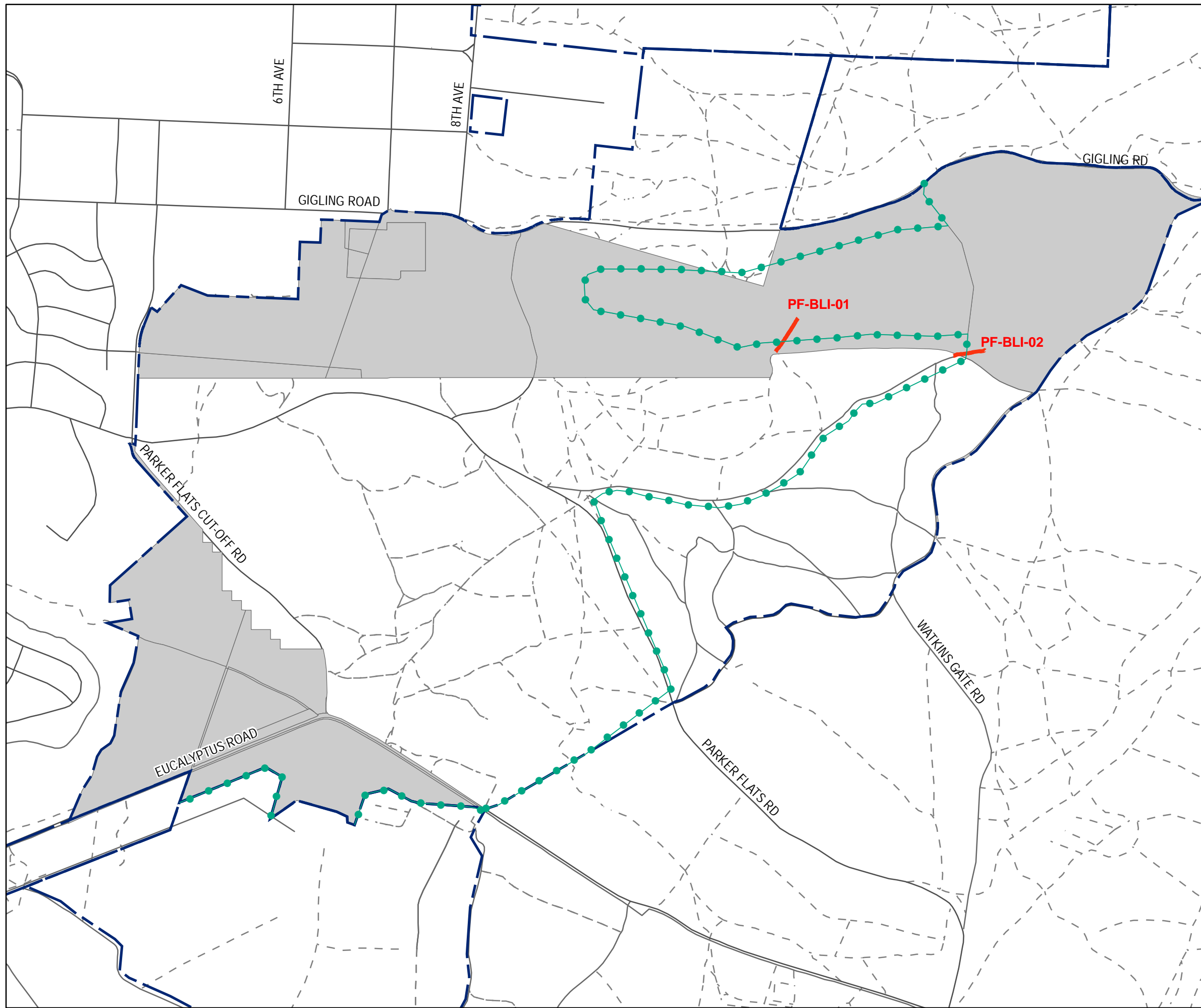
Berms (e.g., “rolling dips”) and channels (relatively permanent BMPs) were installed along construction roadways in the development portion of Parker Flats. In addition, weed-free wattles or a silt fence will be installed where necessary to minimize erosion into the habitat area. Rolling dips and channels may also be installed along access corridors in the habitat area following the completion of anomaly excavation as a more lasting erosion control method. The ESCA Team anticipates installing these BMPs, if needed, in fall 2009.

References







LFR. 2009. Stormwater Management and Erosion Control Plan (For Internal Use Only), Parker Flats Munitions Response Area, Former Fort Ord, Monterey County, California. Prepared for Fort Ord Reuse Authority. March 30.

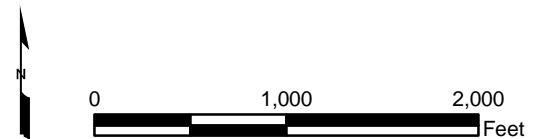
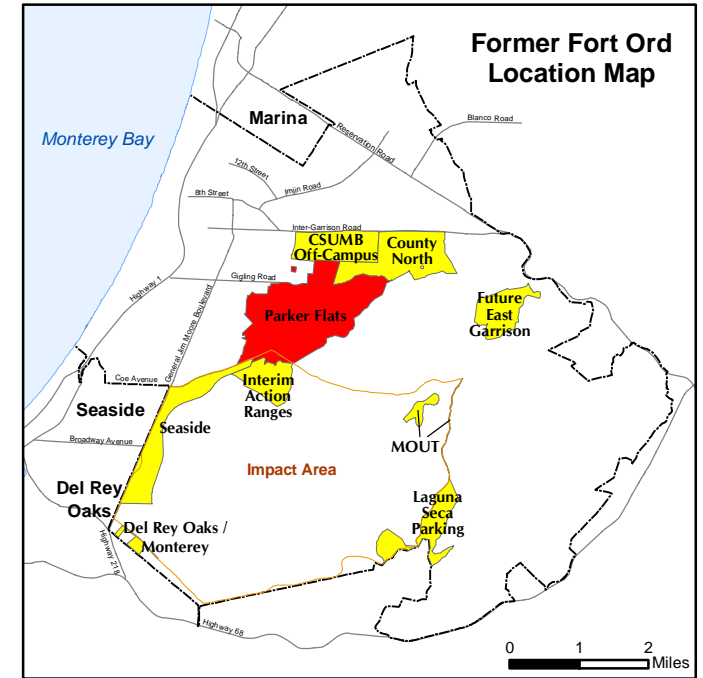
U.S. Army Corps of Engineers. 1997. Installation-wide Multispecies Habitat Management Plan for Former Fort Ord, California. Sacramento, CA. April.

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Legend

-  Potential Erosion Identified in Field
-  MRA Boundary
-  Paved Road
-  Unpaved Road or Trail
-  Borderland Interface
-  Phase II Boundary



3/27/2009
Parker Flats MRA
Potential Erosion Identified in Field

FORA ESCA RP
 Monterey County, California

Figure 1



Top of PF-BLI-1



PF-BLI-1; note very slight depression along trail

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Photolog Figure 1
FORA ESCA RP
Monterey County, California



Top of PF-BLI-2



PF-BLI-2 from bottom

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Photolog Figure 2
FORA ESCA RP
Monterey County, California

APPENDIX B

**Legless Lizard Field Observation Form
and Location Map**

FIELD OBSERVATION FORM
BLACK LEGLESS LIZARD & CALIFORNIA TIGER
SALAMANDER

If these species are discovered, please call Mr. William Collins of the Army Base Realignment and Closure Office at 831-242-7920. Fill out this form and attach a map showing the location of the sighting, and return to:

Mr. William Collins
BRAC – Environmental Office
Building 4463, Gigling Road, Room 209
Monterey, CA 93944-5004

Photograph the specimen if possible.

Location Parker Flats MRA Date/Time 5/21/09, 11:21
(GPS Coordinates, IR Site, MRS #, Range #, etc.)

Grid # NE corner of C364B3 Northing/Easting or
Approx. Coordinates (ft) N. 2128200.0
E. 5748800.0

Type of Activity (check one or write in)

- Surface clearance activity (non-intrusive)
- Vegetation clearance
- Excavation/UXO removal
- Geophysical
- Other _____

Weather: Air Temp. 62° Wind ~7.5 knots Sunny/Cloudy sunny, clear

Depth if known < 6"

Habitat Description (e.g. Maritime chaparral, oak woodland, grassland, vegetation height, presence of surface litter/debris, soil type, plant species where specimen found, etc) :

Encounter occurred in an area of oak woodland, at or near interface w/ chaparral, where vegetation had already been cleared. Soils are sandy, soft, and bare, with some poison oak and black sage nearby.

Description of animal (live/ injured/ dead, color, condition, behavior etc.):

Live legless lizard, observed during excavation, burrowed back into dirt immediately after sighting, uninjured, unhandled.

Length (inches) 5"

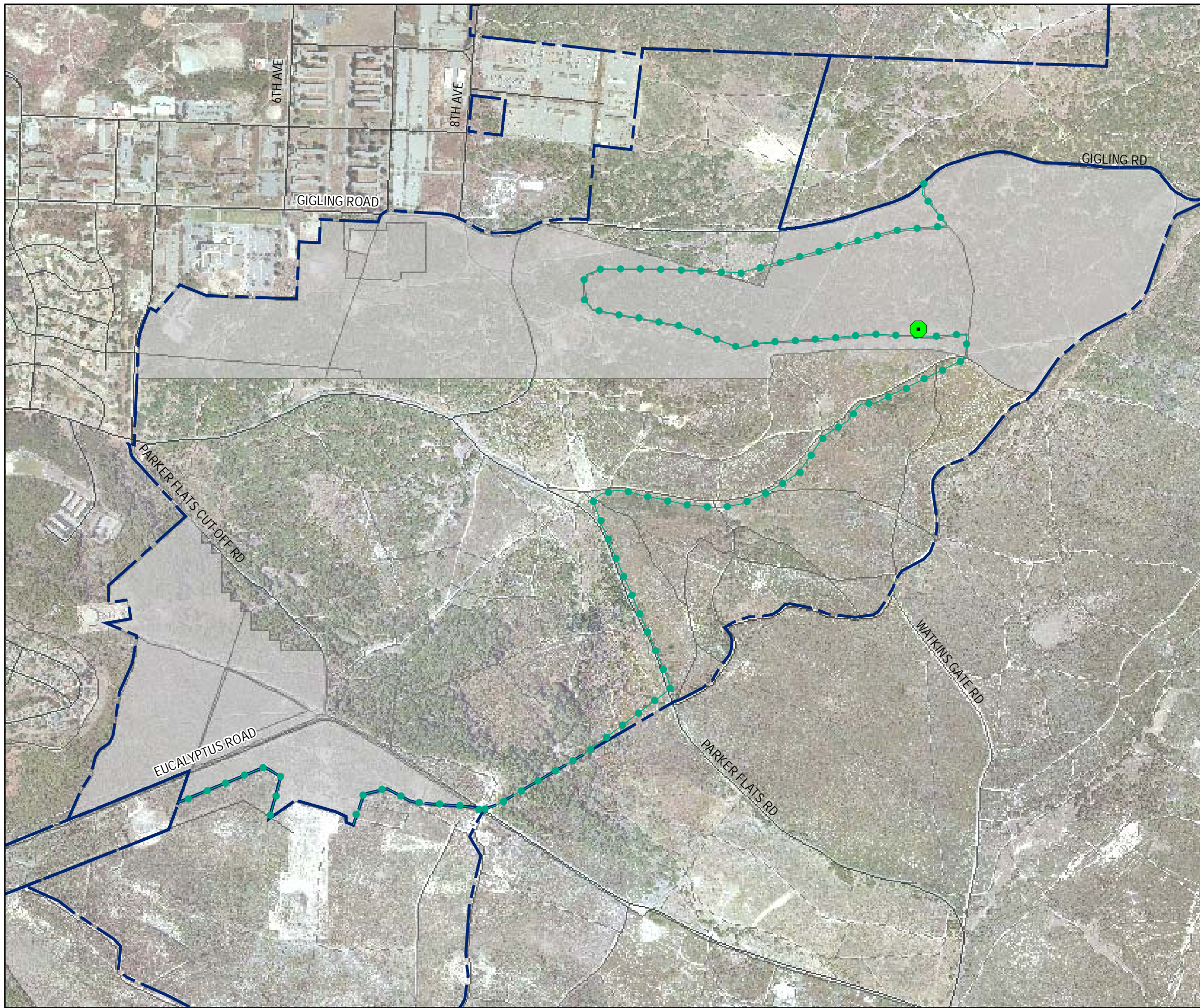
Other Notes _____







Disposition: Found by: Jack Kristensen

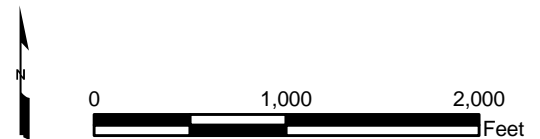
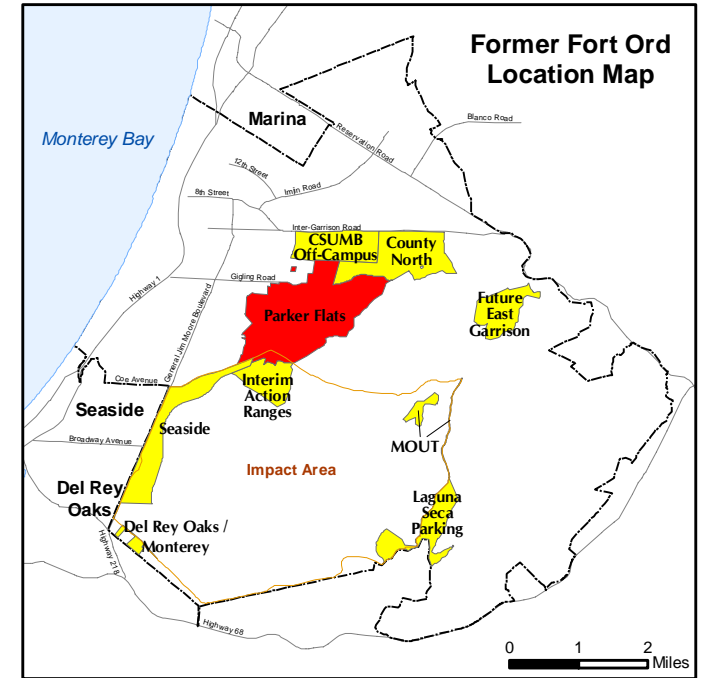
- Observed, released to same location or adjacent habitat
- Observation form completed by: Pablo Martos
- Injured or killed (placed in a Ziploc or plastic bag, and refrigerated)
- Other _____

Attachments: Location map Photograph (specimen and habitat in which found)

T:\Projects\Parker Flats\Biologist Habitat Monitoring\PF_legless lizard locations.mxd - 5/22/2009 @ 11:13:38 AM



- ### Legend
-  Approximate Location of Legless Lizard Encounter
 -  MRA Boundary
 -  Paved Road
 -  Unpaved Road or Trail
 -  Borderland Interface
 -  Phase II Boundary



Approximate Location of Legless Lizard Encounter

FORA ESCA RP
Monterey County, California

Figure 1

APPENDIX C

2009 Vegetation Monitoring Report for the County North MRA

FORA ESCA REMEDIATION PROGRAM

2009 Vegetation Monitoring Report for the County North Munitions Response Area

Former Fort Ord
Monterey County, California

February 5, 2010

Prepared for:

FORT ORD REUSE AUTHORITY

100 12th Street, Building 2880
Marina, California 93933



Prepared Under:

Environmental Services Cooperative Agreement
No. W9128F-07-2-01621

and

FORA Remediation Services Agreement (3/30/07)

Document Control Number: 09595-09-057-002

Prepared by:



WESTCLIFFE ENGINEERS

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ACRONYMS AND ABBREVIATIONS

cm	centimeters
ESCA	Environmental Services Cooperative Agreement
ESCA RP	Environmental Services Cooperative Agreement Remediation Program
FORA	Fort Ord Reuse Authority
ft	feet
GPS	Global Positioning System
HMP	Habitat Management Plan
LFR	LFR Inc.
m	meter
MEC	munitions and explosives of concern
MRA	Munitions Response Area
NWSFO	National Weather Service, Fort Ord
sq ft	square feet
USACE	U.S. Army Corps of Engineers

1.0 INTRODUCTION

This 2009 vegetation monitoring report was prepared by LFR Inc. (LFR) on behalf of the Fort Ord Reuse Authority (FORA) under the Environmental Services Cooperative Agreement (ESCA). This report documents vegetation monitoring conducted in 2009 to satisfy a requirement of the Installation-Wide Multispecies Habitat Management Plan (HMP; USACE 1997).

1.1 Purpose

Vegetation monitoring is required in habitat reserve parcels to document recovery following munitions and explosives of concern (MEC) clearance. This report presents the results of a baseline vegetation survey conducted in 2009 in the habitat reserve parcel located within the County North Munitions Response Area (MRA; previously known as BLM North or Development North MRA). The “baseline” condition is recorded prior to disturbance of the area by ESCA Remediation Program (RP) personnel pursuant to MEC clearance.

After disturbance, vegetation surveys are repeated at intervals prescribed in the applicable monitoring protocol. If the results of the post-MEC-clearance surveys reveal that recovery is proceeding satisfactorily (i.e., temporal changes generally coincide with an anticipated “recovery trajectory” toward the “baseline” condition), no additional mitigation measures (such as active restoration) may be required. If recovery is deemed not to be proceeding satisfactorily, additional monitoring and/or mitigation measures may be proposed.

1.2 Site Description

This survey was conducted at the former Fort Ord, which is located about 8 miles north of the city of Monterey, California. The County North MRA encompasses approximately 506 acres in the north-central portion of the former Fort Ord (Figure 1). The “survey area” is located in the southern portion of the County North MRA and encompasses approximately 134 acres. It is labeled as “Habitat Area” on Figure 2.

Vegetation in the survey area consists primarily of coastal coast live oak woodland and grassland with a small area of maritime chaparral in the northeastern corner of the area (Figure 3; USACE/Jones & Stokes 1992). Vegetation varies from sparsely vegetated areas to heavy brush. Poison oak (*Toxicodendron diversilobum*) has been observed in the area.

The terrain of the County North MRA is primarily rolling hills. The elevation ranges from approximately 210 to approximately 370 feet mean sea level with 2 to 15 percent slopes.

The surface soils are characterized as eolian (sand dune) and terrace (river deposits), which consist of unconsolidated materials of the Aromas and Old Dune Sand formations. The primary soil type present in the County North MRA is Oceano Loamy Sand.

1.3 Prior Vegetation Survey

The vegetation of the former Fort Ord as a whole (including the area covered by this report) was documented in field surveys conducted in 1992 (17 years prior to the 2009 survey), and described in a report titled “Flora and Fauna Baseline Study of Fort Ord, California” (USACE 1992).

The 1992 survey method involved a two-step process. In the first (planning) step, areas of “suitable habitat” for all species to be surveyed were identified by review and marking of “polygons” on aerial photographs. Areas outside of these suitable habitat polygons apparently were not surveyed for any of the species. In the second (fieldwork) step, biologists recorded the abundance of each species in the field for each of the suitable habitat polygons using visual approximation. Three abundance categories in units of individuals/acre were employed: uncommon or low density (“one to hundreds”), occasional or medium density (“hundreds to thousands”), and abundant or high density (“thousands to over tens of thousands”; USACE 1992, p. 6). The report states (p. 6) that these categories do not necessarily indicate that the density is uniform within each area. The areas associated with each assigned category then became abundance polygons that were depicted on the maps by shading. Although not identified in the map legends or explicitly described in the text, a fourth category (i.e., areas not surveyed but where the species presumably was absent) is represented on the maps by unshaded areas.

Two of the three HMP annual species discussed in the present report (sand gilia and coast wallflower) were not reported in 1992 to have been present within the 2009 survey area. However, Monterey spineflower was reported in the 1992 survey in high abundance in portions of the 2009 survey area (Figure 4; the 2009 survey area is labeled on this figure as the “Habitat Area”).

2.0 2009 SURVEY OVERVIEW

The 2009 vegetation monitoring effort in the County North MRA habitat reserve parcel included plans for several focused plant species surveys and a shrub community survey, per the current monitoring protocol. These surveys were intended to document “baseline” vegetation, i.e., vegetation conditions existing prior to disturbance associated with ESCA RP MEC clearance that was planned for the area. However, only the initial spring surveys were conducted. Shortly after these initial surveys were completed, the decision was made not to conduct MEC field investigations within the habitat reserve area. This decision removed the requirement to complete the vegetation monitoring effort in the County North MRA. Consequently, additional required survey efforts that would have been conducted later in the year (focused surveys for seaside bird’s beak and a shrub community survey) were cancelled.

2.1 Scope of Surveys

Focused surveys were conducted for three plant species: coast wallflower (*Erysimum ammophilum*), Monterey spineflower (*Chorizanthe pungens* var. *pungens*), and sand gilia (*Gilia tenuiflora* ssp. *arenaria*).

2.2 Species Accounts

The Protocol for Conducting Vegetation Monitoring in Compliance with the Installation-Wide Multispecies Habitat Management Plan (“2009 protocol”) identifies five species for which focused surveys are to be conducted (Burleson 2009). In the 2009 protocol, such surveys are referred to as “surveys for herbaceous species” (monitoring objective 8); however, the term “herbaceous” is used in other monitoring objectives. In this report, these surveys are referred to as focused species surveys. All five species are relatively rare and some (i.e., sand gilia and to a lesser extent Monterey spineflower) are difficult to detect in the field particularly in years when regional populations are reduced owing to inter-annual variations in controlling factors such as rainfall. Rarity and cryptic appearance pose a risk of “false negative” results (i.e., failure to detect all populations during the field surveys). Therefore, accurate field identification is critical to obtaining robust data for these species. Special care is taken during these surveys to avoid or minimize the risk of false negative results and one element that mitigates this risk is a thorough understanding of available information that assists in field detection. The following information documents the basis for field identification of the focused survey species that was employed in the 2009 survey.

2.2.1 Coast Wallflower

Coast wallflower (*Erysimum ammophilum*) is a biennial or short-lived herb classified in the Brassicaceae or mustard family (Hickman 1993).

2.2.1.1 Flowering Period

The flowering period of this species extends from February to June (Hayes and Taylor 2006c).

2.2.1.2 Habitat

Little detailed information is available in the literature regarding coast wallflower habitat. According to Munz and Keck (1959) and Beauchamp (1986), the species occurs in sandy coastal areas below 50 meters (m). Hickman (1993) indicates that the species is mostly known from coastal dunes. It is stated to occur on stabilized back dunes (Hayes and Taylor 2006c; Calflora 2008). It has also been observed in sandy locales in chaparral openings (UCSC Natural Reserves 2005).

2.2.1.3 Appearance

Coast wallflower is a biennial or short-lived perennial herb with bright yellow flowers that are easily observed in the field (see Appendix B, Photolog page 1). It grows to 4 decimeters tall from a taproot, and its leaves are in a basal rosette, to about 5 centimeters (cm) long and about 10 millimeters wide, oblanceolate, the margin entire or slightly toothed, not at all fleshy, tapering gradually to broad margined petioles as long as the blades. Inflorescences present the flowers dense and crowded (elongating in fruit), petals 2 to 3 cm long, brilliant yellow, style short and stout; siliques fleshy when immature, flattened when dry (Hayes and Taylor 2006c).

2.2.1.4 Summary of Biology and Ecology

Aside from the habitat and descriptive information provided above, very little literature is available on this species.

2.2.2 Monterey Spineflower

Monterey spineflower (*Chorizanthe pungens* var. *pungens*) is an annual plant currently classified in the buckwheat family (Polygonaceae; Appendix B, Photolog pages 2 and 3). Detailed descriptions of the flowering period, habitat, appearance, biology, and ecology of the species were presented in the 2008 Annual Natural Resource Monitoring, Mitigation, and Management Report (“the 2008 report”; ESCA RP Team 2009).

2.2.3 Sand Gilia

Sand gilia (*Gilia tenuiflora* ssp. *arenaria*) is an annual plant currently classified in the phlox family (Polemoniaceae; Appendix B, Photolog page 3). Detailed descriptions of the flowering period, habitat, appearance, biology, and ecology of the species were presented in the 2008 report (ESCA RP Team 2009).

3.0 METHODS

The focused species surveys described in this report were conducted consistent with Objective 8 of the 2009 protocol (Burleson 2009).

3.1 Wet Season Conditions

As discussed in the 2008 report (ESCA RP Team 2009), rainfall in the wet season preceding focused surveys may be a major controlling factor in overall population distribution and density, especially for annual species. Therefore, tabulating nearby rainfall data according to wet season months (i.e., October of prior year through September of current year) may provide useful insights when comparing annual plant populations in different years.

Data for 2009 but not 1992 were available from the site that were used in the 2008 report (Monterey National Weather Service Fort Ord [NWSFO], Coop ID 045802, located about 6.3 miles southwest of the survey area). To obtain comparable data for 1992 and 2009, data were obtained from a site that is farther away (Monterey Coop ID 045795, located about 8 miles southwest of the survey area).

3.2 Focused Species Surveys

For focused species surveys, the 2009 protocol indicates that all areas of “suitable habitat” for each species should be identified within the survey area by conducting “meandering transects.” Suitable habitat descriptions for the three species that were surveyed in 2009 are presented in Section 2.2 under “habitat.” The phrase “suitable habitat” is somewhat of a misnomer because the descriptions are based on visual characteristics that likely do not include all factors that contribute to suitability of a particular location for population establishment. Accordingly, locations identified in the field based on habitat descriptions should more properly be described as “potentially suitable habitat.” During our field observations in 2008 and 2009, many locations were observed that appeared to be potentially suitable habitat for the three species, but no populations of the species were observed in these locations. Absence of populations from potentially suitable habitat may reflect the effects of limited dispersal, intensive grazing pressure, microhabitat/inter-annual differences, and/or the fact that some locations are not suitable habitat despite visual consistency with “suitable habitat” descriptions.

Data to be collected at each population include: soil condition, other physical characteristics, location, population count, phenology, and associated species. Population counts were to be obtained by placing a 2.5-m-radius circular plot within occupied grid cells of the pre-existing 100-by-100-foot (-ft) grid established across former Fort Ord. The 2009 protocol indicates that a sampling scheme is to be employed in determining which of the occupied grid cells to sample.

4.0 RESULTS

The results of surveys for three annual plant species are presented in this section. Subsequent surveys planned for other focused survey species and the shrub community survey were cancelled when it was determined that MEC field clearance work would not be conducted in the MRA. The results therefore represent a partial baseline survey in the MRA; however, no additional monitoring effort is anticipated.

4.1 Wet Season Conditions

During the years 1992 and 1996-2009, wet season rainfall at Monterey ranged from 14.1 inches (2007) to 47 inches (1998). Monterey consistently recorded higher wet season rainfall than Monterey NWSFO for the years 1992 and 1996-2008 (ranging from 5.6-33.6% higher, with a mean of 21.4%). Wet season rainfall at Monterey in 1992 was 17.8 inches and for 2009 was 16.9 inches; however, data were lacking for June through September 2009. During

the years 1992 and 1996-2008, the mean rainfall recorded in June through September was 0.4 inch. If the 2009 wet season data are adjusted by this mean value, the estimated 2009 wet season value is 17.3 inches. All three data sets (1992, 2009 from the farther away site, and 2009 from the closer site) are presented on Figure 5. The monthly distribution of rainfall in the 1992 and 2009 wet seasons as shown on the figure is remarkably similar: rainfall amounts exceeding 1 inch occurred in five of the first six months of the wet season in both years. These data indicate that wet season conditions in 1992 were generally similar to those in 2009.

4.2 Focused Species Surveys

Surveys for coast wallflower, Monterey spineflower, and sand gilia were conducted within the County North MRA Habitat Reserve parcel from May 11 through May 13, 2009 by LFR staff members Pablo Martos, Susan Bernstein, and Phil Lebednik.

The rarity and cryptic appearance of plants the size of sand gilia and to some extent Monterey spineflower make detection by field personnel difficult, increasing the potential for false negative data. Detection of sand gilia in particular is dependent on the survey being conducted during the peak flowering period for that year, as the presence of its small flowers are critical to detecting the diminutive and inconspicuous plants in the field. Therefore, each day of the survey, field observations were made of known populations of sand gilia that occurred in the Interim Action Ranges MRA (approximately 2 miles southwest of the survey area, see “sand gilia reference locations” on Figure 1). These observations confirmed that sand gilia (and incidentally Monterey spineflower) were in flower in the former Fort Ord area during the survey period. As an additional confirmation, a second reference area, approximately 1 mile northeast of the survey area (see “sand gilia reference locations” on Figure 1), was observed two days after the survey (May 15). In this location at this time, the sand gilia population was still in flower; however, flowers of a few individuals exhibited initial stages of senescence. This indicated that the survey had been conducted within the peak flowering period for the area and that the peak flowering period was approaching its end by May 15.

Sand gilia and Monterey spineflower are known to co-occur, but sand gilia is more restricted in its distribution and differs in microhabitat requirements (USACE 1992). Although active sand dunes were absent, sandy soils were predominant throughout the survey area. Potentially suitable habitat (i.e., areas to be closely examined for the species within the survey area) was for the purposes of these surveys identified according to the habitat descriptions provided in Section 2.2, personal knowledge of field personnel, and experience with these species from previous fieldwork conducted in the former Fort Ord (ESCA RP Team 2009).

As an initial step in planning the surveys, areas that appeared to be potentially or marginally (see below) suitable habitat on high-resolution aerial images (i.e., open areas with no or few shrubs and trees) were designated for field inspection. In the field, all potentially suitable areas were inspected (i.e., via meandering transects). These areas included lightly or unvegetated sandy areas, trails, roads, and pathways. Locations where gravel was present on trails and roads were not suitable habitat for the three species.

A representative sample of marginally suitable habitat (i.e., areas with openings within closed-canopy oak woodland and areas of dense, tall grassland) was also examined during the survey. Vegetation in the marginally suitable habitat generally consisted of grasses or low herbaceous vegetation. Where vegetation was sparse or absent, surface soils were frequently weakly cemented into surface crusts or solid masses. Areas with cemented surface soils were not suitable habitat for Monterey spineflower or sand gilia (it is not known whether or not such areas are potentially suitable habitat for coast wallflower). None of the species were detected in these marginally suitable habitat locations.

Where populations were detected, the population perimeters were recorded into the Global Positioning System (GPS) unit. A “population” was defined as a collection of individuals that is closer than 5 m to the nearest neighbor. The locations of 100-by-100-ft grid cells occupied by the population were determined. Grid cells where there was very minor encroachment of a few individuals along an edge of and into a cell were not recorded as being occupied by the species. Every grid cell that was occupied by the species was sampled by a 5-m-diameter sample plot. The center point of the plot was placed in a location that was considered to be representative of the population that was observed within the grid cell. All plants within the plot were counted or estimated with a tally counter and the count or estimate was recorded both in the GPS unit and in field notes. Where the number of plants in a sample plot was too dense to count within a reasonable time, the plot was subsampled by counting within 25% or 50% of the plot and an estimate of the total number of plants in the plot was computed from the subsample.

4.2.1 Coast Wallflower

Coast wallflower suitable habitat is broadly indicated as sandy coastal areas. The specific microhabitat characteristics (if any) are not known for this species. However, flowering plants are quite conspicuous in the field and easily detected from a distance.

Coast Wallflower was not observed in the survey area, though potentially suitable habitat was observed.

4.2.2 Monterey Spineflower

Monterey spineflower is less conspicuous than coast wallflower but detectable when open, sandy areas (i.e., areas lacking non-herbaceous overstory cover) are closely examined. A representative sample of marginally suitable habitat areas (i.e., sandy areas with low vegetation cover, but not meeting all characteristics of potentially suitable habitat for the species) was also examined.

Populations of Monterey spineflower were observed along roadsides or in open, low density grasslands (i.e., in areas consistent with its potentially suitable habitat description). The species was not detected in marginally suitable habitat locations. A total of twelve populations were observed in three locations (A, B, and C). The positions and spatial extent of these locations are shown on Figure 3. “Location” in this report is used to indicate a more

or less spatially contiguous area that also exhibited relatively uniform microhabitat characteristics. A total of N=15 sample plots were obtained within the twelve populations.

Location A is a large grassland area (28,305 square [sq] ft) in the northeastern portion of the parcel, adjacent to a wide trail along the northern border (see Appendix B, Photolog pages 4 and 5). Species co-occurring in this location included *Nasella pulchra* and other grasses. Four relatively dense populations were observed in this location. The populations occupied seven grid cells within each of which a sample plot was located. Total counts of plants were made in four of the plots (see Table 1). The three remaining plots encompassed dense populations, which were estimated by counting plants within a 25% or 50% spatial subsample of the plot. The total plot estimate was computed from the subsample value. The number of plants per plot ranged from 9 to 1,302. The average number of plants per sample in this location was 623.1.

Location B is a small area (589 sq ft) of sandy, open trail margin at the far western portion of the parcel, just east of a large, open, sandy grassland in the adjacent development parcel (see Appendix B, Photolog page 5). Species co-occurring in this location included *Castilleja attenuate*, *Erodium botrys*, *Trifolium* sp., *Cardionema ramosissimum*, and others. Two populations were observed in this location. One sample plot was placed in location B. The number of plants in this plot was 37.

Location C is an open, sandy trail margin (8,128 sq ft) along the western end of the trail that forms the northern border of the parcel, but the populations there were restricted to the trail margins and did not occur within the adjacent grasslands as they did in location A (see Appendix B, Photolog page 6). Species co-occurring in this location included *Nasella pulchra*, *Lessingia* sp., *Phacelia brachyloba*, *Erodium botrys*, and *Hypochaeris* sp. Six populations were observed in this location. Seven sample plots were placed in location C (note that more than one population occurred in some grid cells and therefore not all populations were sampled). Total counts of plants in these plots ranged from 16 to 285. The average number of plants per sample in this location was 111.4.

When data from all samples are combined, the plot counts (N=15) ranged from 9 to 1,302 with a mean of 325.3 individuals, a median of 88, and a standard deviation of 436.7. The skewness of these data indicates that caution should be used when interpreting these statistics, as the data were not transformed prior to computation.

4.2.3 Sand Gilia

Sand gilia is much more inconspicuous than the two previous species and surveys for this species require very careful inspection of potentially suitable habitat (i.e., areas with loose sandy soil). A representative sample of marginally suitable habitat areas (i.e., sandy areas with low vegetation cover, but not meeting all characteristics of potentially suitable habitat for the species) was also examined.

Sand gilia was not observed in the survey area, either in potentially suitable habitat (which was observed to be present) or in marginally suitable habitat locations.

5.0 DISCUSSION AND FINDINGS

The results presented in this report document the 2009 “baseline” focused surveys for three plant species in the habitat reserve parcel of the County North MRA in advance of planned MEC clearance activities. Additional planned surveys of the 2009 monitoring effort in the County North MRA were cancelled when it was determined that MEC clearance activities would not be conducted in the parcel.

5.1 Influence of Wet Season on Populations

Wet season rainfall data indicate that the 1992 and 2009 wet seasons experienced approximately the same total rainfall. The monthly distribution of rainfall in the two years also exhibited nearly identical patterns: rainfall amounts exceeding 1 inch occurred in five of the first six months of the wet season in both years. If wet season rainfall is the primary factor influencing inter-annual variations in annual plant species populations in the survey area, these data indicate that size and spatial extent of the 1992 and 2009 populations should be very similar.

5.2 Focused Species Surveys

Surveys were conducted for three early-season plant species (coast wallflower, Monterey spineflower, and sand gilia) in the habitat parcel of the County North MRA. Because the 2009 monitoring effort in County North MRA was cancelled in May, the remaining planned surveys were not conducted.

5.2.1 Coast Wallflower

Neither the 1992 nor the 2009 survey detected coast wallflower populations within the 2009 survey area.

5.2.2 Monterey Spineflower

Twelve populations of Monterey spineflower in three locations occupying a small portion of the survey area were detected. The spatial distribution of Monterey spineflower in 2009 was entirely within in the area where the species was reported in 1992 (Figures 3 and 4). In the 1992 survey, the species was reported as being present in high density, whereas in 2009 it was observed to be infrequent overall and present in only three locations. The 1992 survey indicated that this species occurred in high density or “thousands” per acre in a portion of the habitat parcel of the County North MRA. The mean density value obtained in the 2009 survey was 325 plants per plot, which translates to plants per acre as follows:

$$[A] \text{ [2009 plant density/acre estimate]} = [\text{mean plant density from 2009 survey}] \times [\text{sq ft/acre}] / [\text{sq ft/sample plot}]$$

$$[A'] \text{ [2009 plant density/acre estimate]} = [325] \times [43,560/10,000] = 1,416$$

The 2009 “area to be sampled” (i.e., twelve populations within locations A, B, and C) was a small portion (less than 10%) of the 1992 high density polygon that was mapped within the 2009 survey area. If the entire 1992 polygon within the survey area was used to compute a 2009 density estimate, a much lower value would have been generated - a value within the low density category. If the 1992 results were accurate and setting aside the skewness of the 2009 data, the results indicate that the density of Monterey spineflower in the habitat parcel of the County North MRA was substantially lower in 2009 than in 1992. Such a result could be explained if the area had been burned prior to the 1992 survey. U.S. Army Corps of Engineers (USACE 1992) stated that numerous fires had occurred at Fort Ord before the 1992 survey (pp. 65-69), but the locations of these burns were not identified. Therefore, this possible explanation cannot be evaluated. An equally plausible and possibly more probable explanation for the apparent difference between the two estimates (given that the 1992 survey method employed visual approximation of large areas whereas the 2009 survey method employed detailed mapping and counting) is that differences in the methods employed in the two surveys generated estimates for this portion of former Fort Ord that are inherently incomparable.

5.2.3 Sand Gilia

Neither the 1992 nor the 2009 survey detected sand gilia populations within 2009 survey area.

5.3 Findings

Focused surveys of three plant species (coast wallflower, Monterey spineflower, and sand gilia) were conducted in 2009 as the initial (baseline) monitoring effort in anticipation of ESCA RP MEC clearance activity in the habitat parcel of the County North MRA. Because the MEC clearance work scheduled for the MRA was cancelled, additional planned surveys were not conducted.

Disturbance of the survey area was observed to be minor in 2009 and there was no evidence of recent burn events.

Coast wallflower and sand gilia were not observed in the survey area in 1992 or 2009.

Twelve populations of Monterey spineflower were detected in three locations within the survey area. The locations where Monterey spineflower was recorded in 2009 were within the area where the species was reported in 1992. The density value computed from the 2009 data appears to be substantially lower than the value that was approximated in 1992, but this difference could be explained by the fact that different methods were employed in the two surveys. Wet season conditions in 1992 were nearly identical to those in 2009, supporting the likelihood that populations were comparable in 1992 and 2009.

The presence/absence and spatial distribution results from 2009 are consistent with those of the 1992 survey and may indicate that major qualitative changes in vegetation have not occurred in the area over the 17-year intervening period.

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Table 1
 Sample Plot Data for Monterey Spineflower Populations
 2009 Vegetation Monitoring Report - County North MRA
 FORA ESCA RP

Location	Plot Number	Number of Individuals	Percent Suitable Habitat in Grid Cell	Notes	Mean Value Per Site	Overall Mean Value
A	1	9	50			
A	2	79	90			
A	3	331	60			
A	4	593	40			
A	5	1302	80	This value arrived at by counting a representative 50% subsample of the cell		
A	6	856	85	This value arrived at by counting a representative 25% subsample of the cell		
A	7	1192	20	This value arrived at by counting a representative 25% subsample of the cell	623.14286	
B	8	37	15		37	
C	9	52	10			
C	10	285	10			
C	11	88	10			
C	12	16	10			
C	13	193	10			
C	14	79	10			
C	15	67	10		111.42857	
						345.26667

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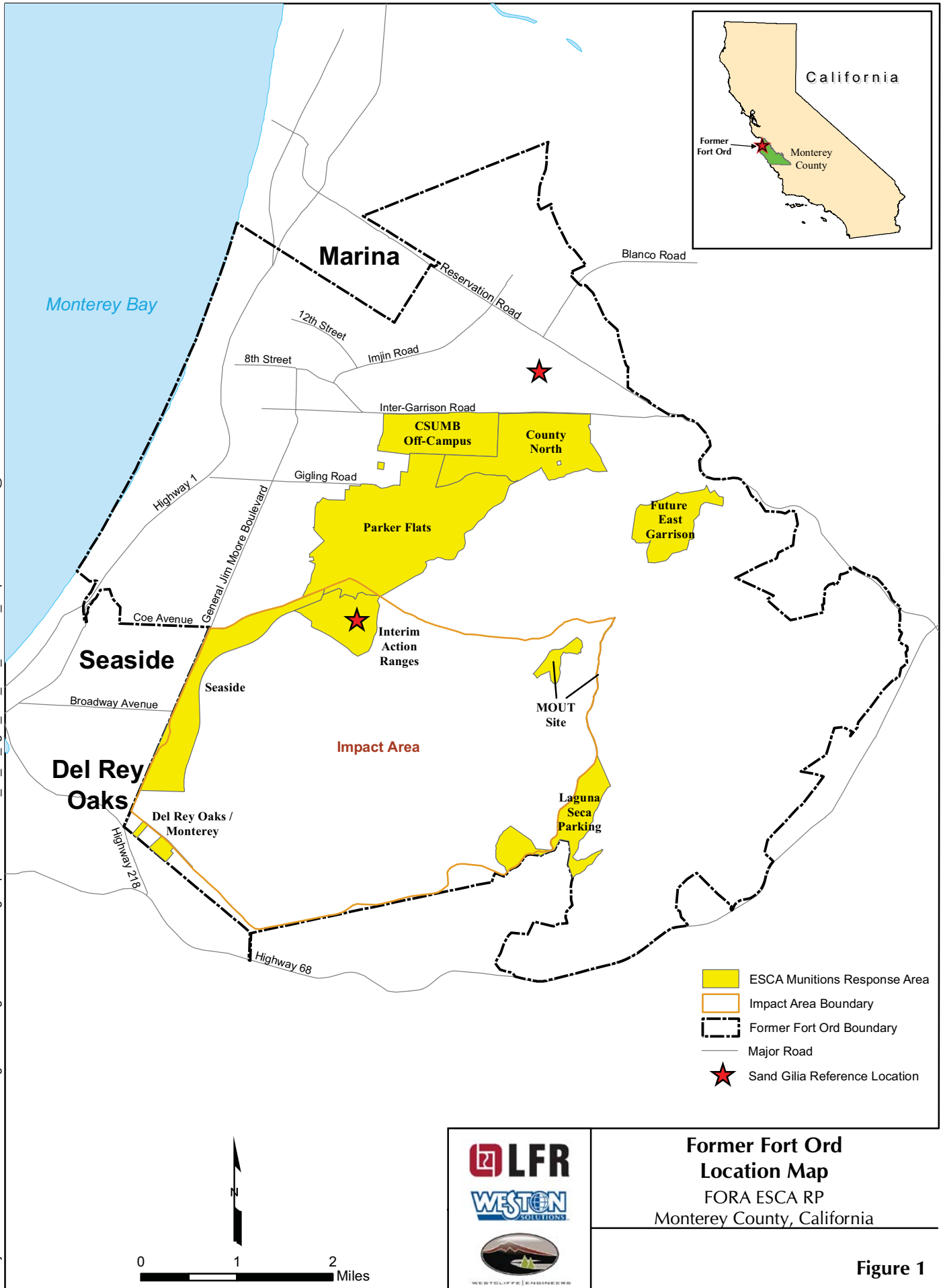
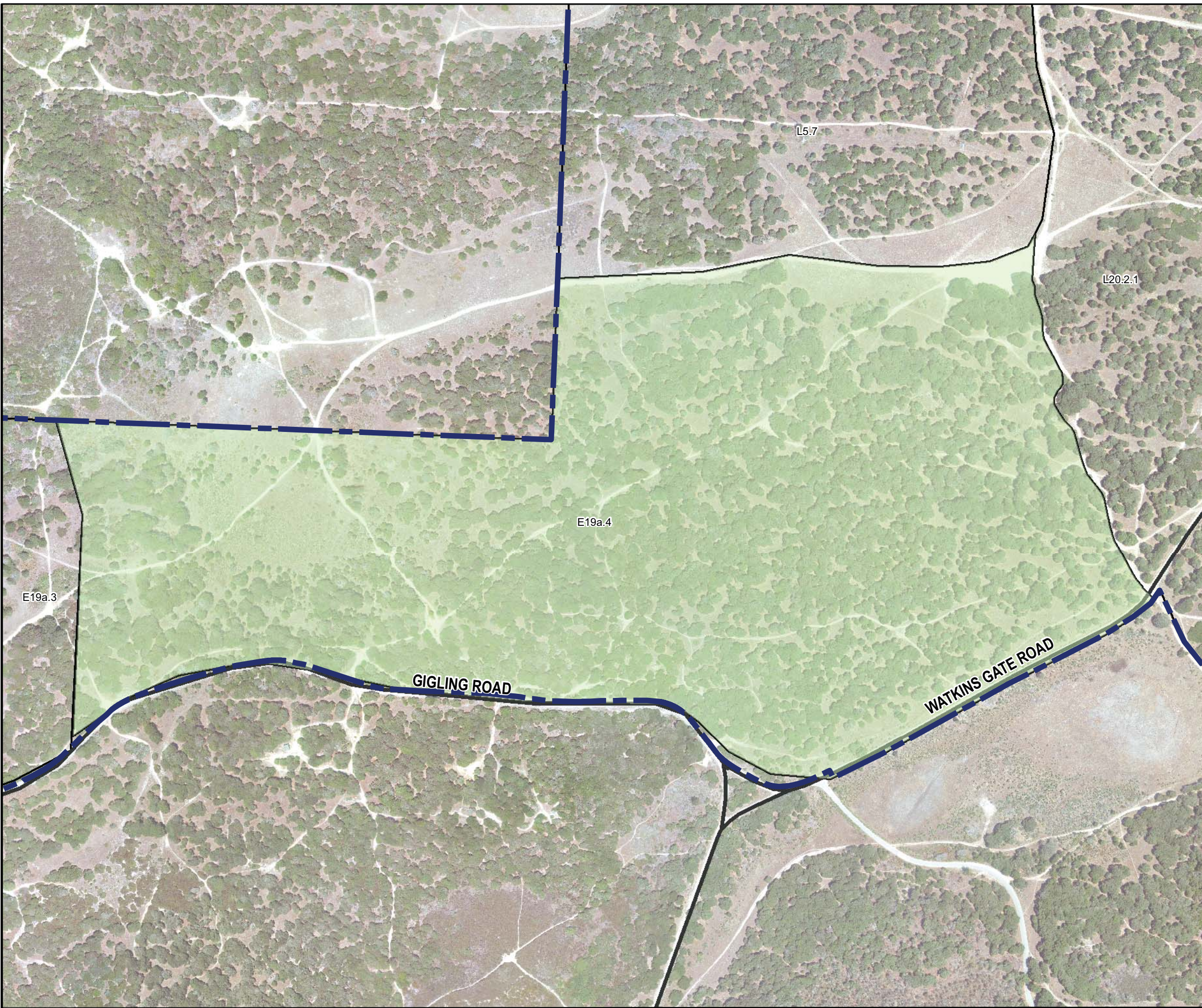






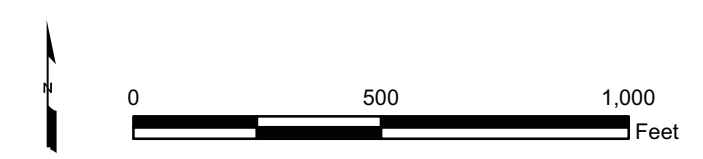
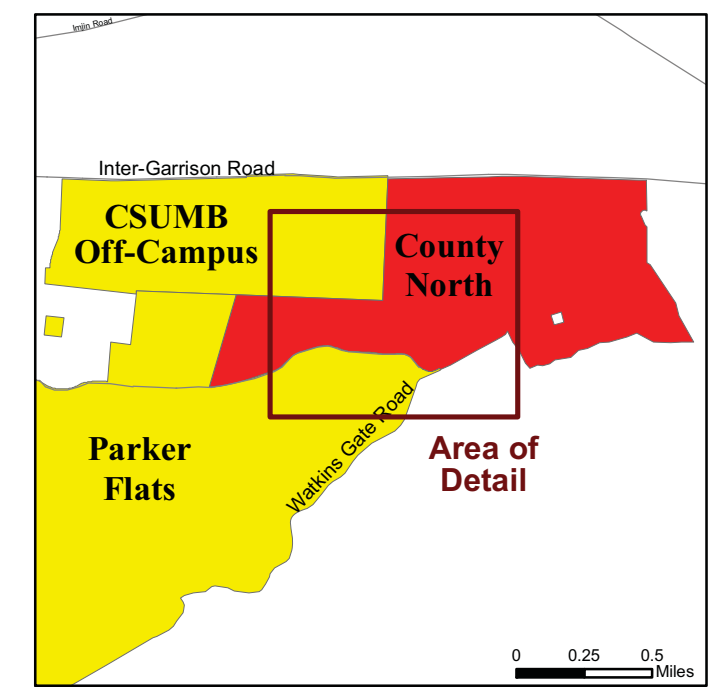
Figure 1

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Legend

- E19a.4**  Parcel Boundary and ID
-  County North MRA
-  Road
-  Habitat Area

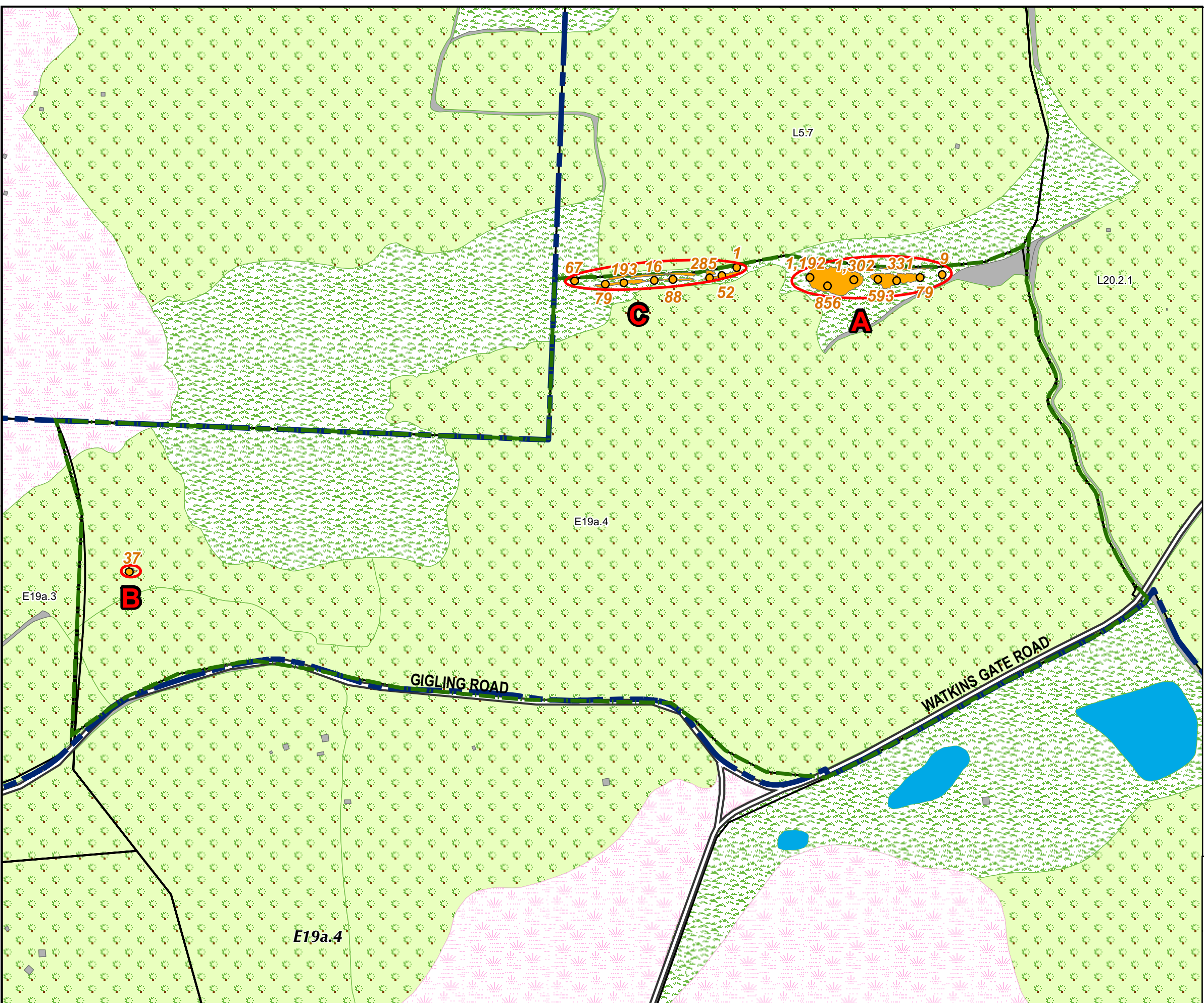


**County North MRA
Habitat Area, Parcels, and
2007 Orthophotos**

FORA ESCA RP
Monterey County, California

Figure 2

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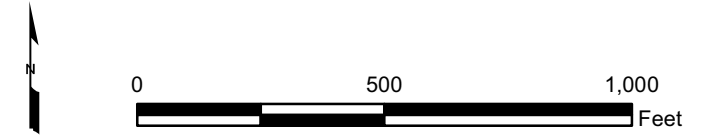
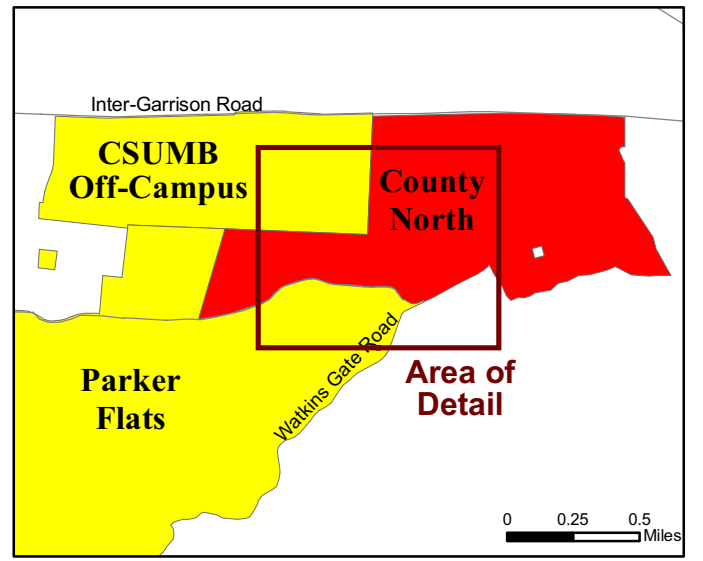
Legend

- Spineflower Survey Location and Count
- Spineflower Survey Location Polygon
- Parcel Boundary and ID
- Habitat Area
- County North MRA
- Road
- Grassland
- Maritime Chaparral
- Coastal Coast Live Oak Woodland
- Aquatic Feature
- Developed / Disturbed

Source: Flora and Fauna Baseline Study of Fort Ord, California, Jones and Stokes Association Inc., December 1992.



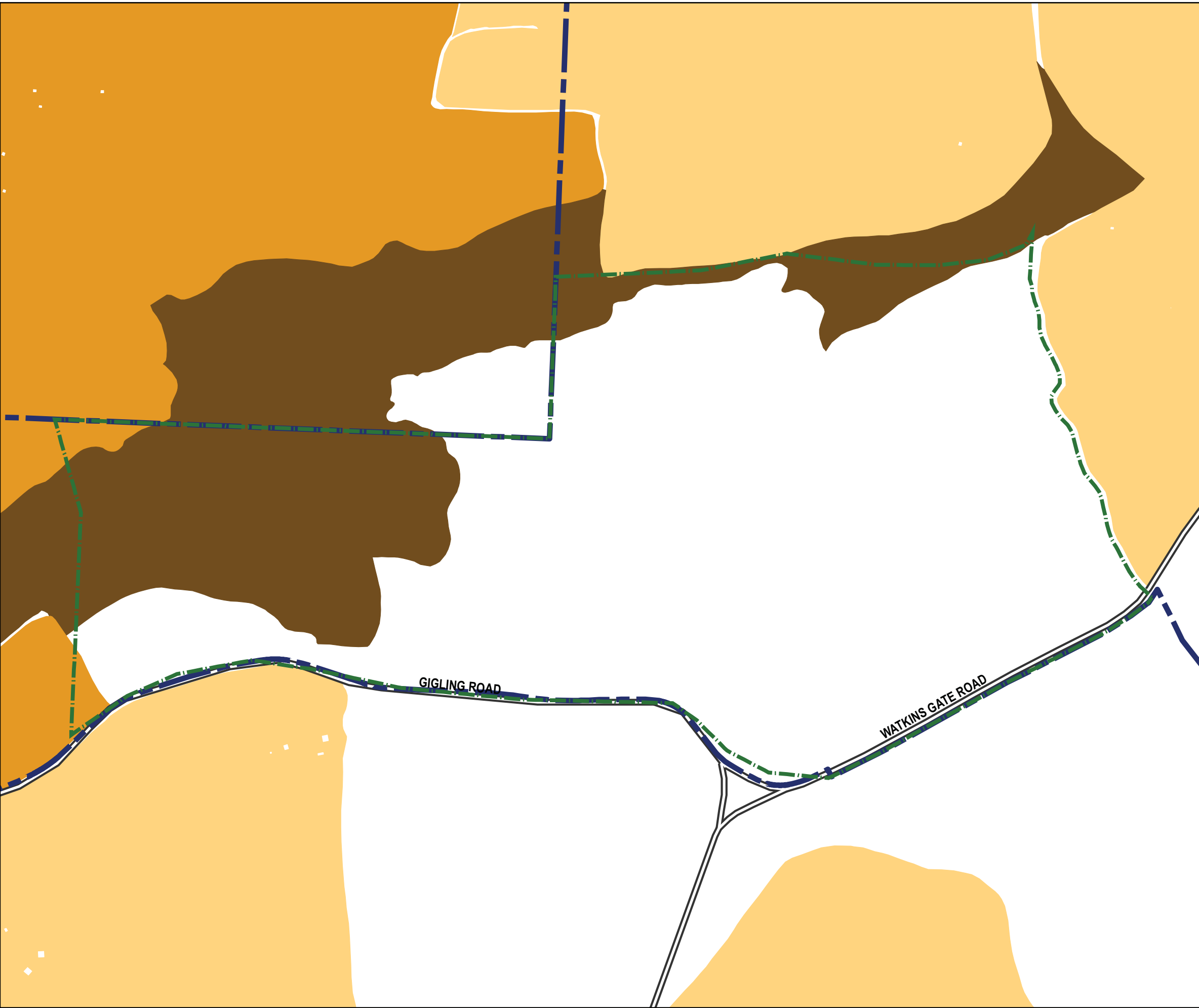
Monterey Spineflower



**County North MRA
Habitat Area
2009 Survey Results:
Monterey Spineflower
And Vegetation Transect Locations**
FORA ESCA RP
Monterey County, California

Figure 3




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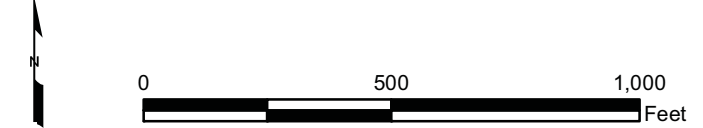
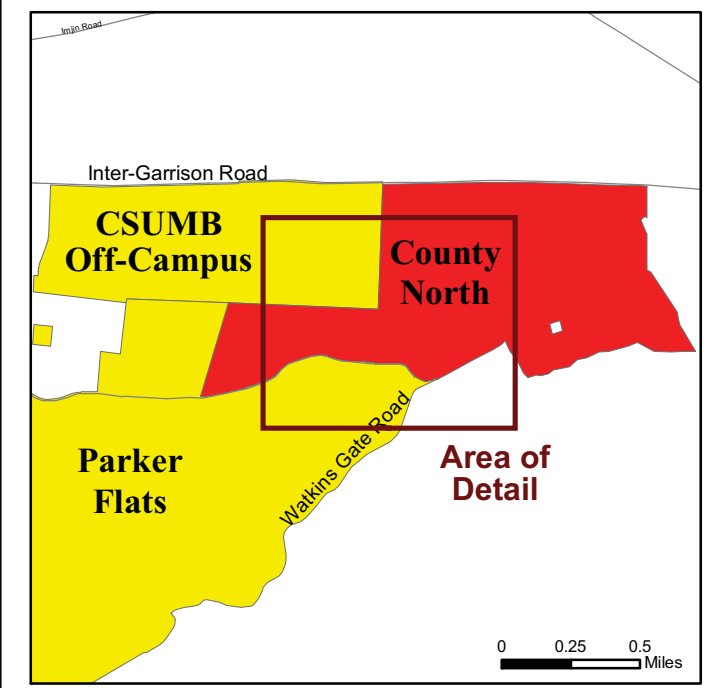
Legend

-  Habitat Area
-  North County MRA
-  Road

Monterey Spineflower Density Categories

-  Low
-  Medium
-  High

Source: Flora and Fauna Baseline Study of Fort Ord, California, Jones and Stokes Association Inc., December 1992.

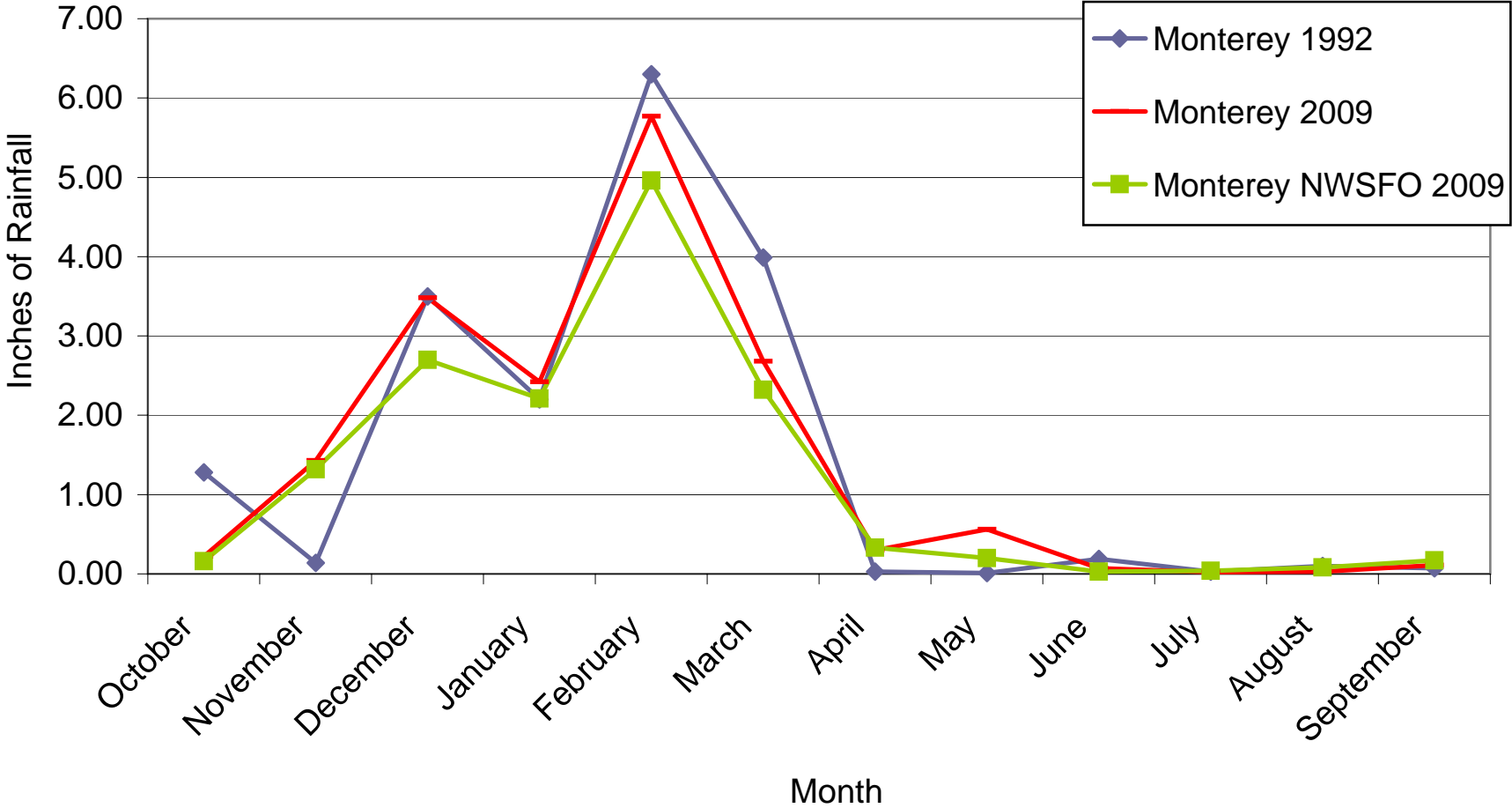


**North County MRA Habitat Area
Baseline Study
Known 1992 Distribution
of Monterey Spineflower**

FORA ESCA RP
Monterey County, California

Figure 4

Figure 5. Monthly Rainfall Recorded in 1992 and 2009



APPENDIX A

Field Data Sample Forms

FORT ORD DENSITY SURVEY FORM

MRS #:			Date:	
Grid #:			Survey Team:	
Location of Grid (distance, direction from known location):				
Description of Grid Location:				
Comments:				
Grid Coordinates	Plot Number	HMP Annual Species	Number of Individuals	Percent Suitable Habitat within 100x100ft Grid

APPENDIX B

Photolog



Coast Wallflower - habit



Coast Wallflower - close-up

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Photolog Page 1

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Monterey County, California

Appendix B



Monterey Spineflower - habit



Monterey Spineflower - close-up

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WESTLIFEENGINEERS

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Monterey County, California

Appendix B



Sand Gilia



Monterey Spineflower and Sand Gilia co-occurrence



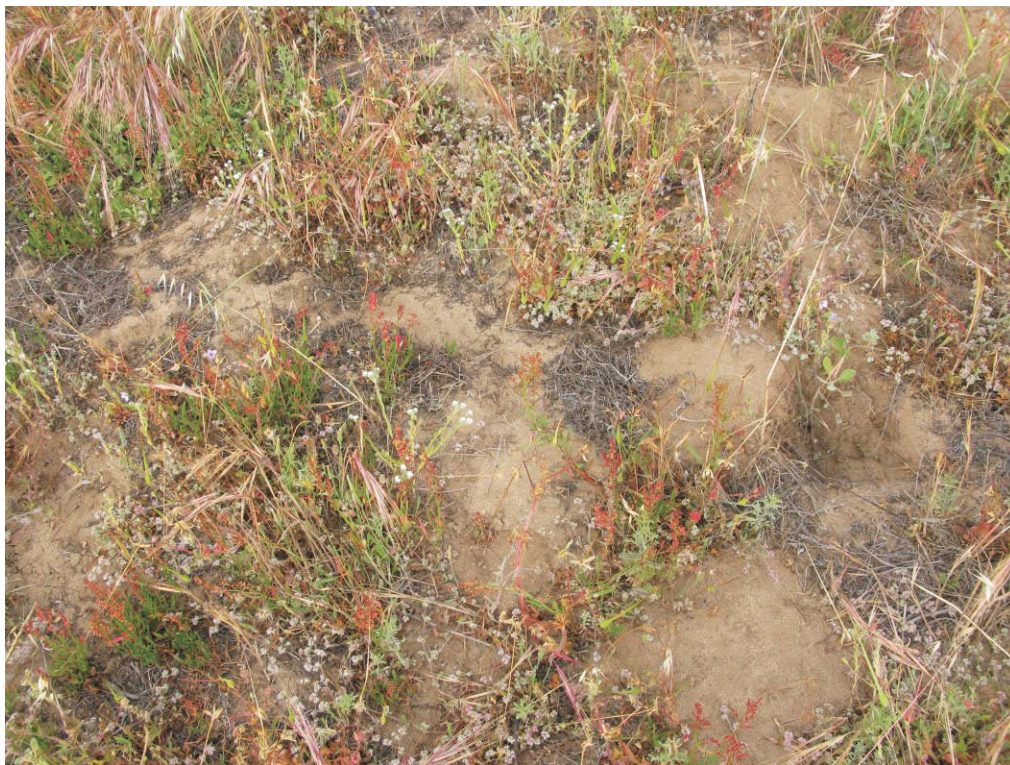
Photolog Page 3

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Appendix B



Field Method



Location A, close-up

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Photolog Page 4
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Monterey County, California

Appendix B



Location A



Location B

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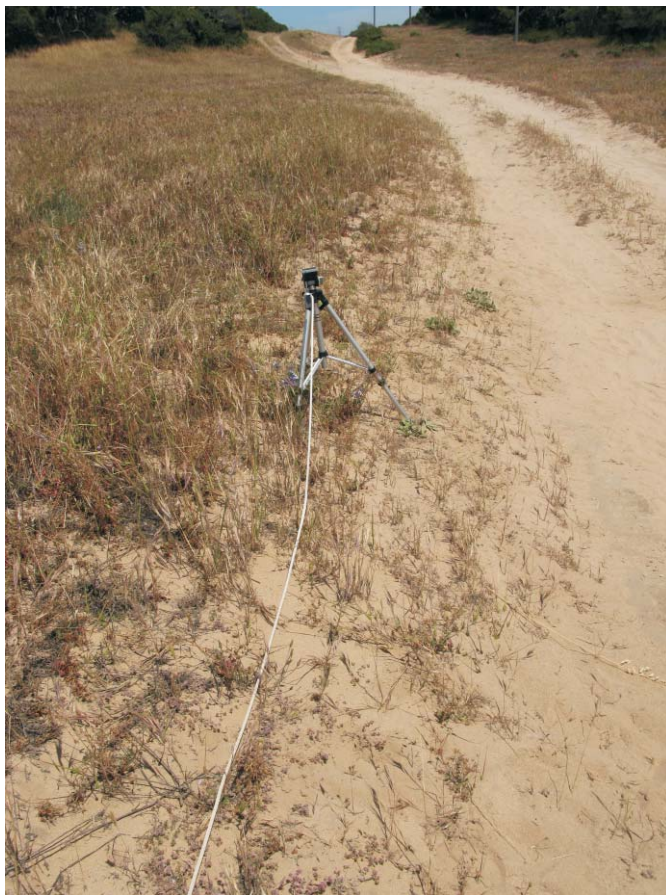


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Appendix B



Location C



Location C

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Photolog Page 6
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Monterey County, California

Appendix B