

2021-2022 ANNUAL BIOLOGICAL MONITORING REPORT
FORMER FORT ORD, CALIFORNIA

Indefinite Delivery Indefinite Quantity (IDIQ) Type Contract
for Base Realignment and Closure (BRAC) Support
at the Former Fort Ord, Monterey, California
Contract No. W9123820D0004
Task Order No. W9123821F0077

Submitted to:

U.S. Army Corps of Engineers
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March 2023

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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
CDFW	California Department of Fish and Wildlife
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
IDIQ	Indefinite Delivery Indefinite Quantity
HA	Historical Area
HCL	Habitat Checklist
HMP	Habitat Management Plan
KEMRON	KEMRON Environmental Services, Inc.
MEC	Munitions and Explosives of Concern
MRA	Munitions Response Area
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
UXOQCS	Unexploded Ordnance Quality Control Specialist

1.0 Introduction

This report was prepared by Denise Duffy & Associates (DD&A) as a subcontractor to KEMRON Environmental Services, Inc. (KEMRON) under the Indefinite Delivery Indefinite Quantity (IDIQ) Type Contract for Base Realignment and Closure (BRAC) Support at the Former Fort Ord, Monterey, California, Contract No. W9123820D0004. This report contains results of the 2021 and 2022 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, 1993) 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 the former Fort Ord (USACE, 1997).

1.1 Background

The HMP (USACE, 1997) 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 and the California Department of Fish and Wildlife (CDFW); the HMP, deed restrictions, and Memoranda of Agreement between the Army and various land recipients provide the legal mechanism to assure HMP implementation. The HMP 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. In 2015, the USFWS issued a Programmatic Biological Opinion (USFWS, 2015) that superseded the previous Biological Opinions. Then, on June 7, 2017, the USFWS issued a reinitiated Programmatic Biological Opinion that supersedes the 2015 Programmatic Biological Opinion (USFWS, 2017). The Programmatic Biological

Opinion contains additional conservation measures and recommendations relating to environmental remediation at former Fort Ord cleanup sites.

Sensitive habitat types identified in the HMP (USACE, 1997) and the Programmatic Biological Opinion (USFWS, 2017) are:

- Central maritime chaparral (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 (USACE, 1997) and/or the Programmatic Biological Opinion (USFWS, 2017) 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 Special Concern
- California tiger salamander (*Ambystoma californiense*; CTS) – Federally Threatened, State Threatened
- California red-legged frog (*Rana draytonii*; CRLF) – Federally Threatened, State Species of Special Concern
- California linderiella (*Linderiella occidentalis*)
- Western snowy plover (*Charadrius alexandrinus nivosus*) – Federally Threatened
- Monterey ornate shrew (*Sorex ornatus salarius*) – State Species of Special 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 to occur at four locations on former Fort Ord. Hooker's manzanita, sandmat manzanita, Monterey manzanita, Monterey ceanothus, and Eastwood's goldenbush are perennial shrub species that typically occur in maritime chaparral, but individuals can 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 forest 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 (USACE, 1997) and Programmatic Biological Opinion (USFWS, 2017) 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 the Programmatic Biological Opinion during and after completion of the cleanup operations to study the recovery of rare species and 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 in 2021 and 2022 and a description of the mitigations and avoidance measures, biological trainings, HMP species encounters, habitat and species protection measures required by the HMP (USACE, 1997) and the Programmatic Biological Opinion (USFWS, 2017), and other environmental protection measures implemented during project activities.

The only work conducted by KEMRON in 2021 and 2022 was munitions remediation at Impact Area MRA Unit 5 ([Figure 1-1](#)). No work was conducted by KEMRON at soil remediation sites in 2021 or 2022, and no further discussion is provided in this report.

2.0 Munitions Remediation Activities in 2021 and 2022

During 2021 and 2022, munitions and explosives of concern (MEC) remediation activities within the former Fort Ord Impact Area were conducted by KEMRON within Impact Area MRA Unit 5 (Figure 1-1). Activities conducted in Unit 5 in 2021 included:

- Mastication and pruning of vegetation; and
- Vehicle use to support these activities.

Activities conducted in Unit 5 in 2022 included:

- Surface MEC removal;
- Digital geophysical mapping (DGM) with EM61 equipment on a towed array;
- Subsurface MEC removal within Pond 21;
- Demolition of live or suspected live MEC items; and
- Vehicle use to support these activities.

Table 2-1 identifies the approximate acreage within Unit 5 affected by the work activities in 2021 and 2022.

2.1 HMP Species and Habitats Mitigation and Avoidance

Mitigation measures to reduce impacts to protected species and sensitive habitats during MEC remedial actions are described in the HMP (USACE, 1997) and the Programmatic Biological Opinion (USFWS, 2017). Mitigation and protection measures that were implemented to avoid or reduce impacts to HMP species and habitats during this project are summarized below.

2.1.1 Minimize Disturbance Associated with MEC Removal

Disturbances were limited to those required for the abovementioned 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 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.

2.1.2 Conduct Employee Education Program

New KEMRON employees and subcontract workers received training on former Fort Ord natural resource protection prior to starting work. KEMRON provided natural resource training to 8 new employees and subcontract workers in 2021, and to 15 new employees and subcontract workers in 2022.

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 the former 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 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, Habitat Checklists (HCLs) were prepared prior to each remediation work activity by the Project Biologist, outlining specific avoidance and minimization measures to be implemented during work activities. The HCLs were reviewed and approved by the BRAC Biologist and the Unexploded Ordnance Quality Control Specialist (UXOQCS). The avoidance and minimization measures were communicated to the project supervisors and field personnel in preparatory meetings prior to work initiation (see [Attachment A](#) for all HCLs implemented for work conducted in 2021 and 2022).

2.1.3 Avoid Disturbance of HMP Annual Plant Populations

Populations of HMP annual plants were identified during baseline and/or follow-up surveys within and adjacent to Unit 5. In addition, although not observed during baseline surveys, populations of Yadon's piperia were observed within or near Unit 5 between 2010 and 2019 along fuel breaks on Darwin and Evolution Roads. Areas supporting populations of HMP annual plants were avoided from the time of assumed germination (February 1) to seed-set (assumed May 31 for Monterey spineflower and sand gilia; as observed by the Project Biologist in

approximately August/September for Yadon's piperia). While MEC removal and DGM activities were necessary within population areas, no equipment or personnel were permitted within these areas during this period, and the populations were flagged off and a map of the locations was provided to all project 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. No subsurface MEC removal was conducted within Monterey spineflower or Yadon's piperia population areas in 2021 or 2022.

2.1.4 Minimize Impacts to California Linderiella, California Tiger Salamander, and California Red-Legged Frog

To minimize impacts to these species, project 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.

Vernal Pools 21 and 76 are present within Unit 5 and were delineated in the field and flagged by the Project Biologist prior to work being conducted in the unit. In 2021 and 2022, the work conducted by KEMRON within vernal pools included vegetation removal (manual clearance; [Figure 2-1](#)) and surface MEC removal within Ponds 21 and 76, and subsurface MEC removal within Pond 21 ([Figure 1-1](#)). The DGM survey within Unit 5 (which used three EM61 sensors on a towed array), excluded Ponds 21 and 76. Work within the vernal pool areas was only permitted during the dry season, and only small mechanical or manual equipment were used to remove vegetation. Subsurface investigation of Pond 21 occurred while the pond was dry and followed the Standard Operating Procedure for Soil and Vegetation Handling in Vernal Pools ([Attachment A](#)) in order to be protective of the biotic constituents of the vernal pool, specifically the soil layers.

No CTS, CRLF, or California linderiella were encountered by KEMRON on the former Fort Ord in 2021 or 2022.

2.1.5 Minimize Impacts to Black Legless Lizard

To minimize impacts to BLL, project 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.

No BLL were encountered during work activities by KEMRON on the former Fort Ord in 2021 or 2022.

2.2 Additional Environmental Protections

In addition to the mitigation and protection measures described above to avoid or reduce impacts to HMP species and habitats, the following environmental protection measures were implemented during this project.

2.2.1 Invasive Weed Control

Several invasive plant species are known to occur on the former Fort Ord, including iceplant (*Carpobrotus sp.*), French broom (*Genista monspessulana*), jubata (pampas) grass (*Cortaderia jubata*), and Klamathweed (*Hypericum perforatum*). 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* (CIPC, 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 outside of the former Fort Ord work areas, including those of subcontractors, before they are allowed to enter the site; 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.

Significant populations of invasive species have not been observed in Unit 5. Therefore, site-specific avoidance and minimization measures were not necessary during the work in 2021 and 2022, and applicable BMPs identified above were implemented.

2.2.2 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 monitored the work sites for potential erosion problems, and a final inspection was conducted at the conclusion of work within Unit 5 by the KEMRON Project Biologist. No erosion control materials were installed within Unit 5 in 2021 or 2022.

3.0 References

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

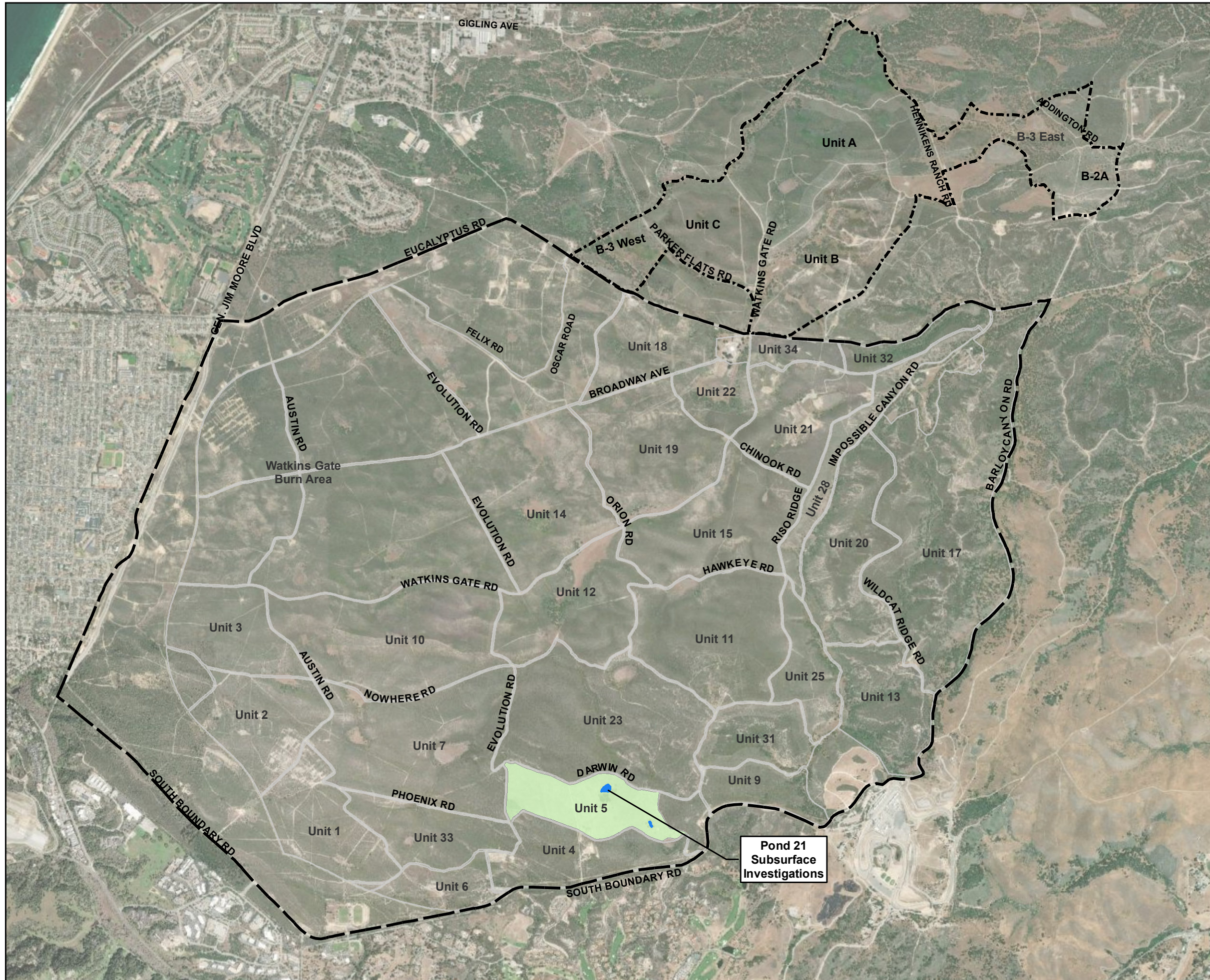
U.S. Army Corps of Engineers (USACE), 1997. *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord*. April. (AR# BW-1787)

U.S. Fish and Wildlife Service (USFWS), 1993. *Biological and Conference Opinion for the Disposal and Reuse of Fort Ord, Monterey County, California (1-8-93-F-14)*. October. (AR# OE-0045)

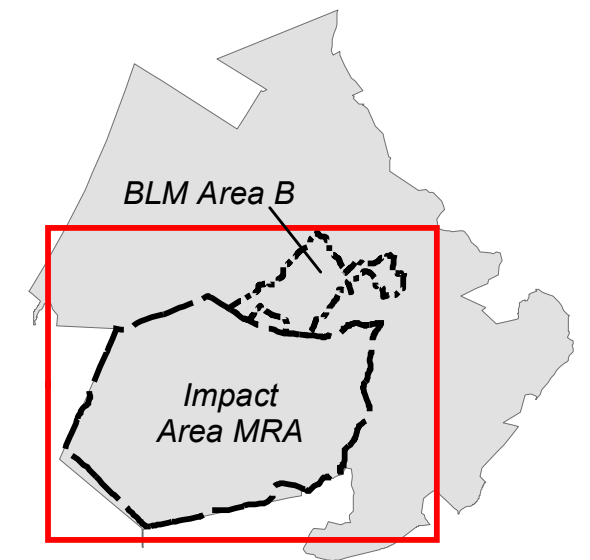
USFWS, 2015. *Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California (8-8-09-F-74)*. May. (AR# BW-2747)

USFWS, 2017. *Reinitiation of Formal Consultation for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California (Original Consultation 8-8-09-F-74, 81440-2009-F-0334)*. June. (AR# BW-2747A)

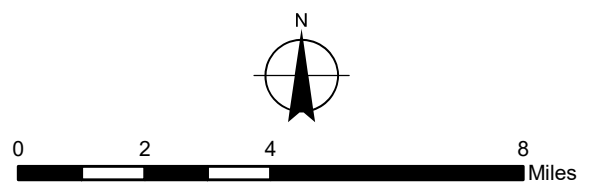
Figures



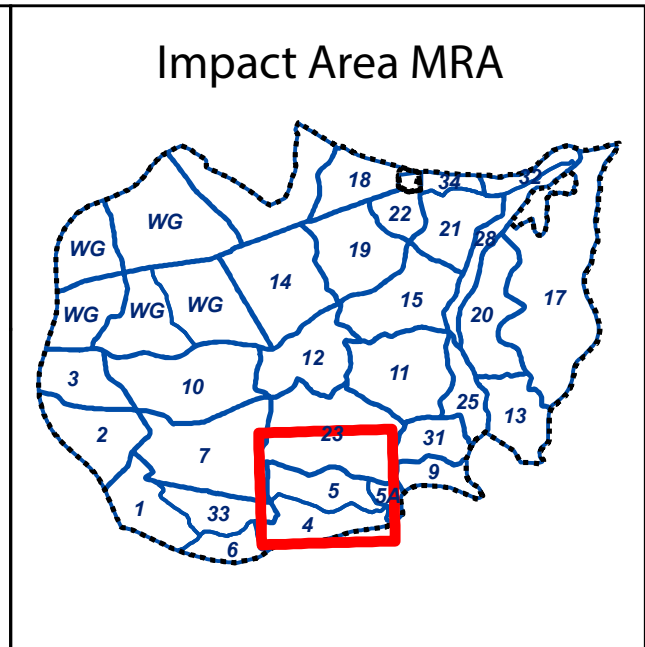
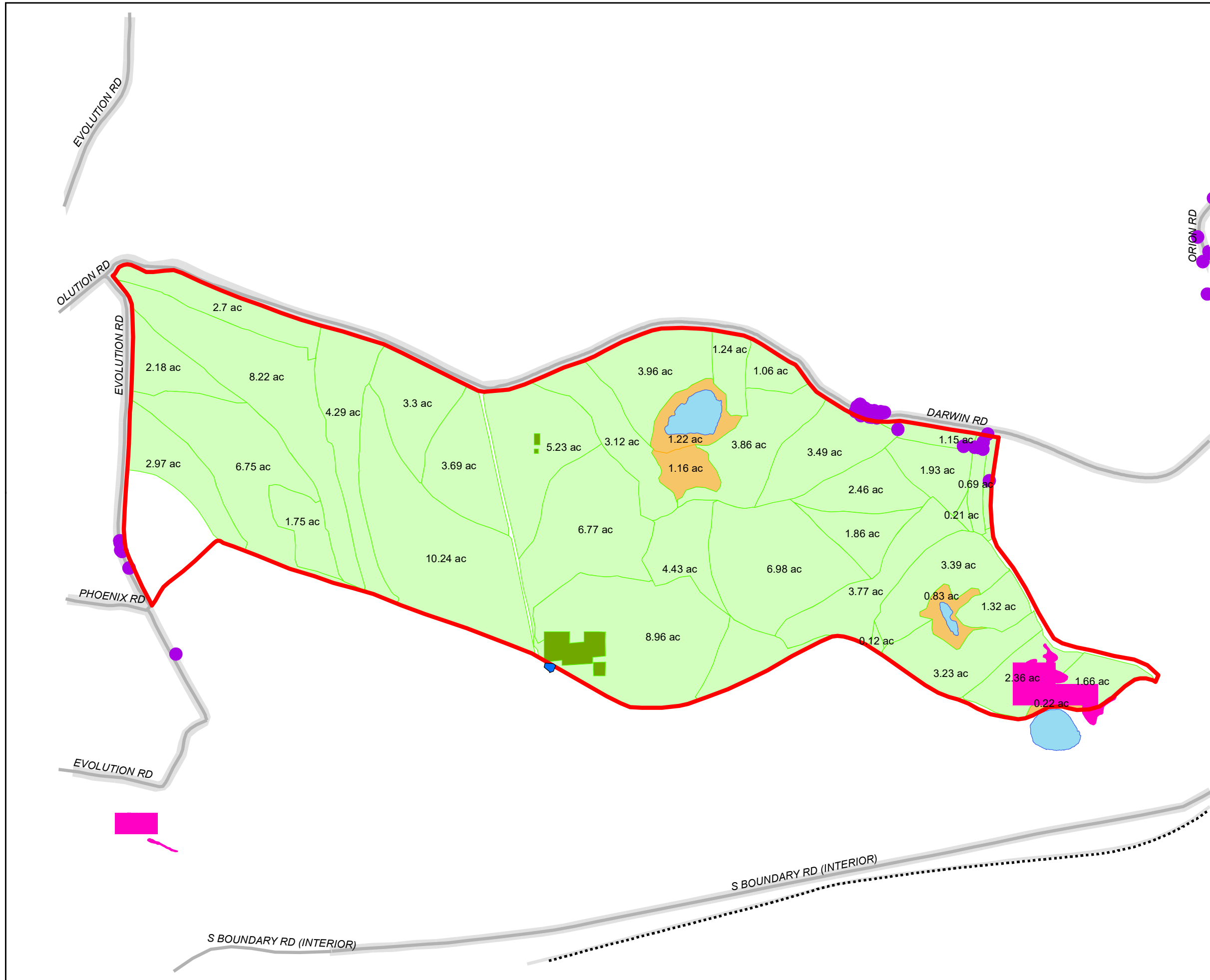
Former Fort Ord



	Impact Area MRA
	BLM Area B
	Burn Unit Boundaries
	Units Where Biological Monitoring Occurred



U.S. ARMY CORPS OF ENGINEERS SACRAMENTO DISTRICT		
FORMER FORT ORD		
FIGURE NUMBER 1-1	2021-2022 Annual Biological Monitoring Report Munitions Remediation Areas Where Biological Monitoring Occurred in 2021 & 2022	
DATE 3/8/2023	PROJECT NUMBER WP001	FILE NAME SEE FOOTER



Legend

- Roads
- Impact Area
- Chip Pile
- Unit Boundary
- Fuel Breaks
- Restoration Area
- Monterey spineflower
- Yadon's piperia
- Ponds

Vegetation Clearing Summary

- Manual Cut
- Mechanical Cut

Acres	Manual Cut	Mechanical Cut	Grand Total
Total	3.42	119.35	122.77

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

FORMER FORT ORD

FIGURE NUMBER 2-1	2021-2022 Annual Biological Monitoring Report	
	2021 Unit 5 Vegetation Removal Areas	

DATE	PROJECT NUMBER	FILE NAME
1/12/2023	WP001	SEE FOOTER

Tables

Table 2-1. 2021 and 2022 Work Area Activity Acreages

Year	Work Activities				
	Mechanical Vegetation Mastication	Manual Vegetation Removal	Surface MEC Removal	Subsurface MEC Investigation	DGM
Impact Area MRA – Unit 5					
2021	119.4	3.4	0	0	0
2022	0	0	124.7	0.85	123.7

Attachment A
Habitat Checklists (HCLs) for
Work Completed in 2021 and 2022

Attachment A Table of Contents

Unit 5 Mechanical and Manual Vegetation Removal, Surface MEC Removal, DGM HCL

Unit 5 Surface MEC Removal & DGM HCL

Unit 5 DGM & Pond 21 Subsurface Removal HCL

FORT ORD SITE HABITAT CHECKLIST

The following are requirements to minimize biological disturbances to protected species and habitat.

Please notify Jami Colley, Project Biologist (925-783-3112) or Patric Krabacher (831-583-5022), *before* proceeding if work tasks or work boundaries change, additional vegetation removal is necessary, vegetation cutting methods change, or any other conditions change. Field Supervisors must receive a copy of this checklist.

SITE:	Unit 5	DATE:	11-8-21
WORK TO BE CONDUCTED:	Mechanical and manual vegetation removal, surface MEC removal, DGM		

1. LAND USE:	<input checked="" type="checkbox"/> Habitat Reserve <input type="checkbox"/> Development Area <input type="checkbox"/> Other (specify):		
2. LANDOWNER:	<input checked="" type="checkbox"/> Army	Location:	
	<input type="checkbox"/> BLM	Location:	
	<input type="checkbox"/> Other:	Location:	

3. ENDANGERED, THREATENED, RARE, OR HMP-LISTED SPECIES	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Flagged/Marked		
Species:	California Tiger Salamander (CTS), Black Legless Lizard (BLL), Yadon's piperia, Monterey spineflower, HMP shrubs		
Location:	See attached map for known locations of HMP annual plants		
Grid Numbers:			

Restrictions:

- CTS encounters must be reported immediately to field supervisor and BRAC Biologist. Contact Jami Colley (925-783-3112), Patric Krabacher (831-583-5022), or Bart Kowalski (832-595-5569) to document, handle, or relocate CTS if encountered.
- Report all encounters of BLL and follow the BLL encounter protocol
- No vegetation removal shall occur from approximately February 1 to May 31 due to the presence of Monterey spineflower (see attached Sensitive Resources Map).
- No work shall occur in flagged areas of Yadon's piperia from February 1 until it has been determined by the KEMRON biologist that the plants are no longer blooming and have set seed (approximately August/September). Tracking of heavy equipment within these areas shall be the minimum necessary to complete the work and shall not be used for regular access (see attached Sensitive Resources Map).
- Piling of cut vegetation and staging of equipment in areas known to support Monterey spineflower and Yadon's piperia shall be avoided (see attached Sensitive Resources Map). Staging and stockpile areas shall be evaluated and approved by the Project biologist prior to use.
- Mature Toro manzanitas shall be retained to the greatest extent feasible. In areas where the density of Toro manzanita is high, individuals 10 feet or taller and shorter individuals with a very wide canopy cover shall be retained. In areas where the density of Toro manzanita is low, the largest, most mature individuals in that area shall be retained. Project Biologist shall evaluate and (where feasible) flag individual Toro manzanitas to be retained prior to vegetation removal. Masticator operators shall receive additional training from the Project Biologist in Toro manzanita identification and shall cut around the large individuals. If necessary, the remaining Toro manzanitas may be limbed up to 8 feet to allow access beneath the individuals for future surface clearance.

4. VERNAL POOLS/PONDS PRESENT		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Flagged/Marked
Location:	Unit 5: Pond 21 & Unnamed Pond, Unit 4: Pond 49			
Grid Numbers:				
Work Can Proceed in Pools/Ponds:		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Restrictions:				
<ul style="list-style-type: none"> Boundaries of the ponds shall be staked and flagged in coordination with the Project Biologist. No work shall occur within the vernal ponds while inundated or saturated, as determined by the Project Biologist (see attached Sensitive Resources Map). The Project Biologist shall complete surveys following rain events to determine if work can proceed within vernal ponds. Masticators shall not be permitted within 50 feet of the vernal ponds. A buffer of 50 feet from the ponds shall be staked and flagged for avoidance. Small equipment, such as a bobcat or other manual equipment may be used to remove vegetation within the vernal pond buffer if necessary. If significant rain events occur during the work period, the buffer may need to increase to 300 feet – increase in buffer size shall be coordinated with the BRAC Biologist. Manual methods shall be used for DGM within vernal ponds. 				

5. VEGETATION REMOVAL	
<input type="checkbox"/> No Removal Needed	Location:
<input checked="" type="checkbox"/> Manual Removal Needed	Location: Areas of dense oak woodland, within 50 feet of vernal pond, and areas inaccessible to masticators.
<input checked="" type="checkbox"/> Mechanical Removal Needed	Location:
Vegetation Removal Restrictions:	
<ul style="list-style-type: none"> Masticators shall not be used in dense areas of oak woodland or within 50 feet of the vernal ponds, as identified above. Small equipment or manual equipment shall be used in areas where masticators are not permitted or are unable to access. Coast live oak trees greater than 4" in diameter shall not be removed. Removal of coast live oak trees smaller than 4" in diameter shall be minimized to the greatest extent feasible. Coast live oak trees may be limbed up to 8 feet to allow access beneath the trees. No branches larger than 4" shall be cut from coast live oak trees. Branches shall be cut all the way up to the next branch. Toro manzanitas 10 feet in height or taller and any other flagged Toro manzanitas shall be preserved as identified above. 	

6. EROSION CONCERNS/SITE RESTORATION:
<ul style="list-style-type: none"> Use of heavy equipment on steep slopes may cause erosion. If soil erosion occurs during the rainy season appropriate erosion control measures must be taken, which may include use of straw wattles, straw bales, silt fencing, or sterile barley. Heavy equipment should minimize topsoil disturbance as much as possible, avoid making hard turns, and enter and exit the site from a limited number of routes. Equipment operators should minimize driving parallel to the slope to the greatest extent feasible to prevent creating rills.

7. SITE ACCESS:

- Vehicle access should be limited to existing roads and approved interior access roads (see attached Access Map). Use of interior access roads shall be minimized and used only when necessary. Parking of vehicles is allowed within fuel breaks along existing roads and on interior access roads.
- Heavy equipment transport from site to site must be along existing roads only.
- Equipment (skid steer) traffic to access any stockpiled vegetation shall be minimized to the greatest extent feasible.
- Restoration Areas shall not be used for access to other areas of the work area (see attached Sensitive Resources Map).

8. INVASIVE SPECIES:

- All equipment coming from off-site must be pressure-washed prior to entering habitat reserve areas to reduce the potential for spread of invasive plant species.

9. ADDITIONAL SITE CONCERNS:

- Only heavy equipment may be refueled in the field. All refueling of heavy equipment will be conducted on the approved roads. Spill control materials such as absorbent pads, noncombustible granular absorbent material, and polyethylene sheeting, will be immediately available to all refueling crews. No refueling shall occur within 400 feet of the vernal ponds.
- No work shall occur within Restoration Areas (staked/flagged; see attached Sensitive Resources Map).

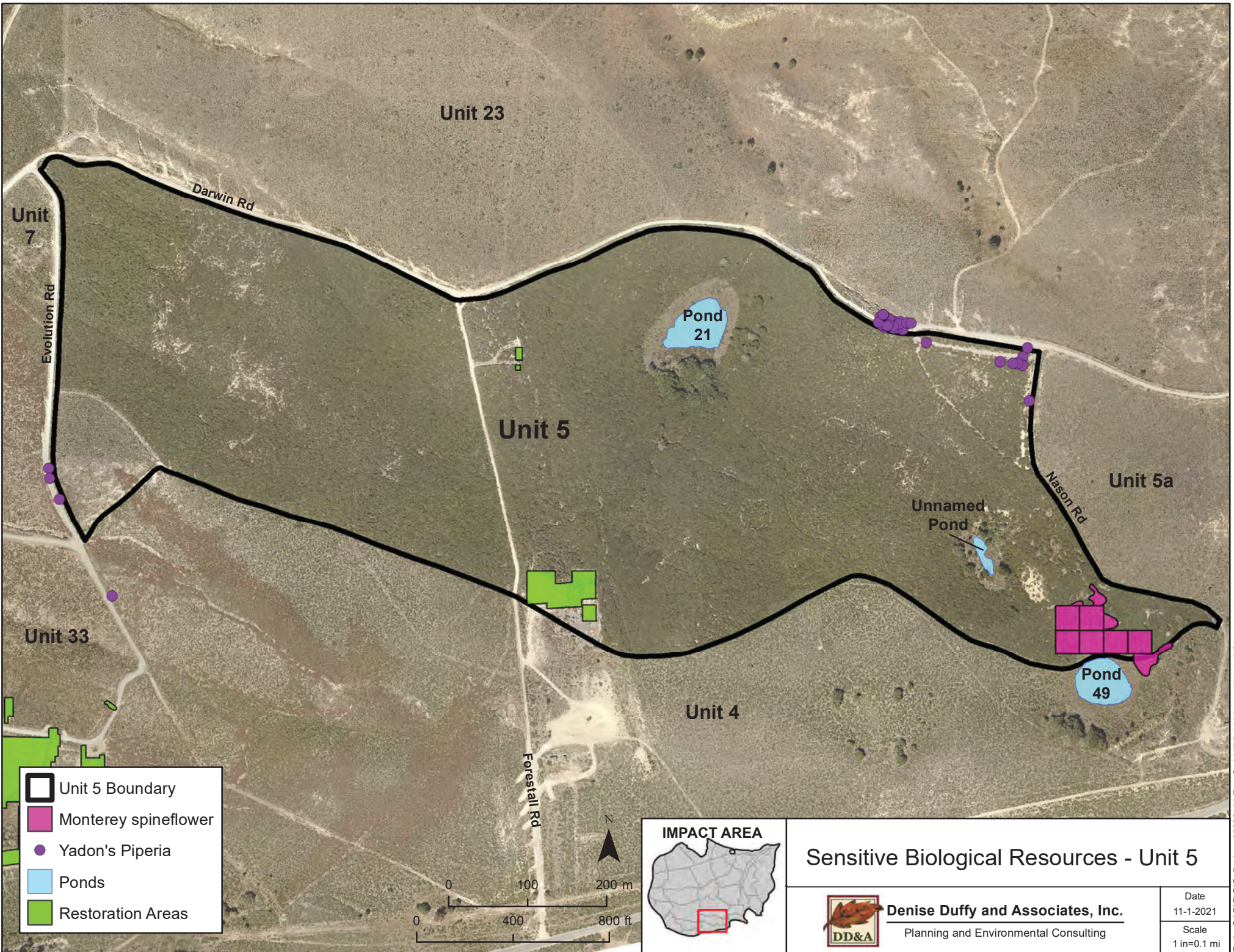
This checklist has been read, approved, and signed by the following:






Project Biologist: _____ *Jami Colley* _____ **Date:** 11-9-2021

QC Manager: _____ *Bruce McClain* _____ **Date:** 11-10-2021

BRAC Biologist: _____ KOWALSKI.BARTHOLOMEW.L.1 387978115 _____ **Date:** _____

Digitally signed by
KOWALSKI.BARTHOLOMEW.L.1387978115
Date: 2021.11.09 13:24:47 -08'00'



-  Unit 5 Boundary
-  Monterey spineflower
-  Yadon's Piperia
-  Ponds
-  Restoration Areas

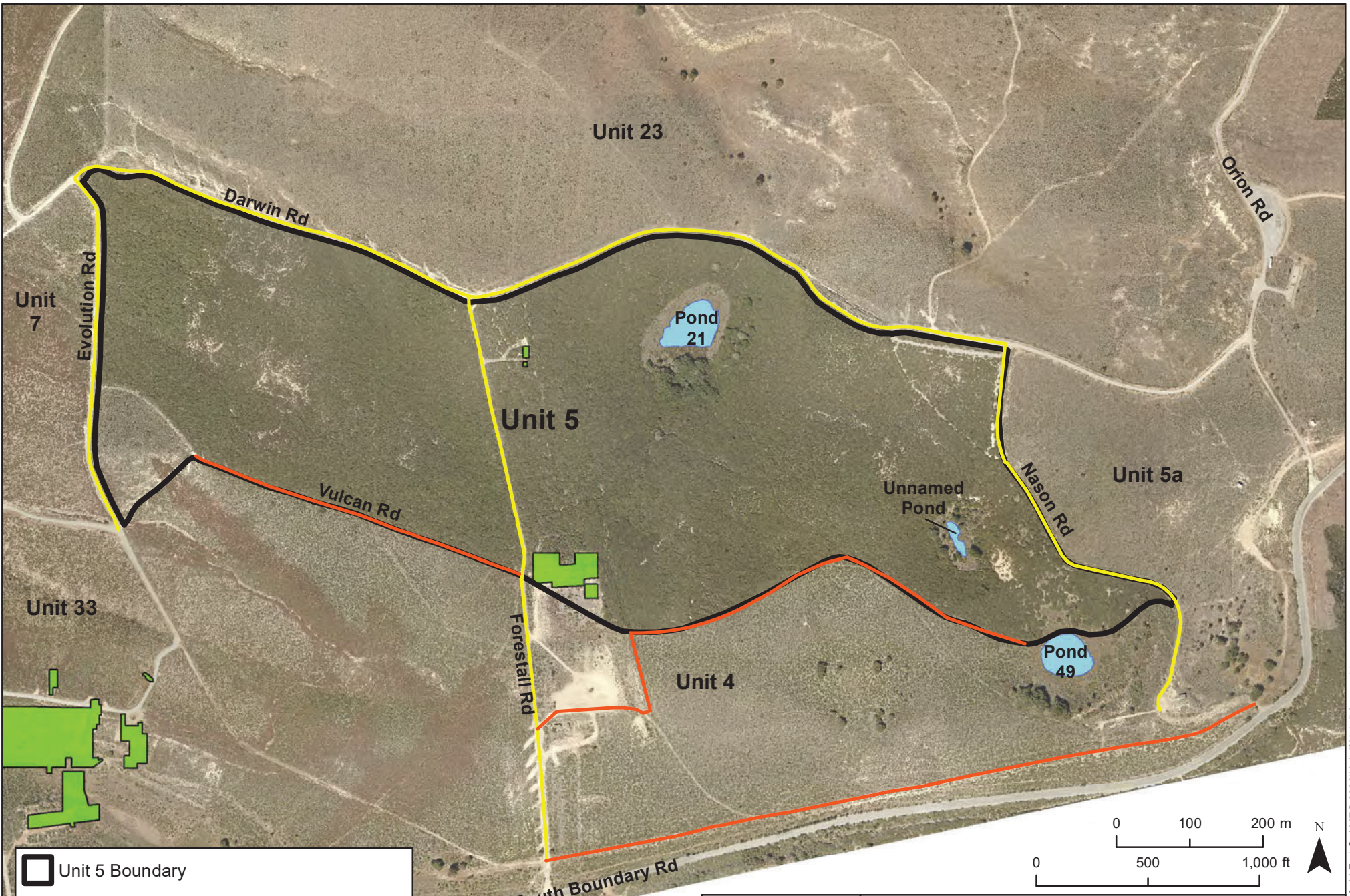







Sensitive Biological Resources - Unit 5

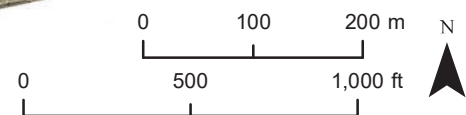


Denise Duffy and Associates, Inc.
 Planning and Environmental Consulting

Date	11-1-2021
Scale	1 in=0.1 mi



-  Unit 5 Boundary
-  Main Road
-  Approved Interior Access (As Needed Only)
-  Ponds
-  Restoration Areas (No Access)



Denise Duffy and Associates, Inc.
 Planning and Environmental Consulting

Date
 11-1-2021
 Scale
 1 in=0.1 mi

FORT ORD SITE HABITAT CHECKLIST

The following are requirements to minimize biological disturbances to protected species and habitat.

Please notify Jami Colley, Project Biologist (925-783-3112) or Patric Krabacher (831-583-5022), *before* proceeding if work tasks or work boundaries change, additional vegetation removal is necessary, vegetation cutting methods change, or any other conditions change. Field Supervisors must receive a copy of this checklist.

SITE:	Unit 5	DATE:	2-23-2022
WORK TO BE CONDUCTED:	Surface MEC removal & DGM		

1. LAND USE:	<input checked="" type="checkbox"/> Habitat Reserve	<input type="checkbox"/> Development Area	<input type="checkbox"/> Other (specify):
2. LANDOWNER:	<input checked="" type="checkbox"/> Army	Location:	
	<input type="checkbox"/> BLM	Location:	
	<input type="checkbox"/> Other:	Location:	

3. ENDANGERED, THREATENED, RARE, OR HMP-LISTED SPECIES	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Flagged/Marked
Species:	California Tiger Salamander (CTS), Black Legless Lizard (BLL), Yadon's piperia, Monterey spineflower, HMP shrubs
Location:	See attached map for known locations of HMP annual plants
Grid Numbers:	

Restrictions:

- CTS encounters must be reported immediately to field supervisor and BRAC Biologist. Contact Jami Colley (925-783-3112), Patric Krabacher (831-583-5022), or Bart Kowalski (832-595-5569) to document, handle, or relocate CTS if encountered.
- Report all encounters of BLL and follow the BLL encounter protocol
- No work shall occur in areas known to support Monterey spineflower from approximately February 1 to May 31 (see attached Sensitive Resources Map).
- No work shall occur in flagged areas of Yadon's piperia from February 1 until it has been determined by the KEMRON biologist that the plants are no longer blooming and have set seed (approximately August/September). Tracking of heavy equipment within these areas shall be the minimum necessary to complete the work and shall not be used for regular access (see attached Sensitive Resources Map).
- Staging of equipment in areas known to support Monterey spineflower and Yadon's piperia shall be avoided (see attached Sensitive Resources Map).

4. VERNAL POOLS/PONDS PRESENT		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Flagged/Marked
Location:	Unit 5: Pond 21 & Unnamed Pond, Unit 4: Pond 49			
Grid Numbers:				
Work Can Proceed in Pools/Ponds:		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Restrictions:				
<ul style="list-style-type: none"> Boundaries of the ponds shall be staked and flagged in coordination with the Project Biologist. No work shall occur within the vernal ponds while inundated or saturated, as determined by the Project Biologist (see attached Sensitive Resources Map). The Project Biologist shall complete surveys following rain events to determine if work can proceed within vernal ponds. Heavy equipment shall not be permitted within 50 feet of the vernal ponds. A buffer of 50 feet from the ponds shall be staked and flagged for avoidance. Manual methods shall be used for DGM within vernal ponds. 				

5. VEGETATION REMOVAL	
<input checked="" type="checkbox"/> No Removal Needed	Location:
<input type="checkbox"/> Manual Removal Needed	Location:
<input type="checkbox"/> Mechanical Removal Needed	Location:
Vegetation Removal Restrictions:	
<ul style="list-style-type: none"> 	


6. EROSION CONCERNS/SITE RESTORATION:
<ul style="list-style-type: none"> Use of heavy equipment on steep slopes may cause erosion. If soil erosion occurs during the rainy season appropriate erosion control measures must be taken, which may include use of straw wattles, straw bales, silt fencing, or sterile barley. Heavy equipment should minimize topsoil disturbance as much as possible, avoid making hard turns, and enter and exit the site from a limited number of routes. Equipment operators should minimize driving parallel to the slope to the greatest extent feasible to prevent creating rills.


7. SITE ACCESS:
<ul style="list-style-type: none"> Vehicle access should be limited to existing roads and approved interior access roads (see attached Access Map). Use of interior access roads shall be minimized and used only when necessary. Parking of vehicles is allowed within fuel breaks along existing roads and on interior access roads. Heavy equipment transport from site to site must be along existing roads only. Restoration Areas shall not be used for access to other areas of the work area (see attached Sensitive Resources Map).

8. INVASIVE SPECIES:
<ul style="list-style-type: none"> All equipment coming from off-site must be pressure-washed prior to entering habitat reserve areas to reduce the potential for spread of invasive plant species.

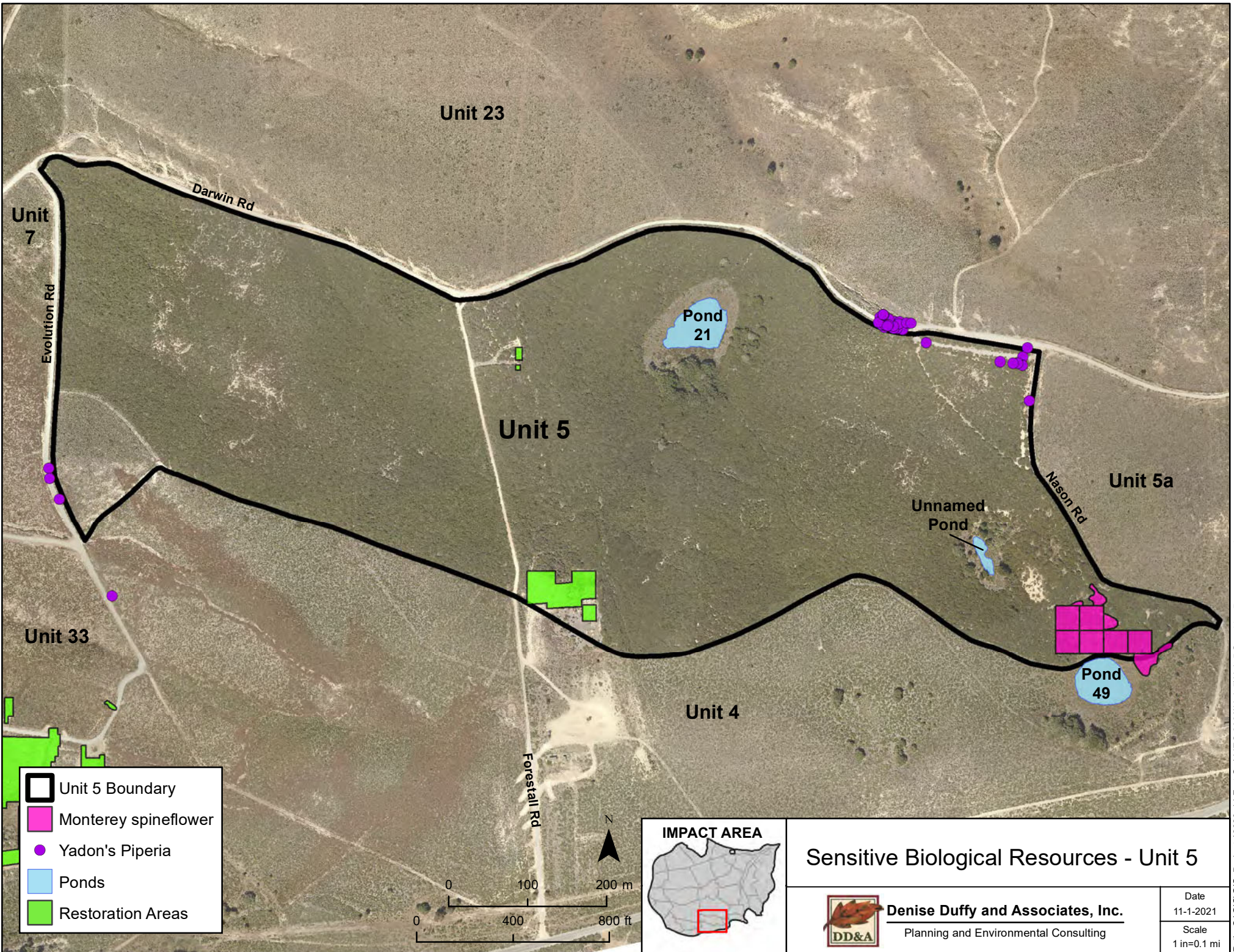
- 9. ADDITIONAL SITE CONCERNS:**
- Only heavy equipment may be refueled in the field. All refueling of heavy equipment will be conducted on the approved roads. Spill control materials such as absorbent pads, noncombustible granular absorbent material, and polyethylene sheeting, will be immediately available to all refueling crews. No refueling shall occur within 400 feet of the vernal ponds.
 - No work shall occur within Restoration Areas (staked/flagged; see attached Sensitive Resources Map).






This checklist has been read, approved, and signed by the following:

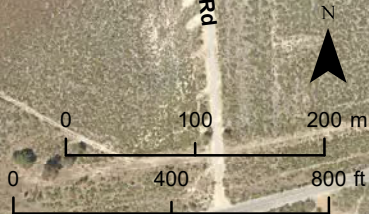
Project Biologist:  **Date:** 03-15-2022

QC Manager:  **Date:** 04-14-2022

BRAC Biologist: KOWALSKI.BARTHOLOMEW.L.1387978115 Digitally signed by KOWALSKI.BARTHOLOMEW.L.1387978115 Date: 2022.02.25 15:22:12 -08'00' **Date:** _____



-  Unit 5 Boundary
-  Monterey spineflower
-  Yadon's Piperia
-  Ponds
-  Restoration Areas

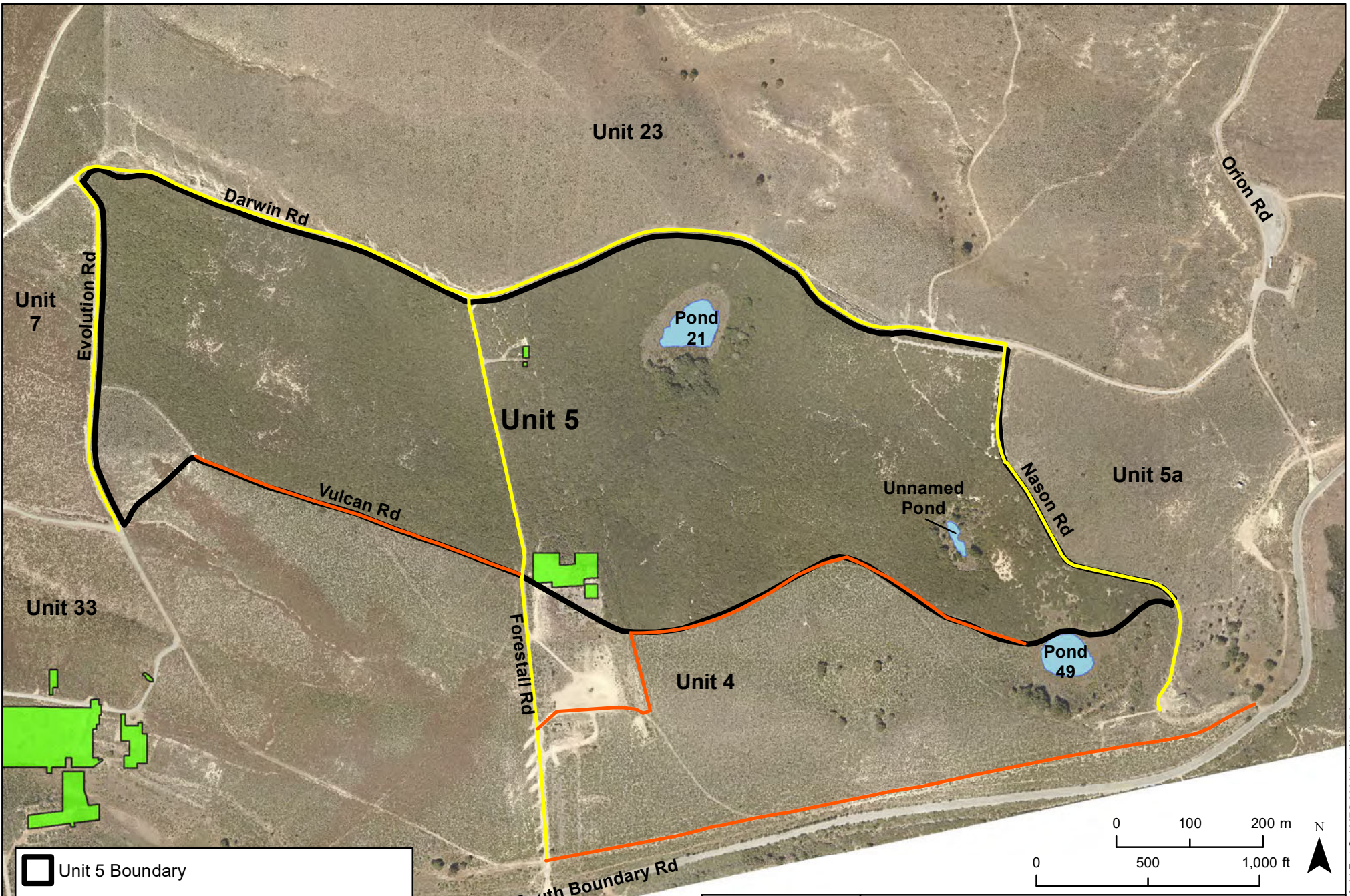







Sensitive Biological Resources - Unit 5

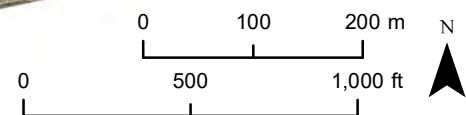


Denise Duffy and Associates, Inc.
 Planning and Environmental Consulting

Date
11-1-2021
 Scale
1 in=0.1 mi



-  Unit 5 Boundary
-  Main Road
-  Approved Interior Access (As Needed Only)
-  Ponds
-  Restoration Areas (No Access)



Access Map - Unit 5

Denise Duffy and Associates, Inc.
 Planning and Environmental Consulting

Date	11-1-2021
Scale	1 in=0.1 mi

FORT ORD SITE HABITAT CHECKLIST

The following are requirements to minimize biological disturbances to protected species and habitat.

Please notify Jami Colley, Project Biologist (925-783-3112) or Patric Krabacher (831-583-5022), *before* proceeding if work tasks or work boundaries change, additional vegetation removal is necessary, vegetation cutting methods change, or any other conditions change. Field Supervisors must receive a copy of this checklist.

SITE:	Unit 5	DATE:	8-29-2022
WORK TO BE CONDUCTED:	DGM and Pond 21 Subsurface Removal		

1. LAND USE:	<input checked="" type="checkbox"/> Habitat Reserve <input type="checkbox"/> Development Area <input type="checkbox"/> Other (specify):		
2. LANDOWNER:	<input checked="" type="checkbox"/> Army	Location:	
	<input type="checkbox"/> BLM	Location:	
	<input type="checkbox"/> Other:	Location:	

3. ENDANGERED, THREATENED, RARE, OR HMP-LISTED SPECIES	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Flagged/Marked		
Species:	California Tiger Salamander (CTS), Black Legless Lizard (BLL), Yadon's piperia, Monterey spineflower, HMP shrubs		
Location:	See attached map for known locations of HMP annual plants		
Grid Numbers:			

Restrictions:

- CTS encounters must be reported immediately to field supervisor and BRAC Biologist. Contact Jami Colley (925-783-3112), Patric Krabacher (831-583-5022), or Bart Kowalski (832-595-5569) to document, handle, or relocate CTS if encountered.
- If substantial rainfall (greater than 0.5 inch of rain in a 24-hour period) occurs, work activities must cease until the Service-approved biologist, and workers trained to identify CTS, have searched the work area for dispersing salamanders. Work activities may resume once the biologist and search crew have determined that CTS that could be killed or injured by work activities are not present in the work area.
- No work shall occur in areas known to support Monterey spineflower from approximately February 1 to May 31 (see attached Sensitive Resources Map).
- No work shall occur in flagged areas of Yadon's piperia from February 1 until it has been determined by the KEMRON biologist that the plants are no longer blooming and have set seed (approximately August/September). Tracking of heavy equipment within these areas shall be the minimum necessary to complete the work and shall not be used for regular access (see attached Sensitive Resources Map).
- Staging of equipment in areas known to support Monterey spineflower and Yadon's piperia shall be avoided (see attached Sensitive Resources Map).
- Toro manzanitas that were left standing following vegetation removal shall be avoided.

4. VERNAL POOLS/PONDS PRESENT		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Flagged/Marked
Location:	Unit 5: Pond 21 & Pond 76, Unit 4: Pond 49			
Grid Numbers:				
Work Can Proceed in Pools/Ponds:		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Restrictions:				
<ul style="list-style-type: none"> Boundaries of the ponds shall be staked and flagged in coordination with the Project Biologist. Manual methods only shall be used for DGM within vernal ponds. No heavy equipment will be permitted within the ponds. Heavy equipment shall not be permitted within 50 feet of the vernal ponds. A buffer of 50 feet from the ponds shall be staked and flagged for avoidance. No work shall occur within the vernal ponds while inundated or saturated, as determined by the Project Biologist (see attached Sensitive Resources Map). The Project Biologist shall complete surveys following rain events to determine if work can proceed within vernal ponds. Subsurface work shall be conducted as described in the SOP (Attached). 				

5. VEGETATION REMOVAL	
<input checked="" type="checkbox"/> No Removal Needed	Location:
<input type="checkbox"/> Manual Removal Needed	Location: Limited vegetation removal may be necessary within Pond 21
<input type="checkbox"/> Mechanical Removal Needed	Location:
Vegetation Removal Restrictions:	
<ul style="list-style-type: none"> Any vegetation removal necessary shall be completed manually using mowers, weed whackers, chainsaws, or similar equipment. No heavy equipment (such as a masticator) shall be used within the pond. Only the minimum amount of vegetation removal necessary to complete work shall be conducted. 	

6. EROSION CONCERNS/SITE RESTORATION:
<ul style="list-style-type: none"> Use of heavy equipment on steep slopes may cause erosion. If soil erosion occurs during the rainy season appropriate erosion control measures must be taken, which may include use of straw wattles, straw bales, silt fencing, or sterile barley. Heavy equipment should minimize topsoil disturbance as much as possible, avoid making hard turns, and enter and exit the site from a limited number of routes. Equipment operators should minimize driving parallel to the slope to the greatest extent feasible to prevent creating rills.

7. SITE ACCESS:
<ul style="list-style-type: none"> Vehicle access should be limited to existing roads and approved interior access roads (see attached Access Map). Use of interior access roads shall be minimized and used only when necessary. Parking of vehicles is allowed within fuel breaks along existing roads and on interior access roads. Heavy equipment transport from site to site must be along existing roads only. Restoration Areas shall not be used for access to other areas of the work area (see attached Access Map).

8. INVASIVE SPECIES:

- All equipment coming from off-site must be pressure-washed prior to entering habitat reserve areas to reduce the potential for spread of invasive plant species.

9. ADDITIONAL SITE CONCERNS:

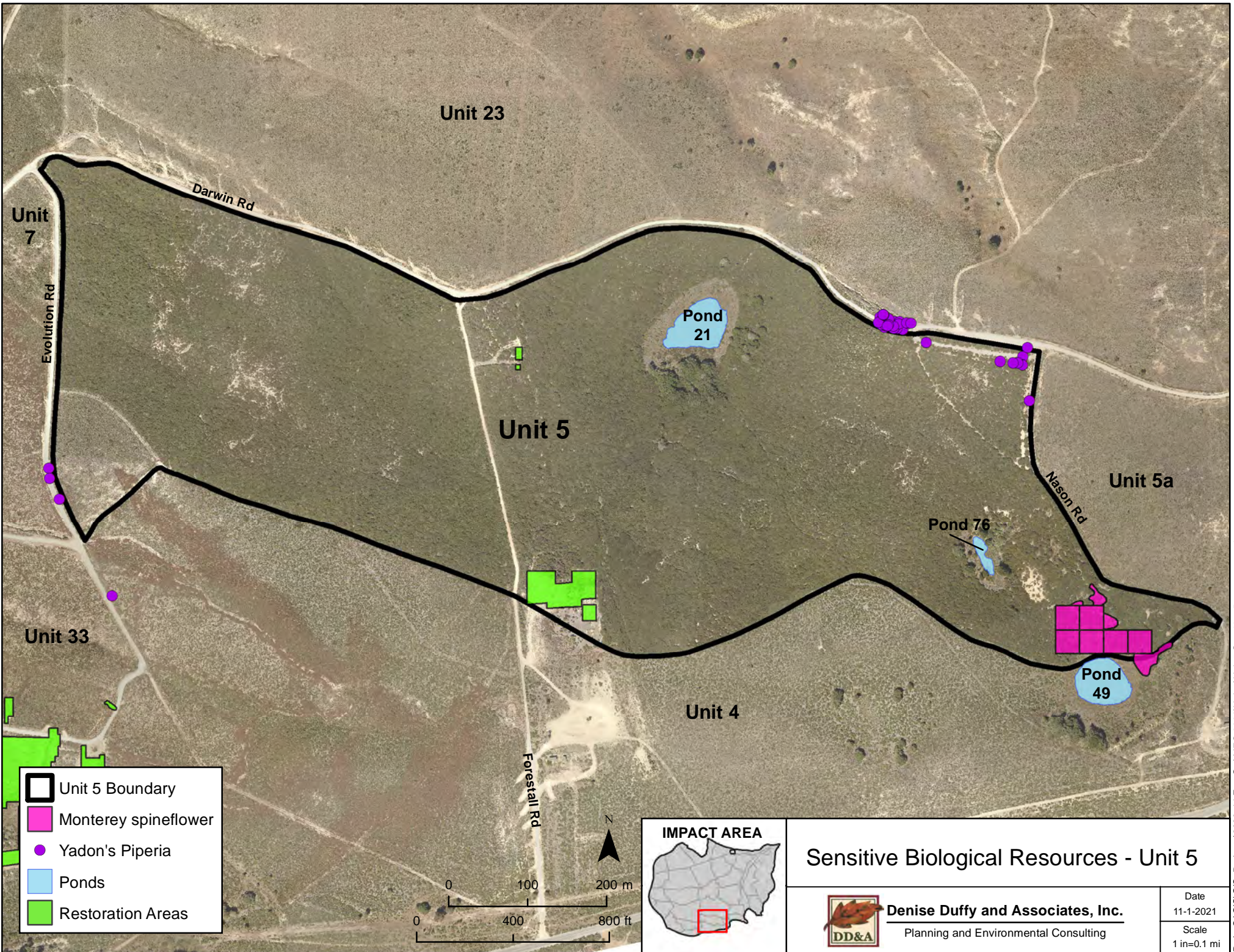
- Only heavy equipment may be refueled in the field. All refueling of heavy equipment will be conducted on the approved roads. Spill control materials such as absorbent pads, noncombustible granular absorbent material, and polyethylene sheeting, will be immediately available to all refueling crews. No refueling shall occur within 400 feet of the vernal ponds.
- No work shall occur within Restoration Areas (staked/flagged; see attached Sensitive Resources Map).






This checklist has been read, approved, and signed by the following:

Project Biologist: _____ *Jami Colley* _____ **Date:** 8-29-2022


QC Manager: _____ *Bruce McClain* _____ **Date:** 8-30-2022

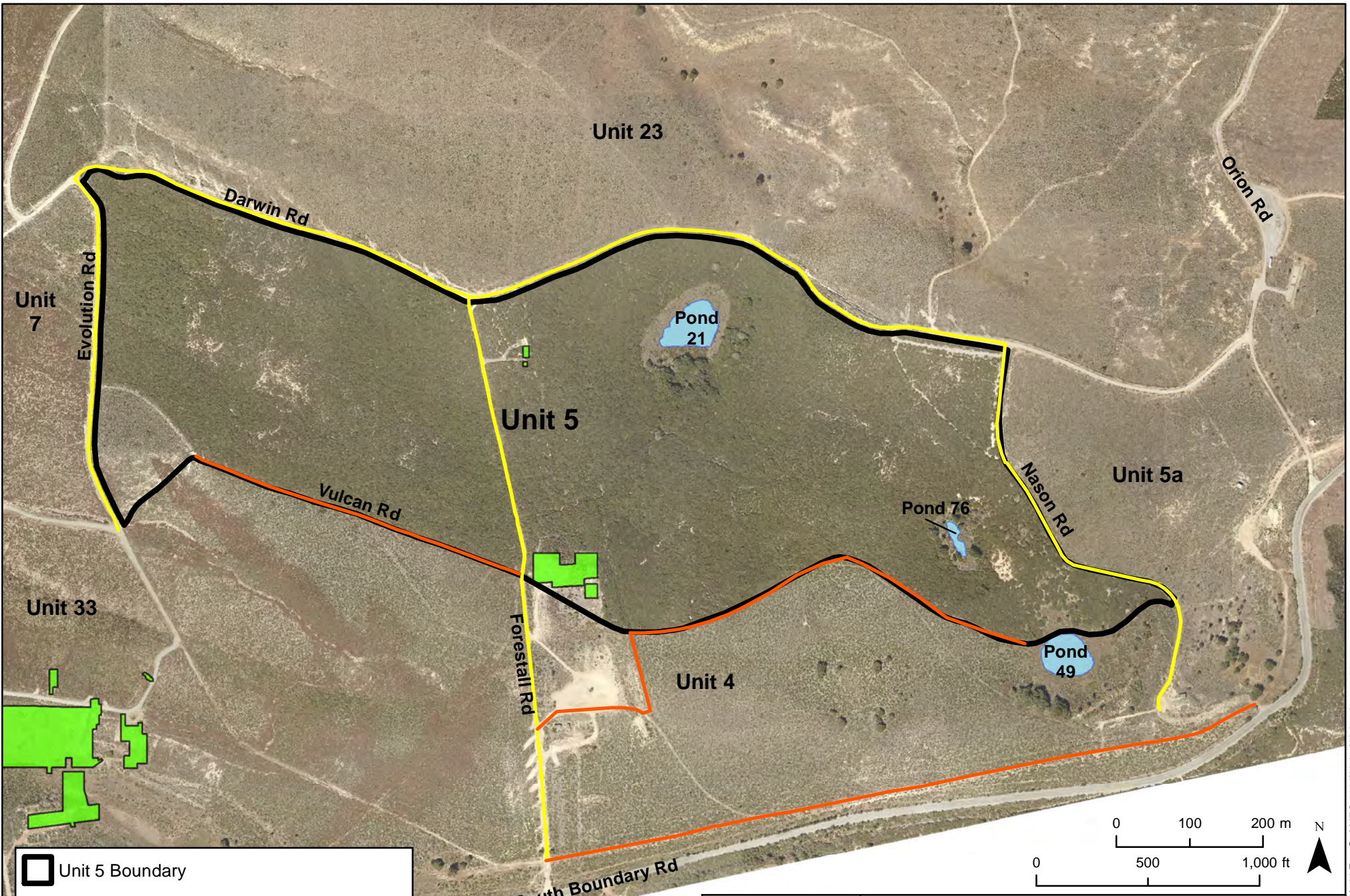
BRAC Biologist: _____ **Date:** _____








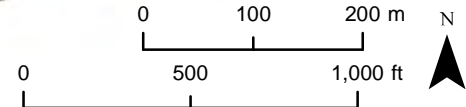
-  Unit 5 Boundary
-  Monterey spineflower
-  Yadon's Piperia
-  Ponds
-  Restoration Areas



<h2>Sensitive Biological Resources - Unit 5</h2>	
	Denise Duffy and Associates, Inc. Planning and Environmental Consulting
Date 11-1-2021	Scale 1 in=0.1 mi



-  Unit 5 Boundary
-  Main Road
-  Approved Interior Access (As Needed Only)
-  Ponds
-  Restoration Areas (No Access)



Access Map - Unit 5

Denise Duffy and Associates, Inc.
 Planning and Environmental Consulting

Date	11-1-2021
Scale	1 in=0.1 mi

Standard Operating Procedure for Soil and Vegetation Handling In Vernal Pools

PURPOSE:

The purpose of this standard operating procedure (SOP) is to describe the process that will be protective of biotic constituents of vernal pools affected by manual soil investigation activities in support of Munitions and Explosives of Concern (MEC) remedial investigations located in the BLM Area B and the Impact Area. Handling of soil and vegetation in aquatic features should be conducted under the guidance of the Wetland Monitoring and Restoration Plan for Munitions and Contaminated Soil Remedial Activities at Former Fort Ord (Burleson 2006); and in accordance with the Installation-Wide Multispecies Habitat Management Plan (HMP; USACE 1997). The work falls under the Programmatic Biological Opinion (PBO; USFWS 2017) issued to the United States Department of the Army to enable compliance with the federal Endangered Species Act and to avoid or minimize, to the extent feasible, take of listed species as well as protecting other species of concern and their habitats.

GEOLOGIC CONDITIONS:

Core sampling and GPR analysis were conducted across eight vernal pools in BLM Area B Subunits A and B. Core sampling identified clay layers with varying sand content present in all vernal pools sampled that became difficult to auger at depths around 10 inches and deeper. Three vernal pools had a second layer of clay around 12 inches that differed in color and texture. Based on the profiles of the cores and GPR results it is expected that most of the target digs will occur within clay layers, and that the excavations will not penetrate past them.

PROCEDURE:

MEC remedial investigation activities in identified vernal pools is required to make the vernal pools safe for entry when they are inundated with water. Targets will be acquired down to 18 inches. For each excavated target, soil will be stockpiled separately to allow for replacement that mirrors preexisting conditions after operations are complete, to the extent feasible. Soil disturbance activities will be conducted when the vernal pools are dry, as determined by the project biologist. Each excavated target will be backfilled with stockpiled soil immediately after the target is acquired.

The soil and vegetation handling process for each anomaly investigation shall be conducted as follows:

1. For each target, prior to any work, a digital photograph with a GPS tag should be taken of the target location with an engineer's ruler (Photo 1), and a whiteboard with the following information:

Date

Pond number

Unique target ID

2. In case that the location of the target is overgrown with vegetation, vegetation will be cut around the target and set aside in a pile.
3. During anomaly excavation the top 6 inches of topsoil layer should be removed first and set aside. Subsequent soil layers will be removed at 6 inch intervals down to the target item, but not further than 18 inches. Soils should be stockpiled into separate piles at 6 inch intervals and placed on wooden board or plastic sheet for easy transfer back into to the excavated area.
4. After acquisition of the target item is complete, a digital photograph with a GPS tag should be taken of the excavated area with an engineer's ruler placed in the X and Y axis for estimation of the excavated area. The photograph should also include a whiteboard with the following information:

Date

Pond number

Unique target ID

Depth of excavation

5. A digital photograph with a GPS tag should be taken of the separate soil piles with an engineer's ruler and the whiteboard with information from # 3 above.
6. The excavated area should be backfilled using soils in the reverse order that were excavated and were set aside. Each layer should be returned to its original position. During backfilling, the soil should be compacted at 6-inch intervals to help preserve the impermeability of the disturbed soil. Use enough water to moisten the soil, but not saturate it to ensure even compaction. Placement of hard chips may require breaking the large fragments of clay into smaller, more readily compacted pieces before placement. Use a compaction and breaker bar to compact the filled area uniformly, by dropping the bar 20 times from 1 foot height across the excavated area with the flat end (Photo 2). The final layer must be the top 6 inches saved from the surface. If vegetation was removed the clippings should be placed back on top of the excavation area.
7. After backfilling of the excavated area is complete, a digital photograph with a GPS tag should be taken of the backfilled area with an engineer's ruler placed approximately in the same position as in No. 4 above. The photograph should also include a whiteboard with the following information:

Date

Pond number

Unique target ID

Depth of excavation



Photograph 1. Suggested example of an engineer's ruler.



Photograph 2. Suggested example of a compaction and breaker bar.

REFERENCES:

[Burleson] Burleson Consulting, Inc. 2006. Wetland monitoring and restoration plan for munitions and contaminated soil remedial activities at former Fort Ord, California.

[USACE] U.S. Army Corps of Engineers. 1997. Installation-wide multi-species habitat management plan for former Fort Ord, California. April. Sacramento, California.

[USFWS] U.S. Fish and Wildlife Service. 2017. Reinitiation of Formal Consultation for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California (Original Consultation #8-8-09-F-74, 81440-2009-F-0334).