

**2015 ANNUAL BIOLOGICAL MONITORING REPORT, FORT ORD
DUNES STATE PARK, FORMER FORT ORD, CALIFORNIA**



Prepared for:

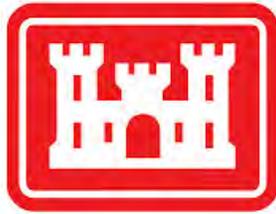
**U.S. Army Corps of Engineers
Sacramento District
1325 J Street
Sacramento, CA 95814-2922**

**Prepared by:
Bart Kowalski
Chenega Support Services**

April 2016

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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

CDFW	California Department of Fish and Wildlife
FODSP	Fort Ord Dunes State Park
ft ²	square feet
GIS	geographic information system
GPS	global positioning system
GWETS	groundwater extraction and treatment system
HGL	HydroGeoLogic, Inc.
HMP	Habitat Management Plan
OU	operable unit
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

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1.0 INTRODUCTION

This report describes the methods and results for the 1st year follow up monitoring of rare plants after the destruction of 21 wells in Operable Unit 2/12 (OU 2/12), as well as methods and set up for the study of survivorship of seacliff buckwheat (*Eriogonum parvifolium*) plants in Site 3 restoration area located in Fort Ord Dunes State Park (FODSP), former Fort Ord, California.

The 21 wells destroyed at FODSP were a subset of wells that were no longer needed for collection of groundwater chemical data and/or water level data as part of the groundwater remediation activities at OU 2/12 (Figure 1). The Army obtained concurrence from the U.S. Fish and Wildlife Service (USFWS) that the removal of 21 wells on State Parks property was not likely to adversely affect listed species if specific avoidance and minimization measures were implemented (USFWS 2014). The description of well destruction activities are described in the HGL report (HGL 2014). In accordance with the conservation measures outlined in the Programmatic Biological Opinion (USFWS 2015) the Army will conduct three years of follow-up monitoring for federally listed species Monterey spineflower (*Chorizanthe p. pungens*) at the locations of destroyed wells to assess the impact of the activity. This report covers the first year of follow up monitoring for Monterey spineflower at FODSP.

Following lead cleanup activities at Site 3, two restoration sites were identified within coastal dune scrub habitat for habitat restoration to demonstrate that this plant community can be self-sustaining within non-remediated areas with no deleterious effects to native dune vegetation from residual metals in soil (Shaw 2008). The sites were planted with native species, including Seacliff buckwheat (*Eriogonum parvifolium*) - a host plant to the endangered Smith's blue butterfly (*Euphilotes enoptes smithi*), to determine whether healthy dune vegetation can be reintroduced in non-remediated areas. The restoration sites were located in the so called 'blue zones' which were identified as having 1-10 percent ammunition cover, and had no soil remediation, while the corresponding reference sites were located in the remediated areas (Shaw 2008). Beginning in 2010, annual monitoring was conducted at these sites to measure plant health and habitat characteristics (State Parks 2010, 2011, 2012, 2013, 2014). After 5 years of monitoring, all of the success criteria outlined in the Site 3 Habitat Restoration and Monitoring Plan (Shaw 2008) have been met, except for buckwheat planting survivorship and the difference in the number of leaves and peduncle lengths between the restoration and the reference sites. These differences may likely have been due to the ongoing drought and high level of herbivory (State Parks 2014). California Department of Fish and Wildlife (CDFW) expressed concern about the unexplained die off of the seacliff buckwheat, and the Army decided to conduct

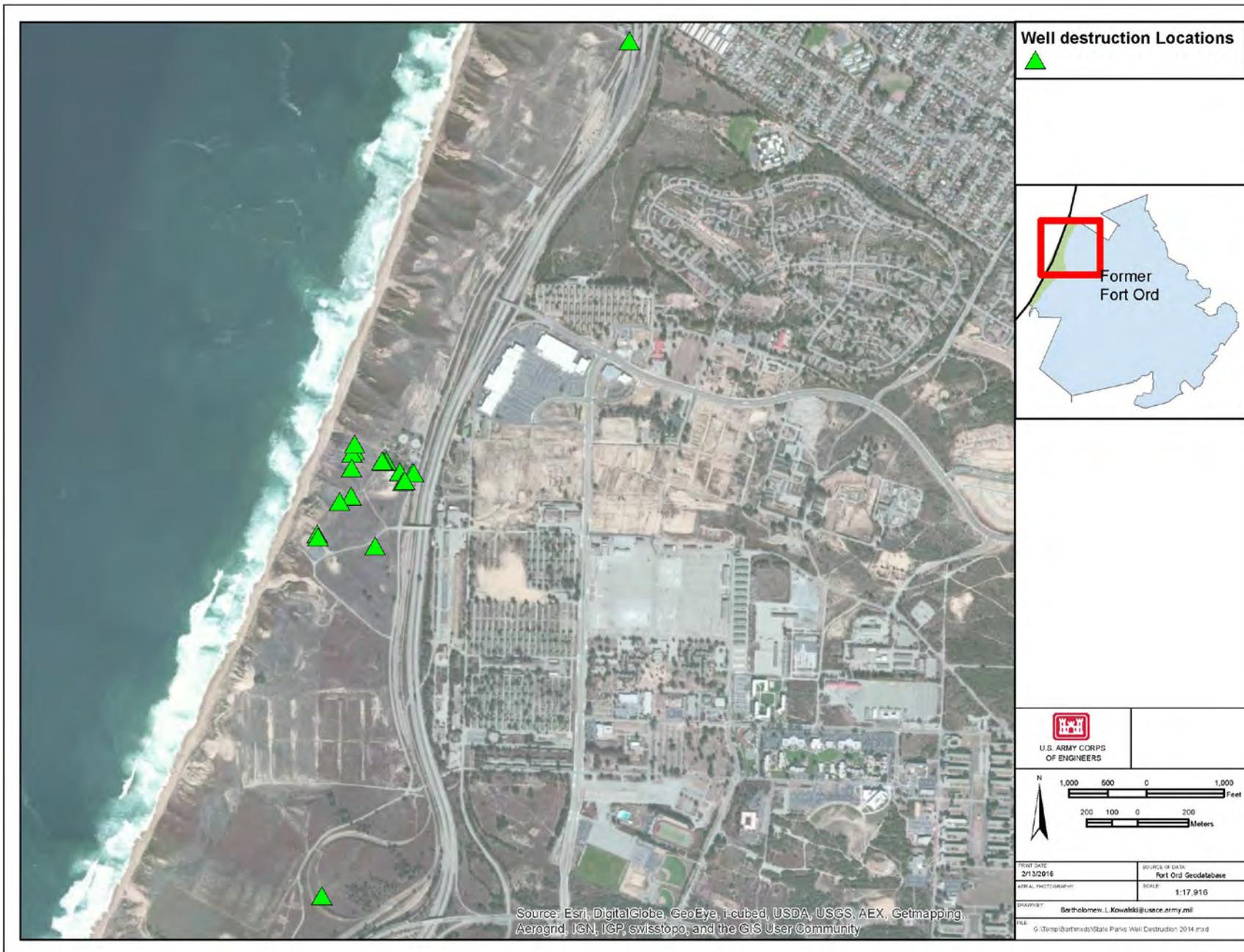


Figure 1. Locations of wells destroyed in 2014 in Fort Ord Dunes State Park

additional monitoring of buckwheat plants to determine if there are differences between buckwheat survivorship in non-remediated and reference areas that could be attributed to remaining metal in the soil. This report outlines the procedures for that monitoring.

2.0 SITE DESCRIPTION

Fort Ord was established in 1917 as a military training base for infantry troops. In January 1991, the U.S. Secretary of Defense announced the closure of the base. In September 2006, portions of the property were transferred to California Department of Parks and Recreation, and the FODSP was opened to the public in February 2009.

The former Fort Ord is located in the northwestern part of Monterey County, California, on the boundary of Monterey Bay, approximately 80 miles south of San Francisco. FODSP is located along the coast, west of California State Highway 1, between the cities of Marina and Seaside. FODSP includes approximately 990 acres of parkland, including 4 miles of ocean beach. FODSP is characterized by coastal dunes and dune habitat with extensive areas dominated by ice plant (*Carpobrotus* species). The area's maritime climate is characterized by cool, overcast, foggy summers, and cool rainy winters, with the warmest days generally occurring in late summer and early fall.

Several federally protected species are known or suspected to be present within the FODSP. These include the federally threatened Monterey spineflower, and the endangered Smith's blue butterfly. Several special status plant and animal species are also present in the FODSP and include the following:

- Coast wallflower (*Erysimum ammophilum*);
- Coast buckwheat (*Eriogonum latifolium*);
- Seacliff buckwheat (*Eriogonum parvifolium*);
- California legless lizard (*Anniella pulchra*).

The California legless lizard (*Anniella pulchra*) and coast wallflower (*Erysimum ammophilum*) are species identified in the Habitat Management Plan (HMP, Army 1997), while both buckwheat species are host plants to the endangered Smith's blue butterfly (*Euphilotes enoptes smithi*).

3.0 OVERVIEW OF PLANT SURVEY METHODS

Baseline survey for special status plants in proximity to the 21 wells slated for destruction was conducted on April 28, 2014. The survey was timed to coincide with the peak blooming period which was determined by observing known occurrences of the species in the nearby areas.

Each rare plant survey was conducted along well locations and existing or proposed access routes. The width of the survey area was approximately 30 feet around the wells and beyond the edge of the roadway on either side. If a rare plant was identified, the survey in that area was extended to the boundary of the population encountered.

Seacliff buckwheat survivorship monitoring at the restoration sites was conducted during the annual surveys (State Parks 2010, 2011, 2012, 2013, 2014). In 2009, one year after initial planting, the buckwheat survivorship in Site A was 90% and 85% at Site B (State Parks 2010). In 2012, a downward trend in buckwheat percent cover was observed at Site B. In 2013, one year after additional planting of 198 buckwheat plants at Site B, the buckwheat survivorship was only 3%.

The survivorship monitoring methodology proposed in this report differs from the previous surveys in that it is specifically designed to compare survivorship of buckwheat plants between the non-remediated restoration site (Site B) and the remediated reference sites (Sites Ax and Bx). Results of the comparison of buckwheat survivorship between remediated and non-remediated areas will aid in determination if the cause of the die off observed at Site B was caused by residual metals in the soil.

3.1 Monterey Spineflower Survey Methods

Large areas of Monterey spineflower were mapped as polygons using a GPS unit. Plant groups of 5 or less were mapped as points with attributes to identify the number of individuals at each location. When a Monterey spineflower was identified, the survey in that area was extended to the boundary of the population encountered. In larger populations, Monterey spineflower was characterized according to the percent of cover; specifically, the percentage of the polygon covered by the Monterey spineflower divided by the total area enclosed within the polygon. The cover classes are defined as follows:

- Very Sparse (corresponding to an absolute cover of less than 3 percent);
- Sparse (3 to 25 percent);
- Medium Low (26 to 50 percent);
- Medium (51 to 75 percent);
- Medium High (76 to 97 percent); and

-
- Very High (greater than 97 percent).

The first year follow up monitoring was conducted on April 29, 2015.

3.2 Buckwheat survivorship methods

The objective of the buckwheat survivorship study is to compare survivorship of buckwheat plants between the non-remediated restoration site (Site B, where low survivorship was observed) and the remediated reference sites. Previous buckwheat survivorship monitoring was conducted only at the non-remediated restoration sites, and it was impossible to determine if the low survivorship at Site B differed from the adjacent remediated areas. Thus, the cause of the buckwheat die off and low survivorship could not be determined. While presence of metals in the soil at the non-remediated site is a concern, State Parks reported that other environmental factors, such low precipitation or herbivory may have been the cause (State Parks 2013). Low precipitation is not expected to be an issue this first monitoring year, as the El Nino weather pattern is expected to result in the above average precipitation year. While it is possible that herbivory will vary between the sites, its effects can generally be observed. Thus differences in survivorship rates between non-remediated and remediated sites that could not be explained by herbivory would be a cause for further investigation.

A power analysis was conducted in order to determine how many seacliff buckwheat plants would need to be monitored in order to be able to detect a difference in survivorship that could be attributed to geographical location. It was estimated that around 100 plants should be monitored for survivorship. The following actions were completed between June 11 and 23, 2015.

- Marked and GPS'ed 50 healthy buckwheat plants in the remediated area (near site Bx)
- Marked and GPS'ed 30 healthy buckwheat plants in the adjacent non-remediated area (near site B)
- Marked and GPS'ed additional healthy 19 buckwheat plants in non-remediated area (near site A)

Healthy plants were assumed as those that had greater than 50% of stems with green leaves. The marked plants will be revisited in approximately a year's time and their status recorded. This data will then be analyzed using survivorship models developed in the power analysis.

4.0 RESULTS OF 2015 PLANT SURVEY

4.1 Monterey spineflower results

Monterey spineflower was found only in proximity to one well (PZ-02-05-180) on FODSP property during baseline surveys in 2014. There were three Monterey spineflower populations in the Sparse density category covering 1036 ft², one population in the Very Sparse category covering 24 ft², and three locations with fewer than 5 plants (Figure 2)

In the 2015 follow up survey, there were two Monterey spineflower populations in the Sparse density category covering 969 ft². Two populations identified in baseline were not found during the first year follow up surveys (Figure 2).

4.2 Buckwheat survivorship results

There are no results to report on buckwheat survivorship. The first follow up survey will occur in spring 2016, and will be reported in 2017.

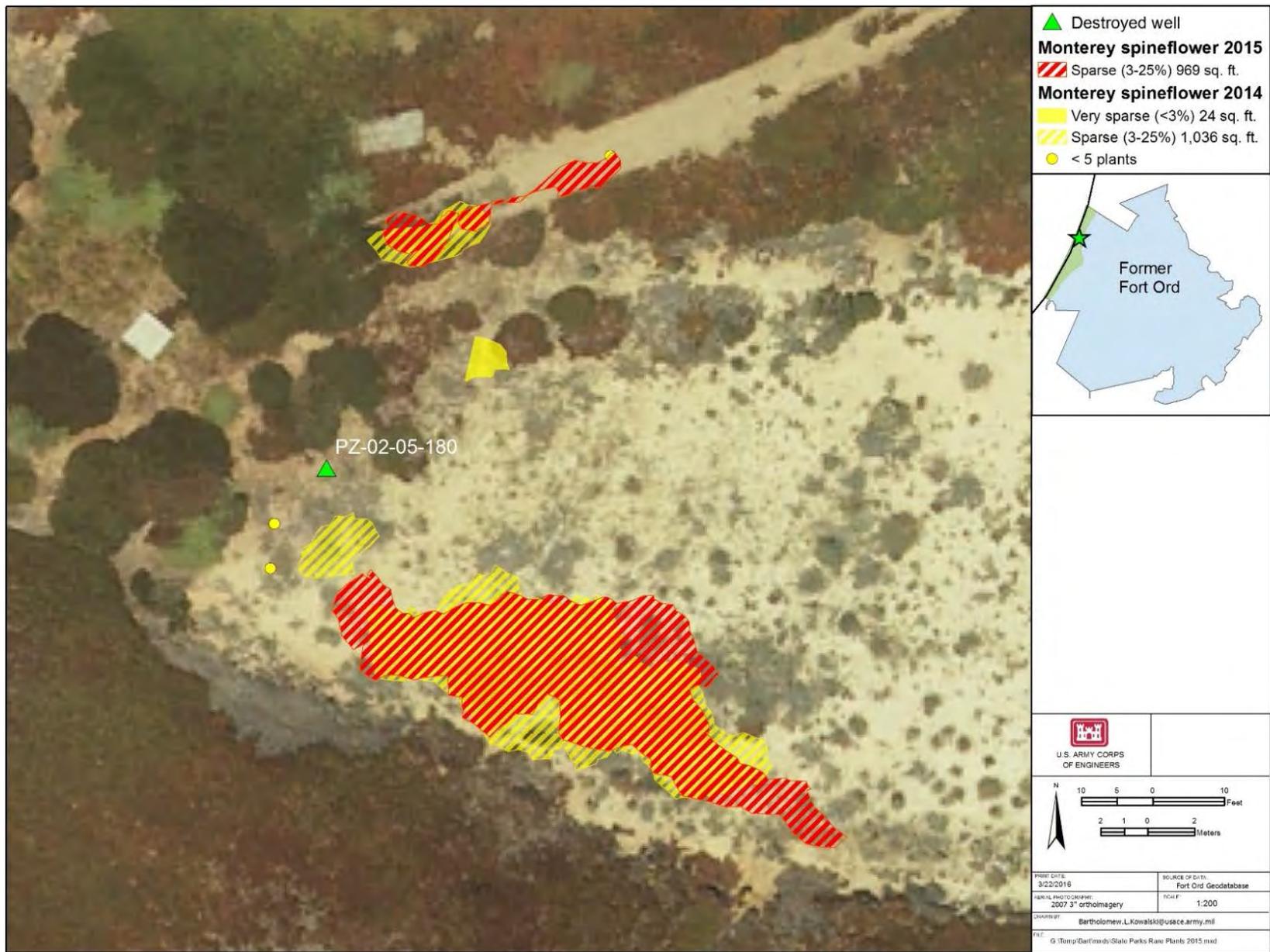


Figure 2. Results of baseline and first year follow up monitoring of Monterey spineflower near well PZ-02-05-180

5.0 DISCUSSION

5.1 Monterey Spineflower

Well destruction efforts were undertaken by HGL in 2014 to remove 21 groundwater treatment and monitoring wells within the Operable Unit 2/12 portion of the FODSP. Well destruction activities at well PZ-02-05-180 included the following;

- Conducting baseline surveys for special status species
- Marking the present special status species in the field
- Developing a Habitat Checklist for the field crews
- Giving environmental awareness training to the field crews
- Presence of a qualified biologist overseeing destruction activities
- Staging equipment outside of the areas with special status species
- Pressure filling the well with bentonite using a hose

Well PZ-02-05-180 was a flush mounted well and it did not require removal of any well casings or bollards, thus no heavy equipment was utilized near that well. Considering all the precautions taken to minimize impact to the special status species around the wells, the decreased area covered by Monterey spineflower may not have been a result of the well destruction activities. There are several environmental factors that affect the amount of Monterey spineflower that blooms in a given year, the length of time since El Niño events being an important factor (Fox et al., 2006). The well locations will be monitored for an additional two years, as required per the 2015 BO.

5.2 Seacliff buckwheat

The first follow up survey of seacliff buckwheat will occur in spring 2016, and will be reported in 2017.

6.0 CONCLUSIONS AND RECOMMENDATIONS

This is the first year of follow up surveys after destruction of 21 wells on FODSP. Baseline surveys indicated Monterey spineflower presence in proximity to one well. First year follow up survey identified Monterey spineflower was present, but covered a smaller area. The trend of Monterey spineflower population at that well will be monitored for additional two years. There are no recommendations at this time.

7.0 REFERENCES

- California State Parks, (State Parks), 2010. 2009 Habitat Restoration and Monitoring Report, Non-remediated Areas, Fort Ord Dunes State Park, Former Fort Ord, California. Administrative Record Series Number BW-2526A.
- California State Parks, (State Parks), 2011. 2010 Habitat Restoration and Monitoring Report, Non-remediated Areas, Fort Ord Dunes State Park, Former Fort Ord, California. Administrative Record Series Number BW-2549A.
- California State Parks, (State Parks), 2012. 2011 Habitat Restoration and Monitoring Report, Non-remediated Areas, Fort Ord Dunes State Park, Former Fort Ord, California. Administrative Record Series Number BW-2595A.
- California State Parks, (State Parks), 2013. 2012 Habitat Restoration and Monitoring Report, Non-remediated Areas, Fort Ord Dunes State Park, Former Fort Ord, California. Administrative Record Series Number BW-2638.
- California State Parks, (State Parks), 2014. 2013 Habitat Restoration and Monitoring Report, Non-remediated Areas, Fort Ord Dunes State Park, Former Fort Ord, California. Administrative Record Series Number BW-2677B.
- Fox, L., H. Steele, K. Holl, and M. Fusari. 2006. Contrasting demographics and persistence of rare annual plants in highly variable environments. *Plant Ecology*. Vol 183. Pp. 157-170.
- HydroGeoLogic, Inc. (HGL), 2014. Well Destruction and Former OU-1 Treatment Plant Decommissioning Completion Report, Former Fort Ord, California. August. Administrative Record Series Number OU1-611A.
- Shaw Environmental, Inc. (Shaw), 2008. Final Habitat Restoration And Monitoring Plan Non-remediated Areas, Fort Ord Dunes State Park (Formerly Site 3), Former Fort Ord, California. June. Administrative Record Series Number BW-2279J.
- U.S. Army, 1997. Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California. April. Administrative Record Series Number BW-1787.
- United States Fish and Wildlife Service, (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. Administrative Record Series Number BW-2747.
- USFWS, 2014. Well Abandonment Activities conducted by the U.S. Department of the Army on Fort Ord Dunes State Park, Marina, Monterey County, California. May 21. Administrative Record Series Number BW-2715.1.

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