KEMRON
ENVIRONMENTAL SERVICES

TRANSMITTAL MEMORANDUM

To:	Distribution	**Date:**	09/28/16
Subject:	2015 Annual Biological Monitoring Report, Former Fort Ord, California		
DCN:	SH4914-112		

Enclosed for your information is the revised *2015 Annual Biological Monitoring Report, Former Fort Ord, California*, dated September 2016.

Comments received on Section 1.1 of the previous version of this report have been addressed. Changes have been made to the following pages:

Cover
Spine
Title Page
Signature Page
Page 1-2
Page 1-3

Hardcopy submittals consist of these change pages. CD submittals consist of the final report in its entirety.

KEMRON Environmental Services | 4522 Joe Lloyd Way, Monterey, CA 93944 | PO Box 2283, Marina, CA 93933
Tel: 831-824-2301 | Fax: 831-824-2338 | www.KEMRON.com

2015 ANNUAL BIOLOGICAL MONITORING REPORT
FORMER FORT ORD, CALIFORNIA

WORLDWIDE ENVIRONMENTAL REMEDIATION SERVICES
CONTRACT NO. W912DY-10-D-0024
AND
CONTRACT NO. W912DY-10-D-0027

Submitted to:

U.S. Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, California 95814

Prepared by:

Denise Duffy & Associates, Inc.
947 Cass Street, Suite 5
Monterey, California 93940

On behalf of:

KEMRON Environmental Services, Inc.
1359A Ellsworth Industrial Blvd, Atlanta, GA 30318

September 2016

2015 ANNUAL BIOLOGICAL MONITORING REPORT
FORMER FORT ORD, CALIFORNIA

WORLDWIDE ENVIRONMENTAL REMEDIATION SERVICES
CONTRACT NO. W912DY-10-D-0024
AND
CONTRACT NO. W912DY-10-D-0027

September 2016

Approved by: Jami Davis Digitally signed by Jami Davis DN: cn=Jami Davis, o=Denise Duffy & Associates, Inc, ou, email=jdavis@ddaplanning.com, c=US Date: 2016.09.27 11:05:18 -07'00' Date: 09/27/16

Jami Davis
Project Biologist, DD&A

Approved by: Charles C Clyde Digitally signed by cclyde@gilbaneco.com DN: cn=cclyde@gilbaneco.com Date: 2016.09.27 14:09:59 -07'00' Date: 09/27/16

Charles Clyde
Contractor Quality Control Systems Manager, Gilbane

Approved by: Steve Crane Digitally signed by Steve Crane DN: cn=Steve Crane, o=KEMRON, ou, email=scrane@kemron.com, c=US Date: 2016.09.27 14:41:21 -07'00' Date: 09/27/16

Stephen Crane, PE, F.SAME
Senior Project Manager, KEMRON

Approved by: Erin K. Caruso Digitally signed by Erin K. Caruso DN: C=US, E=ecaruso@gilbaneco.com, O=Gilbane, OU=Federal Services, CN=Erin K. Caruso Reason: I am approving this document Date: 2016.09.27 15:28:27-07'00' Date: 09/27/16

Erin Caruso, PE, PMP
Deputy Project Manager, Gilbane

Approved by: Maggie Sheatzley Date: 09/27/16

Margaret Sheatzley
Technical Editor, KEMRON

Table of Contents

List of Figures

List of Acronyms and Abbreviations

Army	U.S. Department of the Army
BLL	Black Legless Lizard
BLM	Bureau of Land Management
BMP	Best Management Practice
BRAC	Base Realignment and Closure
CIPC	California Invasive Plant Council
CRLF	California Red-Legged Frog
CTS	California Tiger Salamander
DGM	Digital Geophysical Mapping
DD&A	Denise Duffy & Associates, Inc.
ESA	Endangered Species Act
HA	Historical Area
HMP	Habitat Management Plan
KEMRON	KEMRON Environmental Services, Inc.
MEC	Munitions and Explosives of Concern
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
UXO	Unexploded Ordnance
WERS	Worldwide Environmental Remediation Services Contract

1.0 Introduction

This report was prepared by Denise Duffy & Associates (DD&A) as a subcontractor to KEMRON Environmental Services, Inc. (KEMRON) under the WERS No. W912DY-10-D-0027 and includes biological monitoring activities conducted for Gilbane under the Worldwide Environmental Remediation Services (WERS) No. W912DY-10-D-0024. This report contains results of the 2015 biological monitoring surveys which are required as part of the *Installation-Wide Multispecies Habitat Management Plan* (HMP) *for Former Fort Ord, California* (U.S. Army Corps of Engineers [USACE], 1997). The U.S. Department of the Army's (Army's) decision to close and dispose of the Fort Ord military base was considered a major federal action that could affect listed species under the Endangered Species Act (ESA). The U.S. Fish and Wildlife Service (USFWS) issued a Biological Opinion (USFWS, 1999) on the disposal and reuse of former Fort Ord requiring that the HMP be developed and implemented to reduce the incidental take of listed species and loss of habitat that supports these species. The HMP was prepared to assess impacts on vegetation and wildlife resources and provide mitigation for their loss associated with the disposal and reuse of former Fort Ord (USACE, 1997).

1.1 Background

The HMP establishes guidelines for the conservation and management of species and habitats on former Fort Ord lands by identifying lands that are available for development, lands that have some restrictions with development, and habitat reserve areas. The intent of the plan is to establish large, contiguous habitat conservation areas and corridors to compensate for future development in other areas of the former base. The HMP identifies what type of activities can occur on each parcel at former Fort Ord. The HMP sets the standards to assure the long-term viability of former Fort Ord's biological resources in the context of base reuse, so that no further mitigation should be necessary for impacts to species and habitats considered in the HMP. This plan has been approved by the USFWS; the HMP, deed restrictions, and Memoranda of Agreement between the Army and various land recipients provide the legal mechanism to assure HMP implementation. It is a legally binding document, and all recipients of former Fort Ord lands are required to abide by its management requirements and procedures.

In addition to the HMP, multiple Biological Opinions have been issued by the USFWS over the years as a result of consultation with the Army. The Biological Opinions contain additional conservation measures and recommendations relating to environmental cleanup actions at former Fort Ord cleanup sites. On May 28, 2015, the USFWS issued a Programmatic Biological Opinion that supersedes the previous Biological Opinions. Work conducted prior to May 28, 2015 was subject to the measures included in five Biological Opinions and one

amendment (USFWS, 1999, 2002, 2005, 2007 [amendment], 2011, and 2014). Work conducted after May 28, 2015 was subject to the measures included in the Programmatic Biological Opinion (USFWS, 2015).

Sensitive habitat types identified in the HMP and Biological Opinions are:

- Central maritime chaparral
- Wetlands and vernal ponds
- Other habitats where listed species are known or suspected to occur (including coastal scrub, coast live oak woodlands, and grasslands with a significant native component of grasses or forbs)

Special-status species listed in the HMP and Biological Opinions are:

- Sand gilia (*Gilia tenuiflora* ssp. *arenaria*) – Federally Endangered, State Threatened
- Monterey spineflower (*Chorizanthe pungens* var. *pungens*) – Federally Threatened
- Robust spineflower (*C. robusta* var. *robusta*) – Federally Endangered
- Seaside bird's-beak (*Cordylanthus rigidus* ssp. *littoralis*) – State Endangered
- Hooker's manzanita (*Arctostaphylos hookeri* ssp. *hookeri*)
- Sandmat manzanita (*A. pumila*)
- Monterey manzanita (*A. montereyensis*)
- Monterey ceanothus (*Ceanothus rigidus*)
- Eastwood's goldenbush (*Ericameria fasciculata*)
- Yadon's piperia (*Piperia yadonii*) – Federally Endangered
- Coast wallflower (*Erysimum ammophilum*)
- Contra Costa goldfields (*Lasthenia conjugens*) –Federally Endangered
- California black legless lizard (*Anniella pulchra nigra*; BLL) – State Species of Concern
- California tiger salamander (*Ambystoma californiense*; CTS) – Federally Threatened, State Threatened
- California red-legged frog (*Rana draytonii*; CRLF) – Federally Threatened
- California linderiella (*Linderiella occidentalis*)
- Western snowy plover (*Charadrius alexandrinus nivosus*) – Federally Threatened
- Monterey ornate shrew (*Sorex ornatus salarius*) – State Species of Concern

Sand gilia, Monterey spineflower, Seaside bird's-beak, and coast wallflower are annual herb species that may occur within maritime chaparral, coastal scrub, grasslands, dune scrub, or disturbed areas. Robust spineflower is an annual herb that also occurs within these habitat types; however, the only documented occurrence on former Fort Ord, within dune scrub habitat, has not since been observed and may be erroneous. The Contra Costa goldfield is an annual herb associated with vernal ponds and is known from approximately five locations on former Fort Ord. Hooker's manzanita, sandmat manzanita, Monterey manzanita, Monterey ceanothus,

Eastwood's goldenbush are perennial shrub species that typically occur in maritime chaparral, but individuals may also be found mixed with oak woodland or coastal scrub habitats. Yadon's piperia is a perennial herb that is typically found in maritime chaparral and Monterey pine habitats.

The BLL is a rare variety of the California legless lizard (*A. pulchra*) that inhabits areas with sandy soils on the former Fort Ord. The Monterey ornate shrew is a rare variety of the ornate shrew (*S. ornatus*) found in riparian, forest, and oak woodland habitats. The western snowy plover is a rare avian species found along coastal strand areas. The CTS, CRLF, and California linderiella are typically found in vernal or seasonal ponds on the former Fort Ord. The CTS may also be found aestivating in small mammal burrows or under logs in upland areas within 2.2 kilometers of vernal ponds.

The HMP and Biological Opinions also outline avoidance and mitigation measures that are necessary if the Army's cleanup activities could significantly impact protected species or habitats. These cleanup activities include munitions remediation, soil remediation, groundwater remediation, and other related environmental cleanup operations within former Fort Ord lands designated as Habitat Reserve. To determine whether mitigation measures would be needed to restore populations of affected HMP-listed species or habitats, the HMP requires that a baseline biological survey be conducted prior to work operations within a proposed cleanup site to establish whether protected species are present and map the locations and quantify abundance, and to avoid and minimize impacts. The HMP also requires monitoring consistent with existing Biological Opinions during and after completion of the cleanup operations to determine whether work activities have significantly impacted rare species or habitat. Monitoring data are compared to a site's baseline data to determine if recovery or restoration of the protected habitat (maritime chaparral, wetlands, etc.) and associated species are proceeding toward baseline conditions. The results of monitoring of affected areas are presented in annual biological reports managed under several different contracts.

1.2 Report Content

This report includes the results of biological monitoring performed by KEMRON and Gilbane in 2015 and a description of the mitigations and avoidance measures, biological trainings, HMP species encounters, and other habitat and species protection measures required by the HMP and the Biological Opinions.

Work was conducted by KEMRON in 2015 at the following sites:

- **Soil remediation sites:** Former Historical Areas 28, 34, and 37.
- **Munitions remediation sites:** Units 5a, 9, 11, 12, 14, 15, 18, 19, 23, 25, 28, and 31.

Work was conducted by Gilbane in 2015 at the following sites:

- **Munitions remediation sites:** Units 1, 2, 3, and 6; and the Phase C fuel breaks.

2.0 Site 39 - Soil Remediation Activities

There are several former ranges on the former Fort Ord, referred to as Historical Areas (HAs), where soil remediation for lead or munitions-related contamination was necessary. Soil remediation activities at several HAs were completed in previous years and no soil remediation work was conducted in 2015. However, site re-contouring and erosion control work was conducted at three of the HAs in 2015: HA 28, HA 34, and HA 37 (Figure 2-1 to Figure 2-4), in support of the restoration activities being completed by another Army contractor.

2.1 HMP Species Mitigation and Avoidance

Avoidance and minimization measures were implemented during site re-contouring and erosion control activities in order to reduce impacts to HMP species, sensitive habitats, and the restoration areas. Mitigation measures for soil remediation areas are specifically addressed in the HMP, in the 1999 Biological Opinion (USFWS, 1999), the Programmatic Biological Opinion (USFWS, 2015), and in the *Wetland Monitoring and Restoration Plan for Munitions and Contaminated Soil Remedial Activities at Former Fort Ord* (USACE, 2006). These measures are summarized as follows:

- Only previously established access routes and staging areas were used at each site to minimize impacts to surrounding habitats and HMP species to the greatest extent feasible. Existing roads and trails; pre-existing paved, graded, or disturbed areas; and areas known to be unoccupied by HMP annual species (based on previous surveys) were used for access, staging, and soil stockpiling wherever available.
- CTS avoidance and minimization measures were implemented from October through June or when adjacent vernal ponds were wet. Regular ground checks were made during the rainy season, flooded detention basins were dip-netted prior to excavation, and employee briefings were conducted to ensure that the field staff followed the protocols for CTS avoidance and reporting.
- Visual surveys of the work area were conducted by the Project Biologist and workers trained to identify CTS, prior to the day's work if rain was forecasted within 48 hours (50% chance or greater) or if it had rained overnight; or during work hours if substantial rainfall occurred (work was halted if greater than 0.5 inch of rain fell in a 24-hour period). Work activities commenced once the Project Biologist and the search crew determined that no CTS had dispersed into the area. Workers were also required to conduct morning inspections for CTS under equipment following all rain events.
- Erosion problems were treated by a combination of light grading, woven coir fabric, straw wattles, sterile barley seed, and native plant seed. Additionally, 2015 was the first year that the Army utilized mulch for erosion control, which was obtained from

vegetation removal activities at other location of the cleanup project. The mulch contained trimmings from coast live oak limbs and maritime chaparral shrubs.

- In addition, a Habitat Checklist was prepared by the Project Biologist, and reviewed by the BRAC Biologist, that outlined specific avoidance and minimization measures, which were communicated to the project supervisors in preparatory meetings prior to work initiation.

3.0 Other Biological Support Activities in 2015

3.1 Munitions Remediation Activities - HMP Species Mitigation and Avoidance

During 2015, munitions and explosives of concern (MEC) remediation activities within the Fort Ord Impact Area were conducted within Units 1, 2, 3, 5a, 6, 9, 11, 12, 14, 15, 18, 19, 23, 25, 28, and 31, and the Phase C fuel breaks (Figure 3-1). Activities within these areas included mastication and pruning of vegetation, surface MEC removal, target and structure removal, digital geophysical mapping (DGM), mapping with geophysical MetalMapper equipment, installation of a helicopter pad, subsurface MEC removal where necessary, demolition of sensitive MEC items, and vehicle use to support these activities. Mitigation measures to reduce impacts to protected species and sensitive habitats during MEC remedial actions are described in the HMP (USACE, 1997), the five Biological Opinions provided by the USFWS to address Army clean-up activities (USFWS, 1999, 2002, 2005, 2007 [amendment], 2011, and 2014), and the Programmatic Biological Opinion (USFWS, 2015). Mitigation and other environmental protection measures that were implemented during this project are summarized below.

3.1.1 Minimize Disturbance Associated with MEC Removal

Disturbances were limited to those required for the above-mentioned activities. As required by the HMP, existing roads were used. Exceptions were made where it was necessary to traverse the site using tracked vehicles in order to access excavation sites, remove piles of debris, remove vegetation, and conduct the DGM portion of the MEC removal process. Access routes, staging areas, stockpiles, and other appurtenant facilities were sited to avoid impacts to HMP plant and wildlife species and potential erosion issues.

3.1.2 Conduct Employee Education Program

New KEMRON and Gilbane employees and subcontract workers receive training on Fort Ord natural resource protection prior to starting work. In 2015, KEMRON provided natural resource training to 52 new employees; no new employees were hired under the Gilbane contract in 2015 that required natural resource training.

Training includes the following topics:

- Identification of sensitive HMP-protected habitats and HMP species specific to the work area. Habitats covered in the training include maritime chaparral, vernal ponds, and wetlands. Species covered include CTS, CRLF, California linderiella, BLL, Monterey ornate shrew, sand gilia, Monterey spineflower, Seaside bird's-beak, Yadon's piperia, Contra Costa goldfields, coast wallflower, Monterey manzanita, sandmat manzanita, Hooker's manzanita, Eastwood's goldenbush, and Monterey ceanothus. Additional HMP species occurring within the dune habitats on Fort Ord are not included in the training

because work has been completed in these areas and these species will not be impacted by work in the inland ranges.

- Specific guidance for CTS and CRLF protection, including the ability to recognize the species, the protocol for reporting all encounters to the Project or Base Realignment and Closure (BRAC) biologists (who are permitted by USFWS to handle and relocate CTS), placing escape ramps or covering open trenches, and checking equipment and excavations for CTS and CRLF during migration seasons.
- Instructions for minimizing all work impacts and work footprints, and for avoidance of areas flagged for sensitive species or habitats wherever marked in the field.
- Instructions for restricting vehicle movement and parking to roads, staging areas, designated access routes, and other designated work areas wherever possible.
- How to reduce soil disturbances in sensitive habitat, particularly areas containing seed bank or live individuals of HMP-listed plant species and vernal ponds.
- How to reduce erosion problems and spread of invasive species.

In addition to the training, a Habitat Checklist was prepared by the Project Biologist, and reviewed by the BRAC Biologist, prior to each activity that outlined specific avoidance and minimization measures, which were communicated to the project supervisors in preparatory meetings prior to work initiation.

3.1.3 Avoid Disturbance of HMP Annual Plant Populations

Populations of HMP annual plants were identified during baseline surveys within the following work areas:

- Monterey spineflower: Units 2, 3, 11, 12, 14, 15, and 19
- Seaside bird's-beak: Units 14, 15, and 19
- Sand gilia: Units 12, 14, 15, 19, 28, and 31.

In addition, populations of Seaside bird's-beak and Yadon's piperia were observed by the Project Biologist on the east side of Unit 11 during surveys conducted in 2014 and 2015 prior to subsurface investigations of the fuelbreaks and MetalMapper work (Figure 3-2). While MEC removal and DGM activities were necessary within population areas, no equipment or personnel were permitted within these areas from the approximate time of germination through the approximate time of seed-set for each species. During this period, the populations were flagged off and a map of the locations was provided to all supervisors and field personnel. The Project Biologist monitored the populations to ensure that work was not conducted in these areas until the time of seed-set for the majority of the individuals.

Subsurface MEC removal was conducted within Monterey spineflower and sand gilia population areas in Unit 12 where the results of the MetalMapper indicated that large MEC items were present. During this work activity, the top two to three inches of topsoil were preserved and replaced on top of the backfilled holes. Subsurface MEC removal was not conducted within Seaside bird's-beak or Yadon's piperia population areas in Unit 11.

3.1.4 Minimize and Compensate for Impacts to California Linderiella, California Tiger Salamander, and Red-legged Frog

No CTS or CRLF were encountered during work activities by KEMRON or Gilbane on the former Fort Ord in 2015. To minimize impacts to these species, supervisors and field personnel were trained during the Employee Education Program to identify CTS and CRLF, and they were informed of the potential for these species (as well as California linderiella) to occur within the project site and the established protocol if any individuals were encountered. Additionally, work within the vernal pool areas was only permitted during the dry season and heavy equipment was precluded to the greatest extent feasible. In 2015, the work conducted by KEMRON and Gilbane within vernal pools included mowing, surface MEC removal, target removal, and DGM surveys within Ponds 18, 54, And 72. These work activities were completed using manual equipment with the exception of the target removal in Pond 54, which required the use of a fork-lift. Additionally, subsurface MEC removal was conducted within Pond 72 at four locations where the results of the MetalMapper indicated that large MEC items were present. Excavations within Pond 72 were approximately 18-30 inches wide and 20-24 inches deep. During this work activity, the top two to three inches of topsoil were preserved and replaced on top of the backfilled holes; therefore, no restoration of habitat for these species was necessary.

3.1.5 Minimize Impacts to Black Legless Lizard

No BLL were encountered during work activities by KEMRON or Gilbane on the former Fort Ord in 2015. To minimize impacts to this species, supervisors and field personnel were trained during the Employee Education Program to identify BLL, and they were informed of the potential for this species to occur within the project site and the established protocol if any individuals were encountered.

3.1.6 Invasive Weed Control

Several invasive plant species are known to occur on the former Fort Ord, including iceplant (*Carpobrotus sp.*), French broom (*Genista monspessulana*), and jubata (pampas) grass (*Cortaderia jubata*). These species spread rapidly and can severely degrade native habitats if measures are not taken to control their spread. The Army has reviewed the California Invasive Plant Council's (CIPC's) *Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers* (CPIC, 2011) and has identified appropriate Best Management Practices (BMPs) that can be implemented during cleanup activities. Specifically, BMPs that are

employed to the greatest extent practicable include: washing all vehicles and equipment that come from off of Fort Ord, including those of subcontractors; finding weed-free sources for straw, fill, and road base materials that are imported from off-site; using on-site sources for mulch, fill, and road base materials that come only from areas without invasive plant infestations; planning any off-road haul routes to avoid invasive plant populations; and cleaning boots, equipment, and vehicles that have been used in high infestation areas prior to moving to sites where invasive species populations are low or have not been identified. Additionally, each new work area is evaluated for the presence of invasive species, and the appropriate avoidance and minimization measures are identified prior to work initiation.

In 2015, activities within Units 1, 2, and 3 included mastication and pruning of vegetation, surface MEC removal, target removal, DGM, and vehicle use to support these activities. Prior to initiation of these activities (in 2014), the Project Biologist completed an evaluation of the presence or absence of invasive plant species within these units. The evaluation identified significant populations of jubata grass within Unit 1 and a portion of Unit 2, and limited to no populations of jubata grass or other invasive plants within Unit 3 and the remaining portion of Unit 2. Due to the presence of very dense chaparral within Unit 2, the extent of the jubata grass could not be identified until the completion of the mastication. Upon completion of the mastication of Unit 2, the Project Biologist mapped the extent of the densest populations of jubata grass. This map was utilized to inform personnel of the area where decontamination would be necessary following work. It was also utilized to guide the direction of the DGM surveys; the DGM towed array surveyed the infested areas first and then moved to the uninfested areas after decontaminating their equipment.

Decontamination by pressure washing was required on a daily basis for the DGM towed array. For the masticators, pressure washing was required prior to leaving Units 1 and 2, as the extent of the jubata grass was not known until mastication was complete and the heavy equipment was stored on-site overnight. For vehicles, boots, and equipment, decontamination was conducted on a daily basis (or more if personnel left the units multiple times per day) using brushes. If any caked-on soils or materials remained that could not be removed with a brush, boots and equipment were washed with water at the office compound; however, vehicles were required to be pressure-washed on site.

3.1.7 Erosion Control

To reduce erosion concerns on bare mineral soils, normal vehicle access was restricted to existing roads and established access routes. Tracked vehicles were used to conduct vegetation removal and DGM surveys over the site. KEMRON and Gilbane monitored the work sites for potential erosion problems, and a final inspection was conducted at the conclusion of work at each site by the Project Biologist. In areas where subsurface MEC removal was conducted in

fuelbreaks on steep slopes, water bars and straw mulch were installed to reduce erosion. Silt fencing was installed surrounding Pond 18 (outside of the wetland area) due to potential erosion concerns resulting from use of the adjacent access route and mastication of Unit 5a. Silt fence sections were 50 feet long and were installed in a manner that would not preclude use of the pond by CTS and other wildlife. The end of each fence length overlapped by approximately one-foot and a gap was left between the overlapping fence lengths to allow wildlife passage. Please refer to Figure 3-3 for photographs of the silt fence installation at Pond 18.

3.2 Staff Gauge Installation

During 2015, KEMRON supported the Army's biological monitoring efforts by installing staff gauges in 18 ponds on the former Fort Ord (Figures 3-4 and 3-5). Thirteen of the ponds are located on Army property and the remaining five of the ponds are located on Bureau of Land Management (BLM) property[1]. Staff gauges were installed at the lowest point within each pond using a laser level, with the exception of four ponds where the lowest point was inaccessible due to overgrown vegetation (willows) or significant inundation. Each installation location was evaluated by an Unexploded Ordnance (UXO) technician to identify potential subsurface MEC and ensure that the staff gauges could be installed safely. Table 3-1 is a summary of the staff gauge installation at each pond. Please refer to Figure 3-5 for photographs of the staff gauges.

[1] Please note that BLM was consulted and agreed to installation of the staff gauges prior to installation.

Table 3-1. Summary of Staff Gauge Installation

Pond	Installation Date	Water Present	Installed at Lowest Point?
3 North	3/16/2015	Yes	No – lowest point inaccessible due to inundation
3 South	3/16/2015	No	Yes
14	3/21/2015	No	Yes
16	3/16/2015	No	Yes
17	3/17/2015	No	No – lowest point inaccessible due to overgrown vegetation
18	3/16/2015	No	Yes
35	3/16/2015	No	Yes
39	3/16/2015	Yes	No – lowest point inaccessible due to inundation
40 North	3/16/2015	Yes	Yes
40 South	3/16/2015	Yes	Yes
41	3/17/2015	No	Yes
42	3/17/2015	Yes	Yes
43	1/11/2016	Yes	No – lowest point inaccessible due to inundation
44	3/17/2015	No	Yes
54	3/17/2015	No	Yes
60	3/17/2015	Yes	Yes
101 West	3/17/2015	No	Yes
Machine Gun Flats	3/17/2015	Yes	No – lowest point inaccessible due to inundation

4.0 References

Army, 2009. *Final, Habitat Restoration Plan, Site 39 Inland Ranges, Former Fort Ord, California.* Prepared by Shaw/Denise Duffy Associates. (AR BW-2450)

California Invasive Plant Council (CIPC). 2011. *Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers.*

U.S. Army Corps of Engineers (USACE), 1997. *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord.* With Technical assistance from Jones and Stokes Associates. (AR BW-1787)

USACE, 2006. *Wetland Monitoring and Restoration Plan for Munitions and Contaminated Soil Remedial Activities at Former Fort Ord.* Prepared by Burleson Consulting, Inc. Folsom, California. (AR BW-2453)

USACE, 2009. *Annual Biological Monitoring Report, 2008, Fort Ord, California.* Prepared by Shaw Environmental, Inc. (AR BW-2503)

U.S. Fish and Wildlife Service (USFWS), 1999. Biological and Conference Opinion on the Closure and Reuse of Fort Ord, Monterey County, California (1-8-99-F/C-39R). Response to Army letter dated 11/11/98 to reinitiate formal consultation in accordance with Section 7 of Endangered Species Act of 1973, March 30. (AR BW-2232A)

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), October 22. (AR BW-2233)

USFWS, 2005. Biological Opinion, Cleanup and Reuse of Former Fort Ord, Monterey County, California, as it affects CTS and Critical Habitat for Contra Costa Goldfields (1-8-04-F-25R), March 14. (AR BW-2334)

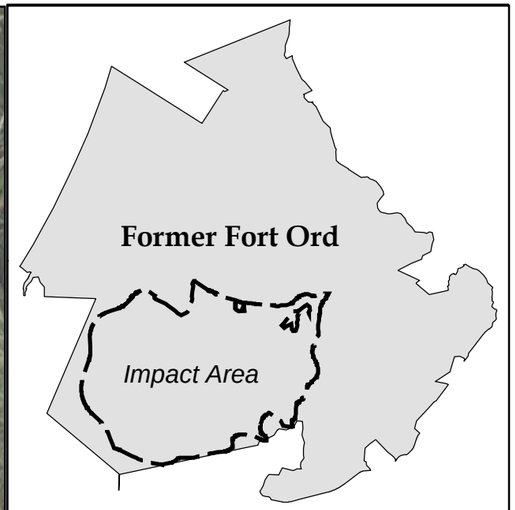
USFWS, 2007. Biological Opinion, Cleanup and Reuse of Former Fort Ord, Monterey County, California, as it affects CTS and Critical Habitat for Contra Costa Goldfields (1-8-04-F-25R), June 1. (AR BW-2334c)

USFWS, 2011. Biological Opinion for the Former Fort Ord Vegetation Clearance Activities and Transfer of Parcel E29b.3.1 (8-8-11-F-39), August 3. (AR BW-2579)

USFWS, 2014. Formal Consultation for Vegetation Clearance Activities on 309 Acres in Burn Units 1, 2, and 3 on Former Fort Ord, Monterey County, California (8-8-14-F-28), April 28. (AR BW-2713)

USFWS, 2015. Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California (8-8-09-F-74), May 28. (AR BW-2747)

Figures



Remediated Area
Impact Area MRA

N

0 1,000 2,000 4,000 Feet

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

FORMER FORT ORD

FIGURE NUMBER 2-1

Biological Annual Report 2015
Impact Area Soil Remediation Areas Where Biological Monitoring Occurred in 2015

DATE	PROJECT NUMBER	FILE NAME
3/7/2016	WP001	SEE FOOTER

C:\ArcGIS\USACE\Fort_Ord\Projects\Biological_Annual_Report_2015\Map_Docs\HA_index_2015.mxd, LCarr, Gilbane

Pond 10

RISO RIDGE

Former Fort Ord

Impact Area

Haul Route
Restoration Area
Pond

N

0 150 300 FEET

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

FORMER FORT ORD

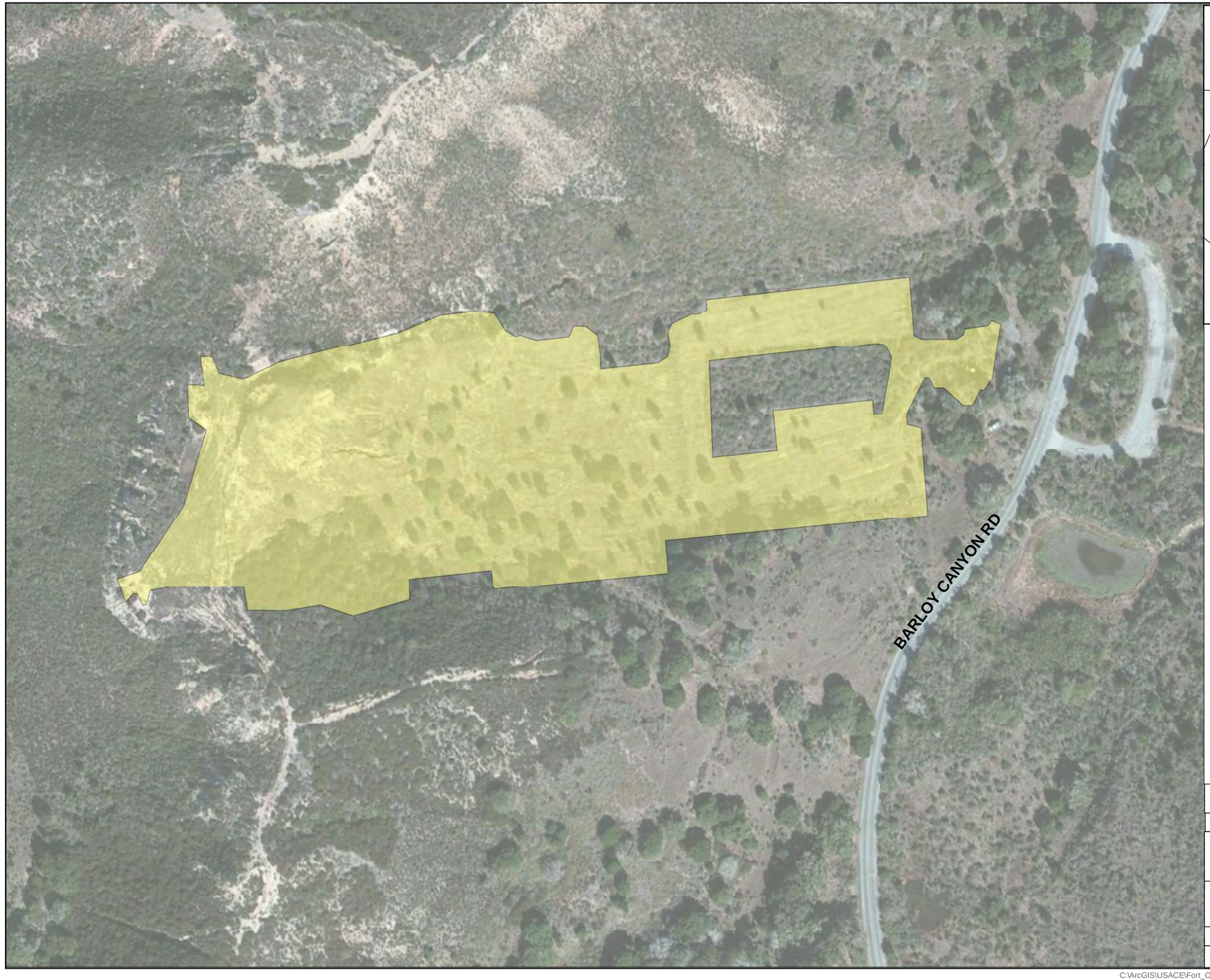
FIGURE NUMBER
2-2

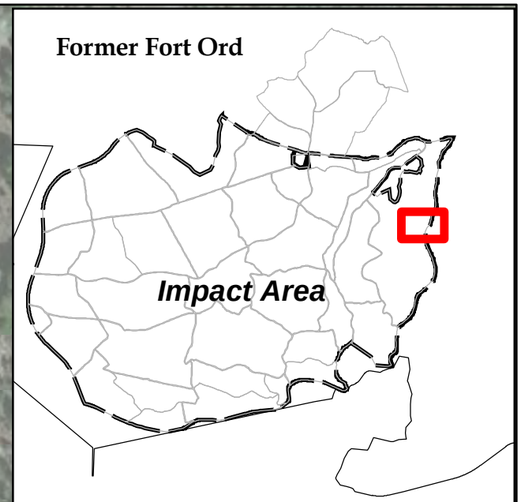
Biological Annual Report 2015

Restoration Areas Within HA 37

DATE	PROJECT NUMBER	FILE NAME
3/7/2016	WP001	SEE FOOTER

C:\ArcGIS\USACE\Fort_Ord\Projects\Biological_Annual_Report_2015\Map_Docs\HA37_2015.mxd, LCarr, Gilbane





Restoration Area

N

0 150 300 FEET

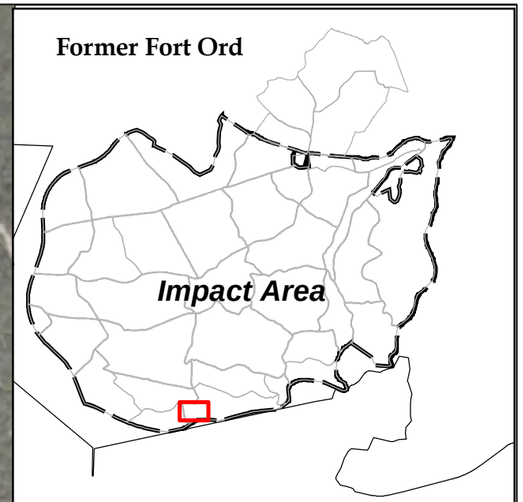
U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

FORMER FORT ORD

FIGURE NUMBER	*Biological Annual Report 2015*
2-3	Restoration Areas Within HA 34

DATE	PROJECT NUMBER	FILE NAME
3/7/2016	WP001	SEE FOOTER

C:\ArcGIS\USACE\Fort_Ord\Projects\Biological_Annual_Report_2015\Map_Docs\HA34_2015.mxd, LCarr, Gilbane



Erosion Repair Areas

N

0 50 100 200 Feet

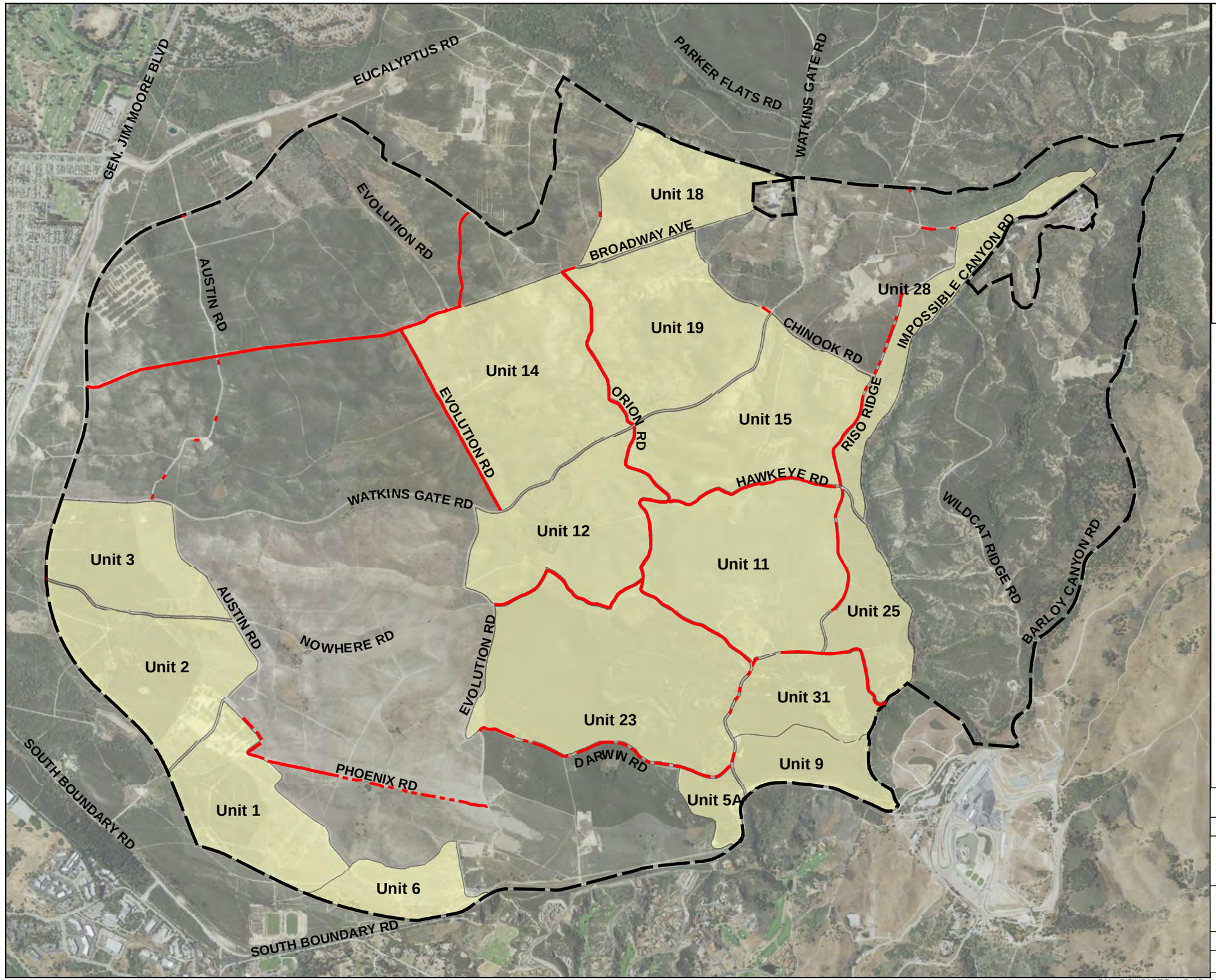
U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

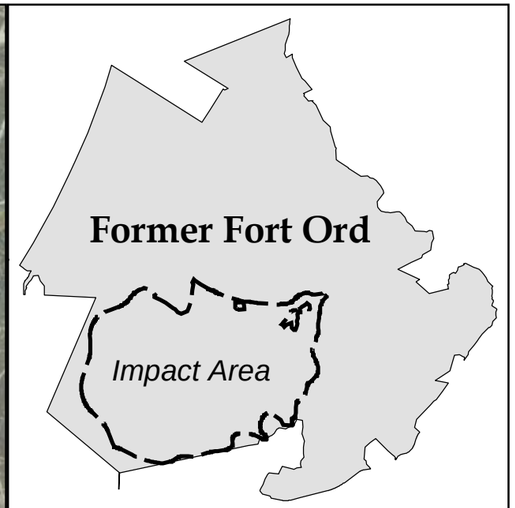
FORMER FORT ORD

FIGURE NUMBER	*Biological Annual Report 2015*
2-4	**Erosion Repair Area Within HA 28**

DATE	PROJECT NUMBER	FILE NAME
3/7/2016	WP001	SEE FOOTER

C:\ArcGIS\USACE\Fort_Ord\Projects\Biological_Annual_Report_2015\Map_Docs\HA28.mxd, LCarr, Gilbane





Fuel Breaks with Munitions Removal

Unit Where Biological Monitoring Occurred

Impact Area MRA

N

0 2,000 4,000 FEET

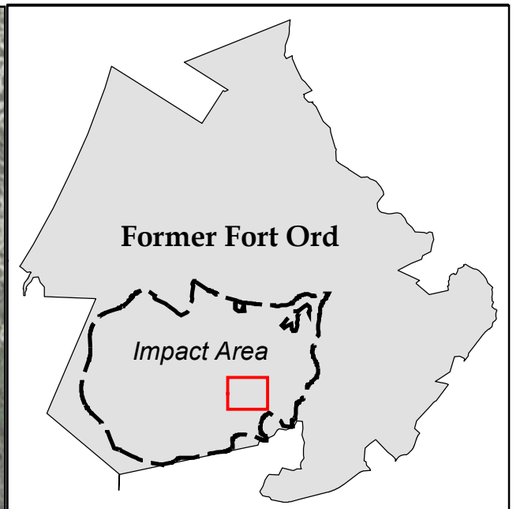
U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

FORMER FORT ORD

FIGURE NUMBER	
3-1	Impact Area Munitions Remediation Areas Where Biological Monitoring Occurred in 2015

DATE	PROJECT NUMBER	FILE NAME
3/7/2016	WP001	SEE FOOTER

C:\ArcGIS\USACE\Fort_Ord\Projects\Biological_Annual_Report_2015\Map_Docs\MMRP_index_2015.mxd, LCarr, Gilbane



- Yadon's piperia Location
- Seaside Bird's-Beak
- Burn Unit
- Impact Area MRA

N

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

FORMER FORT ORD

FIGURE NUMBER	*Biological Annual Report 2015*
3-2	Seaside Bird's-Beak and Yadon's Piperia Locations

DATE	PROJECT NUMBER	FILE NAME
3/8/2016	WP001	SEE FOOTER

C:\ArcGIS\USACE\Fort_Ord\Projects\Biological_Annual_Report_2015\Map_Docs\Unit_11_Birds_Beak.mxd, LCarr, Gilbane

1.

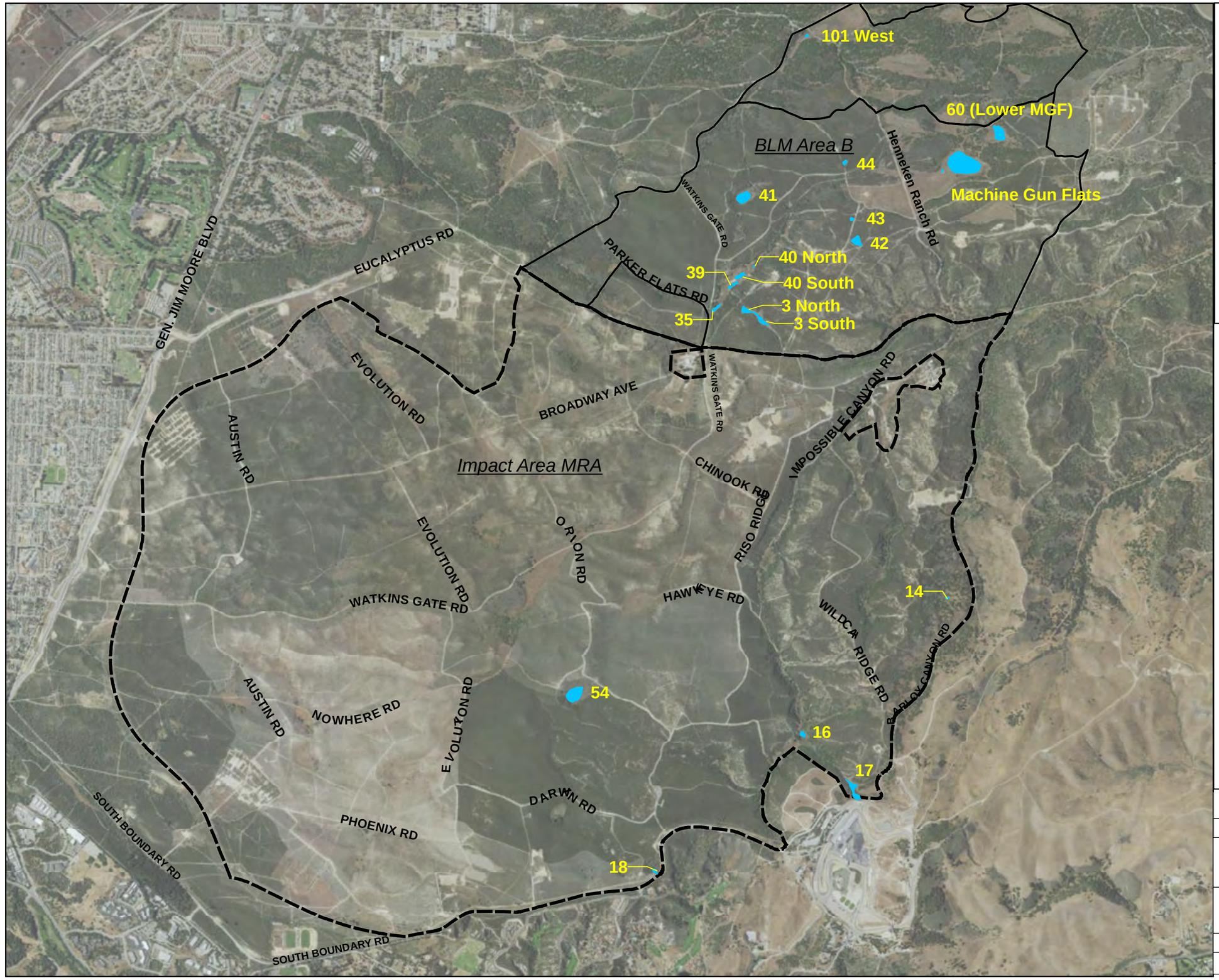
2.

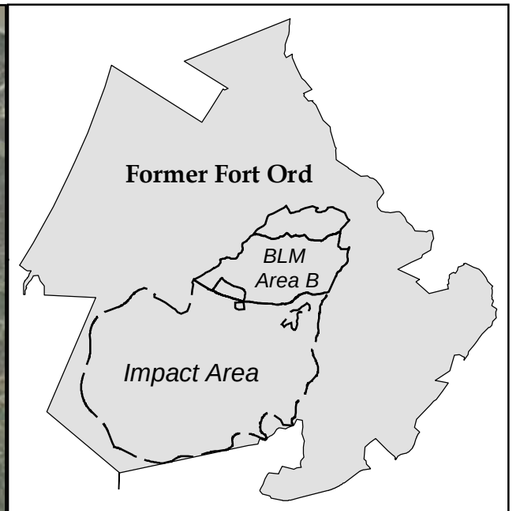
3.

4.

1. Silt fence looking northwest
2. Silt fence looking northeast
3. Gap between silt fence lengths
4. Gaps between silt fence lengths

U.S. ARMY CORPS OF ENGINEERS SACRAMENTO DISTRICT		
FORMER FORT ORD		
FIGURE NUMBER 3-3	*Biological Annual Report 2015* Photographs of Silt Fence Installed Around Pond 18	
	KEMRON ENVIRONMENTAL SERVICES	Gilbane
DATE	PROJECT NUMBER	FILE NAME
1/13/2016	WP001	SEE FOOTER





Pond where staff gauge was installed
Impact Area MRA
BLM Area B

N

0 2,500 5,000 FEET

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

FORMER FORT ORD

FIGURE NUMBER	Ponds Where Staff Gauges Were Installed in 2015
3-4	

DATE	PROJECT NUMBER	FILE NAME
3/1/2016	WP001	SEE FOOTER

C:\ArcGIS\USACE\Fort_Ord\Projects\Biological_Annual_Report_2015\Map_Docs\Ponds_Locs.mxd, LCarr, Gilbane

1.

2.

3.

4.

1. Pond 3N (Photo Date 12/16/15)
2. Pond 3S (Photo Date 12/16/15)
3. Pond 14 (Photo Date 12/21/15)
4. Pond 16 (Photo Date 1/14/16)

U.S. ARMY CORPS OF ENGINEERS SACRAMENTO DISTRICT		
FORMER FORT ORD		
FIGURE NUMBER 3-5a	*Biological Annual Report 2015* Photographs of Staff Gauges Installed in 2015	
	KEMRON ENVIRONMENTAL SERVICES	Gilbane
DATE	PROJECT NUMBER	FILE NAME
1/13/2016	WP001	SEE FOOTER

1.

2.

3.

4.

1. Pond 35(Photo Date 12/16/15)
2. Pond 39 (Photo Date 12/16/15)
3. Pond 40N (Photo Date 12/16/15)
4. Pond 40S (Photo Date 12/16/15)

U.S. ARMY CORPS OF ENGINEERS SACRAMENTO DISTRICT		
FORMER FORT ORD		
FIGURE NUMBER 3-5b	*Biological Annual Report 2015* Photographs of Staff Gauges Installed in 2015	
	KEMRON ENVIRONMENTAL SERVICES	Gilbane
DATE	PROJECT NUMBER	FILE NAME
1/13/2016	WP001	SEE FOOTER

1.

2.

3.

4.

1. Pond 41(Photo Date 12/17/15)
2. Pond 43 (Photo Date 1/12/16)
3. Pond 44 (Photo Date 1/14/16)
4. Pond 54 (Photo Date 12/17/15)

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

FORMER FORT ORD

FIGURE NUMBER	*Biological Annual Report 2015* Photographs of Staff Gauges Installed in 2015
3-5c	

DATE	PROJECT NUMBER	FILE NAME
1/13/2016	WP001	SEE FOOTER

1.

2.

3.

4.

5.

1. Machine Gun Flats (Photo Date 12/17/15)
2. Pond 101W (Photo Date 12/17/15)
3. Pond 18 (Photo Date 12/16/15)
4. Pond 42 (Photo Date 12/21/15)
5. Pond 60 (Photo Date 12/21/15)

U.S. ARMY CORPS OF ENGINEERS SACRAMENTO DISTRICT		
FORMER FORT ORD		
FIGURE NUMBER 3-5d	*Biological Annual Report 2015* Photographs of Staff Gauges Installed in 2015	
	KEMRON ENVIRONMENTAL SERVICES	Gilbane
DATE	PROJECT NUMBER	FILE NAME
1/13/2016	WP001	SEE FOOTER