2016 ANNUAL REPORT
WETLAND VEGETATION AND WILDLIFE MONITORING
CONTRACT NO. W91238-14-D-0010-0004

FORMER FORT ORD

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March 2017

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ACRONYMS AND ABBREVIATIONS

USACE	United States Army Corps of Engineers
BO	Biological Opinion
Burleson	Burleson Consulting, Inc.
CDFW	California Department of Fish and Wildlife
CNPS	California Native Plant Society
CTS	California Tiger Salamander
DD&A	Denise Duffy and Associates, Inc.
DQO	Data Quality Objectives
FAC	Facultative Plant
FACU	Facultative Upland Plant
FACW	Facultative Wetland Plant
fairy shrimp	California Fairy Shrimp
FNU	Formazin Nephelometric Unit
HMP	Habitat Management Plan
m	meter(s)
mg/L	milligram(s) per liter
NCDC	National Climatic Data Center
NOAA	National Oceanic and Atmospheric Administration
NPS	Naval Postgraduate School
NWSFO	National Weather Service Forecast Office
NL	Not Listed
OBL	Obligate Wetland Plant
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UXO	Unexploded Ordnance
UPL	Obligate Upland Plant
Wetland Plan	Wetland Monitoring and Restoration Plan for Munitions and Contaminated Soil Remediation

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1 INTRODUCTION

The United States Army Corps of Engineers (USACE) contracted Burleson Consulting, Inc. (Burleson) to conduct wetland monitoring at former Fort Ord, Monterey County, California (see Figure 1-1). Wetland monitoring includes three types of monitoring: hydrology, vegetation, and wildlife. These monitoring activities are centered around historic vernal pools on former Fort Ord. Burleson subcontracted Denise Duffy & Associates, Inc. (DD&A) to support monitoring.

Hydrology monitoring was led by Biologist Kayti Christianson and supported by Wildlife Biologist Shawn Wagoner and Biologist Phillip Reyes of Burleson. Vegetation monitoring was led by Senior Environmental Biologist Josh Harwayne and Associate Environmental Biologist Jami Davis of DD&A. They were supported by other DD&A staff including Assistant Environmental Biologists Patric Krabacher and Shaelyn Hession and Burleson staff including Kayti Christianson, Shawn Wagoner, and Botanist Chris Bronny. Wildlife monitoring was led by Jami Davis. She was supported by Josh Harwayne, Senior Environmental Biologist Matt Johnson, Shaelyn Hession, Patric Krabacher, and Senior Environmental Biologist Erin Harwayne. Jami Davis, Josh Harwayne, and Matt Johnson possess all appropriate state and federal permits to conduct California tiger salamander (CTS) studies. Shaelyn Hession is authorized to work under their supervision. Patric Krabacher and Erin Harwayne are not authorized to conduct CTS studies and, therefore, only conducted surveys for California fairy shrimp and other aquatic invertebrates.

The team monitored vegetation, the state and federally threatened CTS (*Ambystoma californiense*), and the California fairy shrimp (*Linderiella californica*; fairy shrimp) in wetlands on former Fort Ord. These requirements were documented in the *Installation-wide Multispecies Habitat Management Plan* (HMP), the *Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California* (BO); and the *Wetland Monitoring and Restoration Plan for Munitions and Contaminated Soil Remedial Activities at Former Fort Ord* (Wetland Plan); (USACE, 1997; USFWS, 2015; Burleson, 2008). This report presents the results of hydrology and water quality monitoring, vegetation monitoring, and invertebrate and protocol-level CTS aquatic sampling surveys within a number of vernal pools on former Fort Ord. Vernal pools assessed in 2016 included Ponds 3 North, 3 South, 5, 8, 10, 14, 18, 30A, 30B, 30C, 35, 39, 40 South, 41, 43, 44, 56, 60, 101 West, 101 East (West), and 101 East (East) (see Figures 2a - 2b). In 2016, vegetation monitoring was conducted at all vernal pools with the exception of Ponds 60 and 3 North; however, the population of Contra Costa goldfields (*Lasthenia conjugens*) at Pond 3 North was evaluated and mapped. Invertebrate and protocol-level CTS aquatic sampling surveys were conducted at all vernal pools except Pond 35 and 44, which did not hold water long enough to meet the hydrologic criteria established to conduct additional monitoring for CTS and fairy shrimp. The criterion used to identify suitable CTS breeding habitat requires that a vernal pool retain average depth of at least 25 cm from the first rain event through March (Burleson, 2008). The criterion used to identify suitable fairy shrimp habitat requires that a vernal pool retain an average of 10 cm of water for at least 18 consecutive days. Monitoring for both species began when the vernal pools maintained a minimum depth of 10 cm of water during the March/April hydrologic monitoring survey. Suitability of a vernal pool for breeding was based upon the results of the survey.

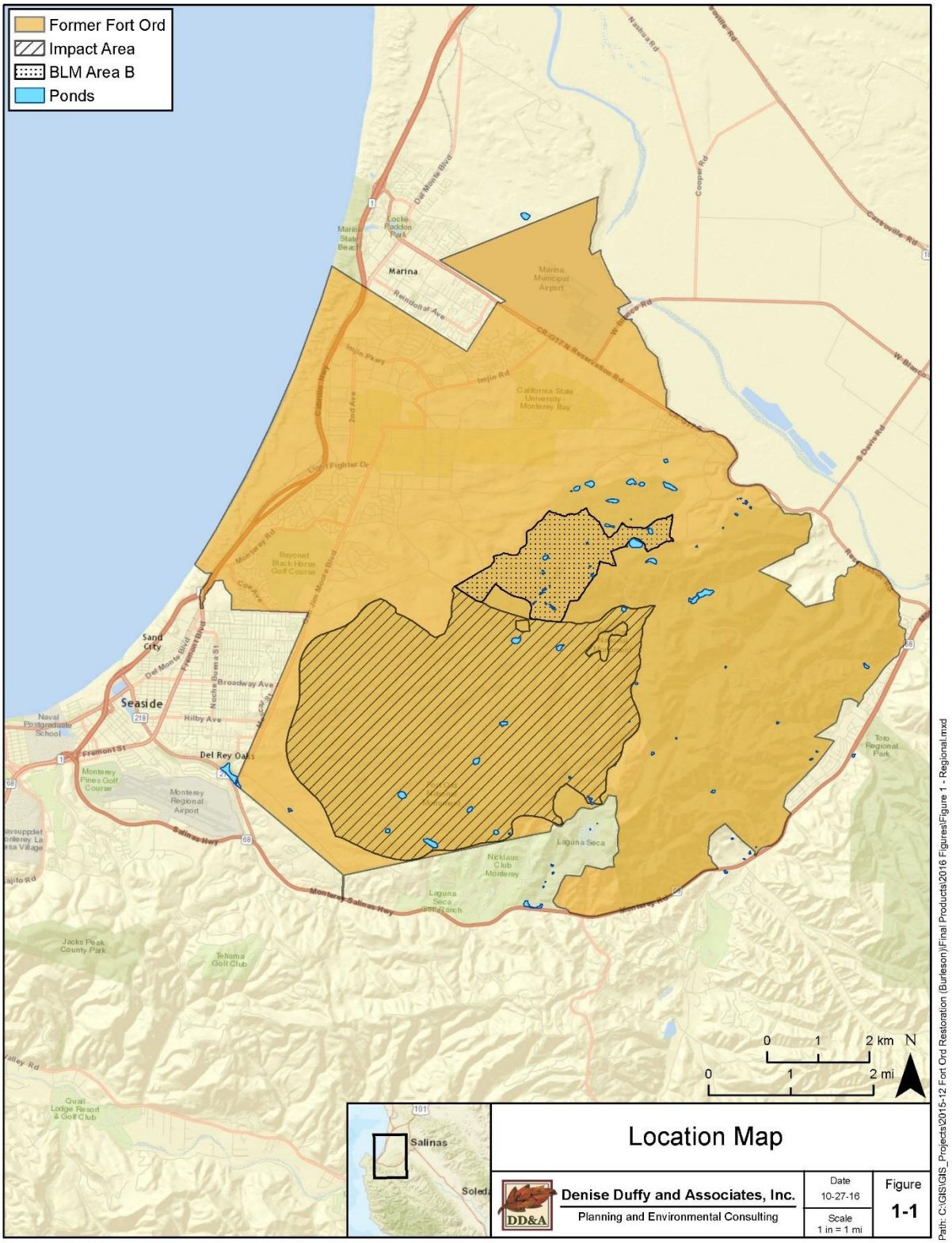

Figure 1-1. Location Map of Vernal Pools on Former Fort Ord

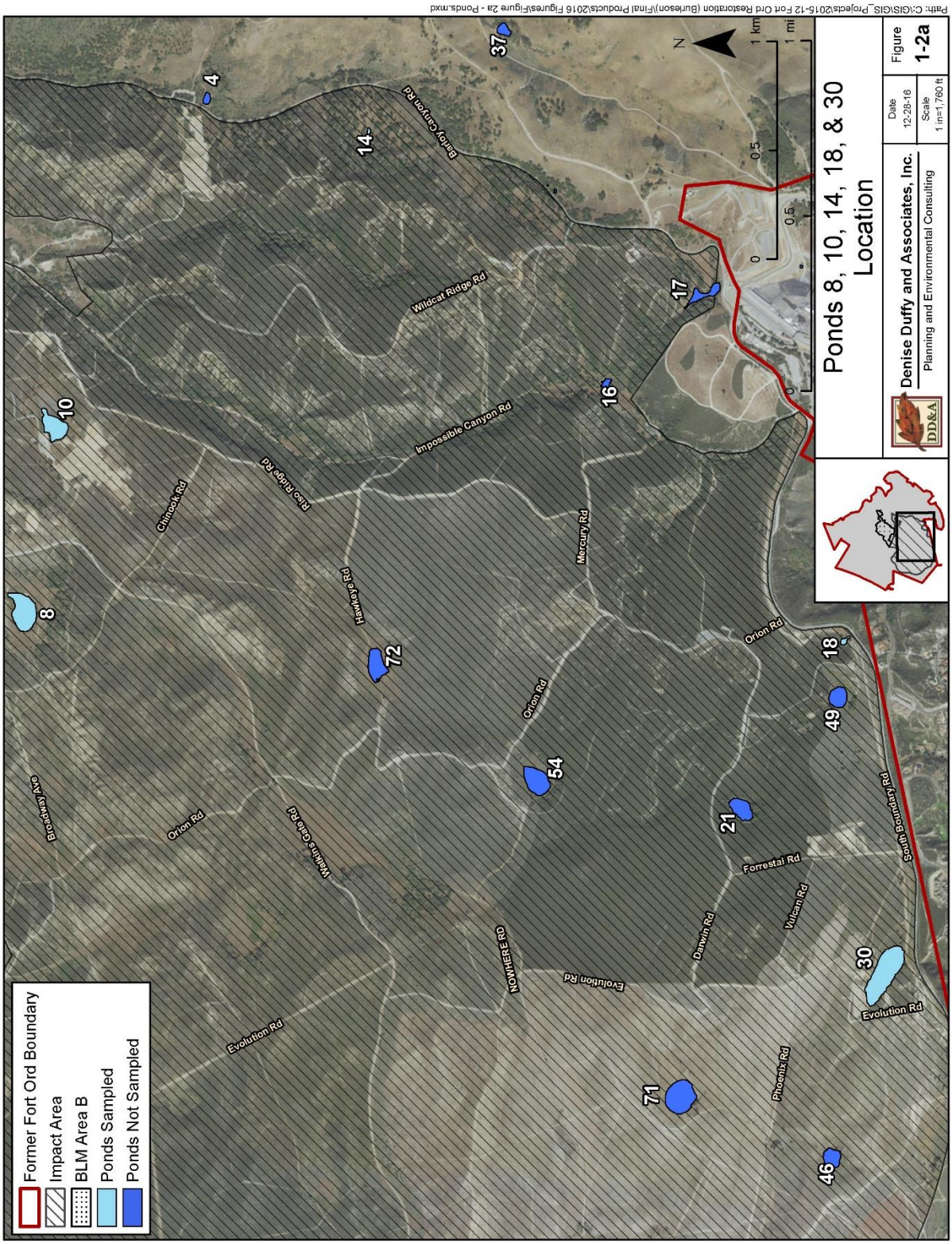

Figure 1-2a. Location Map of Ponds 8, 14, 18, and 30

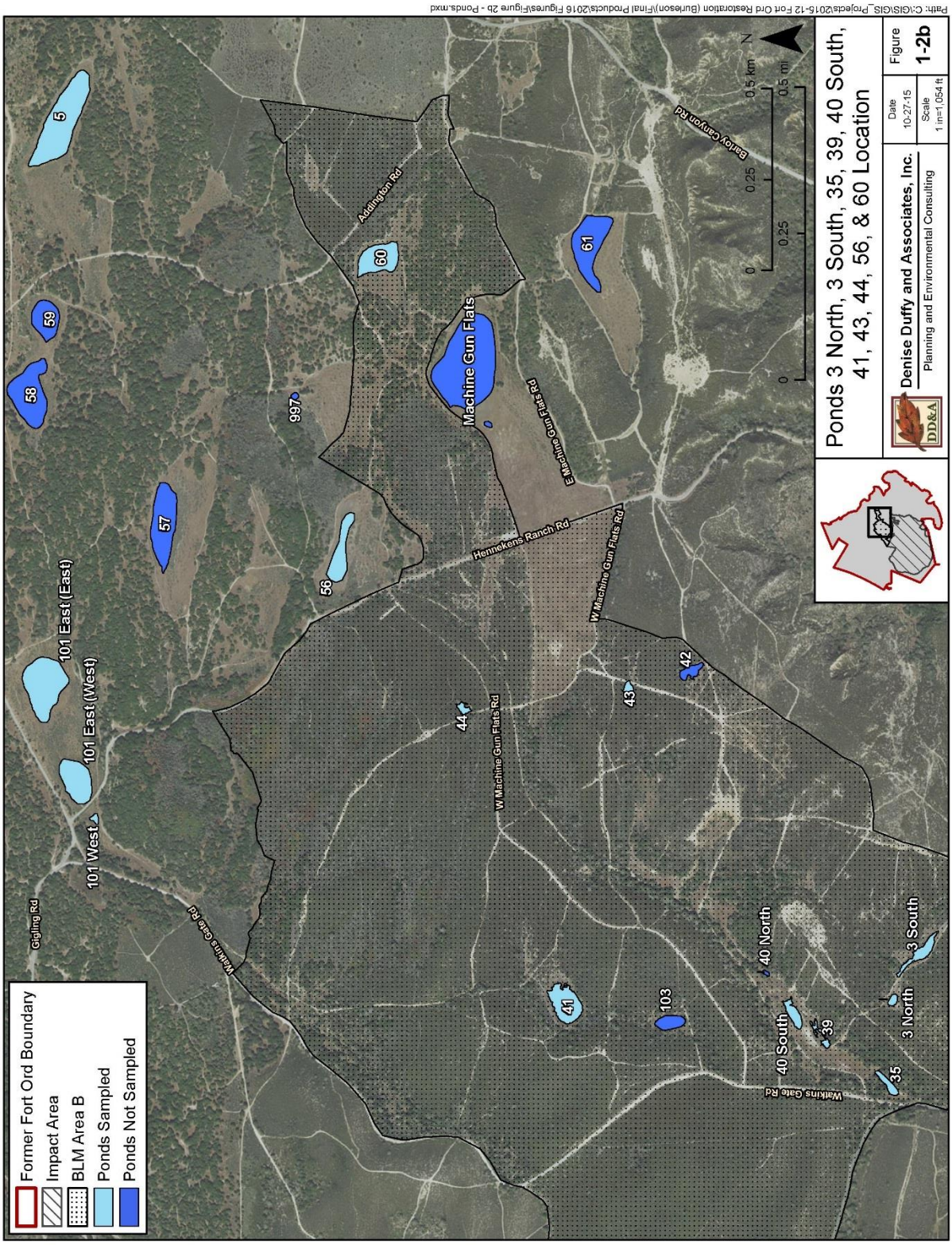

Figure 1-2b. Location Map of Ponds 3 North, 3 South, 35, 39, 40, 41, 43, 44, 56 and 60

In the 2015-2016 water-year, the state of California experienced its fifth consecutive year of drought (USGS, 2016). Despite the persistent drought, the National Weather Service Forecast Office meteorological tower located approximately 5 miles southwest of Site 39 on former Fort Ord, recorded cumulative monthly precipitation values above normal (NPS, 2016; see Figure 1-3). Normal rainfall for the National Weather Service is based on a 30-year average that at the end of each decade, is moved forward another 10 years. Normal for this station is defined as the mean precipitation over years 1981-2010. Consistent above normal rainfall in November through January and March contributed to these conditions. February was the only month that had below normal rainfall (see Figure 1-4). A corresponding maximum temperature increase was observed in February as well. On average, temperatures throughout the water-year exhibited normal patterns. As rainfall increased, temperature decreased early in the water-year. A gradual temperature increase occurred late in the water-year as monthly rainfall decreased. Conversely, in the previous water-year (2014-2015) there was an above normal spike followed by a dip below normal in February that kept the cumulative precipitation below normal for the remainder of the year. This was due to intense early season storms followed by persistent dry conditions.

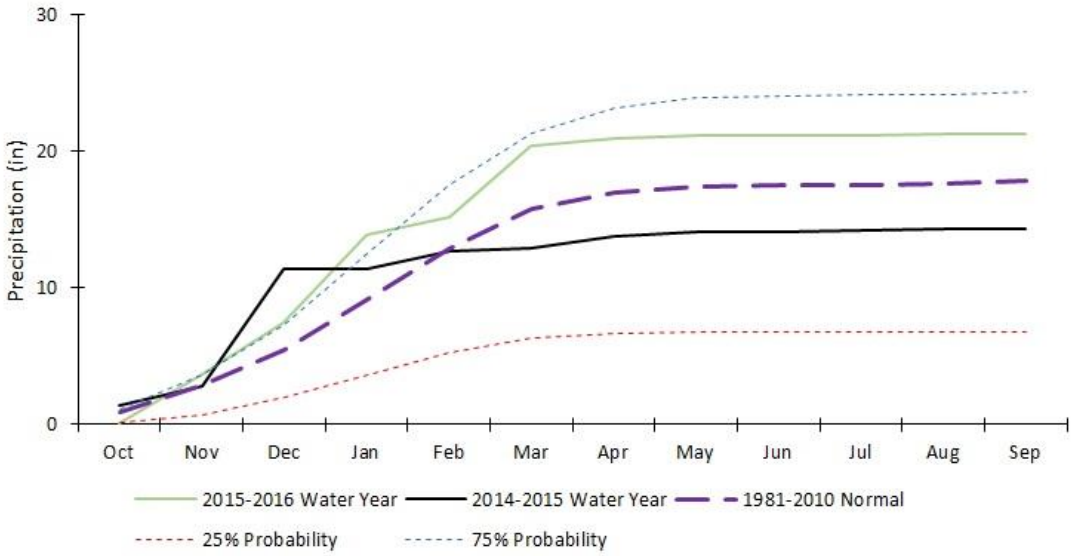

Figure 1-3. Cumulative Monthly Precipitation for the 2015-2016 Water-Year compared to the 30-Year Normal (mean 1981-2010), the 2014-2015 Water-Year, and the 25 and 75% Probabilities (NPS, 2016; NCDC NOAA, 2016)

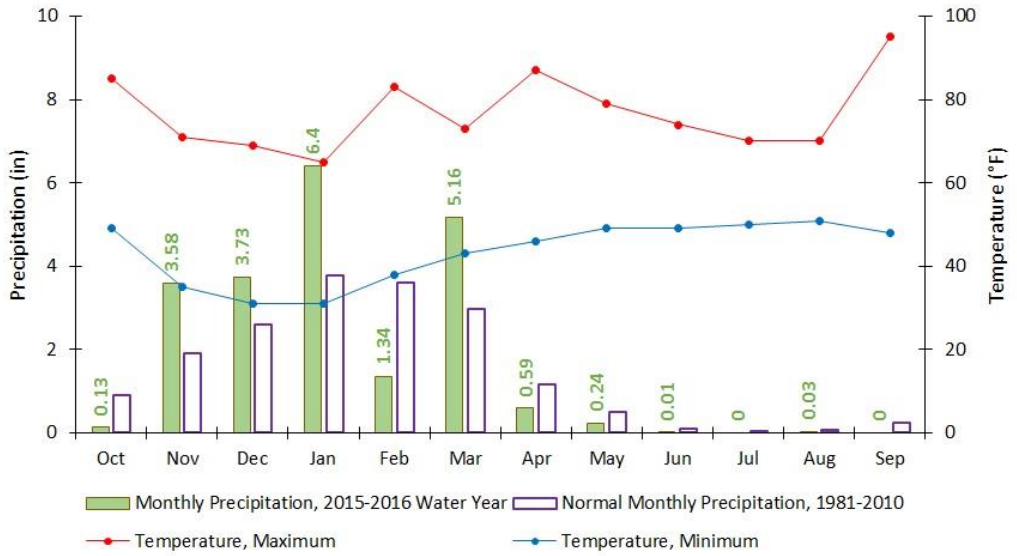

Figure 1-4. Monthly Precipitation, Maximum and Minimum Temperatures for the 2015-2016 Water-Year and Normal Monthly Precipitation (NPS, 2016)

The goal of wetland vegetation and wildlife monitoring efforts is to evaluate success criteria identified in the HMP, BO, and the Wetland Plan (USFWS, 2015; USACE, 1997; Burleson, 2008). Table 1-1 presents the status of vernal pools monitored at former Fort Ord indicating which year of monitoring occurred in 2016. This can guide decision making when corrective actions are necessary. Secondarily, mitigation and monitoring methodologies can be evaluated. The goals of hydrology monitoring were to understand hydrologic function and water quality, document baseline conditions of the vernal pools, provide data for follow up comparison, and document the ability of the vernal pools to support CTS and fairy shrimp.

Table 1-1. 2016 Monitoring Status for Vernal Pools on Former Fort Ord

Vernal Pool	Monitoring Status
Pond 5	Reference
Pond 56	Reference
Pond 101 East (West)	Reference
Pond 101 East (East)	Reference
Pond 3 North	Baseline
Pond 3 South	Baseline
Pond 14	Baseline
Pond 35	Baseline
Pond 39	Baseline
Pond 40 South	Baseline
Pond 41	Baseline
Pond 43	Baseline
Pond 44	Baseline
Pond 60	Baseline
Pond 101 West	Baseline
Pond 18	Year 2 post-remediation
Pond 10	Year 4 post remediation
Pond 30A	Year 4/5 post-remediation
Pond 30B	Year 4/5 post-remediation
Pond 30C	Year 4/5 post-remediation
Pond 8	Year 5 post-remediation

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2 METHODS

Sampling methods for vegetation monitoring and aquatic surveys were consistent with the BO and Wetland Plan (USFWS, 2015; Burleson, 2008). Biologists did not enter areas where standing water was present except at Ponds 5, 10, 56, 101 West, 101 East (West), and 101 East (East) where it was deemed safe by USACE. Sampling and observations were completed from the bank for all other vernal pools due to risk of MEC presence.

Vernal pools must be monitored for baseline condition prior to any remedial activities such as mastication, excavation, or artificial draining (Burleson, 2008). Vernal pools are then monitored post activity in years 1, 3, and 5, or annually for 5 years depending on the type of disturbance. Reference vernal pools that will not be remediated will also be monitored for comparison. In 2016, Ponds 3 North, 3 South, 14, 35, 39, 40 South, 41, 43, 44, 60, and 101 West were monitored for baseline. Pond 8 was monitored for year 5 lead remediation. Pond 10 was monitored for year 4 lead remediation. Pond 18 was monitored for year 2 mastication. Ponds 30, 30B, and 30C were monitored for year 4 fire retardant application and year 5 lead remediation. Ponds 5, 56, 101 East (West), and 101 East (East) are reference vernal pools.

2.1 Hydrology Monitoring

Biologists measured pH, turbidity, temperature, dissolved oxygen, and depth. Water quality data was collected using the Hannah Instrument 9829 Multi-parameter Meter. The meter was calibrated prior to each data collection event (see Appendix A). Data were collected monthly between March and October 2016. Data collection ceased when vernal pools became completely dry. These sampling methods are consistent with the BOs and Wetland Plan (Burleson, 2008). Recommendations were to collect data at mid-pool and mid-depth in all vernal pools, which required pool entry. Due to ordnance-associated safety concerns of BRAC, biologists were only able to enter Pond 5, 101 West, 101 East (West), and 101 East (East); however, additional safety concerns of field staff further excluded the vernal pools Pond 5 and 101 East (East). Accordingly, data was collected at the pool edge for all ponds except Ponds 101 West and 101 East (West).

When water quality data was collected from the pool edge, the probe was tossed just beyond vegetation. Care was taken to ensure the probe was completely covered by water and within reach of the biologist. These collection points were recorded with GPS units. Data were collected at the same location in subsequent months. However, when pools began drying, sampling locations moved inward. The pH, temperature, and turbidity were logged and recorded on the field data sheet after initial probe adjustment was complete (see Appendix A). The dissolved oxygen was recorded while the probe was held vertically and bobbed up and down in the water column. When dissolved oxygen values stabilized, the reading was taken. This was done because the probe consumes oxygen as it is takes the reading. If the probe is left motionless in low oxygen water, false readings of 0.00 mg/L are possible.

Vernal pool inundation surface area and photo points were also documented. Inundated surface area was delineated by creating shape files with a Trimble Geoexplorer 6000 Series GPS unit. The perimeters of the pools were mapped in their entirety, unless physically impossible due to safety risks. Areas were calculated from the resulting shape files. Pool depths were recorded from staff gauges in the deepest point of each pool. Depths were not measurable at Pond 5 because a staff gauge was not present. Depths were not measured at Pond 10 from March through June because water levels covered the maximum gauge marking. Estimates were made in these cases and are noted as such.

2.2 Vegetation Monitoring

Prior to collecting transect data, vernal pools were visited in early spring to assess the condition and initiate a plant species list. When possible, vegetation quadrat data was collected after the vernal pools had dried. Some pools were visited more than once prior to the collection of quadrat data to identify species present, evaluate strata, and determine the ideal time to collect data. Vegetation quadrat data was collected at each of the vernal pools between May 18, 2016 and September 21, 2016. Data were collected as the vernal pools dried and the vegetation was sufficiently identifiable. Biologists visually assessed the historic vernal pool basins for each resource and identified homogeneous vegetative strata.

Vernal pool basins are defined by the hydrogeomorphic basin feature and the distinctly different vegetative community compared to the surrounding upland area. Because the basins vary from year to year and from wet to dry weather cycles over decades, the center portions of the basins typically support wetland vegetation associations, while outer portions at the highest elevations may not. The boundary portions between basin and upland may only be inundated for a significant duration every 10 or 20 years. This hydrologic regime often precludes the presence of mature stands of upland tree and shrub communities in these boundaries. For vernal pools located within grasslands, basin boundaries are typically defined by a change from mesic grasses to monotypic stands of upland grasses.

Soil remediation activities immediately adjacent to Pond 8 resulted in creating an artificial wetland. Prior to soil remediation, water would pond in this area in very wet years; however, the area did not historically support wetland vegetation. This area holds standing water for a sufficient period which supports wetland vegetation and amphibian breeding. Vegetation and wildlife surveys were conducted in this area, and the area was mapped as an “adjacent wetland” since it does not occur in the historic basin.

For the purposes of this report, vegetative strata refer to the different homogenous vegetative communities that are distributed around the vernal pools in a zonate pattern. These are generally concentric circles similar to a bullseye. Open water typically recedes towards the center though the dry season. Differing depths and duration of inundation result in suites of plant species which are organized into discernable functional zones. These can be readily differentiated and mapped. During the visual assessment, biologists recorded the percent of submergent, emergent, and floating vegetative cover within the inundated areas when present.

The team used a stratified random quadrat method to collect data within each accessible stratum (Barbour *et al.*, 1980). Only visual data was collected for strata inundated with water, vegetation that was too tall and dense, or for areas with unexploded ordnance (UXO) concerns. Biologists placed each transect in the most homogenous representative area for each accessible stratum. These were mapped using a Trimble® Geo 7 Series GPS. Transects were 5 meters (m) or 10 m in length depending on stratum size. Biologists used a random number table to determine placement of a 0.25 m^2 quadrat along each transect. The quadrat was placed a minimum of three times for every 5 m of transect. Biologists recorded the absolute percent cover by plant species, groundcover, and bare ground. Species percent cover was averaged for each stratum of the sampled vernal pools. Biologists mapped strata the same day as quadrat sampling using a Trimble® Geo 7 Series GPS and calculated absolute percent cover of the strata using the XTools extension for ArcGIS software. This data represents baseline conditions that will be compared against future monitoring results. This can identify changes in location or size of strata between and among vernal pools, which can be considered with respect to remediation efforts.

Plant species observed at each vernal pool were recorded. Most species were identified in the field using *The Plants of Monterey County, an Illustrated Field Key; Second Edition* (Matthews and Mitchell, 2015) and *The Jepson Manual: Vascular Plants of California, Second Edition* (Baldwin *et al.*, 2012). Additional categorization of the plants occurred to identify them as one of the following: obligate wetland (OBL), facultative (FAC), facultative wetland (FACW), facultative upland (FACU), obligate upland (UPL), or not listed (NL) (Lichvar et al., 2016). Some species could not be identified in the field. These samples were taken from the vernal pool (not from the quadrats) and identified in the office.

On June 7, 2016, Contra Costa goldfields (*Lasthenia conjugens*) populations were mapped by creating polygons using a Trimble® Geo 7 Series GPS. Absolute cover was visually estimated for these polygons. Contra Costa goldfields is a species listed as federally endangered under the Endangered Species Act.

2.3 Wildlife Monitoring

Following BO, HMP, and Wetland Plan protocols, biologists conducted aquatic surveys for CTS and fairy shrimp. These were conducted concurrently on multiple occasions. Invertebrate and protocol-level CTS aquatic sampling surveys were conducted at all vernal pools except Pond 35, which did not hold water long enough to meet the hydrologic criteria established to conduct additional monitoring for CTS and fairy shrimp. The criterion used to identify suitable CTS breeding habitat requires that a vernal pool retain average depth of at least 25 cm from the first rain event through March (Burleson, 2008). The criterion used to identify suitable fairy shrimp habitat requires that a vernal pool retain an average of 10 cm of water for at least 18 consecutive days. Monitoring for both species began when the vernal pools maintained a minimum depth of 10 cm of water during the March/April hydrologic monitoring survey.

To reduce the possibility of spreading disease, nets, boots, and other equipment were scrubbed with Quat-128 solution and completely air-dried before moving from one watershed to another. Nets, boots, and equipment were then treated with Quat-128 solution and air-dried at the end of each day. Cleaning solutions were applied to equipment in areas away from aquatic resources, on disturbed or developed roads to reduce contamination. Disposable nitrile gloves were used when handling CTS. Biologists used a new pair of gloves at each vernal pool.

2.3.1 California Tiger Salamander

Survey methods for CTS followed the *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (USFWS and CDFW, 2003). Some exceptions were made as needed; aquatic sampling continued after initial detection and some inundated vernal pools were not entered. Further aquatic sampling was completed to provide additional insight into vernal pool function. Biologists did not enter some pools due to UXO-related safety concerns and collected samples from the pool's edge. Vernal pools deemed safe of UXO to enter by USACE Safety were Ponds 5, 10, 56, 101 West, 101 East (West), and 101 East (East).

On April 20, 2016, CTS tissue samples were collected for genetic sampling purposes by Dr. Brad Shaffer of UCLA from 115 individuals during aquatic surveys. The results of the tissue sampling are not discussed within this report. These monitoring efforts found CTS at Pond 71 but not at Pond 46. Both of these vernal pools are historically known to support breeding CTS.

Vernal pools were sampled for CTS using long-handled, fine-meshed, D-shaped dipnets. All sites were sampled using dipnets to minimize aquatic habitat disturbance. This methodology was chosen to allow direct comparison to past results. Depending on the extent of aquatic habitat, one or two biologists

sampled each site. One exception occurred on April 20, when four biologists sampled at some of the vernal pools. Biologists collected samples from each vernal pool until the habitat was adequately represented.

Biologists measured and recorded the length of a subset of CTS larvae encountered. CTS and other amphibian species encountered were identified and the total numbers recorded. The relative abundance of amphibian species other than CTS was reported as follows:

- Few (F): 1 to 10 individuals;
- Common (C): 11 to 100 individuals; and
- Abundant (A): greater than 101 individuals

2.3.2 California Fairy Shrimp

Aquatic sampling for fairy shrimp and other aquatic invertebrates was conducted using a fine-meshed dip net. Biologists recorded the presence/absence of these species.

3 RESULTS

3.1 Hydrology Monitoring

Measurable ponding was observed in all vernal pools monitored in 2016. Maximum vernal pool depths failed to trigger CTS and fairy shrimp sampling in March, April, and May for three, five, and seven vernal pools, respectively The mean pH, temperature, dissolved oxygen and turbidity vary across vernal pools with no clear trends across remediation status. This is illustrated in Figure 3-1 – Figure 3-4. These water quality results represent baseline, reference, or post-remediation conditions for the vernal pools monitored and can be used for comparison to previous and future results (see Appendix A).

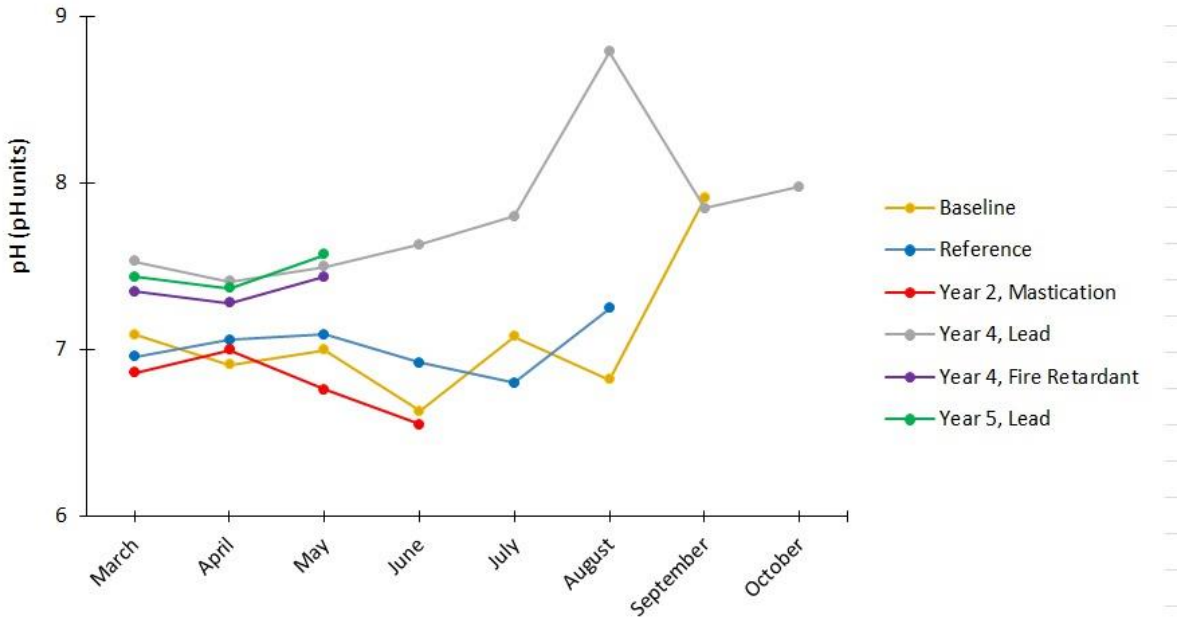

Figure 3-1. Monthly pH Values Averaged Across Remediation Status for Vernal Pools Monitored in 2016

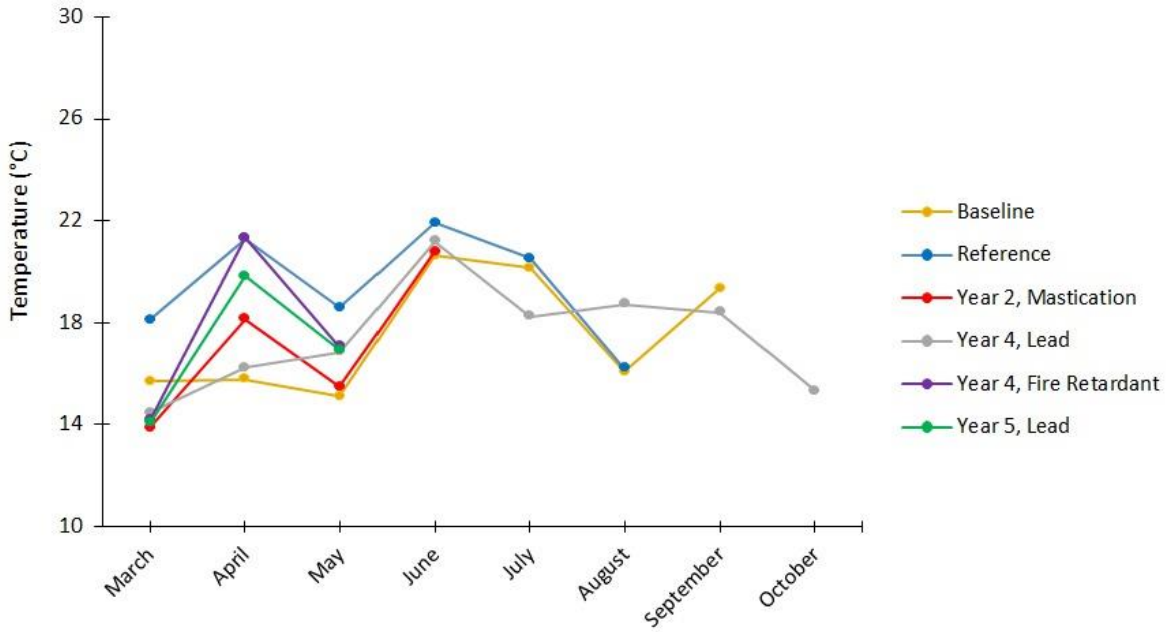

Figure 3-2. Monthly Temperature Values Averaged Across Remediation Status for Vernal Pools Monitored in 2016

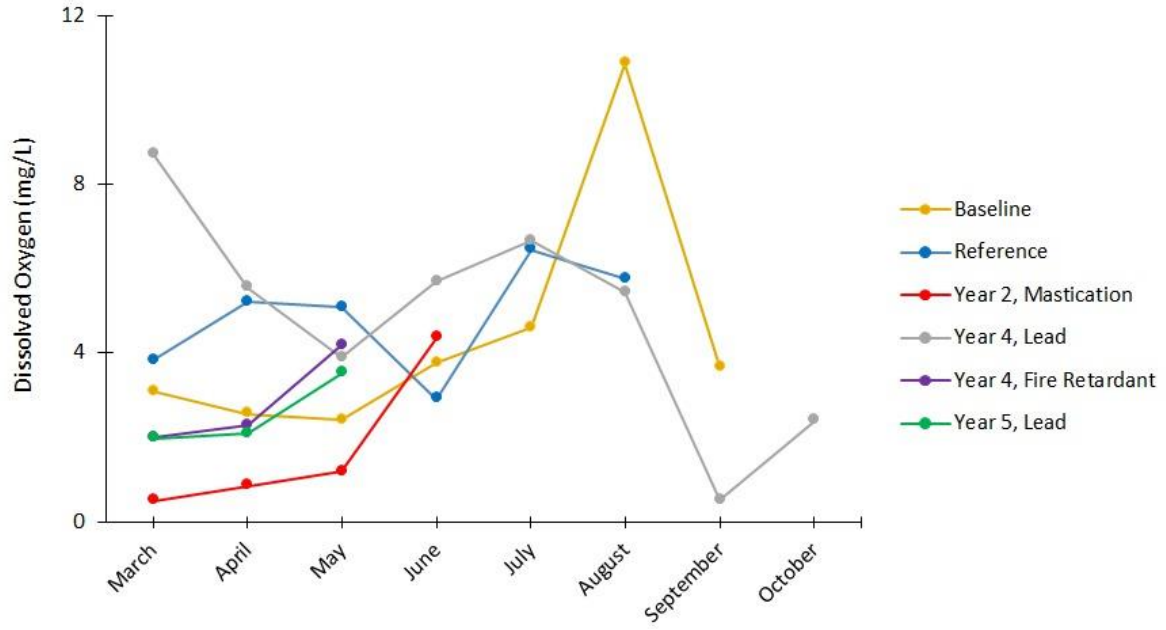

Figure 3-3. Monthly Dissolved Oxygen Values Averaged Across Remediation Status for Vernal Pools Monitored in 2016

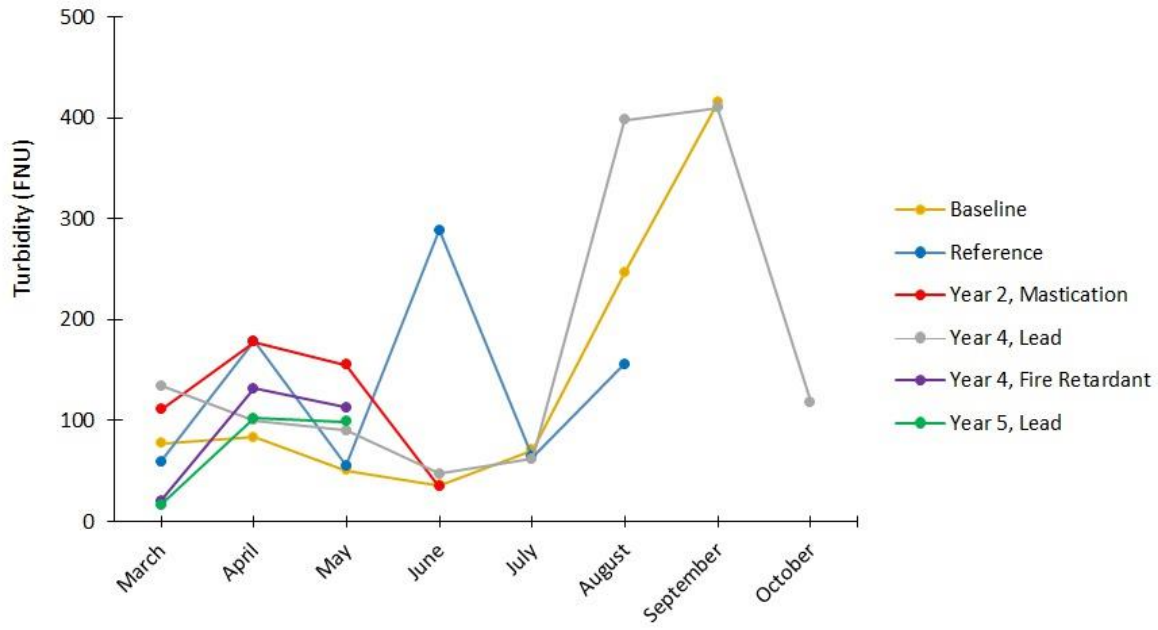

Figure 3-4. Monthly Turbidity Values Averaged Across Remediation Status for Vernal Pools Monitored in 2016

Typical water quality measurements were observed in all vernal pools (see Tables 3-1 – 3-8). Mean temperature increased from 15.8 °C in March to 21.4 °C in June, and then cooled to 15.3 °C in October. Mean dissolved oxygen values were 3.2 milligrams per liter (mg/L) in March, increased to 7.0 mg/L in August, and decreased to 2.4 mg/L in October. Mean pH values gradually increased from 6.6 in March to 7.5 in October. Mean turbidity values generally increased between March and October with some variability. The minimum turbidity value was 64.8 formazin nephelometric units (FNU) in July and the maximum was 412.5 FNU in September.

Table 3-1. Hydrology Results for March/April Monitoring (3/31/2016, 4/4/2016, 4/5/2016)

Vernal Pool	Monitoring Status	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Max Depth (cm)	Inundated Surface Area (acres)
3 North	Baseline	11:48	6.75	18.40	5.61	56.7	54	0.218
3 South	Baseline	11:58	7.00	16.42	9.87	12.2	30	0.519
5	Reference	16:54	6.41	25.06	6.91	63.4	no gauge, ~100	5.325
8	Year 5	13:28	7.11	13.88	1.97	8.3	62	0.062
10	Year 4	12:43	7.03	14.46	8.72	134.0	gauge submerged, ~100	6.196
14	Baseline	11:58	6.56	14.89	3.88	64.0	45	0.135
18	Year 2	10:59	6.36	13.88	0.50	111.0	38	0.265
30A	Year 4/5	10:02	6.53	13.86	1.32	14.4	50	0.618
30B	Year 4/5						connected to Pond 30A	
30C	Year 4/5	9:46	7.17	14.44	2.65	26.1	28	0.120
35	Baseline	10:31	6.76	17.76	0.00	230.0	5	0.001

Table 3-1. Hydrology Results for March/April Monitoring (3/31/2016, 4/4/2016, 4/5/2016)

Vernal Pool	Monitoring Status	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Max Depth (cm)	Inundated Surface Area (acres)
39	Baseline	11:03	6.31	13.85	2.25	177.0	8 @ gauge, 66 max	0.028
40 South	Baseline	11:30	6.71	16.59	0.08	84.6	20	0.081
41	Baseline	9:42	6.56	12.64	2.40	124.0	60	1.439
43	Baseline	10:34	6.46	15.35	4.56	33.5	18	0.020
44	Baseline	10:12	6.54	16.94	5.34	23.0	0 @ gauge, 8.9 max	0.031
56	Reference	10:55	6.54	16.27	0.50	28.6	125	5.167
60	Baseline	11:33	6.35	15.03	0.00	7.6	130	2.646
101 West	Baseline	17:32	6.53	14.85	0.00	36.7	43	0.090
101 East (West)	Reference	15:03	6.43	13.95	0.00	5.7	70	1.893
101 East (East)	Reference	15:46	6.44	17.09	7.93	138.0	68	3.244

Table 3-2. Hydrology Results for April Monitoring (4/18/2016, 4/19/2016)

Vernal Pool	Monitoring Status	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Max Depth (cm)	Inundated Surface Area (acres)
3 North	Baseline	9:27	6.12	15.50	3.67	45.4	45	0.108
3 South	Baseline	9:37	6.38	14.44	4.00	10.2	30	0.412
5	Reference	14:29	6.51	20.27	5.73	23.8	no gauge, ~100	5.139
8	Year 5	16:12	7.12	15.28	1.51	12.5	22	0.041
10	Year 4	11:58	6.91	16.24	5.56	100.0	no gauge visible, ~100	5.916
14	Baseline	13:37	6.44	18.63	3.71	83.3	40	0.092
18	Year 2	14:21	6.50	18.14	0.85	178.0	36	0.180
30A	Year 4/5	15:05	6.38	15.39	2.37	168.0	40	0.484
30B	Year 4/5	15:19	7.29	25.23	4.05	28.2	25	0.012
30C	Year 4/5	15:24	6.67	23.32	0.45	199.0	23	0.107
35	Baseline						DRY	0.000
39	Baseline	8:53	6.37	11.31	2.29	23.8	6	0.005
40 South	Baseline						DRY	0.000
41	Baseline	10:39	6.73	14.73	1.58	15.8	46	1.281
43	Baseline						DRY	0.000
44	Baseline						DRY	0.000
56	Reference	11:23	6.67	18.90	2.23	375.0	120	4.206
60	Baseline	12:30	6.39	18.27	2.64	51.0	110	2.571
101 West	Baseline	17:30	6.45	17.46	0.00	354.0	33	0.053
101 East (West)	Reference	17:24	6.67	23.28	6.4	204.0	55	1.199
101 East (East)	Reference	17:11	6.38	22.72	6.50	112.0	68	3.132

Table 3-3. Hydrology Results for May Monitoring (5/9/2016-5/10/2016)

Vernal Pool	Monitoring Status	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Max Depth (cm)	Inundated Surface Area (acres)
3 North	Baseline	8:23	6.28	15.56	2.11	9.6	29	0.069
3 South	Baseline	8:27	6.39	13.85	1.31	4.0	11	0.005
5	Reference	13:25	6.45	17.99	7.3	19.6	no gauge, ~100	4.862
8	Year 5	11:56	7.47	16.55	1.55	55.9	12	0.020
10	Year 4	12:21	7.00	16.85	3.9	89.6	no gauge visible, ~100	5.805
14	Baseline	10:29	6.69	15.3	4.74	158	26	0.078
18	Year 2	10:56	6.26	15.46	1.2	155	34	0.125
30A	Year 4/5	11:13	6.23	15.66	0.13	99.5	20	0.335
30B	Year 4/5	11:17	6.98	17.22	6.31	83.8	6	0.003
30C	Year 4/5	11:21	7.61	18.27	6.1	156	15	0.050
39	Baseline						DRY	0.000
41	Baseline	8:25	6.79	15.01	1.75	54.3	34	0.333
56	Reference	9:28	6.63	16.09	3.24	16.9	100	3.110
60	Baseline	10:01	6.36	15.75	2.16	27.2	80	2.435
101 West	Baseline						DRY	0.000
101 East (West)	Reference	14:24	6.22	17.22	2.9	77.1	44	0.665
101 East (East)	Reference	14:04	7.07	22.97	6.92	106	55	2.765

Table 3-4. Hydrology Results for June Monitoring (6/7/2016-6/8/2016)

Vernal Pool	Monitoring Status	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Max Depth (cm)	Inundated Surface Area (acres)
3 North	Baseline	10:30	6.07	18.71	3.88	24.2	16	0.025
3 South	Baseline						DRY	0.000
5	Reference	15:07	6.48	21.32	0.34	17.7	no gauge	4.437
8	Year 5						DRY	0.000
10	Year 4	12:00	7.13	21.18	5.69	47	no gauge visible, ~100	5.628
14	Baseline						DRY	0.000
18	Year 2	10:40	6.05	20.8	4.36	34.1	9	0.006
30A	Year 4/5						DRY	0.000
30B	Year 4/5						DRY	0.000
30C	Year 4/5						DRY	0.000
41	Baseline						DRY	0.000
56	Reference	13:08	6.16	20.76	3.55	57.4	80	2.287
60	Baseline	14:00	6.18	22.5	3.66	46.8	80	2.132
101 East (West)	Reference	13:40	6.55	22.9	3.42	525	20	0.066
101 East (East)	Reference	13:55	6.49	22.63	4.36	553	32	1.226

Table 3-5. Hydrology Results for July Monitoring (7/7/2016)

Vernal Pool	Monitoring Status	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Max Depth (cm)	Inundated Surface Area (acres)
3 North	Baseline						DRY	0.000
5	Reference	14:28	6.37	23.01	6.65	83.2	no gauge, ~60	3.190
10	Year 4	9:54	7.3	18.23	6.66	61.5	84	5.270
18	Year 2						DRY	0.000
56	Reference	11:15	6.23	18.04	6.27	44	60	0.419
60	Baseline	11:53	6.58	20.15	4.61	70.3	62	1.040
101 East (West)	Reference						DRY	0.000
101 East (East)	Reference						DRY	0.000

Table 3-6. Hydrology Results for August Monitoring (8/10/2016)

Vernal Pool	Monitoring Status	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Max Depth (cm)	Inundated Surface Area (acres)
5	Reference	10:09	6.85	16.37	0.97	295	4	0.358
10	Year 4	11:02	8.29	18.71	5.44	398	58	3.033
56	Reference	9:05	6.64	16.03	10.56	16.3	40	0.189
60	Baseline	9:28	6.32	26.38	10.86	246	38	0.221

Table 3-7. Hydrology Results for September Monitoring (9/12/2016)

Vernal Pool	Monitoring Status	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Max Depth (cm)	Inundated Surface Area (acres)
5	Reference	11:45					DRY	0.000
10	Year 4	10:00	7.35	18.4	0.51	410	54	1.705
56	Reference	10:40					DRY	0.000
60	Baseline	11:00	7.41	19.34	3.68	415	12	0.014

Table 3-8. Hydrology Results for October Monitoring (10/11/2016)

Vernal Pool	Monitoring Status	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Max Depth (cm)	Inundated Surface Area (acres)
10	Year 4	10:20	7.48	15.32	2.4	118	34	1.392
60	Baseline						DRY	0.000

Inundation through the monitoring period was variable among the vernal pools. By June, 62% of pools were dry. All but Pond 10 were dry by October. Maximum depth and acreage measurements indicate that vernal pools which were smaller and shallower in early season, dried sooner than larger, deeper pools as expected (see Table 3-9).

Table 3-9. Month Vernal Pools Dried Compared to Initial Inundated Surface Areas and Max Depths

Month Vernal Pools Dried	Number of Vernal Pools Dried	Mean Inundated Surface Area from Initial Survey (acres)	Mean Max Depth from Initial Survey (cm)
April	4 (Ponds 35, 40 South, 43, and 44)	0.033	13.0
May	2 (Ponds 39 and 101 West)	0.059	25.5
June	7 (Ponds 3 South, 30A, 30B, 30C, 8, 14, and 41)	0.45	45.8
July	4 (Ponds 18, 3 North, 101 East (West), and 101 East (East))	1.78	57.5
August	0	-	-
September	2 (Ponds 5 and 56)	5.25	112.5
October	1 (Pond 60)	2.65	130.0
Did Not Dry	1 (Pond 10)	6.20	~100.0

CTS and fairy shrimp wildlife monitoring minimum depth requirements were met at nineteen of the twenty-one vernal pools monitored for hydrology in the March/April hydrology survey (see Table 3-10). The depth requirement to trigger wildlife surveys was 10 cm and was based on the success criteria for fairy shrimp outlined in the Wetland Plan (Burleson, 2008).

Table 3-10. 2016 Wildlife Monitoring Minimum Depth Requirements, Greater than 10 cm based on March/April Vernal Pool Depth[1]

Vernal Pool	CTS		Fairy Shrimp	
	Met	Not Met	Met	Not Met
3 North	●		●	
3 South	●		●	
5	●		●	
8	●		●	
10	●		●	
14	●		●	
18	●		●	
30A	●		●	
30B	●		●	
30C	●		●	

[1] Please note that pond suitability for sensitive species habitat is based upon the results of the entire survey effort and wildlife monitoring surveys for both CTS and fairy shrimp were initiated within a pond if it held a minimum of 10 cm of water during the March/April hydrologic monitoring survey.

Table 3-10. 2016 Wildlife Monitoring Minimum Depth Requirements, Greater than 10 cm based on March/April Vernal Pool Depth[1]

Vernal Pool	CTS		Fairy Shrimp	
	Met	Not Met	Met	Not Met
35		●		●
39	●		●	
40 South	●		●	
41	●		●	
43	●		●	
44		●		●
56	●		●	
60	●		●	
101 West	●		●	
101 East (East)	●		●	
101 East (West)	●		●	

3.2 Vegetation Monitoring

Vegetation monitoring was conducted at Ponds 3 South, 5, 8, 10, 14, 18, 30A, 30B, 30C, 35, 39, 40 South, 41, 43, 44, 56, 101 West, 101 East (West), and 101 East (East). The following sections present a summary of vegetation data collected at each of the 19 vernal pools. Pond 3 North is also discussed in this section as the population of Contra Costa goldfields was mapped; however, no transects were conducted and no species list was completed at this vernal pool. Please refer to Appendix B for vegetation transect data and Appendix D for vernal pool photos.

3.2.1 Pond 3 South

Vegetation monitoring at Pond 3 South occurred on June 13, 2016. Surveys represent baseline data. No standing water was present during vegetation monitoring. The historic basin boundary was identified and all vegetative strata in the basin were mapped and tabulated (see Table 3-11). Biologists identified four strata and a few small islands of upland vegetation (see Figure 3-5). A total of 69 plant species were observed within the historic basin boundary. Of these species 45 were native and 24 were non-native, and one was unidentified. Additionally, 12 of species were obligate wetland (OBL) plants, 22 were facultative (FAC) or facultative wetland (FACW), 35 were facultative upland (FACU), obligate upland (UPL), or not listed (NL). Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-11. Pond 3 South Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	20%
2	38%
3	35%
4	5%
Upland	2%

Transect 1 at Pond 3 South consisted of a 10-m transect placed in stratum 1. A total of eight plant species were observed along the transect. Of these species seven were native and one was non-native. Pale spike-rush (*Eleocharis macrostachya*) and coast eryngo (*Eryngium armatum*) were the dominant species present. Bare ground and thatch were prominent within the stratum. Other plant species present in lesser quantities included Hickman's popcorn flower (*Plagiobothrys chorisianus hickmanii*), rabbit-foot grass (*Polypogon monspeliensis*), salt grass (*Distichlis spicata*), water pygmy weed (*Crassula aquatica*), alkali mallow (*Malvella leprosa*), and brown-headed rush (*Juncus phaeocephalus*).

Transect 2 at Pond 3 South consisted of a 10-m transect placed in stratum 2. A total of 13 plant species were observed along the transect. Of these species seven were native and five were non-native, and one was unidentified. Brown-headed rush was the dominant species present. Other species present included grass poly (*Lythrum hyssopifolia*), common toad rush (*Juncus bufonius* var. *bufonius*), Italian ryegrass (*Festuca perenne*), rattail sixweeks grass (*Festuca myuros*), rabbit-foot grass, alkali mallow, small quaking grass (*Briza minor*), dwarf brodiaea (*Brodiaea terrestris* ssp. *terrestris*), California oatgrass (*Danthonia californica*), Hickman's popcorn flower, rush (*Juncus* sp.), and Johnny nip (*Castilleja ambigua*). Thatch and bare ground were also present in this stratum.

Transect 3 at Pond 3 South consisted of a 10-m transect placed in stratum 3. A total of 18 plant species were observed along the transect. Of these species eight were native and 10 were non-native. Common toad rush and California oat grass were the dominant species present. Bare ground was prominent to a lesser degree in this stratum. Other species present included coast eryngo, cut-leaved plantain (*Plantago coronopus*), grass poly, rattail sixweeks grass, silver hair grass (*Aira caryophyllea*), brown-headed rush, pacific foxtail (*Alopecurus saccatus*), scarlet pimpernel (*Lysimachia arvensis*), Johnny nip, narrow-leaved clover (*Trifolium angustifolium*), slender tarweed (*Madia gracilis*), smooth cat's ear (*Hypochaeris glabra*), Dave's centuary (*Zeltnera davyi*), dwarf rush (*Juncus capitatus*), small quaking grass, and soft chess (*Bromus hordeaceus*). A small amount of thatch was also present in this stratum.

Transect 4 at Pond 3 South consisted of a 10-m transect placed in stratum 4. A total of 12 plant species were observed along the transect. Of these species five were native and seven were non-native. Italian rye grass was dominant, accounting for approximately 70% of the vegetation cover. Other vegetation present in lesser quantities included rattail sixweeks grass, slender tarweed, brown-headed rush, alkali mallow, small quacking grass, poly grass, smooth cat's ear, cut-leaved geranium (*Geranium dissectum*), scarlet pimpernel, slender wooly-heads (*Psilocarphus tenellus*), and small tarweed (*Madia exigua*). A small amount of bare ground was also present in this stratum.

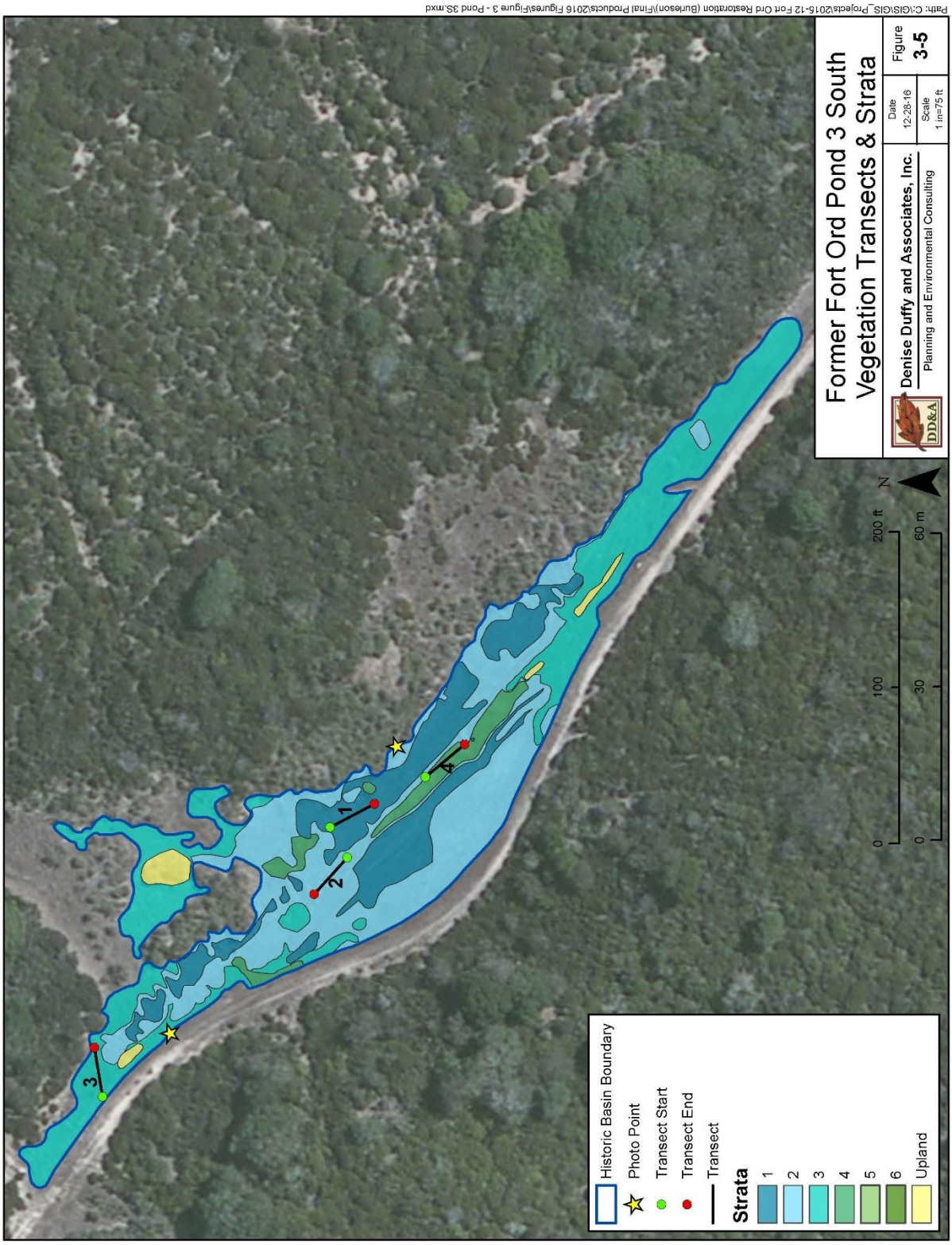

Figure 3-5. Former Fort Ord Pond 3 South Vegetation Transects and Strata

3.2.2 Pond 5

Vegetation monitoring at Pond 5, a reference vernal pool, occurred on September 21 and 22, 2016. Surveys at this pool can be considered control. No standing water was present during monitoring. Biologists identified four strata at Pond 5 (see Figure 3-6). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-12). A total of 40 plant species were observed within the historic basin boundary. Of these species 23 were native and 17 were non-native. Additionally, seven of species were OBL wetland plants, 16 were FAC or FACW, 17 were FACU, UPL, or not listed. Appendix F identifies the number of native and non-native species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-12. Pond 5 Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	26%
2	32%
3	38%
4	4%

Transect 1 at Pond 5 consisted of a 10-m transect placed in stratum 1. Pale spike-rush was the only species identified within this stratum and accounted for approximately 78% cover. The remaining portion of the stratum was comprised of thatch. As such, all species observed along this transect were native.

Transect 2 at Pond 5 consisted of a 10-m transect placed in stratum 2. A total of four plant species were observed along the transect; all of these species were native. Pale spike-rush and salt grass (*Distichlis spicata*) were the dominant species, accounting for 29% and 32% cover, respectively. Thatch was fairly abundant, accounting for approximately 37% cover. Other species present in lesser quantities included alkali mallow and alkali weed (*Cressa truxillensis*).

Transect 3 at Pond 5 consisted of a 10-m transect placed in stratum 3. A total of seven plant species were observed along the transect; all of these species were native. Howell's quillwort (*Isoetes howellii*) was the dominant species, accounting for approximately 50% cover. Other species included alkali weed, pale spike-rush, salt grass, bugle hedge-nettle (*Stachys ajugoides*), brown-headed rush, and alkali mallow.

No transects were placed in stratum 4 since the vegetation was too desiccated to conduct surveys. This stratum was composed largely of grasses. During surveys, enough flowers were present to determine species; however, sufficient flowering material was not present to discern percent cover in quadrats. Species present within stratum 4 included salt grass, Italian rye grass, small quaking grass, silvery hair grass, sheep sorrel (*Rumex acetosella*), slender tarweed, rattlesnake grass (*Briza maxima*), curly dock (*Rumex crispus*), and coyote bush (*Baccharis pilularis*). Of these species three are native and six are non-native. The coyote brush present in this stratum was dying or dead due to extensive inundation this year. These individuals likely moved into the stratum as a result of drought conditions over the past five years.

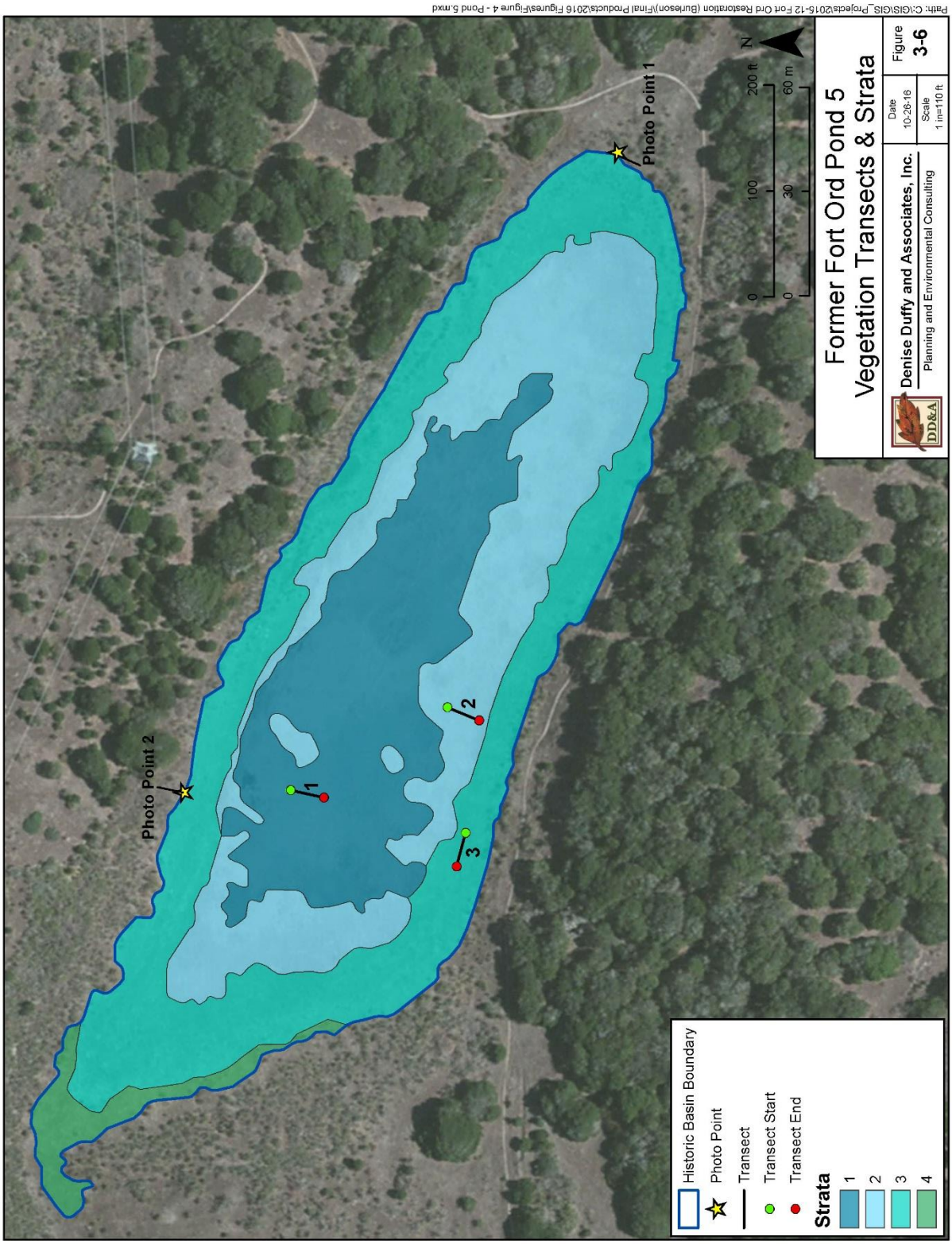

Figure 3-6. Former Fort Ord Pond 5 Vegetation Transects and Strata

3.2.3 Pond 8

Vegetation monitoring occurred at Pond 8 on May 25, 2016. Surveys at this vernal pool represent year 5 follow up surveys for lead remediation efforts. No standing water was present when vegetation monitoring efforts occurred; however, the soil surface was saturated at the lowest point in the vernal pool near the staff gage. During visual assessment, biologists identified two strata and a separate wetland in an excavation area adjacent to the vernal pool (see Figure 3-7). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-13). A total of 49 plant species were observed within the historic basin boundary. Of these species 30 were native, 17 were non-native, and two were unidentified. Additionally, eight species were OBL wetland plants, 17 were FAC or FACW, 24 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-13. Pond 8 Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	40%
2	60%

Transect 1 at Pond 8 consisted of a 10-m transect placed in stratum 1. A total of six plant species were observed along the transect. Of these species five were native and one was non-native. Pale spike-rush was the most abundant species accounting for approximately 40% cover. Smooth goldfields (*Lasthenia glaberrima*) were fairly abundant, accounting for approximately 24% cover. Thatch was present and also fairly abundant. Other species included alkali mallow, meadow barley (*Hordeum brachyantherum*), Hickman's popcorn flower, and Italian rye grass.

Transect 2 at Pond 8 consisted of a 10-m transect placed in stratum 2. A total of nine plant species were observed along the transect. Of these species six were native and three were non-native. Italian ryegrass and pale spike-rush were the dominant species. Additional species present included bugle hedge-nettle, Hickman's popcorn flower, cut-leaved geranium, curly dock, meadow barley, alkali mallow, and smooth goldfields. Thatch was present in this stratum.

A 10-m transect (transect 3) was placed in the excavated soil remediation area that held water in 2016. Bare ground was very prominent in the excavation area, accounting for approximately 93% cover. A total of eight plant species were observed along the transect. Of these species six were native and two were unidentified. Vegetation in the excavation area was very sparse and consisted of salt grass, Hickman's popcorn flower, common toad rush, brown-headed rush, Baltic rush (*Juncus balticus*), tall cyperus (*Cyperus eragrostis*), an unidentified grass (*Poaceae* sp.), and an unidentified plant. A small amount of thatch was present.

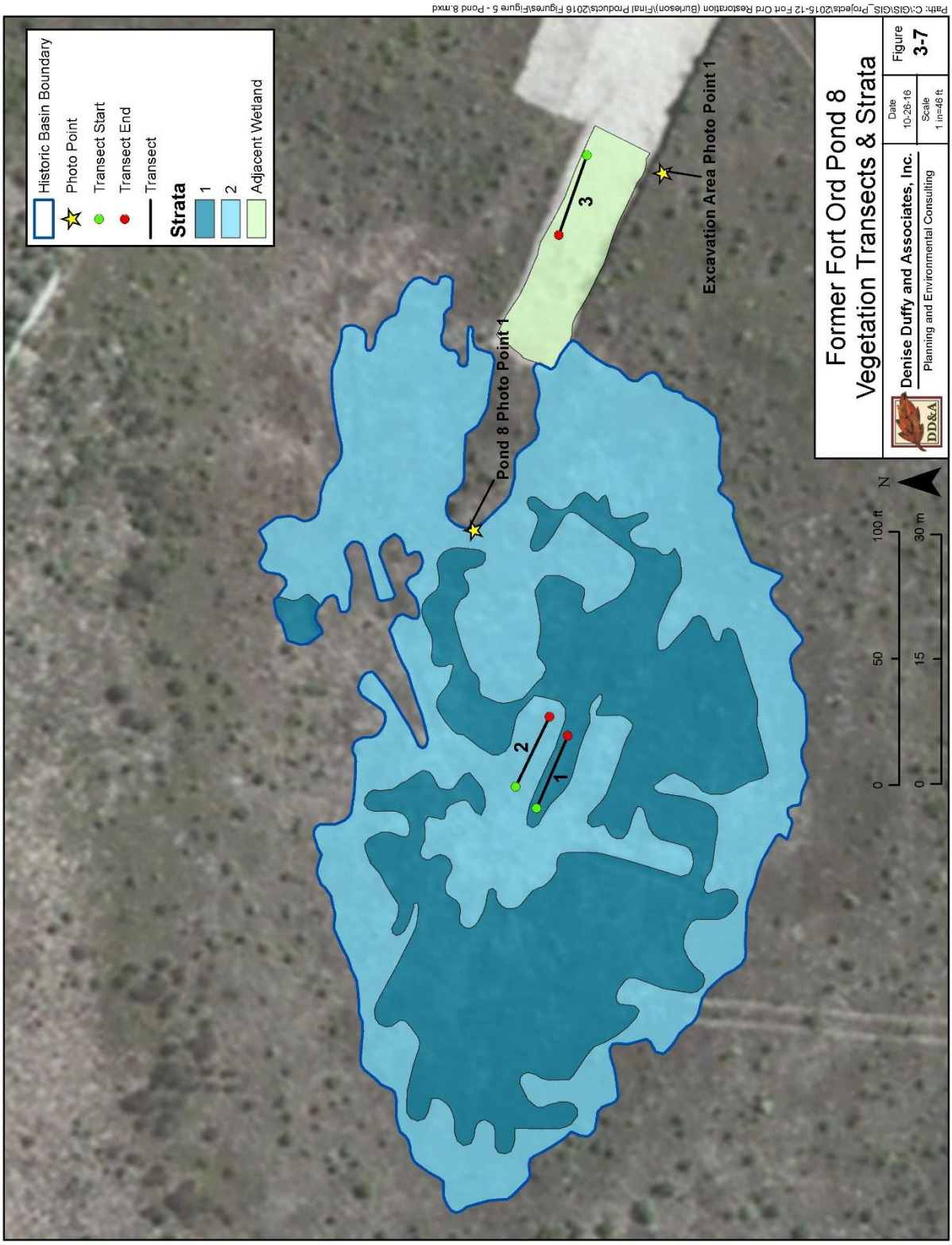

Figure 3-7. Former Fort Ord Pond 8 Vegetation Transects and Strata

3.2.4 Pond 10

Vegetation monitoring occurred at Pond 10 on September 20, 2016. These surveys represent year 4 follow-up data following lead remediation. During visual assessment, five strata were identified (see Figure 3-8). Standing water was present during monitoring. Approximately 60% of the boundary of the basin appears to be a man-made berm. The basin boundary was identified and mapped at the top of the berm, where present. As such, upland vegetation was identified within the basin of Pond 10. All vegetative strata within the basin were also mapped and tabulated (see Table 3-14). A total of 66 plant species were observed within the historic basin boundary. Of these species 36 were native, 29 were non-native, and one was unidentified. Additionally, seven species were OBL wetland plants, 23 were FAC or FACW, 36 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-14. Pond 10 Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	24%
2	3%
3	55%
4	8%
6	4%
Upland	6%

Stratum 1 consisted of the inundated area with about 60% emergent vegetation and 40% open water or bare ground. Emergent vegetation consisted of pale spike-rush and broad-leaved cattail (*Typha latifolia*). As such, all of the species observed are native. No transects were placed in the stratum since it was inundated at the time. Percent cover was visually assessed for this stratum. Some submerged vegetation was also observed along the edges of the water; however, due to the turbidity of the water, percent cover and species could not be determined.

Stratum 2 was characterized by an area of dense California tule (*Schoenoplectus californicus*), accounting for about 90% cover. Small amounts of pale spike-rush and bare ground were present. As such, all of the species observed are native. No transects were placed in the stratum since the height and density of the California tule created accessibility issues. Percent cover was visually assessed.

Transect 3[2] at Pond 10 consisted of a 10-m transect placed in stratum 3. A total of three plant species were observed along the transect; all of these species are native. Pale spike-rush was the dominant species in the strata, accounting for approximately 96% cover. Small amounts of salt grass and brown-headed rush were present.

Transect 4 at Pond 10 consisted of a 10-m transect placed in stratum 4. A total of 13 plant species were observed along the transect. Of these species five were native, seven were non-native, and one was unidentified. Brown-headed rush and salt grass were the dominant species. Other species present

[2] A total of three transects were completed at Pond 10 in 2016: Transect 3, Transect 4, and Transect 5. Transect numbers coincide with the stratum they were placed in; therefore, because transects were not placed in strata 1 or 2, there was no transect 1 or 2 for Pond 10.

included pale spike-rush, bugle hedge-nettle, western goldenrod (*Euthamia occidentalis*), cut-leaved plantain, rabbit-foot grass, weedy cudweed (*Pseudognaphalium luteoalbum*), smooth cat's ear, sheep sorrel, scarlet pimpernel, vetch (*Vicia* sp.), and grass poly. Thatch was present in this stratum.

Transect 5 at Pond 10 consisted of a 5-m transect placed in stratum 5. A total of nine plant species were observed along the transect. Of these species six were native and three were non-native. Baltic rush was the dominant species. Thatch was also fairly abundant in this stratum, accounting for approximately 22% of the cover. Other species present included coast tarweed (*Madia sativa*), common madia (*Madia elegans*), scarlet pimpernel, poly grass, slender wild oat (*Avena barbata*), Spanish lotus (*Acmispon americanus*), telegraph weed (*Heterotheca grandiflora*), and horseweed (*Erigeron canadensis*).

3.2.5 Pond 14

Vegetation monitoring occurred at Pond 14 on May 25, 2016. This survey represents baseline data. No standing water was present when vegetation monitoring occurred. During visual assessment, biologists identified four strata at Pond 14 (see Figure 3-9). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-15). A total of 43 plant species were observed within the historic basin boundary. Of these species 27 were native, 15 were non-native, and one was unidentified. Additionally, three species were OBL wetland plants, 15 were FAC or FACW, 25 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-15. Pond 14 Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	16%
2	8%
3	37%
4	38%

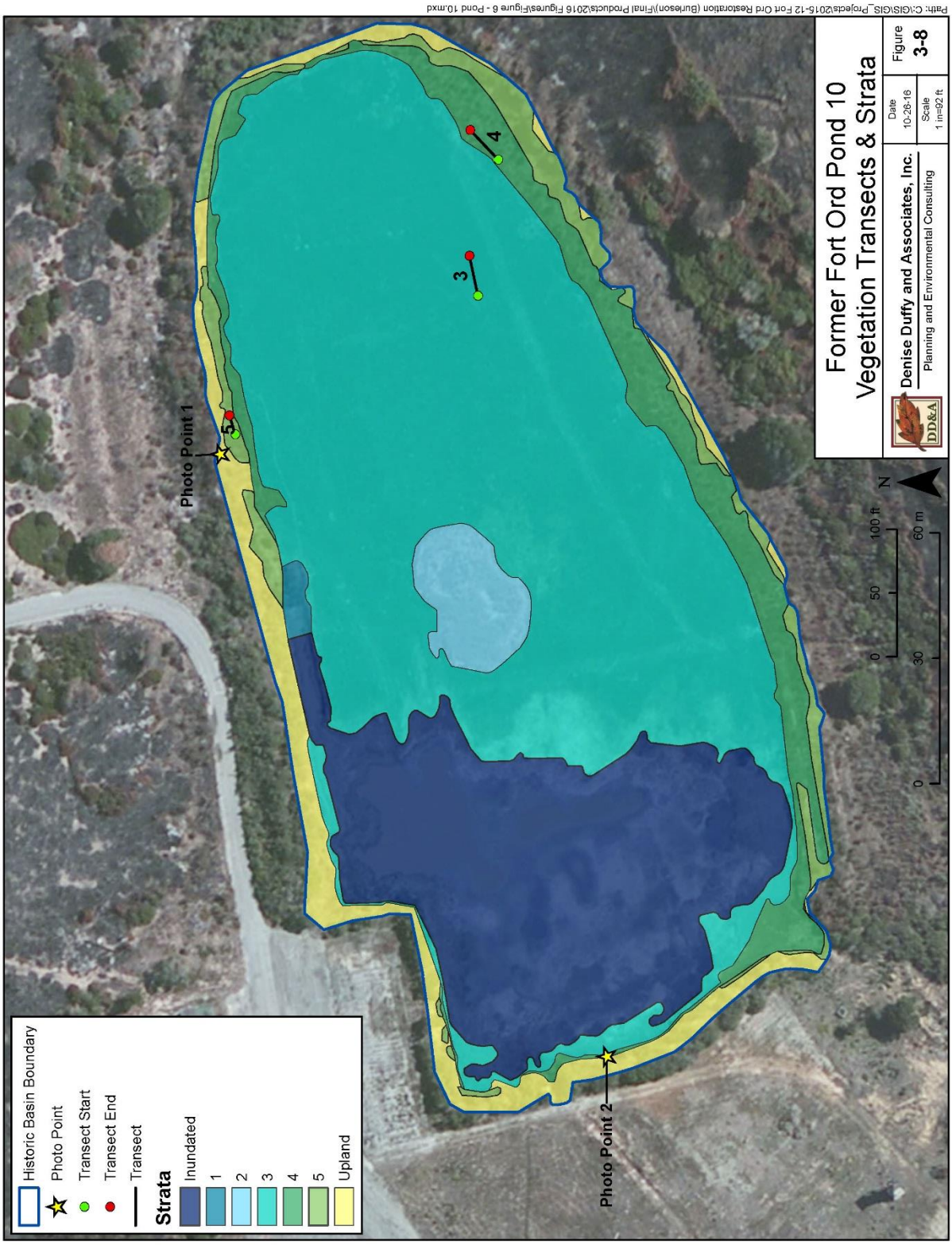

Figure 3-8. Former Fort Ord Pond 10 Vegetation Transects and Strata

Transect 1 at Pond 14 consisted of a 10-m transect placed in stratum 1. This stratum was characterized by a fairly even mix of bare ground and pale spike-rush. As such, all of the species observed on the transect are native.

Transect 2 at Pond 14 consisted of a 5-m transect placed in stratum 2. A total of five plant species were observed along the transect. Of these species four were native and one was unidentified. Pale spike-rush and algal mats were the dominant vegetation. Other species included Lemmon's canary-grass (*Phalaris lemmonii*), alkali mallow, beardless wild-rye (*Elymus triticoides*), and an unidentified species. Thatch was present in this stratum.

Transect 3 at Pond 14 consisted of a 10-m transect placed in stratum 3. A total of 10 plant species were observed along the transect. Of these species five were native and five were non-native. This stratum was predominantly characterized by brown-headed rush, and thatch, which accounted for approximately 42% and 45% of the cover, respectively. Other vegetation included cut-leaved geranium, beardless wild-rye, dwarf brodiaea, smooth cat's ear, algal mats, silver hair-grass, Hickman's popcorn flower, small quaking grass, and California buttercup (*Ranunculus californicus*). Bare ground was present in this stratum.

Transect 4 at Pond 14 consisted of a 10-m transect placed in stratum 4. A total of 11 plant species were observed along the transect. Of these species six were native, four were non-native, and one was unidentified. Italian rye grass was the dominant species. Other species included alkali mallow, dwarf brodiaea, brown-headed rush, soft chess, beardless wild-rye, meadow barley, small quaking grass, smooth cat's ear, soap plant (*Chlorogalum pomeridianum*), and an unidentified species. Thatch was present in the stratum.

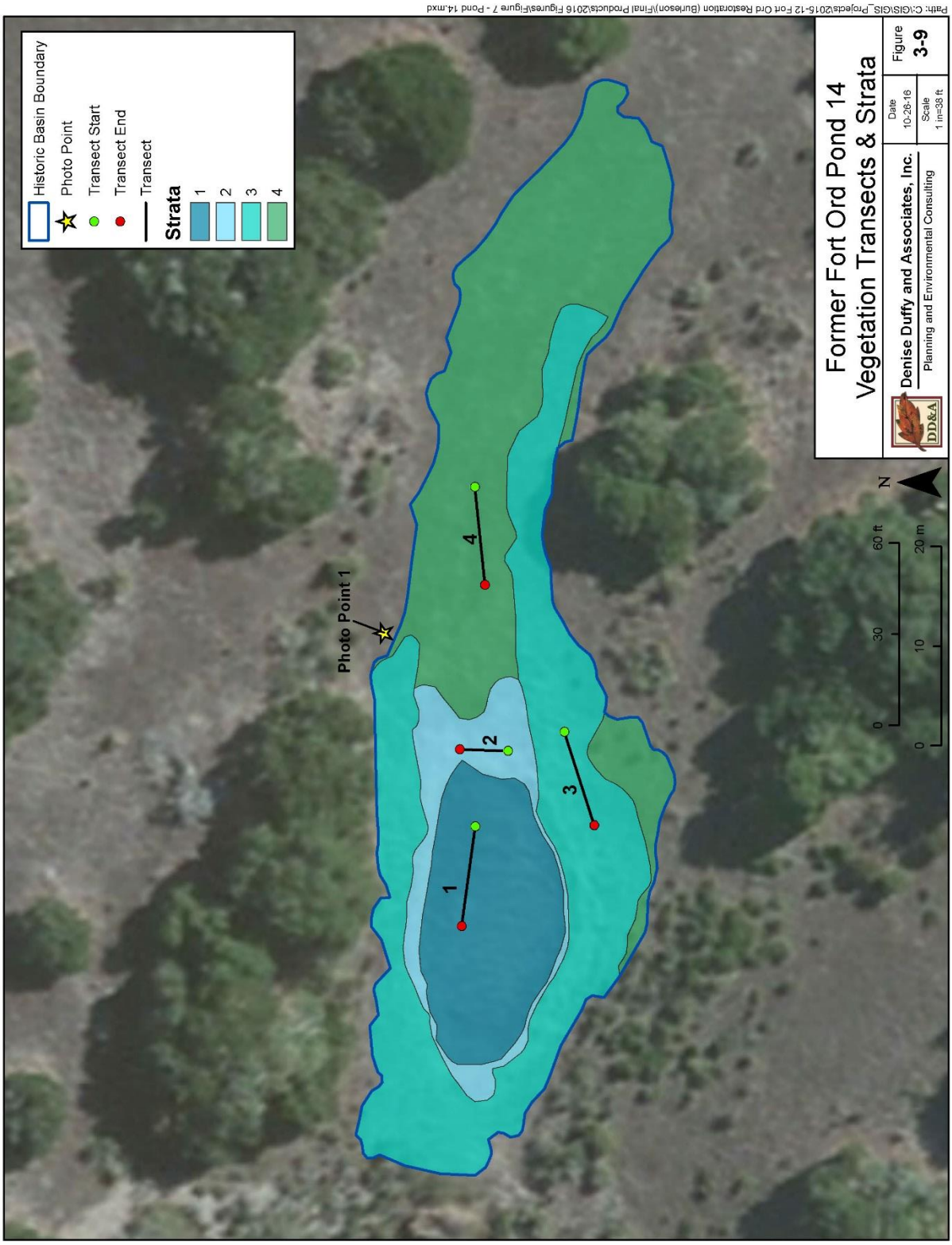

Figure 3-9. Former Fort Ord Pond 14 Vegetation Transects and Strata

3.2.6 Pond 18

Vegetation monitoring occurred at Pond 18 on June 14, 2016. Surveys at this vernal pool represent year 2 mastication follow up data, which occurred for MEC remediation. No standing water was present during monitoring. Biologists identified four strata and a small island of upland vegetation at Pond 18 (see Figure 3-10). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-16). A total of 65 plant species were observed within the historic basin boundary. Of these species 35 were native, 28 were non-native, and two were unidentified. Additionally, 10 species were OBL wetland plants, 20 were FAC or FACW, 35 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-16. Pond 18 Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	19%
2	22%
3	43%
4	15%
Upland	1%

Transect 1 at Pond 18 consisted of a 5-m transect placed in stratum 1. Pale spike-rush was the dominant species present. Flowering quillwort (*Triglochin scilloides*) was present, as well as bare ground and thatch. As such, all of the species observed along the transect were native.

Transect 2 at Pond 18 consisted of a 10-m transect placed in stratum 2. Thatch was the most abundant cover, accounting for approximately 44%. Of the vegetation present, beardless wild-rye was dominant. Pale spike-rush and bare ground were present in the stratum. As such, all of the species observed along the transect were native.

Transect 3 at Pond 18 consisted of a 10-m transect placed in stratum 3. A total of 19 plant species were observed along the transect. Of these species nine were native and seven were non-native. Fiddle dock (*Rumex pulcher*) and coast eryngo were the dominant species present. Thatch was also fairly abundant. Other vegetation included beardless wild-rye, grass poly, Howell's quillwort, Hickman's popcorn flower, rattail sixweeks fescue, rattlesnake grass, soft chess, small quaking grass, common toad rush, Chinese pusley (*Heliotropium curassavicum*), pale spike-rush, low bulrush (*Isolepis cernua*), poison oak, and sheep sorrel. Bare ground was present in stratum 3.

Transect 4 at Pond 18 consisted of a 5-m transect placed in stratum 4. A total of 14 plant species were observed along the transect. Of these species three were native and 11 were non-native. Common toad rush, rattlesnake grass, and cut-leaved plantain were the dominant plant species. Thatch was also common. Other species present, in lesser quantities, included grass poly, slender tarweed, Spanish lotus, small quaking grass, rattail sixweek fescue, silvery hair-grass, sheep sorrel, soft chess, slender wild oat, windmill pink (*Silene gallica*), and scarlet pimpernel. Bare ground was present as well.

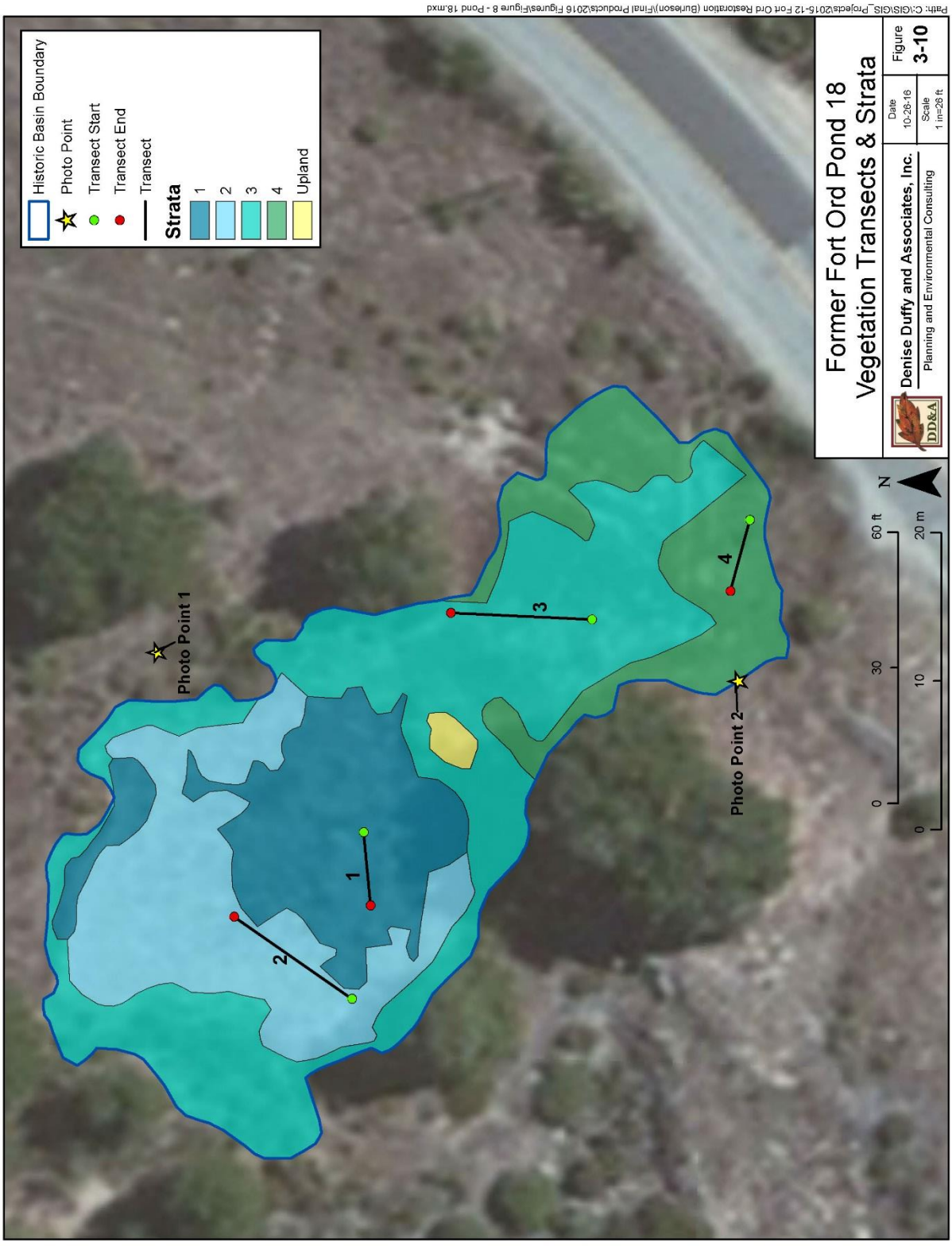

Figure 3-10. Former Fort Ord Pond 18 South Vegetation Transects and Strata

3.2.7 Pond 30A

Vegetation monitoring occurred at Pond 30A on June 14, 2016. These surveys represent year 5 follow-up for soil remediation and year 4 follow-up for fire retardant application. Pond 30A is the largest vernal pool within the area. Ponds 30B and 30C (discussed separately below) are adjacent to Pond 30A. These depressions were created as a result of soil remediation in 2011. Ponds 30B and 30C are distinguished from Pond 30A by the abrupt change in elevation where the excavation occurred; however, at times, these three vernal pools are hydrologically connected and the vegetation is contiguous. No standing water was present when vegetation monitoring efforts occurred. During visual assessment, biologists identified three strata at Pond 30A (see Figure 3-11). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-17). A total of 44 plant species were observed within the historic basin boundary. Of these species 26 were native, 17 were non-native, and one was unidentified. Additionally, six species were OBL wetland plants, 17 were FAC or FACW, 21 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-17. Pond 30A Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	62%
2	2%
3	37%

Transect 1 at Pond 30A consisted of a 10-m transect placed in stratum 1. A total of four plant species were observed along the transect. Of these species two were native and two were non-native. Pale spike-rush was the dominant species. Thatch was also fairly abundant in the stratum. Other species present in lesser quantities included curly dock, alkali mallow, and rabbit-foot grass.

Transect 2 at Pond 30A consisted of a 5-m transect placed in stratum 2. A total of five plant species were observed along the transect. Of these species four were native and one was non-native. Thatch was very prominent. Vegetation present in the stratum included marsh baccharis (*Baccharis glutinosa*), pale spike-rush, tall cyperus, rabbit-foot grass, and California tule. Bare ground was also present.

Transect 3 at Pond 30A consisted of a 5-m transect placed in stratum 3. A total of 11 plant species were observed along the transect. Of these species four were native, six were non-native, and one was unidentified. Pale spike-rush was the dominant species. Thatch was also fairly abundant. Other species included curly dock, grass poly, pale spike-rush, Spanish lotus, scarlet pimpernel, soft chess, willow dock (*Rumex transitorius*), brown-headed rush, an unidentified species in the sunflower family (*Asteraceae*), and rattail sixweeks grass.

3.2.8 Pond 30B

Vegetation monitoring occurred at Pond 30B on June 14, 2016. These surveys represent year 5 follow-up for soil remediation and year 4 follow-up for fire retardant application. Pond 30B is a depression that was created as a result of soil remediation in 2011. No standing water was present during monitoring. Biologists identified two strata at Pond 30B (see Figure 3-11). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-18). A total of 30 plant species were observed within the historic basin boundary. Of these species 19 were native and 11

were non-native. Additionally, four species were OBL wetland plants, 15 were FAC or FACW, 11 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-18. Pond 30B Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	28%
2	72%

Transect 1 at Pond 30B consisted of a 5-m transect placed in stratum 1. A total of five plant species were observed along the transect. Of these species three were native and two were non-native. Bare ground was very prominent, accounting for about 40% cover. Of the vegetation present, pale spike rush and Baltic rush were the most abundant. Thatch was fairly common, accounting for about 13% cover in the stratum. Other vegetation present included low bulrush and grass poly, in lesser quantities.

Transect 2 at Pond 30B consisted of a 5-m transect placed in stratum 2. A total of seven plant species were observed along the transect. Of these species three were native and four were non-native. Rabbit-foot grass was the dominant species. Bare ground and thatch were fairly abundant accounting for about 25% cover and 22% cover, respectively. Other species included common toad rush, grass poly, hairy cat's ear (*Hypochaeris radicata*), cut-leaved plantain, arroyo willow (*Salix lasiolepis*), and brown-headed rush.

3.2.9 Pond 30C

Vegetation monitoring occurred at Pond 30C on June 14, 2016. These surveys represent year 5 follow-up for soil remediation and year 4 follow-up for fire retardant application. Pond 30C is a depression that was created as a result of soil remediation in 2011. No standing water was present during monitoring. Biologists identified two strata at Pond 30C (see Figure 3-11). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-19). A total of 47 plant species were observed within the historic basin boundary. Of these species 31 were native, 15 were non-native, and one was unidentified. Additionally, six species were OBL wetland plants, 16 were FAC or FACW, 25 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-19. Pond 30C Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	20%
2	80%

Transect 1 at Pond 30C consisted of a 5-m transect placed in stratum 1. A total of six plant species were observed along the transect; all of these species were native. Bare ground was prominent, accounting for approximately 43% cover. Of the vegetation present, pale spike-rush was the most abundant. Howell's quillwort, low bulrush, Bolander's water starwort (*Callitriche heterophylla* var. *bolanderi*), salt grass, and flowering quillwort were also present, in lesser quantities. Thatch accounted for approximately 16% cover.

Transect 2 at Pond 30C consisted of a 5-m transect placed in stratum 2. A total of 13 plant species were observed along the transect. Of these species seven were native, five were non-native, and one was unidentified. Brown-headed rush was the dominant species. Thatch and bare ground was also fairly prominent, accounting for approximately 27% cover and 16% cover, respectively. Other species included cut-leaved plantain, rabbit-foot grass, salt grass, grass poly, salt grass, Chinese pusley, smooth cat's ear, Howell's quillwort, an unidentified species, tall cyperus, scarlet pimpernel, Bolander's water starwort, and low bulrush.

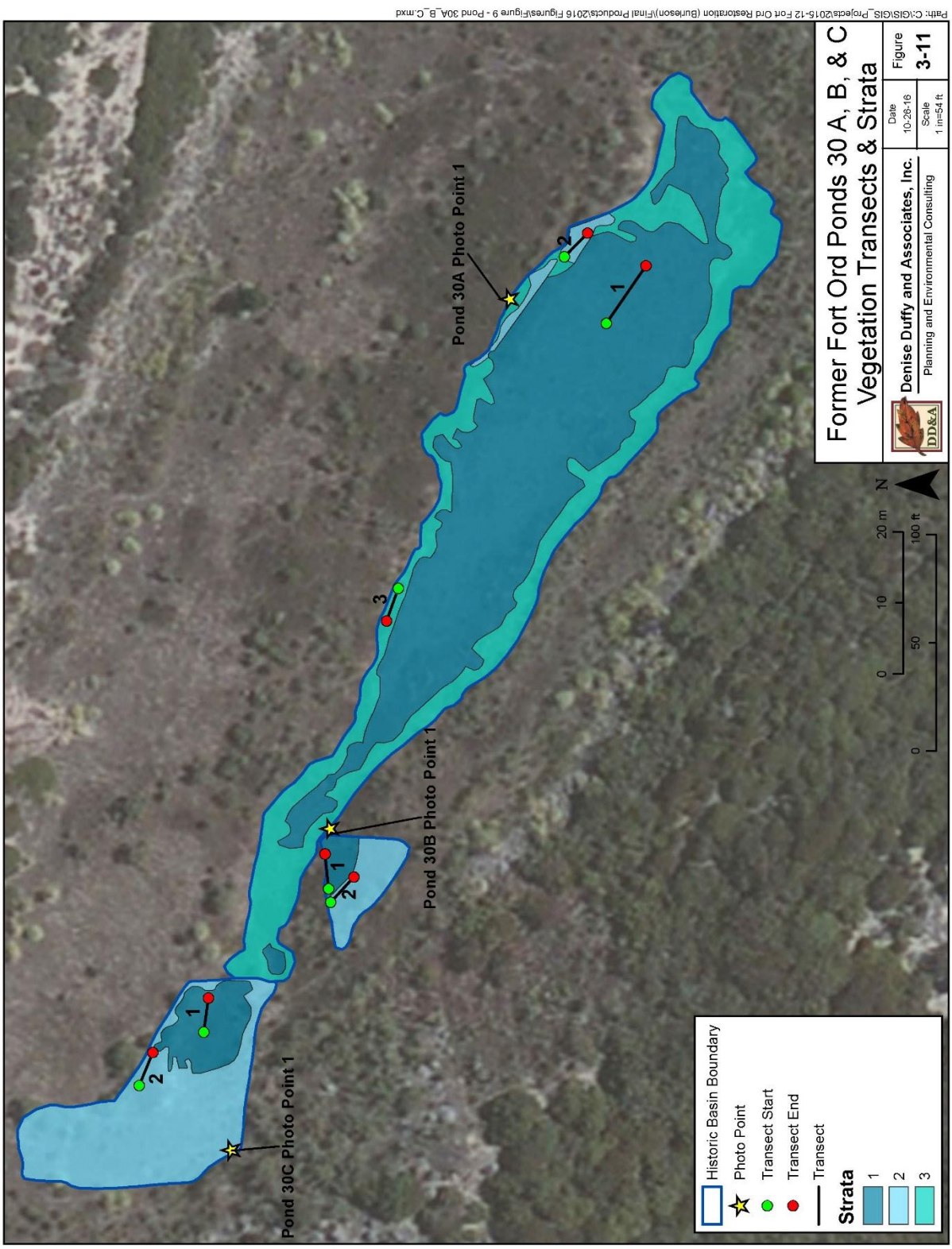

Figure 3-11. Former Fort Ord Ponds 30A, 30B, and 30C Vegetation Transects and Strata

3.2.10 Pond 35

Vegetation monitoring occurred at Pond 35 on May 18, 2016. These surveys represent baseline data. No standing water was present during monitoring. Biologists identified three strata at Pond 35 (see Figure 3-12). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-20). A total of 35 plant species were observed within the historic basin boundary. Of these species 19 were native, 15 were non-native, and one was unidentified. Additionally, seven species were OBL wetland plants, 12 were FAC or FACW, 16 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-20. Pond 35 Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	28%
2	39%
3	33%

Transect 1 at Pond 35 consisted of a 10-m transect placed in stratum 1. A total of nine plant species were observed along the transect. Of these species five were native and four were non-native. Cut-leaved plantain and Hickman's popcorn flower were dominant species. Thatch was also fairly predominant, accounting for approximately 21% of the cover. Other species included poly grass, pale spike-rush, slender wooly-heads, brass buttons, purple cudweed (*Gamochaeta ustulata*), smooth cat's ear, and annual hair grass (*Deschampsia danthonioides*).

Transect 2 at Pond 35 consisted of a 10-m transect placed in stratum 2. A total of four plant species were observed along the transect. Of these species two were native and two were non-native. Cut-leaved plantain was the dominant species, accounting for approximately 22% of the cover. Bare ground and thatch were abundant, accounting for approximately 33% cover and 45% cover, respectively. Other species included poly grass, slender wooly-heads, and annual hair grass.

Transect 3 at Pond 35 consisted of a 10-m transect placed in stratum 3. A total of eight plant species were observed along the transect. Of these species four were native and four were non-native. Meadow barley was the dominant species, accounting for approximately 30% cover. Thatch was also abundant, accounting for approximately 45% cover. Other species included Mediterranean barley (*Hordeum murinum* ssp. *gussoneanum*), cut-leaved plantain, annual hair grass, grass poly, Italian rye grass, and slender wooly-heads.

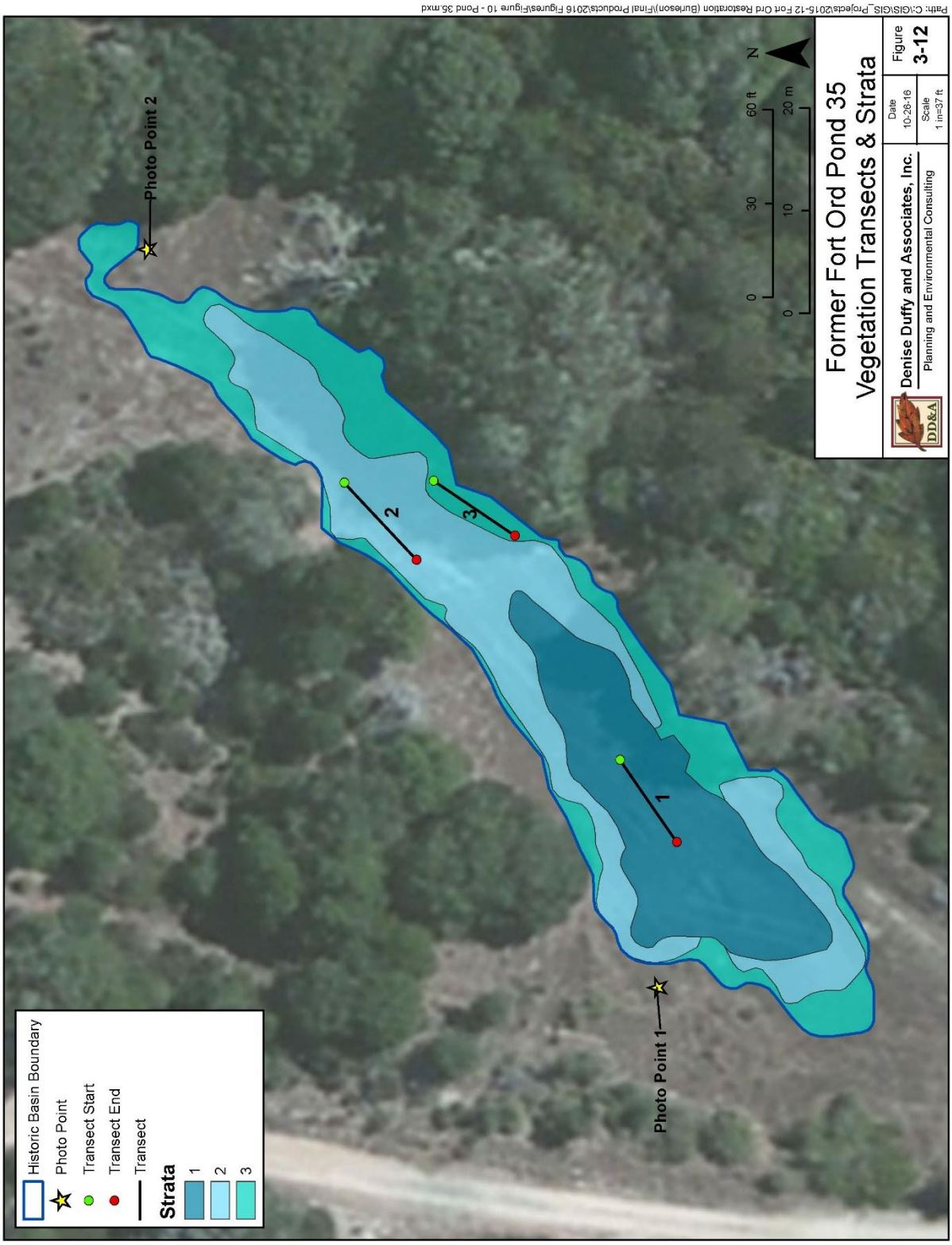

Figure 3-12. Former Fort Ord Pond 35 Vegetation Transects and Strata

3.2.11 Pond 39

Vegetation monitoring occurred at Pond 39 on May 18, 2016. These surveys represent baseline data. No standing water was present during monitoring. Biologists identified three strata at Pond 39 (see Figure 3-13). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-21). A total of 61 plant species were observed within the historic basin boundary. Of these species 36 were native, 21 were non-native, and four were unidentified. Additionally, 10 species were OBL wetland plants, 20 were FAC or FACW, 14 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-21. Pond 39 Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	5%
2	8%
3	87%

Transect 1 at Pond 39 consisted of a 5-m transect placed in stratum 1. A total of six plant species were observed along the transect; all of these species were native. Pale spike-rush and keeled bulrush (*Isolepis cernua*) were the dominant species. Thatch and bare ground were also fairly abundant in the stratum, accounting for approximately 13% cover and 22% cover, respectively. Other species included brown-headed rush, Hickman's popcorn flower, coast eryngo, and flowering quillwort.

Transect 2 at Pond 39 consisted of a 5-m transect placed in stratum 2. A total of nine plant species were observed along the transect. Of these species five were native and four were non-native. Coast eryngo was the dominant species, accounting for approximately 25% cover. Bare ground and thatch were also fairly abundant, accounting for approximately 12% cover and 23% cover, respectively. Other species included Italian rye grass, grass poly, dwarf brodiaea, cut-leaved plantain, Mediterranean barley, brown-headed rush, annual hair grass, and common toad rush.

Transect 3 at Pond 39 consisted of a 10-m transect placed in stratum 3. A total of 20 plant species were observed along the transect. Of these species six were native, 11 were non-native, and three were unidentified. Thatch was prominent, accounting for approximately 38% cover. An unidentified species in the sunflower family was the dominant species, accounting for approximately 19% cover. Italian rye grass and cut-leaved plantain were also fairly abundant. Other species included soft chess, nodding needle grass, smooth cat's ear, vetch, long-stemmed filaree (*Erodium botrys*), slender wild oat, scarlet pimpernel, clover (*Trifolium* sp.), western rush (*Juncus occidentalis*), coyote brush, cut-leaved geranium, small quaking grass, California oat grass, silvery hair-grass, narrow-leaved clover, dwarf brodiaea, and golden brodiaea (*Triteleia ixioides*). A small amount of bare ground was also present.

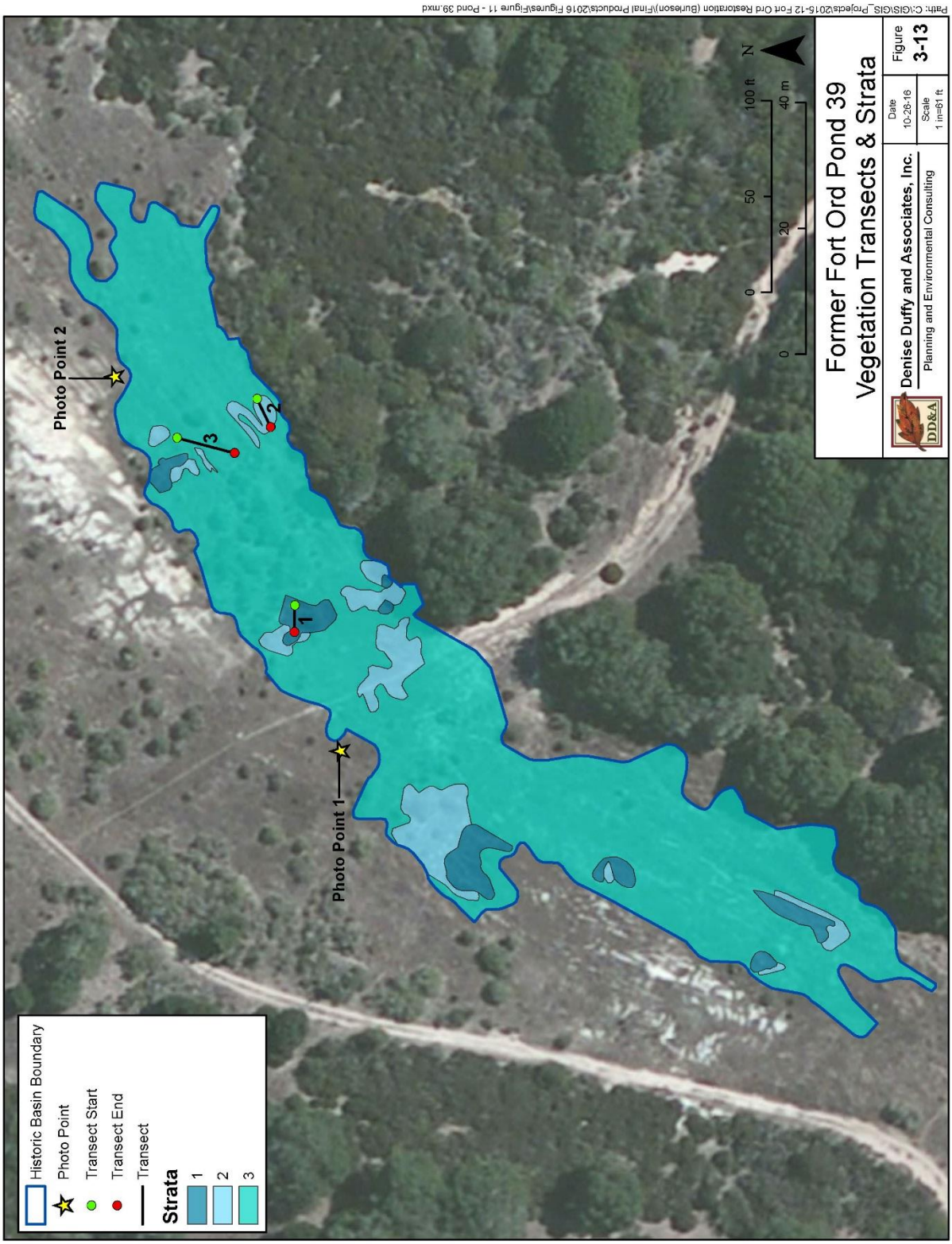

Figure 3-13. Former Fort Ord Pond 39 Vegetation Transects and Strata

3.2.12 Pond 40 South

Vegetation monitoring occurred at Pond 40 South on May 18, 2016. These surveys represent baseline data. No standing water was present during monitoring. Biologists identified three strata at Pond 40 South (see Figure 3-14). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-22). A total of 27 plant species were observed within the historic basin boundary. Of these species 11 were native, 15 were non-native, and one was unidentified. Additionally, three of species were OBL wetland plants, 10 were FAC or FACW, 11 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-22. Pond 40 South Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	9%
2	26%
3	65%

Transect 1 at Pond 40 South consisted of a 5-m transect placed in stratum 1. A total of five plant species were observed along the transect. Of these species three were native and two were non-native. Pale spike-rush was the dominant species, accounting for approximately 27% cover. Bare ground and thatch were also fairly abundant, accounting for 25% cover and 23% cover, respectively. Other species included Hickman's popcorn flower, cut-leaved plantain, grass poly, and common toad rush.

Transect 2 at Pond 40 South consisted of a 5-m transect placed in stratum 2. A total of 11 plant species were observed along the transect. Of these species one was native and 10 were non-native. Brown-headed rush was the dominant species, accounting for approximately 33% cover. Thatch was fairly abundant within the stratum, accounting for approximately 30% cover. Other species included long-stemmed filaree, rattail sixweeks grass, silvery hair-grass, small quaking grass, cut-leaved plantain, spring vetch (*Vicia sativa*), narrow-leaved clover, soft chess, smooth cat's ear, and grass poly. Bare ground was also present.

Transect 3 at Pond 40 South consisted of a 10-m transect placed in stratum 3. A total of 12 plant species were observed along the transect. Of these species two were native, nine were non-native, and one was unidentified. Italian rye grass was the dominant species, accounting for approximately 53% cover. Thatch was also fairly abundant, accounting for approximately 27% cover. Other vegetation included brown-headed rush, dwarf brodiaea, cut-leaved geranium, an unidentified species in the sunflower family, spring vetch, cut-leaved plantain, smooth cat's ear, rattail sixweeks grass, sheep sorrel, soft chess, and ripgut grass (*Bromus diandrus*).

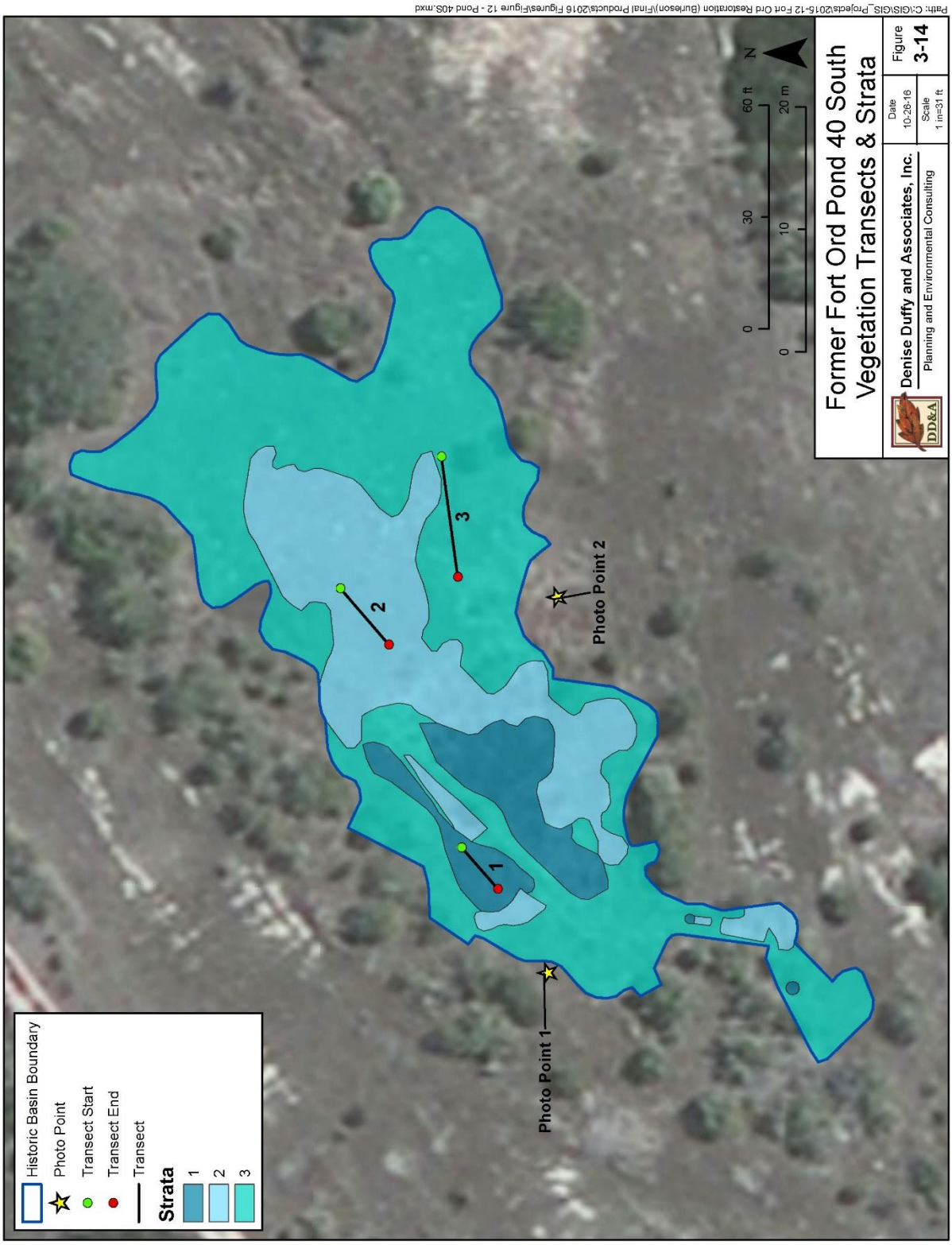

Figure 3-14. Former Fort Ord Pond 40 South Vegetation Transects and Strata

3.2.13 Pond 41

Vegetation monitoring occurred at Pond 41 on June 13, 2016. These surveys represent baseline data. No standing water was present during monitoring. Biologists identified three strata and a few small islands of upland vegetation (see Figure 3-15). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-23). A total of 28 plant species were observed within the historic basin boundary. Of these species 16 were native and 12 were non-native. Additionally, 10 species were OBL wetland plants, seven were FAC or FACW, 11 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-23. Pond 41 South Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	29%
2	52%
3	27%
Upland	3%

Transect 1 at Pond 41 consisted of a 10-m transect placed in stratum 1. A total of seven plant species were observed along the transect. Of these species six were native and one was non-native. Smooth goldfields were the dominant species, accounting for approximately 25% cover. Thatch was fairly abundant, accounting for approximately 28% cover. Other vegetation present included alkali mallow, pale spike-rush, Hickman's popcorn flower, Howell's quillwort, rabbit foot grass, and bugle hedge nettle. Bare ground was also present.

Transect 2 at Pond 41 consisted of a 10-m transect placed in stratum 2. A total of seven plant species were observed along the transect. Of these species six were native and one was non-native. Bugle hedge-nettle was the dominant species, accounting for approximately 32% cover. Thatch was also fairly abundant accounting for approximately 18% cover. Other species included Hickman's popcorn flower, pale spike-rush, Howell's quillwort, smooth goldfields, alkali mallow, and rabbit-foot grass.

Transect 3 at Pond 41 consisted of a 10-m transect placed in stratum 3. A total of 11 plant species were observed along the transect. Of these species five were native and six were non-native. Brown-headed rush was the dominant vegetation, accounting for approximately 43% cover. Thatch was also fairly abundant, accounting for approximately 25% cover. Other vegetation included coast eryngo, alkali mallow, bugle hedge-nettle, curly dock, smooth cat's ear, white-stemmed filaree, soft chess, grass poly, rattail sixweeks grass, and coast tarweed.

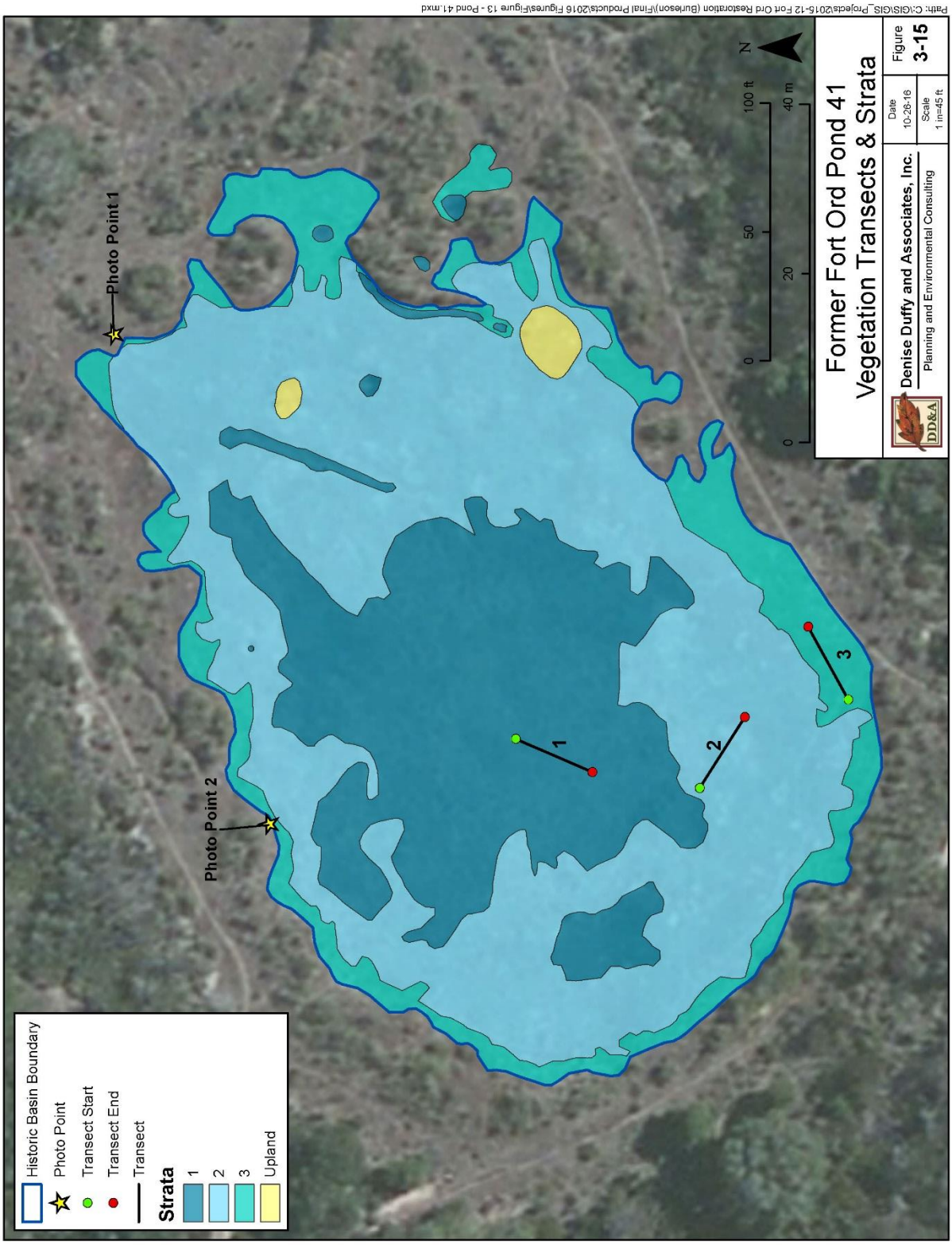

Figure 3-15. Former Fort Ord Pond 41 Vegetation Transects and Strata

3.2.14 Pond 43

Vegetation monitoring occurred at Pond 43 on May 25, 2016. These surveys represent baseline data. No standing water was present during monitoring. Biologists identified three strata and a few small islands of upland vegetation (see Figure 3-16). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-24). A total of 35 plant species were observed within the historic basin boundary. Of these species 24 were native, nine were non-native, and two were unidentified. Additionally, seven species were OBL wetland plants, 14 were FAC or FACW, 14 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-24. Pond 43 Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	19%
2	50%
3	27%
Upland	3%

Transect 1 at Pond 43 consisted of a 10-m transect placed in stratum 1. A total of nine plant species were observed along the transect. Of these species six were native, two were non-native, and one was unidentified. Hickman's popcorn flower was the dominant species, accounting for approximately 23% cover. Thatch was also fairly abundant, accounting for approximately 23% cover. Other species present included Sacramento beardstyle (*Pogogyne zizyphoroides*), annual hair-grass, brown-headed rush, coast eryngo, rabbit-foot grass, slender wooly-heads, grass poly, and an unidentified species. Bare ground was also present.

Transect 2 at Pond 43 consisted of a 10-m transect placed in stratum 2. A total of 18 plant species were observed along the transect. Of these species 12 were native and six were non-native. Common toad rush and brown-headed rush were the dominant species, accounting for approximately 22% cover and 17% cover, respectively. Thatch was also fairly abundant, accounting for approximately 13% cover. Other species included grass poly, Hickman's popcorn flower, rabbit-foot grass, slender tarweed, Sacramento beardstyle, smooth cat's ear, contorted suncup (*Camissonia contorta*), rattail sixweeks grass, California oatgrass, blue eyed grass, coyote brush, coast eryngo, and annual hair-grass. Bare ground was also present.

Transect 3 at Pond 43 consisted of a 10-m transect placed in stratum 3. A total of 13 plant species were observed along the transect. Of these species five were native, seven were non-native, and one was unidentified. Slender tarweed was the dominant vegetation. Thatch and bare ground were also fairly abundant, each accounting for approximately 18% cover. Other vegetation present included silvery hair-grass, rattail sixweeks grass, scarlet pimpernel, California oatgrass, lotus (*Acmispon* sp.), brown-headed rush, grass poly, common toad rush, dwarf rush, Davy's centaury (*Zeltnera davyi*), small quaking grass, and smooth cat's ear. Cryptogrammic crust was also present in the stratum.

Figure 3-16. Former Fort Ord Pond 43 Vegetation Transects and Strata

3.2.15 Pond 44

Vegetation monitoring occurred at Pond 44 on May 18, 2016. These surveys represent baseline data. No standing water was present during monitoring. Biologists identified three strata and islands of upland vegetation (see Figure 3-17). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-25). A total of 48 plant species were observed within the historic basin boundary. Of these species 32 were native, 15 were non-native, and one was unidentified. Additionally, six species were OBL wetland plants, 18 were FAC or FACW, 24 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-25. Pond 44 Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	60%
2	17%
3	7%
Upland	16%

Transect 1 at Pond 44 consisted of a 10-m transect placed in stratum 1. A total of 20 plant species were observed along the transect. Of these species 12 were native and eight were non-native. Coast eryngo was the dominant species. Bare ground and thatch were also fairly abundant, accounting for approximately 13% cover and 7% cover, respectively. Other species included dwarf brodiaea, little hop clover (*Trifolium dubium*), brown-headed rush, slender wooly-heads, grass poly, rabbit-foot grass, common toad rush, California oatgrass, pacific foxtail, vernal-pool bent grass (*Agrostis lacuna-vernalis*), Hickman's popcorn flower, soft chess, small quaking grass, Sacramento beardstyle, dwarf rush, cut-leaved geranium, rattail sixweeks grass, annual hair-grass, and pale spike-rush.

Transect 2 at Pond 44 consisted of a 5-m transect placed in stratum 2. A total of 17 plant species were observed along the transect. Of these species 10 were native and seven were non-native. Common toad rush was the dominant species, accounting for approximately 43% cover. Bare ground was also fairly abundant, accounting for approximately 27% cover. Other species included grass poly, contorted suncup, Hickman's popcorn flower, Sacramento beardstyle, rabbit-foot grass, small tarweed, Monterey centaury (*Zeltnera muehlenbergii*), rattail sixweeks grass, slender tarweed, slender wooly-heads, scarlet pimpernel, slivery hair-grass, valley tassels (*Castilleja attenuata*), small quaking grass, and coast eryngo.

Transect 3 at Pond 44 consisted of a 5-m transect placed in stratum 3. A total of 21 plant species were observed along the transect. Of these species 10 were native, 10 were non-native, and one was unidentified. An unidentified species in the sunflower family was the dominant species, accounting for approximately 23% cover. Thatch was fairly abundant, accounting for approximately 22% cover. Other species included small-flowered lotus (*Acmispon parviflorus*), silvery hair-grass, coyote brush, ripgut grass, soft chess, small quaking grass, dwarf brodiaea, California oatgrass, coast eryngo, long-stemmed filaree, rattail sixweeks grass, pacific foxtail, cut-leaved geranium, smooth cat's ear, common toad rush, western toad rush, pacific wood rush (*Luzula comosa*), cut-leaved plantain, and little hop clover.

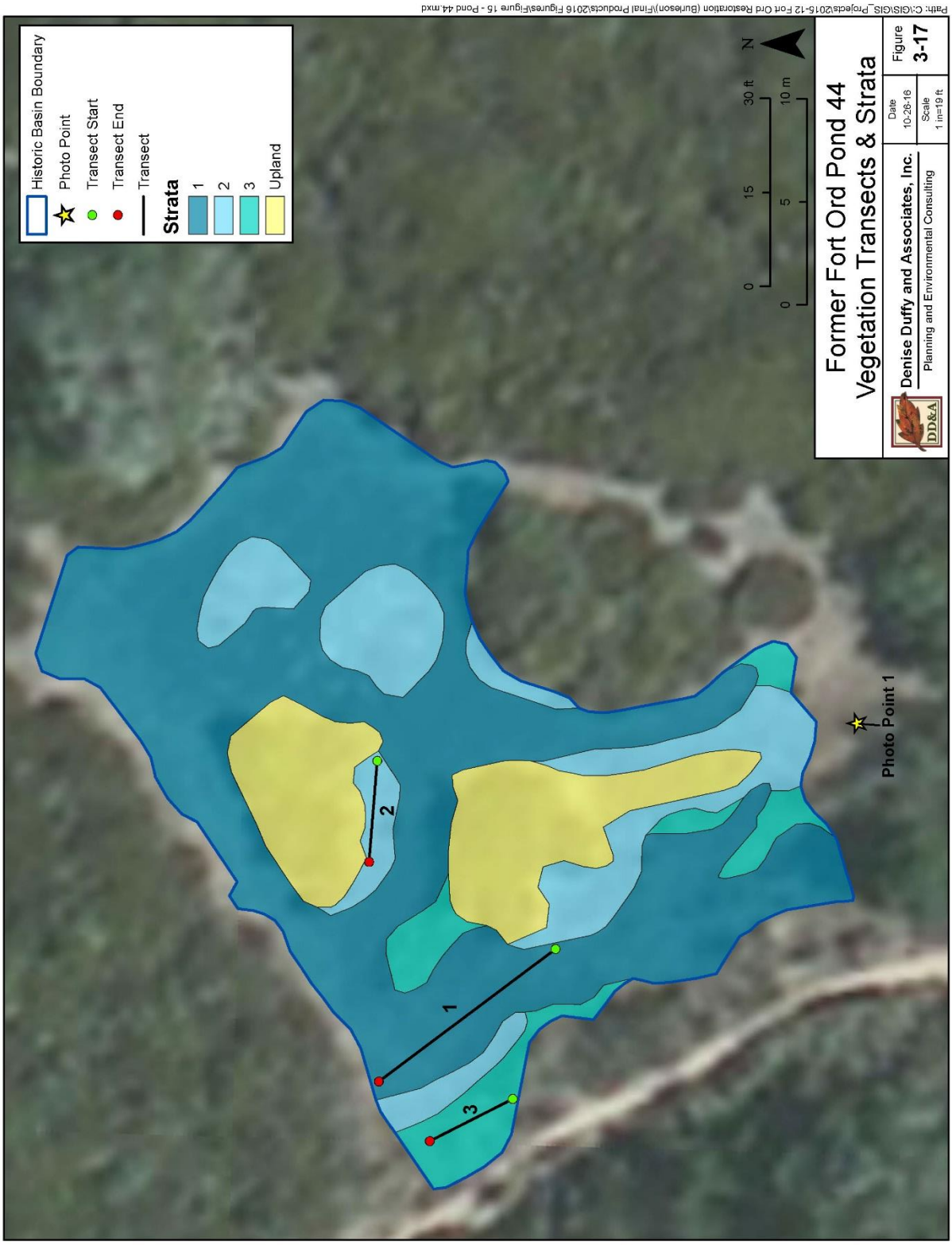

Figure 3-17. Former Fort Ord Pond 44 Vegetation Transects and Strata

3.2.16 Pond 56

Vegetation monitoring occurred at Pond 56 on September 20 and 21, 2016. These surveys represent control data for reference vernal pools. No standing water was present during monitoring. Biologists identified six strata and small islands of upland vegetation in the vernal pool (see Figure 3-18). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-25). A total of 41 plant species were observed within the historic basin boundary. Of these species 26 were native, 14 were non-native, and one was unidentified. Additionally, eight species were OBL wetland plants, 10 were FAC or FACW, 23 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-25. Pond 56 Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	4%
2	6%
3	12%
4	50%
5	22%
6	3%
Upland	3%

Transect 1 at Pond 56 consisted of a 10-m transect placed in stratum 1. A total of four plant species were observed along the transect. Of these species two were native and two were non-native. Pale spike-rush was the dominant species, accounting for approximately 43% cover. Thatch and bare ground were fairly abundant, accounting for approximately 24% cover and 21% cover, respectively. Alkali mallow was the other species, accounting for approximately 12% cover.

Transect 2 at Pond 56 consisted of a 10-m transect placed in stratum 2. A total of three plant species were observed along the transect. Of these species two were native and one was non-native. Pale spike-rush was the dominant species, accounting for approximately 63% over. Salt grass and sheep sorrel were other species present. Bare ground and thatch were also present.

Transect 3 at Pond 56 consisted of a 10-m transect placed in stratum 3. A total of four plant species were observed along the transect. Of these species three were native and one was non-native. Pale spike-rush, salt grass, and brown-headed rush were the dominant plant species, accounting for approximately 20% cover, 28% cover, and 26% cover, respectively. Thatch was fairly abundant, accounting for approximately 26% cover. Small amounts of bare ground and sheep sorrel were also present.

Transect 4 at Pond 56 consisted of a 10-m transect placed in stratum 4. A total of seven plant species were observed along the transect. Of these species five were native and two were non-native. Brown-headed rush was the dominant species, accounting for approximately 53% cover. Thatch was also fairly abundant, accounting for approximately 12% cover. Other species present included rabbit-foot grass, bugle hedge-nettle, pale spike-rush, salt grass, coast eryngo, and grass poly.

Transect 5 at Pond 56 consisted of a 10-m transect placed in stratum 5. A total of eight plant species were observed along the transect. Of these species six were native and two were non-native. Brown-

headed rush was the dominant species, accounting for approximately 45% cover. Bare ground was fairly abundant, accounting for approximately 19% cover. Other species included alkali mallow, coast eryngo, low bulrush, Howell's quillwort, grass poly, rabbit-foot grass, and salt grass. Thatch was also present.

The vegetation in stratum 6 was too desiccated to conduct transect surveys. Stratum 6 was comprised of mostly grasses. At the time of the surveys, enough flowers were present to determine species; however, sufficient flowering material was not present to discern percent cover in quadrats. Species present included alkali mallow, rattlesnake grass, Italian rye grass, soft chess, grass poly, cut-leaved plantain, and bugle hedge nettle. Of these species two were native and five were non-native. Thatch was also present. Stratum 6 can be differentiated from the surrounding upland by the lack of coyote brush, slender wild oat, purple needle grass (*Stipa pulchra*), and coast live oak (*Quercus agrifolia*).

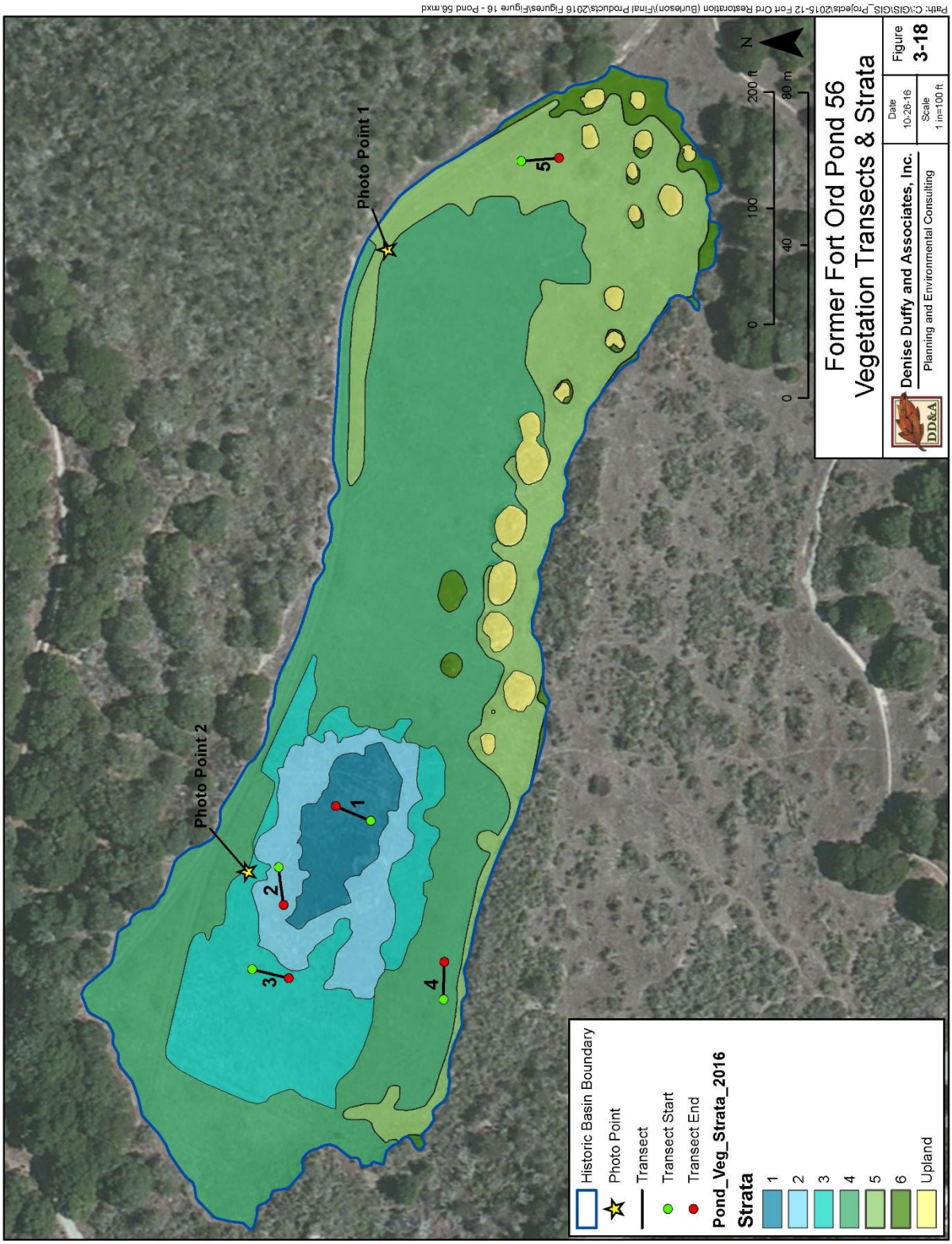

Figure 3-18. Former Fort Ord Pond 56 Vegetation Transects and Strata

3.2.17 Pond 101 West

Vegetation monitoring occurred at Pond 101 West on June 13, 2016. These surveys represent baseline data. No standing water was present during monitoring. Biologists identified two strata at Pond 101 West (see Figure 3-19). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-26). A total of 43 plant species were observed within the historic basin boundary. Of these species 22 were native and 21 were non-native. Additionally, eight species were OBL wetland plants, 18 were FAC or FACW, 17 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-26. Pond 101 West Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	56%
2	44%

Transect 1 at Pond 101 West consisted of a 10-m transect placed in stratum 1. A total of 13 plant species were observed along the transect. Of these species seven were native and six were non-native. Hickman's popcorn flower was the dominant species, accounting for approximately 33% cover. Thatch was fairly abundant, accounting for approximately 21% cover. Other species included curly dock, pale spike-rush, rabbit foot-grass, smooth goldfields, smooth cat's ear, purple cudweed, grass-leaved western goldenrod (*Euthamia occidentalis*), western yellow crest (*Rorippa curvisiliqua*), Chinese pusley, brass buttons, cut-leaved plantain, and prickly sow-thistle (*Sonchus asper*). Bare ground was present as well.

Transect 2 at Pond 101 West consisted of a 10-m transect placed in stratum 2. A total of 16 plant species were observed along the transect. Of these species seven were native and nine were non-native. Italian rye grass was the dominant species, accounting for approximately 27% cover. Thatch was fairly abundant, accounting for approximately 28% cover. Other species included cut-leaved plantain, brown-headed rush, salt grass, smooth cat's ear, rattail sixweeks grass, Hickman's popcorn flower, pale spike-rush, curly dock, rabbit-foot grass, small quaking grass, common toad rush, meadow barley, smooth cat's ear, coast tarweed, and sheep sorrel.

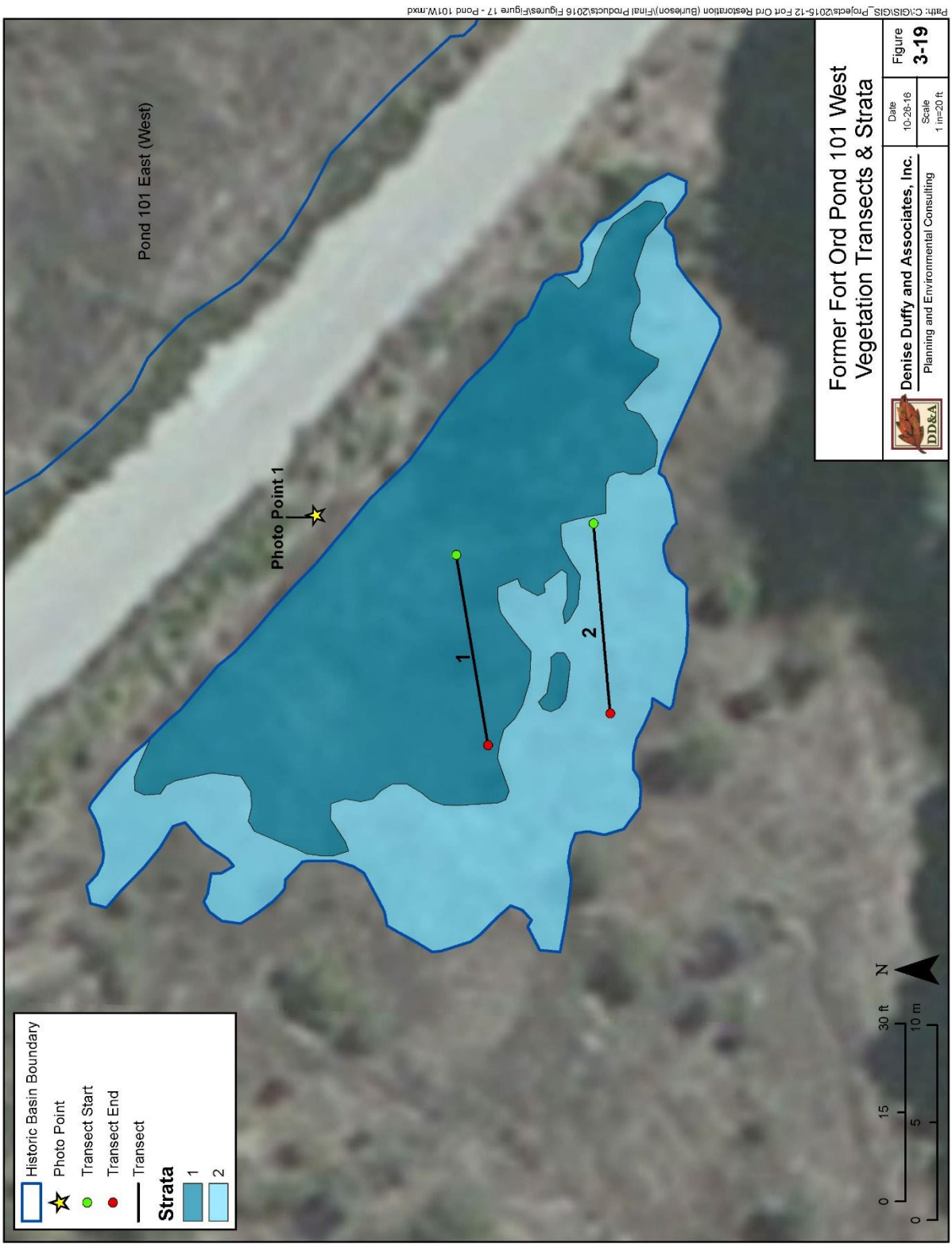

Figure 3-19. Former Fort Ord Pond 101 West Vegetation Transects and Strata

3.2.18 Pond 101 East (West)

Vegetation monitoring occurred at Pond 101 East (West) on July 7, 2016. These surveys represent control data for reference vernal pools. No standing water was present during monitoring. Biologists identified five strata at the pool (see Figure 3-20). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-27). A total of 58 plant species were observed within the historic basin boundary. Of these species 33 were native and 25 were non-native. Additionally, 10 species were OBL wetland plants, 24 were FAC or FACW, 24 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-27. Pond 101 East (West) Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	13%
2	37%
3	12%
4	22%
5	15%

Transect 1 at Pond 101 East (West) consisted of a 10-m transect placed in stratum 1. A total of 11 plant species were observed along the transect. Of these species eight were native and three were non-native. Purple cudweed was the dominant species, accounting for approximately 42% cover. Bare ground was fairly abundant, accounting for approximately 30% cover. Other species included alkali mallow, common knotweed (*Polygonum aviculare* subsp. *depressum*), western yellow crest, Howell's quillwort, pale spike-rush, pacific foxtail, grass poly, Chinese pusley, rabbit-foot grass, and flowering quillwort. Thatch was also present.

Transect 2 at Pond 101 East (West) consisted of a 10-m transect placed in stratum 2. A total of eight plant species were observed along the transect. Of these species five were native and three were non-native. Pale spike-rush was the dominant species, accounting for approximately 55% cover. Bare ground and thatch were fairly abundant, accounting for approximately 19% cover and 20% cover, respectively. Other species included curly dock, alkali mallow, grass poly, western yellow crest, common knotweed, purple cudweed, and Howell's quillwort.

Transect 3 at Pond 101 East (West) consisted of a 10-m transect placed in stratum 3. A total of 16 plant species were observed along the transect. Of these species ten were native and six were non-native. Howell's quillwort was the dominant plant species, accounting for approximately 43% cover. Bare ground was fairly abundant, accounting for approximately 20% cover. Other species included smooth cat's ear, Hickman's popcorn flower, grass poly, alkali mallow, Italian rye grass, rabbit-foot grass, coast eryngo, salt grass, prickly sow-thistle, Chinese pusley, pacific bent grass, bugle hedge-nettle, pacific foxtail, and pale spike-rush. Thatch was also present.

Transect 4 at Pond 101 East (West) consisted of a 10-m transect placed in stratum 4. A total of 14 plant species were observed along the transect. Of these species seven were native and seven were non-native. Coast tarweed and salt grass were the dominant species, comprising approximately 26% cover and 29% cover, respectively. Thatch was fairly abundant, accounting for approximately 14% cover. Other species included coyote brush, grass poly, rattail sixweeks grass, soft chess, Chinese pusley, common

toad rush, ripgut grass, Italian rye grass, California oatgrass, purple cudweed, small quaking grass, and smooth cat's ear. Bare ground was also present.

Transect 5 at Pond 101 East (West) consisted of a 10-m transect placed in stratum 5. A total of six plant species were observed along the transect. Of these species two were native and four were non-native. Italian rye grass was the dominant species, accounting for approximately 70% cover. Other species included grass poly, alkali mallow, rattail sixweeks grass, slender tarweed, and small quaking grass. Thatch and bare ground were also present.

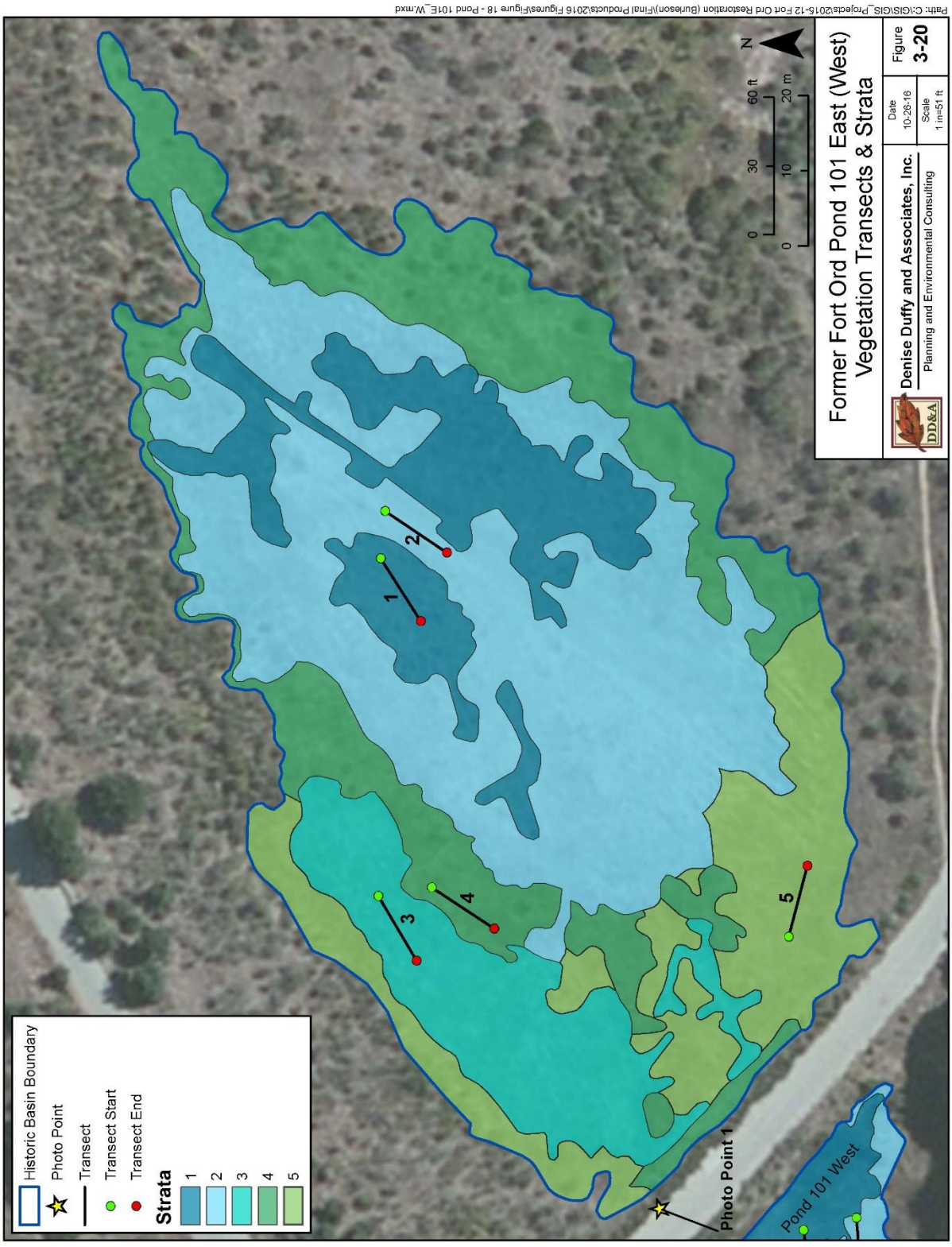

Figure 3-20. Former Fort Ord Pond 101 East (West) Vegetation Transects and Strata

3.2.19 Pond 101 East (East)

Vegetation monitoring occurred at Pond 101 East (East) on July 7, 2016. These surveys represent control data for reference vernal pools. No standing water was present during monitoring. Biologists identified four strata at this vernal pool (see Figure 3-21). The historic basin boundary was identified and all vegetative strata within the basin were mapped and tabulated (see Table 3-28). A total of 37 plant species were observed within the historic basin boundary. Of these species 19 were native, 17 were non-native, and one was unidentified. Additionally, five species were OBL wetland plants, 12 were FAC or FACW, 20 were FACU, UPL, or not listed. Appendix F identifies the number of native, non-native, and unidentified species within each stratum. Appendix G identifies the number of species within each wetland indicator category for each stratum.

Table 3-28. Pond 101 East (East) Vegetative Strata Percentage Within the Historic Basin Boundary

Stratum	Percentage
1	0.4%
2	48%
3	44%
4	8%

Transect 1 at Pond 101 East (East) consisted of a 5-m transect placed in stratum 1. A total of seven plant species were observed along the transect. Of these species six were native and one was non-native. Bare ground was very prominent, accounting for approximately 75% cover. Of the vegetation present, alkali mallow and Mexican rush (*Juncus mexicanus*) were the most abundant, accounting for approximately 7% cover and 9% cover, respectively. Pacific foxtail, curly dock, western yellow crest, pale spike-rush, and thatch were also present.

Transect 2 at Pond 101 East (East) consisted of a 10-m transect placed in stratum 2. A total of four plant species were observed along the transect. Of these species two were native and two were non-native. Pale spike-rush was the dominant species, accounting for approximately 85% cover. Other species included curly dock, alkali mallow, and rabbit-foot grass. Bare ground and thatch were also present.

Transect 3 at Pond 101 East (East) consisted of a 10-m transect placed in stratum 3. A total of 10 plant species were observed along the transect. Of these species four were native and six were non-native. Thatch was very prominent, accounting for approximately 54% cover. Of the vegetation present, alkali mallow was the most abundant, accounting for approximately 54% cover. Other species included curly dock, ripgut grass, pale spike-rush, western yellow crest, smooth cat's ear, grass poly, pacific bent grass, prickly sow-thistle, and weedy cudweed. Bare ground was also present.

Transect 4 at Pond 101 East (East) consisted of a 10-m transect placed in stratum 4. A total of nine plant species were observed along the transect. Of these species seven were native and two were non-native. Baltic rush was the dominant species present, accounting for approximately 45% cover. Thatch was fairly abundant, accounting for approximately 27% cover. Other species included grass poly, purple cudweed, willow-leaved dock (*Rumex salicifolius*), alkali mallow, coast tarweed, western yellow cress, and prickly sow-thistle. Bare ground was also present.

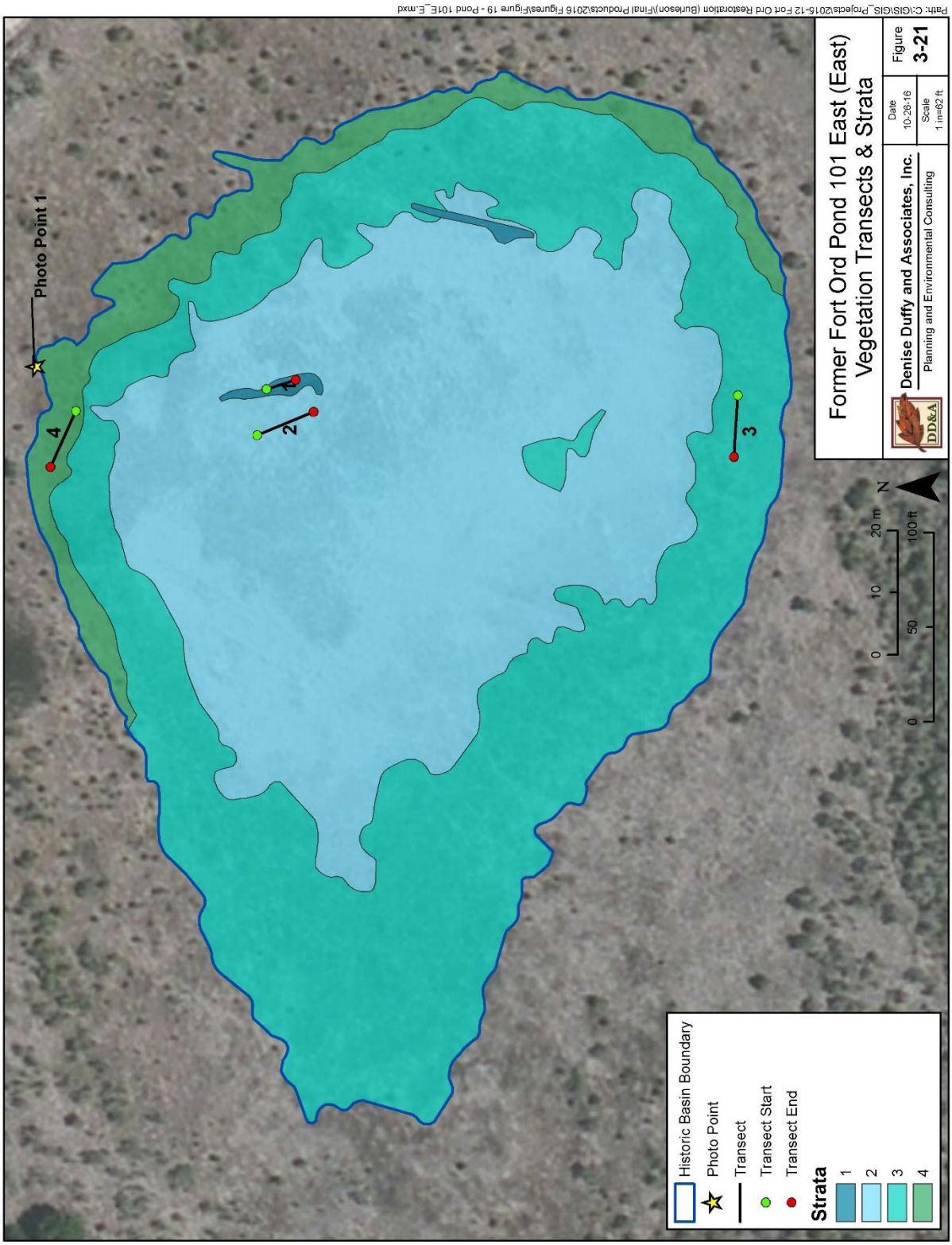

Figure 3-21. Former Fort Ord Pond 101 East (East) Vegetation Transects and Strata

3.2.20 Pond 3 North

No transect survey data was collected at this vernal pool. However, the population of Contra Costa goldfields was mapped on June 7, 2016. Approximately 0.13 acre of Contra Costa goldfields was identified with densities ranging from 5% cover to 40% cover (see Figure 3-22).

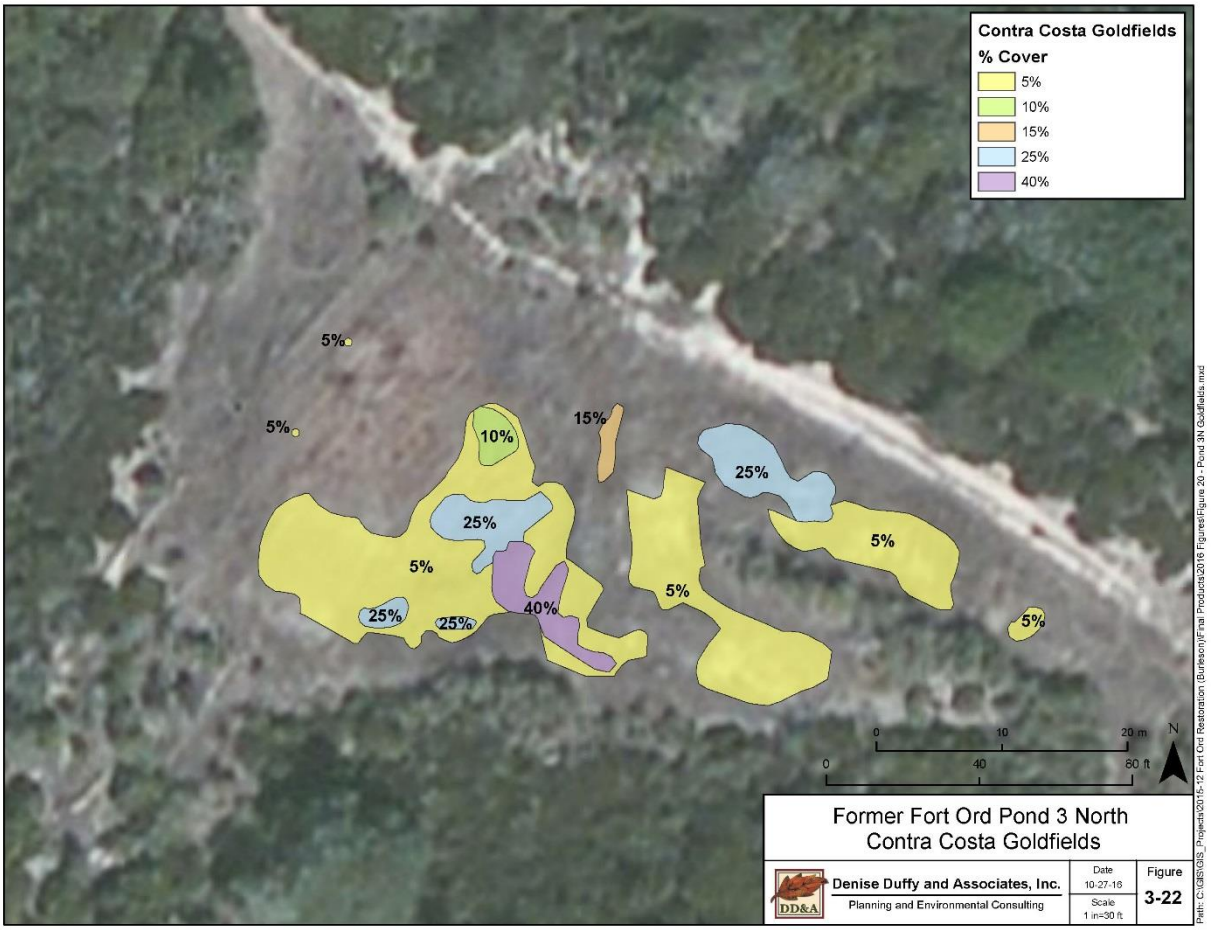

Figure 3-22. Contra Costa Goldfield Vegetative Cover at Pond 3 North on Former Fort Ord

3.3 Wildlife Monitoring

Aquatic wildlife surveys occurred between April 4 and May 10, 2016. When possible, biologists sampled vernal pools three times; however, this was not possible in all cases since some pools dried sooner than others. Aquatic sampling was conducted at vernal pools that held at least 10 cm of water during the March/April hydrologic monitoring survey: Ponds 3 North, 3 South, 5, 8, 10, 14, 18, 30A, 30B, 30C, 39, 40 South, 41, 43, 56, 60, 101 West, 101 East (West), and 101 East (East). Ponds 39, 40 South, and 43 dried up during the sampling period and were not sampled during all events.

3.3.1 California Tiger Salamander

Biologists encountered CTS larvae in Ponds 5, 8, 10, 30A, 30C, 41, 56, 60, 101 West, 101 East (West), and 101 East (East) during the aquatic surveys (see Table 3-29). No CTS were observed at Ponds 3 North, 3

South, 14, 18, 30B, 39, 40 South, and 43. Only CTS larvae were found during the aquatic surveys; no adult CTS were encountered.

Pacific tree frogs (*Pseudacris regilla*) and western toads (*Anaxyrus boreas halophilus*) were also detected at vernal pools during aquatic surveys. Pacific tree frogs were observed at all vernal pools where aquatic surveys were conducted in 2016, except Pond 43. Western toads were observed at Ponds 8, 30A, 30B, and 30C. Additionally, a spent California newt (*Taricha torosa*) egg mass was observed at Pond 10.

3.3.2 California Fairy Shrimp

Biologists did not detect fairy shrimp in any vernal pools during the 2016 aquatic surveys. Biologists observed a number of aquatic invertebrates including water fleas (*Daphnia* sp.), clam shrimp (order Conchostraca), and backswimmers (family Corixidae) during sampling events (see Table 3-30a - 3-30b).

Table 3-29. CTS Aquatic Survey Results for Former Fort Ord Monitored Vernal Pools 2016

Pond	Sampling Date	# of Larvae Obs.	# of Larvae Measured	Total Length of Larvae (mm)			Snout-Vent Length of Larvae (mm)			Comments
				Mean*	Range	Mode	Mean*	Range	Mode	
5	4/6/2016	101	22	75	50-100	65	38	25-52	40	
	4/21/2016	75	42	87	50-130	91	44	30-65	43	Tail tips collected on three individuals measured
	5/10/2016	100	24	103	75-120	110	58	44-69	59	
8	4/5/2016	0	-	-	-	-	-	-	-	
	4/20/2016	5	5	22	20-25	22	11	10-12	10	
	5/9/2016	0	-	-	-	-	-	-	-	
10	4/6/2016	>101	29	72	36-115	75	39	20-60	40	
	4/20/2016	127	47	85	49-130	86	44	22-64	46	47 tail tips collected by B. Schaffer after measurements were taken
	5/10/2016	29	22	84	51-122	57	46	27-70	44	
30A	4/5/2016	15	15	73	62-82	70	34	29-40	35	
	4/20/2016	30	30	93	81-102	90	48	41-55	45	30 tail tips collected by B. Schaffer after measurements were taken
	5/9/2016	29	29	102	85-120	100	53	43-60	55	Tail tips collected on two individuals measured
30C	4/5/2016	0	-	-	-	-	-	-	-	
	4/20/2016	5	5	65	57-71	#N/A	34	30-37	#N/A	
	5/9/2016	5	5	75	60-88	#N/A	42	40-45	40	Tail tip collected on one individual measured; one individual was missing both front legs
41	4/4/2016	0	-	-	-	-	-	-	-	
	4/19/2016	0	-	-	-	-	-	-	-	
	5/9/2016	3	3	116	102-130	#N/A	58	50-63	#N/A	
56	4/5/2016	0	-	-	-	-	-	-	-	
	4/19/2016	28	27	67	25-100	80	34	10-52	30	27 tail tips collected by B. Schaffer after measurements were taken
	5/10/2016	101	20	97	73-130	120	53	35-70	50	
60	4/4/2016	3	3	82	75-90	#N/A	44	42-45	45	
	4/19/2016	11	11	100	85-120	100	55	45-70	45	11 tail tips collected by B. Schaffer after measurements were taken
	5/9/2016	7	7	113	60-145	#N/A	58	40-70	70	Tail tips collected on one individual measured
101 West	4/6/2016	11	11	65	45-80	65	35	20-45	35	
	4/21/2016	12	12	80	70-100	80	41	34-50	40	
	5/10/2016	10	10	60	27-99	66	31	12-56	#N/A	
101 East (West)	4/6/2016	>101	17	57	20-90	60	31	10-50	30	
	4/21/2016	103	18	52	32-75	35	29	20-40	28	Tail tips collected on one individual measured
	5/10/2016	100	10	59	45-81	81	31	24-47	25	
101 East (East)	4/6/2016	>101	14	68	55-75	75	36	30-41	40	
	4/21/2016	101	36	88	50-110	85	43	32-55	40	Tail tips collected on four individuals measured
	5/10/2016	67	21	91	67-115	100	53	45-73	50	

* The mean was rounded to the nearest whole number

Table 3-30a. Aquatic Invertebrates Observed During the Former Fort Ord Aquatic Survey 2016

Aquatic Invertebrate	Vernal Pool									
	3 North	3 South	5	8	10	14	18	30A	30B	30C
clam shrimp (order Conchostraca)	●		●	●	●	●	●		●	
water flea (order Cladocera)	●	●	●	●	●	●	●	●	●	●
seed shrimp (order Ostracoda)	●	●	●	●	●	●	●	●	●	●
copepods (order Eucopepoda)	●	●	●	●	●	●	●	●	●	●
mayfly larvae (order Ephemeroptera)	●	●	●	●	●	●	●	●	●	●
dragonfly larvae (order Anisoptera)	●	●	●	●	●	●	●	●	●	●
damselfly larvae (order Zygoptera)	●	●	●	●	●	●	●	●	●	●
backswimmer (family Corixidae)	●	●	●	●	●	●		●	●	●
water boatman (family Corixidae)			●	●	●	●		●	●	●
predacious diving beetle (family Dytiscidae)	●	●	●	●	●	●	●			●
mosquito (family Culicidae)	●	●	●	●	●	●	●	●	●	●
water scavenger beetle (family Hydrophilidae)				●	●		●	●		
snail	●	●		●	●					
dipteran larvae (order Diptera)	●	●	●	●	●	●	●	●		●

Table 3-30b. Aquatic Invertebrates Observed During the Former Fort Ord Aquatic Survey 2016

Aquatic Invertebrate	Vernal Pool								
	39	40 South	41	43	56	60	101 West	101 East (West)	101 East (East)
clam shrimp (order Conchostraca)	●	●	●		●	●	●	●	●
water flea (order Cladocera)	●	●	●	●	●	●	●	●	●
seed shrimp (order Ostracoda)	●	●	●	●	●	●	●	●	●
copepods (order Eucopepoda)	●	●	●	●	●	●	●	●	●
mayfly larvae (order Ephemeroptera)	●	●	●		●	●			●
dragonfly larvae (order Anisoptera)	●	●	●	ADULT	●	●	●	●	●
damselfly larvae (order Zygoptera)	●		●		●	●	●	●	●
backswimmer (family Corixidae)			●		●	●	●	●	●
water boatman (family Corixidae)	●		●		●	●	●	●	●
predacious diving beetle (family Dytiscidae)	●		●	●	●	●	●	●	●
mosquito (family Culicidae)	●	●	●	●	●	●	●	●	●
water scavenger beetle (family Hydrophilidae)			●		●	●			●
snail					●	●			
dipteran larvae (order Diptera)	●	●	●	●	●	●	●	●	●

4 DISCUSSION

4.1 Hydrology Monitoring

Precipitation allowed for ponding in all vernal pools monitored. While depths and magnitude of inundations were not recorded prior to March, comparing 2015-2016 data to historic data suggests continual inundation was likely throughout the water-year. This can be expected in an above normal water-year. Observed water quality parameters in vernal pools were variable. This is common due to the complex mechanisms contributing to water quality, such as air temperature, plant respiration rates, microbial community structure, and soil chemistry. It is recommended that water quality data be collected from mid-pool, mid-depth to minimize variability for future sampling events.

Based on an evaluation of depth and precipitation data between 1993 and 2016, it was assumed that vernal pools with a 2015-2016 depth of 50 cm or greater by the first survey (March/April) achieved the success criteria for CTS (see Figure 4-1 and Figure 4-2; Appendix E). Vernal pools that met the CTS depth criterion in March between 1993 and 2016 but not for previous months had March depths ranging between 17 cm and 47 cm. To be conservative, it was assumed that vernal pools with March depth values just above this range (50 cm) met the depth criterion. This conservative assumption minimized the potential for misidentifying suitable vernal pools, and it allowed for a reasonable evaluation against success criteria even though monitoring did not occur between the first rain event and March of the 2015-2016 water-year. Table 4-1 summarizes the vernal pools that provided suitable habitat for sensitive species based on the assumption described above. Suitable CTS habitat was defined as a vernal pool that retains average depth of at least 25 cm from the first rain event through March (Burleson, 2008). Suitable fairy shrimp habitat was defined as a vernal pool that retains an average depth of 10 cm for 18 consecutive days through May. For hydrology monitoring in 2016-2017, an attempt will be made to begin monitoring with the first rain event and extend through June.

Table 4-1. 2016 Vernal Pool Suitability for Sensitive Species Habitat at Former Fort Ord Vernal Pools Based on Data Quality Objectives (DQOs) Outlined in The Wetland Plan

Vernal Pool	CTS Suitability Requirements*		Fairy Shrimp Suitability Requirements	
	Met	Not Met	Met	Not Met
3 North	●		●	
3 South		●	●	
5	●		●	
8	●		●	
10	●		●	
14		●	●	
18		●	●	
30A	●		●	
30B		●	●	
30C		●	●	
35		●		●
39	●		●	
40 South		●	●	
41	●		●	
43		●	●	
44		●		●
56	●		●	
60	●		●	
101 West		●	●	
101 East (East)	●		●	
101 East (West)	●		●	

*Following assumption outlined in Section 4.1

Historic data for cumulative precipitation as well as physical characteristics and water quality for all of the reference and post remediation vernal pools are summarized by vernal pool. Vernal pool inundations were mapped and compared to previous years for remediated and reference vernal pools (see Figures 4-3 – Figure 4-9). Previous year comparisons to 2015-2016 show considerable variability in vernal pool area between years and within each vernal pool.

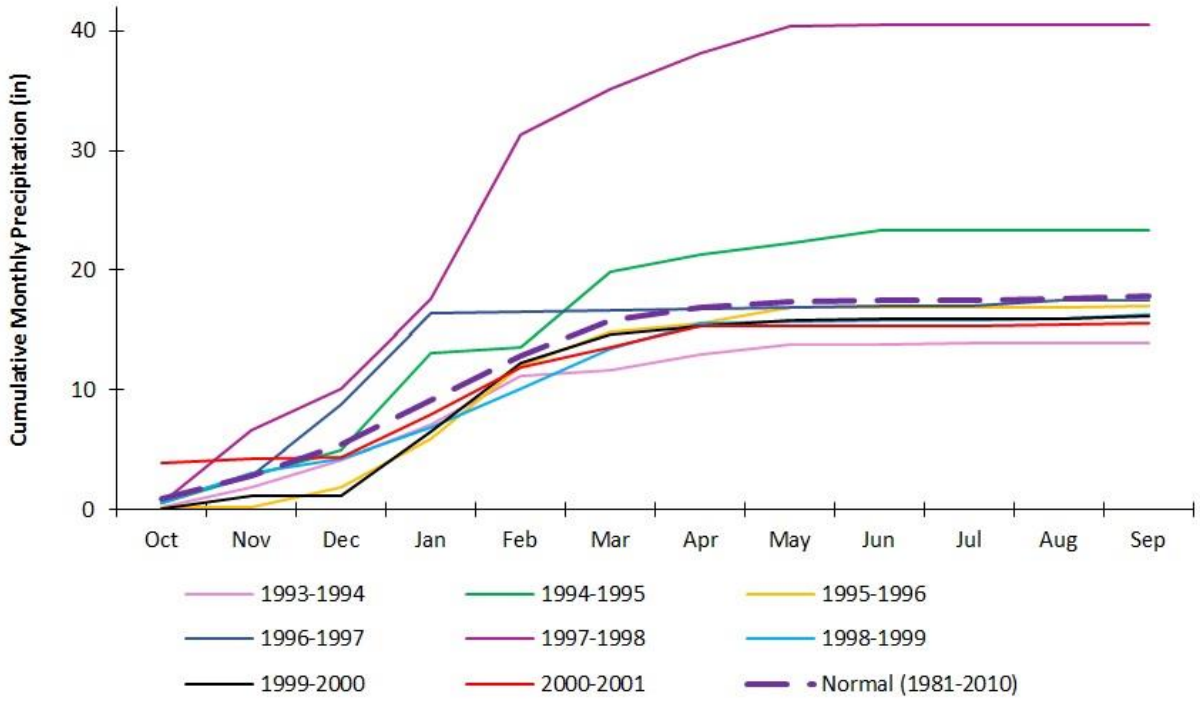

Figure 4-1. Cumulative Monthly Precipitation for Years that Hydrology Monitoring Did Occur between 1993-2001 Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2016; NCDC NOAA, 2016)

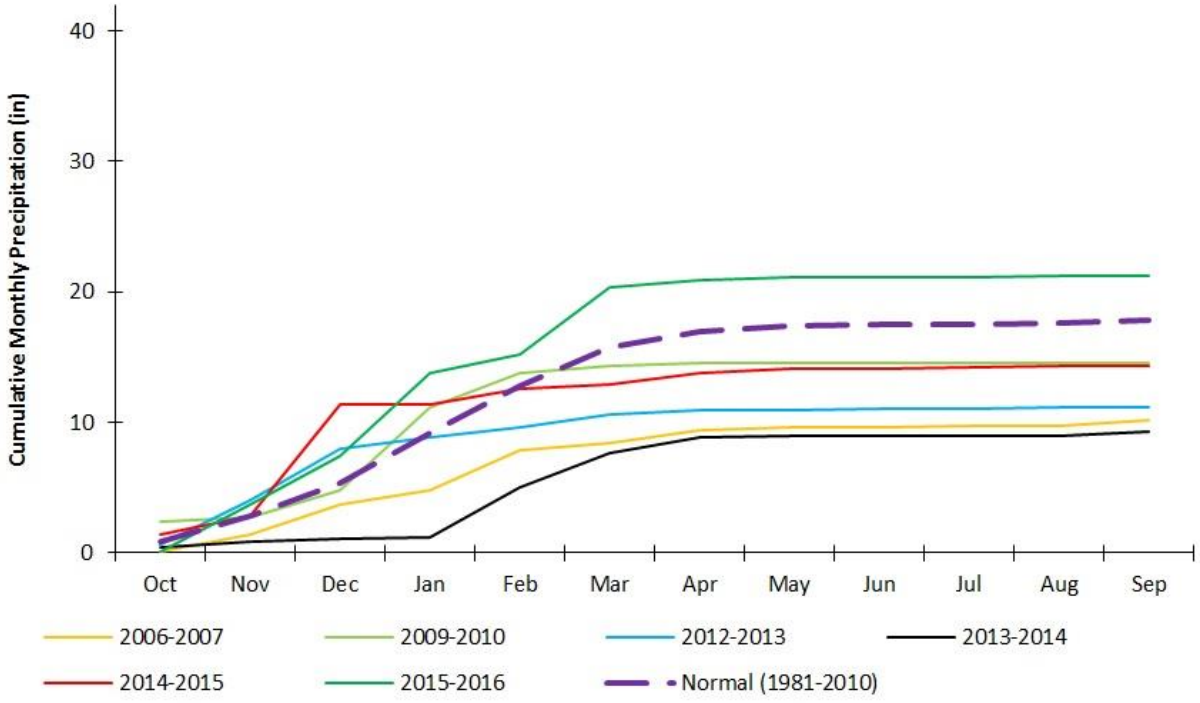

Figure 4-2. Cumulative Monthly Precipitation for Years that Hydrology Monitoring Did Occur between 2006-2016 Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2016; NCDC NOAA, 2016)

4.1.1 Pond 5

Pond 5 was monitored seven years between 1993 and 2016. It is a reference vernal pool and no remediation has occurred here (see Table E-1, Appendix E). Figure 4-3 illustrates historic and current inundation areas.

- 1993-1994 (Jones & Stokes, 1996)
  - In a precipitation year below normal, Pond 5 held water during both monitoring events in March and April with a maximum recorded inundation of 2.75 acres. The temperatures were within a normal range.
  - yearly cumulative precipitation 13.96 inches
  - data collected only in March and April
  - inundated during both monitoring events
  - recorded inundation maximum 2.75 acres in March
  - depth range 20.32-30.48 cm, mean 25.4
  - temperature 17°-20° C, mean 18.5° C
- 1994-1995 (Jones & Stokes, 1996)
  - In a water-year that was above normal, Pond 5 was inundated by January monitoring and stayed inundated through March. Pond 5 inundation area was large compared to other monitored years and filled to 6.89 acres with a maximum depth of 101.6 cm. The temperature fluctuated greatly, which can be expected.
  - yearly cumulative precipitation 23.38 inches
  - data collected January-March, six monitoring events
  - inundated during all monitoring events
  - inundation range 0.17-6.89 acres, mean 1.72 acres
  - depth range 27.94-101.6 cm, mean 58.42 cm
  - temperature range 13°-22° C, mean 16° C
- 1995-1996 (Jones & Stokes, 1996)
  - In a water-year that was approximately normal, ponding occurred from January-May. The maximum depth was much lower than the previous year but similar to the 1993-1994 water-year.
  - yearly cumulative precipitation 16.96 inches
  - data collected January-May, ten monitoring events
  - inundated mid-January to early-May
  - no inundation area recorded
  - depth range 5.08-38.1 cm, mean 19.69 cm
  - no water quality data collected
- 2006-2007 (Shaw, 2008)
  - In a below normal rain year, Pond 5 was inundated to 1.58 acres. The pH at Pond 5 was neutral and the turbidity was relatively low.
  - yearly cumulative precipitation 10.13 inches
  - data collected December-March, three monitoring events
  - some inundation in March, which comprised an area of 1.58 acres
  - depth of 17 cm
  - one water quality sample 7.2 pH, 5.1 FNU turbidity
- 2012-2013 (Tetra Tech, 2014)

  - In a drought year with below normal precipitation, Pond 5 was only inundated in December and January and was a fraction of the size with a maximum inundation of 0.91 acres.
  - drought year with yearly cumulative precipitation of 11.17 inches
  - data collected November-May, seven monitoring events
  - inundated in December and January
  - inundation range 0.01-0.91 acres, mean 0.46 acres
  - depth of 11 cm, only one depth recorded
  - no water quality data collected
- 2013-2014 (Tetra Tech, 2015)
  - In a dry, consecutive drought year Pond 5 did not fill.
  - consecutive drought year with yearly cumulative precipitation 9.33 inches
  - data collected December-June, six monitoring events
  - dry though the entire monitoring season
- 2015-2016
  - In a consecutive drought with precipitation above normal, Pond 5 was inundated from the first recorded monitoring in April through August. The maximum inundation area was 5.325 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was higher on average than some of the other large vernal pools, however, Pond 5 was often monitored in the late afternoon. Dissolved oxygen had a large range. Turbidity was low on average with a few high readings at the end of the season. It is likely that Pond 5 was inundated earlier in the water-year and maximum inundation was most likely not captured. It should be noted that data collection did not start with the first storm or inundation.
  - consecutive drought year with yearly cumulative precipitation 21.21 inches
  - data collected April-September, seven monitoring events
  - inundated April through August
  - inundation range 0.358-5.325 acres, mean 3.89 acres
  - depth range 4-100 cm, mean 74 cm
  - pH range 6.37-6.85, mean 6.51
  - temperature range 16.37°-25.06° C, mean 20.67° C
  - dissolved oxygen range 0.34-7.3 mg/L, mean 4.65 mg/L
  - turbidity range 17.7-295 FNU, mean 83.78 FNU

In below normal precipitation years, Pond 5 is likely to range from 0-30 cm in depth with a maximum inundation of 0-3 acres. In normal precipitation years, Pond 5 is likely to have a maximum depth of approximately 40 cm and a maximum inundation of approximately 3 acres. In above normal precipitation years, Pond 5 could have maximum depths of up to 100 cm or more and a maximum inundation ranging from 3-7 acres.

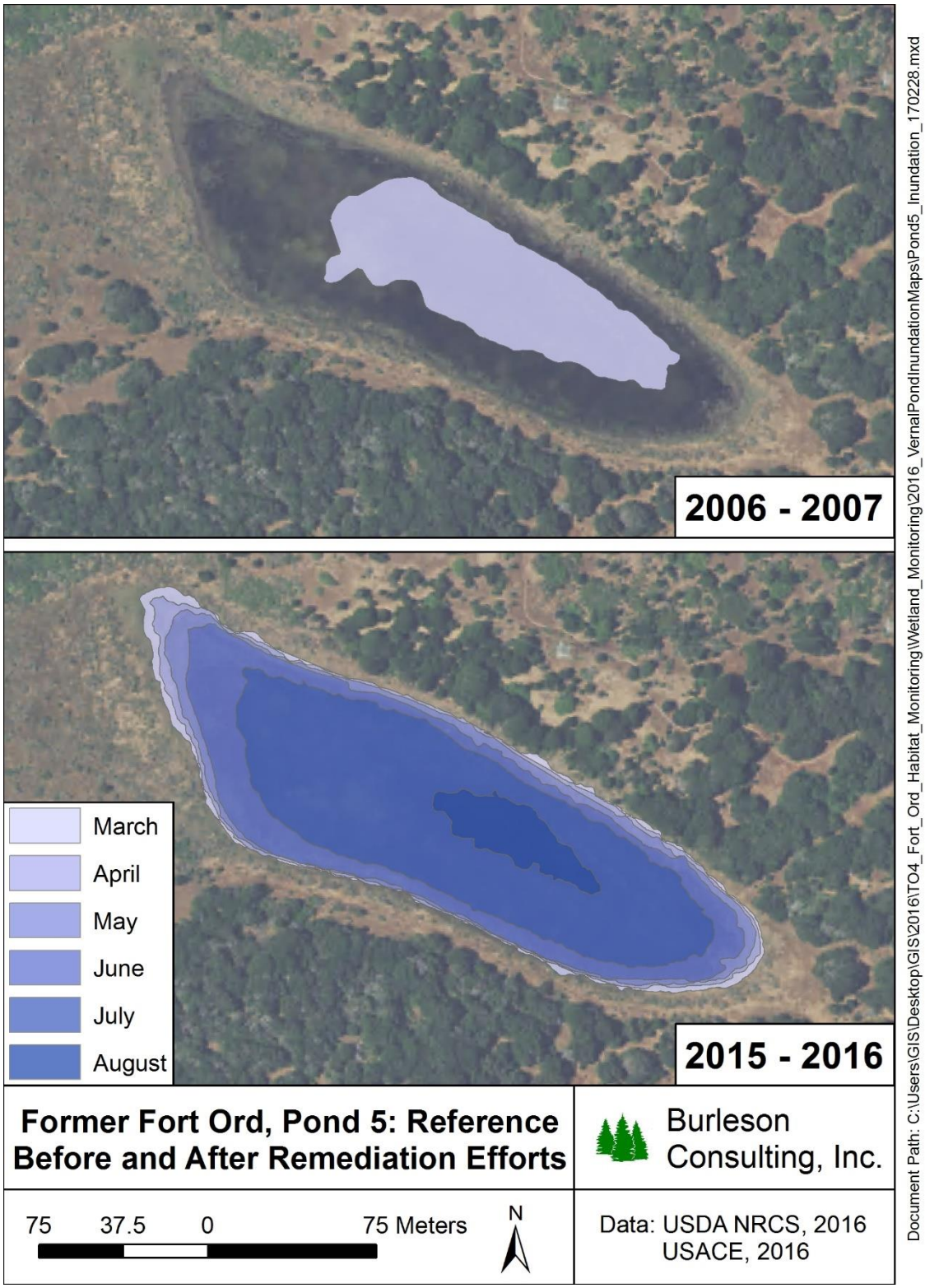

Figure 4-3. Pond 5 Inundation for 2006-2007 and 2015-2016 for Reference. This Vernal Pool Received No Remediation.

4.1.2 Pond 8

Pond 8 was monitored six years between 2000 and 2016. Lead remediation activities occurred in 2010 at the adjacent HA 39/40. This resulted in the excavation of 6,500 cubic yards of soil covering 2.4 acres from the Pond 8 watershed. Approximately 0.17 acre of the total area was within the vernal pool inundation area. (see Table E-2, Appendix E). Figure 4-4 illustrates historic and current inundation areas.

- 1999-2000 (HLA, 2001)
  - In a water-year that was slightly below normal, Pond 8 held water from January to March with a maximum recorded inundation of 1.06 acres. The pH was moderately acidic. The water had low turbidity.
  - yearly cumulative precipitation 16.13 inches
  - data collected January-March and June, four monitoring events
  - inundated January-March
  - inundation range 0.29-1.06 acres, mean 0.74 acres
  - depth range 36-76 cm, mean 62.67 cm
  - one water quality sample in March, pH 5.74 and turbidity 45.7 FNU
- 2006-2007 (Shaw, 2008)
  - In a drier year, Pond 8 did not fill.
  - yearly cumulative precipitation 10.13 inches
  - data collected December-May, six monitoring events
  - dry through the entire monitoring season
- 2009-2010 (USACE, 2016)
  - With heavy early storms the maximum inundation can be as high as 3.9 acres.
  - Early storms brought cumulative precipitation above normal in January and February but did not stay above normal as the water-year continued, and fell to 14.61 inches.
  - only recorded data for 2010 was an inundation of 3.9 acres
- 2010 (Burleson, 2012)
  - Lead remediation occurred in the adjacent HA 39/40.
- 2012-2013 (Tetra Tech, 2014)
  - In a dry, consecutive drought year with below normal cumulative precipitation, Pond 8 inundated very briefly with a maximum inundation of only 0.000229 acres.
  - drought year with yearly cumulative precipitation 11.17 inches
  - data collected November-May, seven monitoring events
  - inundated December and January
  - inundation range from 0.000045-0.000229 acres, mean 0.00014 acres
  - depth range from 8-17 cm, mean 12.5 cm
  - no water quality data collected
- 2013-2014 (Tetra Tech, 2015)
  - In a dry, consecutive drought year with below normal cumulative precipitation, Pond 8 was noted as damp but did not fill.
  - drought year with yearly cumulative precipitation 9.33 inches
  - data collected December-June, six monitoring events
  - Pond 8 did not inundate with water but was noted as damp on April 7
  - no water quality data collected
- 2015-2016
  - In a consecutive drought year with cumulative precipitation above normal, Pond 8 was inundated at the first survey in April and held water through May. Maximum inundation

was 0.062 acres, which did not include damp and minimally ponded areas in the central portion of the historical inundation area. Water quality data were within normal ranges. Neutral to slightly alkaline pH values were observed. Temperature, dissolved oxygen, and turbidity were all relatively low. It is likely that Pond 8 was inundated earlier in the water-year and maximum inundation was most likely not captured. It should be noted that data collection did not start with the first storm or inundation.

- drought year with yearly cumulative precipitation 21.21 inches
- data collected April-June, four monitoring events
- inundated in April and May
- inundation range from 0.020-0.062 acres, mean 0.041 acres
- depth range from 12-62 cm, mean 32 cm
- pH range 7.11-7.47, mean 7.23
- temperature range 13.88°-16.55° C, mean 15.24° C
- dissolved oxygen range 1.51-1.97 mg/L, mean 1.68 mg/L
- turbidity range 8.3-55.9 FNU, mean 25.6 FNU

4.1.2.1 Discussion

There is evidence that the Pond 8 remediation in 2010 has affected the periphery of the historic inundation area but it is unclear that this altered its hydrologic function. It does not appear that large deviations in hydrologic function occurred as a result of remediation. Pond 8 remediation success criteria are measured against Data Quality Objectives (DQOs) outlined in the Wetland Plan (Burleson, 2008). In addition, water quality data are discussed to discern pool function. Hydrology objectives are that remediated vernal pools hold sufficient water to support CTS and fairy shrimp habitat, and that the historical hydrologic function is not affected by the remediation.

Sufficient depths were achieved for both CTS and fairy shrimp during baseline and year 5 post-remediation surveys at Pond 8. The recorded depths were generally higher in baseline than in year 5 post-remediation surveys (maximum depth 1999-2000 = 76 cm, maximum depth 2015-2016 = 62 cm; HLA, 2001). The lower depths of 2015-2016 are likely associated with the timing of monitoring, which occurred later in the year than in baseline. The depths taken in 2015-2016 occurred at the deepest point in the historic inundation area boundary, in a depression, and not at the center of the vernal pool. It is unknown where the depths were taken in 1999-2000.

Sufficient depths were not achieved during the year 2 or 3 post-remediation surveys since the vernal pool was dry during these years. There is no evidence showing that remediation activities were or were not the cause for lack of ponding in year 2 and 3. It is likely due to drought conditions, which existed during these years (USGS, 2016).

Reference Ponds 5, 56, 101 East (East), and 101 East (West) achieved similar success criterion status as Pond 8 in years 2, 3, and 5, with only one exception. This exception was Pond 56, which met CTS and fairy shrimp depth requirements in 2012-2013 when all other reference vernal pools and Pond 8 did not. It is unclear why this is the case, but variability in depths between vernal pools during the same year and between years at the same vernal pools is not uncommon. Baseline year conditions were not documented for these reference vernal pools.

Pond 8 inundation areas were smaller in year 5 post-remediation surveys than in baseline surveys (see Figure 4-4). It is difficult to determine if these differences are due to monitoring timing, rainfall

variation, or remediation. Areas were recorded between January and March in the 1999-2000 year, and between April and May in 2015-2016. Cumulative precipitation in 1999-2000 was slightly below normal, while 2015-2016 was above normal. The year 5 inundation boundary only contains a small, deep depression on the northern edge of the historic vernal pool boundary. During this survey, the area comprising the historic boundary was damp with disparate, irregular pooling but was immeasurable due to safety constraints. It is possible the area was ponded prior to this survey, which would have made the inundation area similar to baseline. No ponding occurred in year 2 and 3, resulting in no vernal pool inundation areas during these drought years.

Reference Ponds 5, 56, and 101 East (East) experienced generally larger inundation areas than Pond 8 during year 5. This is to be expected since the historic inundation areas of these vernal pools are larger than Pond 8, and larger, deeper vernal pools tend to persist longer into the spring and summer season. Pond inundations in years 2 and 3 were similar across all vernal pools and to Pond 8 conditions. The only exception was Pond 56 during year 2, which experienced some inundation in late fall 2012 through early spring 2013. All other measured inundation areas during these years were dry, or minimal. Baseline conditions cannot be compared between Pond 8 and reference vernal pools since no monitoring occurred at reference vernal pools during the 1999-2000 rain year.

Pond 8 water quality data were limited in quantity over monitoring years. Data were limited to two water quality parameters collected in March 1999-2000 and four water quality parameters collected during three monitoring events in 2015-2016. The 2015-2016 turbidity values were consistent with baseline values. They ranged from 8.3-55.9 FNU. However, year 5 post remediation pH values were inconsistent with the baseline value. Year 5 pH values were neutral ranging from 7.11-7.47, yet the 1999-2000 pH value was moderately acidic at 5.74. Conversely, all other pH data across years and vernal pools were slightly acidic, neutral or slightly alkaline which can be expected. Other 1999-2000 pH values were moderately acidic ranging from 5.64 to 5.91 and it is possible that these values can be attributed to sampling or calibration errors. As such, the disparate pH values between baseline and year 5 are unlikely to be attributable to remediation efforts, since the year 5 values are within the reasonable pH range.

Water quality data were collected at the remediated scrape area on the periphery of the Pond 8 historic inundation. This area was referred to as Pond 8B. Its water quality data were generally different than those in the rest of Pond 8 during the 2015-2016 monitoring season. The pH values were slightly to moderately alkaline, ranging from 7.80-8.57. The temperatures were generally higher than most other vernal pools, ranging from 20.85-27.93° C. The dissolved oxygen values were generally higher than the other Pond 8 values, ranging from 4.34-7.57 mg/L. The turbidity values were also generally higher than the rest of Pond 8 values, ranging from 52-64.8 FNU. These values are to be expected since there is little vegetative cover surrounding Pond 8B, which can elevate temperatures and turbidity due to increased solar radiation and inflow of sediment.

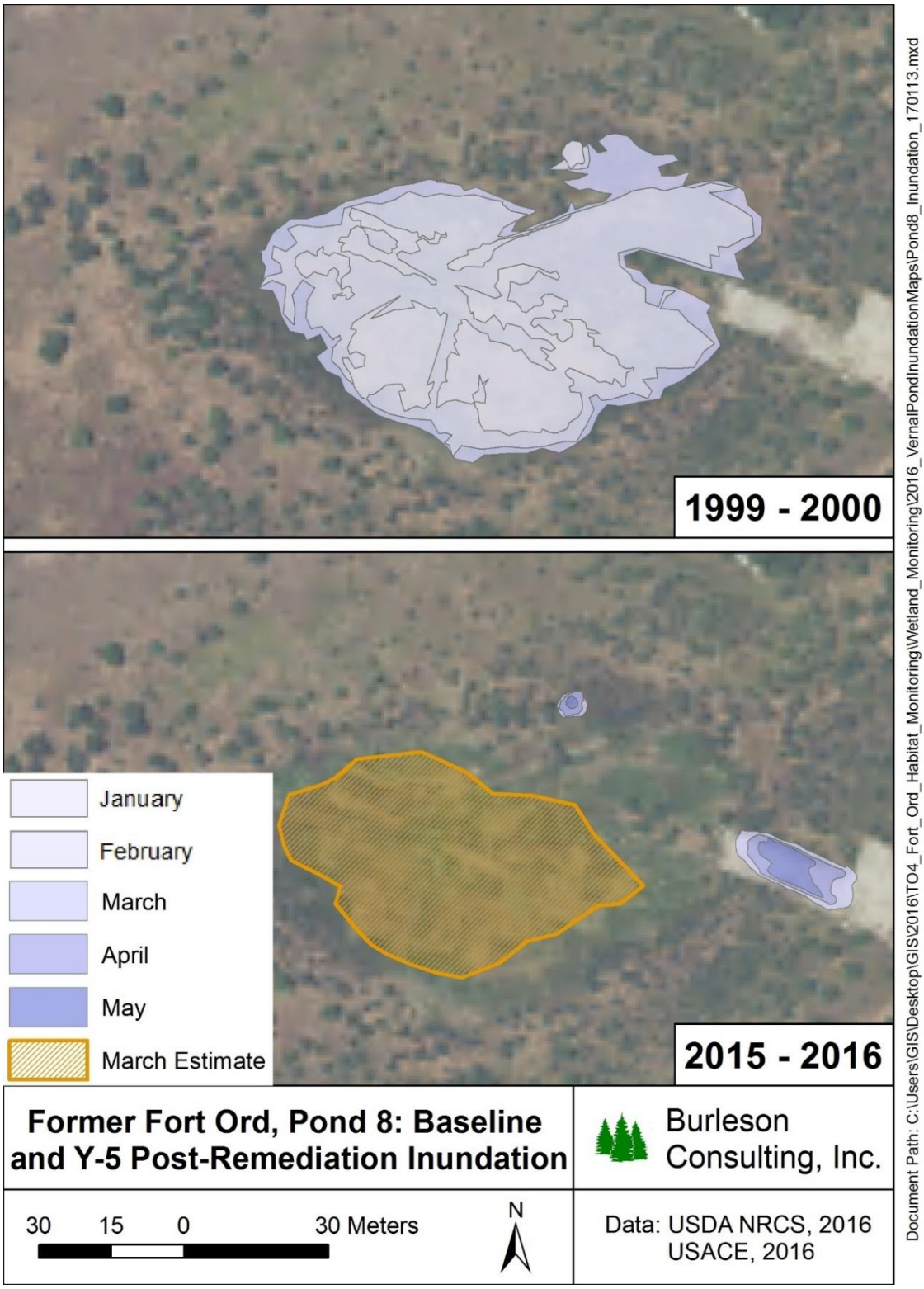

Figure 4-4. Pond 8 Inundations in 1999-2000 and 2015-2016 for Comparison of Baseline and Five Years After Lead Remediation. The Largest Portion of the March 2015-2016 Inundation Located West of the Remediated Scrape Was Estimated *Post-hoc*. This Area Consisted of Disconnected, Disparate Small Puddles Which Appeared Shallower Than 10 cm. Imagery from USDA NRCS (2016).

4.1.3 Pond 10

Pond 10 was monitored five years between 1997 and 2016 (see Table E-3, Appendix E). Lead remediation activities occurred in 2013 at the adjacent HA 37 which resulted in the excavation of approximately 19,500 cubic yards of soil within the Pond 10 watershed. No excavations occurred within the Pond 10 inundation area (Burleson, 2012). Figure 4-5 illustrates historic and current inundation areas.

Pond 10 was monitored for baseline conditions in 1997. 1997 was an above normal cumulative precipitation year. The only data recorded in 1997 is a pH reading in June of 7.45 and a Secchi disk reading of 3.5 inches. The inundation area was recorded as 5.6 acres in August. 2007 was prior to remediation and can also be considered baseline. 2007 was a below normal cumulative precipitation year.

- 1996-1997 (HLA, 1997)
  - The water-year was above normal prior to February, but fell to approximately normal by the end of the season. Pond 10 held water through August with a reasonably large inundation. The water quality results indicate that the pH was slightly alkaline with relatively turbid water.
  - yearly cumulative precipitation 17.45 inches (0.4 in below normal)
  - data collected in June and August
  - inundated in both months
  - inundation recorded in August as 5.6 acres
  - no depths recorded
  - pH 7.45 in June
  - turbidity was 3.5 inches, based on Secchi disk reading in June
- 2006-2007 (Shaw, 2008)
  - In a water-year that was below normal, Pond 10 inundated to a maximum area of 2.1 acres. The water quality results indicate that the pH was slightly alkaline with a relatively moderate turbidity.
  - yearly cumulative precipitation 10.13 inches
  - data collected December-June, seven monitoring events
  - inundated in January and March
  - inundation recorded in March as 2.08 acres
  - depth range 50-85 cm, mean 68 cm
  - pH 7.71 in March
  - turbidity 461 NTU in March
- 2012-2013 (Tetra Tech, 2014)
  - In a dry, consecutive drought year with below normal precipitation, Pond 10 inundated from December-May with a maximum inundation of 4.99 acres. The water quality results indicate that pH was neutral, temperature was within a normal range but generally cooler than other vernal pools, turbidity was consistently high.
  - consecutive drought year with yearly cumulative precipitation 11.17 inches
  - data collected from November to May, seven monitoring events
  - inundated from December-May
  - inundation range 1.53-4.99 acres, mean 3.30 acres
  - depth range 40-66 cm, mean 56 cm
  - pH range 7.04-7.07, mean 7.06

  - temperature range 9.72°-16.5° C, mean 13.1° C
  - dissolved oxygen range 8.98-9.82 mg/L, mean 9.4 mg/L
  - turbidity range 633-642 FNU, mean 638 FNU
- 2013
  - Lead remediation activities completed at the adjacent HA 37.
- 2013-2014 (Tetra Tech, 2015)
  - In a dry, consecutive drought year with below normal precipitation, Pond 10 inundated from February to June. However, the maximum inundation was only 2.03 acres. Water quality results indicate that pH was neutral, temperature was within normal range, dissolved oxygen was high, and turbidity was moderate.
  - consecutive drought year with yearly cumulative precipitation of 9.33 inches
  - data collected December-June, six monitoring events
  - inundated February-June
  - inundation range 0.05-2.03 acres, mean 1.25 acres
  - depth range 4-53 cm, mean 35 cm
  - pH 6.6 in April
  - temperature 22.0° C in April
  - dissolved oxygen 9.3 mg/L in April
  - turbidity 378 FNU in April
- 2015-2016
  - In a consecutive drought year with cumulative precipitation above normal, Pond 10 was inundated at the first survey in April and held water through October at the end of surveying. Maximum inundation was 6.2 acres. Water quality data were within normal ranges. However, pH was neutral to slightly alkaline. Dissolved oxygen had a wide range but generally moderate levels. Temperature was within average ranges for Fort Ord vernal pools. Turbidity values were generally low with a couple moderate recorded values. It is likely that Pond 10 was inundated earlier in the water-year and maximum inundation was most likely not captured. It should be noted that data collection did not start with the first storm or inundation.
  - consecutive drought year with yearly cumulative precipitation of 21.21 inches
  - data collected April-October, eight monitoring events
  - inundated in all monitoring events
  - inundation range from 1.392-6.196 acres, mean 4.37 acres
  - depth range from 34-~100 cm, mean 79 cm
  - pH range 6.91-8.29, mean 7.31
  - temperature range 14.46°-21.18° C, mean 17.42° C
  - dissolved oxygen range 0.51-8.72 mg/L, mean 4.86 mg/L
  - turbidity range 47-410 FNU, mean 170 FNU

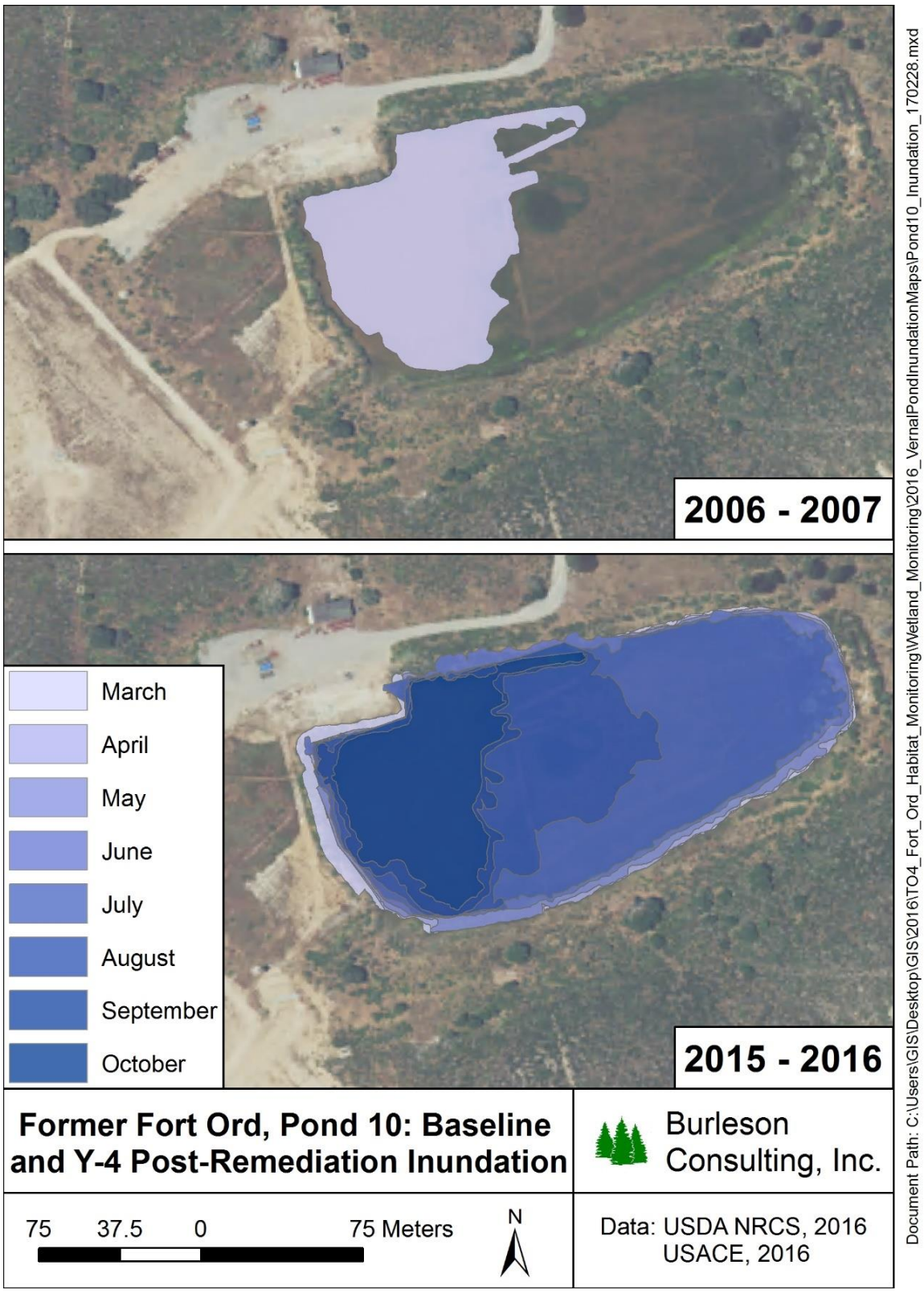

Figure 4-5. Pond 10 Inundations for 2006-2007 and 2015-2016 for a Comparison of Baseline and Four Years After Lead Remediation.

4.1.4 Pond 18

Pond 18 (formerly Pond 50) was monitored three years between 1999 and 2016. In unit 5A in 2014 about 33 acres of the Pond 18 watershed have been masticated. It is a post mastication remediation vernal pool and is in year 2 of monitoring (see Table E-4, Appendix E). Figure 4-6 illustrates historic and current inundation areas.

- 1998-1999 (HLA, 1999)
  - In a precipitation year slightly below normal, Pond 18 was inundated from February to April with a maximum inundation of 0.202 acres. The water quality results indicate that pH was slightly acidic to neutral and turbidity was relatively low.
  - yearly cumulative precipitation 16.31 inches
  - data collected Jan-April, four monitoring events
  - inundated February- March
  - inundation range from 0.09-0.202 acres, mean 0.165 acres
  - depth range from 24.13-30.5 cm, mean 28.4 cm
  - pH range 6.5-6.94, mean 6.72
  - turbidity range 6-50 FNU, only ranges provided in March, no mean calculated
- 2014
  - Unit 5A was masticated, which includes Pond 18.
- 2014-2015 (Burleson *et al.*, 2016)
  - In a dry, consecutive drought year, Pond 18 did not fill.
  - drought year with early storms above normal and yearly cumulative precipitation of 14.35 inches, which were slightly below normal
  - data collected February-May, four monitoring events
  - dry in all monitoring events except February, reported as >0
  - no inundation recorded
  - one depth recorded as >0 in February
  - no water quality data collected
- 2015-2016
  - In a consecutive drought year with yearly cumulative precipitation above normal, Pond 18 was inundated at the first survey in April and held water through June. Maximum inundation was 0.265 acres. Water quality data were within normal ranges. However, pH was slightly acidic. This could be due to the types of vegetation surrounding the vernal pool. Dissolved oxygen values had a wide range but were generally low-moderate. Temperature and turbidity were relatively low. It is likely that Pond 18 was inundated earlier in the water-year and maximum inundation was most likely not captured. It should be noted that data collection did not start with the first storm or inundation.
  - drought year with yearly cumulative precipitation 21.21 inches
  - data collected April-July, five monitoring events
  - inundated from April-June
  - inundation range from 0.006-0.265 acres, mean 0.144 acres
  - depth range from 9-38 cm, mean 29 cm
  - pH range 6.05-6.50, mean 6.29
  - temperature range 13.88°-20.8° C, mean 17.07° C
  - dissolved oxygen range 0.50-4.36 mg/L, mean 1.73 mg/L
  - turbidity range 34.1-178.0 FNU, mean 119.5 FNU

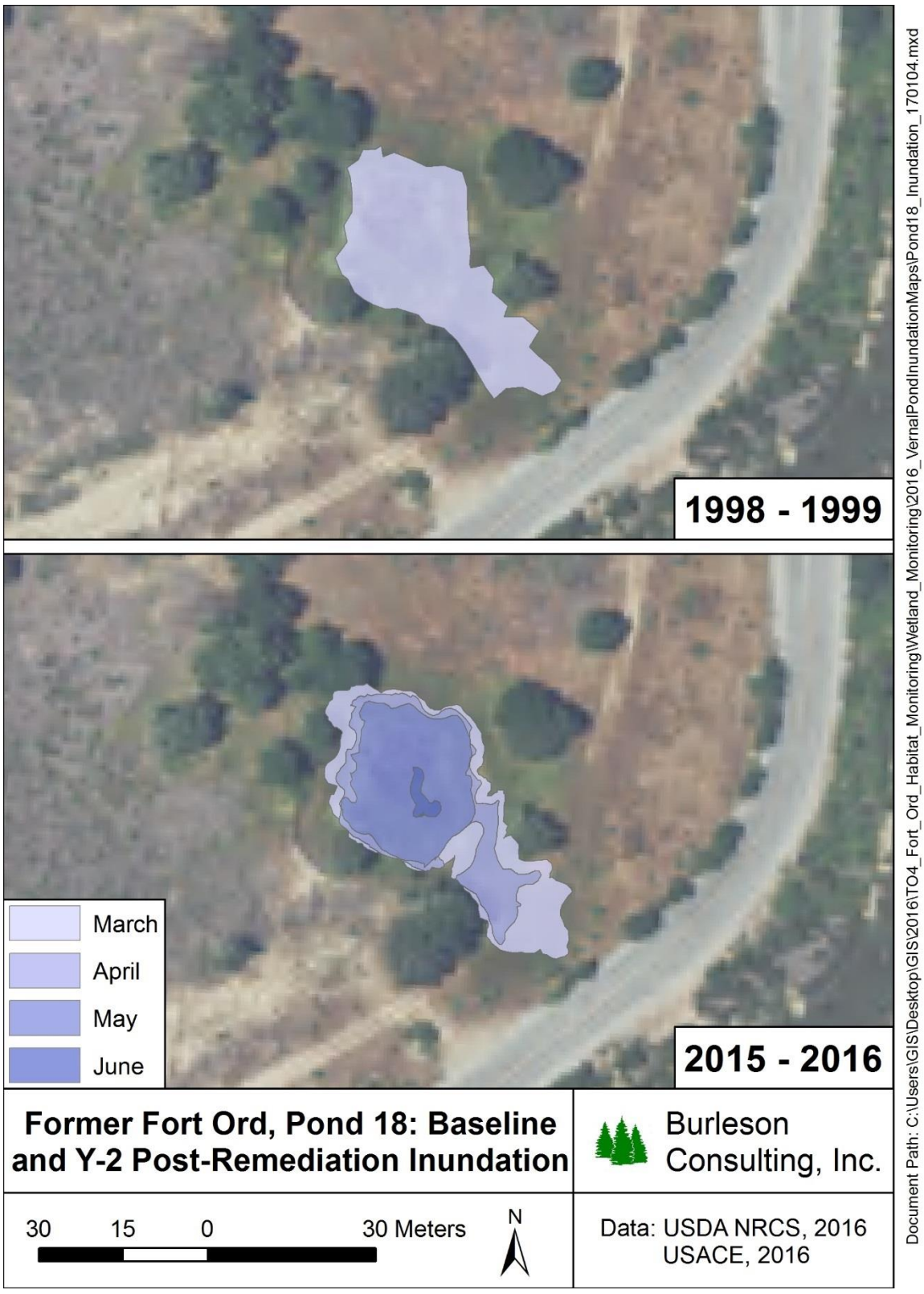

Figure 4-6. Pond 18 Inundations for 1998-1999 and 2015-2016 for a Comparison of Baseline and Two Years After Mastication. Baseline Inundation is Estimated as March and is Not Exact.

4.1.5 Pond 30

Pond 30 (formerly Pond 47) was monitored seven years between 1999 and 2016. In 2011 lead remediation activities at HA 28 resulted in excavation of soil creating Ponds 30B and 30C. During the prescribed burn of unit 7 in the Fall of 2013, there was an emergency application of fire retardant within 300 feet of Pond 30. Thus, Pond 30 is a post lead remediation vernal pool in Year 5 of monitoring as well as a post fire retardant remediation vernal pool in Year 4 of monitoring (see Table E-5 – E-7, Appendix E). Figure 4-7 illustrates historic and current inundation areas. As discussed previously in the report Pond 30 can be separated into three different water bodies. Pond 30A is the largest pool within the area. For this reason, the first recorded historic data for Ponds 30B and 30C started in 2012-2013. Ponds 30B and 30C are distinguished from Pond 30A by the abrupt change in elevation where the excavation occurred; however, at times, these three vernal pools are hydrologically connected.

4.1.5.1 Pond 30A

- 1998-1999 (HLA, 1999)
  - In an approximately normal water-year, Pond 30A (as well as the areas which became 30B and 30C after 2011) filled in January and held water through April with inundation reaching a maximum of 3.573 acres. The pH was within normal range but fluctuated from a slightly acidic to slightly alkaline. The water had very low turbidity.
  - yearly cumulative precipitation 16.31 inches
  - data collected January-April, four monitoring events
  - inundated January-April
  - inundation range 1.15-3.573 acres, mean 2.40 acres
  - depth range 45.72-53.34 cm, mean 50.8 cm
  - pH range 6.40-7.53, mean 6.86
  - turbidity range from 3-5 FNU
- 2006-2007 (Shaw, 2008)
  - In a drier year, Pond 30A did not fill.
  - yearly cumulative precipitation 10.13 inches, which was below normal
  - data collected December-June, seven monitoring events
  - dry though the entire monitoring season
  - no water quality data were recorded
- 2009-2010 (USACE, 2016)
  - With heavy early storms, the maximum inundation at Pond 30A can be as high as 6.27 acres.
  - early storms brought cumulative precipitation above normal in January and February but did not stay above normal as the water-year continued (14.61 inches)
  - only recorded data for 2010 is an inundation recording of 6.27 acres taken during wildlife surveys
- 2012-2013 (Tetra Tech, 2014)
  - In a dry, drought year Pond 30A did not fill.
  - drought year with yearly cumulative precipitation below normal 11.17 inches
  - data collected November-May, seven monitoring events
  - dry though the entire monitoring season
- 2013-2014 (Tetra Tech, 2015)
  - In a dry, drought year Pond 30A did not fill
  - drought year with yearly cumulative precipitation below normal 9.33 inches
  - data collected December-June, six monitoring events

  - dry though the entire monitoring season
- 2014-2015 (Burleson *et al.*, 2016)
  - With early storms, even in a dry drought year, Pond 30A briefly held water
  - drought year with above normal precipitation from early season storms, yielding to below normal cumulative precipitation 14.35 inches
  - data collected February-May, four monitoring events
  - inundated in February with 22 cm depth, but area not recorded
  - no water quality data were collected
- 2015-2016
  - In an above normal water-year Pond 30A held water through May with a maximum inundation of 0.618 acres. Water quality data were all within normal ranges, except for slightly acidic pH values. It should be noted that data collection did not start with the first storms or inundation. Maximum inundation could have been missed.
  - drought year with yearly cumulative precipitation 21.21 inches
  - data collected April-June, four monitoring events
  - inundated from April-May
  - Inundation range from 0.335-0.618 acres, mean 0.479 acres
  - depth range from 20-50 cm, mean 37 cm
  - pH range 6.23-6.53, mean 6.38
  - temperature range 13.86°-15.66° C, mean 14.97° C
  - dissolved oxygen range 0.13-2.37 mg/L, mean 1.27 mg/L
  - turbidity range 14.4-168.0 FNU, mean 94.0 FNU

4.1.5.2 Pond 30B

- 2011
  - Soil remediation activities at HA 28 caused a depression that has become Pond 30B.
- 2012-2013 (Tetra Tech, 2014)
  - Even in a drought year, Pond 30B held a small amount of water from December through March. Water quality data had a normal with a neutral pH, high dissolved oxygen, normal temperature, and high turbidity
  - drought year with yearly cumulative precipitation 11.17 inches (below normal)
  - data collected November-May, seven monitoring events
  - inundated December-March
  - inundation range from 0.002-0.009 acres, mean 0.006 acres
  - depth range ~6-10 cm, mean ~8.5 cm
  - pH 6.9 in February
  - temperature 19.27° C in February
  - dissolved oxygen 9.66 mg/L in February
  - turbidity 606 FNU in February
- 2013-2014 (Tetra Tech, 2015)
  - In a consecutive drought year, Pond 30B held a small amount of water in March and April. Water quality data had a neutral pH, high dissolved oxygen, relatively high temperature, and high turbidity. The high temperature is not surprising considering the small amount of water. The temperature likely fluctuated dramatically with air temperature.
  - drought year with yearly cumulative precipitation 9.33 inches (below normal)
  - data collected December-June, six monitoring events

  - inundated in March and April
  - inundation range from 0.00009-0.01 acres, mean 0.005 acres
  - depth range 1-3 cm, mean 2 cm
  - pH 7.0 in February
  - temperature 24.4° C in February
  - dissolved oxygen 8.8 mg/L in February
  - turbidity 476 FNU in February
- 2014-2015 (Burleson *et al.*, 2015)
  - In a consecutive drought year with early storms and overall low precipitation Pond 30B both filled and dried quickly. It did not hold water throughout the rain season.
  - drought year with early storms above normal and cumulative precipitation slightly below normal (14.35 inches)
  - data collected November-May excluding December and January, five monitoring events
  - inundated in November, February and March
  - inundation range from 0.0002-0.002 acres, mean 0.001 acres
  - depth range ~2-10 cm, mean ~5.7 cm
  - no water quality data collected
- 2015-2016
  - In a consecutive drought year with precipitation above normal Pond 30B connected with Pond 30A. Additionally it held water through May. The water quality data had a neutral pH, a fairly dramatic temperature range with a relatively high mean, moderate to high dissolved oxygen levels and relatively low turbidity. It should be noted that data collection did not start with the first storms or inundation. Maximum inundation could have been missed.
  - drought year with yearly cumulative precipitation 21.21 inches
  - data collected April-June, four monitoring events
  - inundated from April-May, connected with Pond 30A in first April survey
  - inundation range from 0.003-0.012 acres when isolated, mean 0.007
  - depth range from 6-25 cm when isolated, mean 16 cm
  - pH range 6.98-7.29, mean 7.14
  - temperature range 17.22°-25.23° C, mean 21.23° C
  - dissolved oxygen range 4.05-6.31 mg/L, mean 5.18 mg/L
  - turbidity range 28.2-83.8 FNU, mean 56.0 FNU

4.1.5.3 Pond 30C

- 2011
  - Soil remediation activities at HA 28 caused a depression that has become Pond 30C.
- 2012-2013 (Tetra Tech, 2014)
  - Even in a drought year, Pond 30C held a small amount of water from December through April. Water quality data had a neutral pH, high dissolved oxygen, relatively high temperature, and high turbidity.
  - drought year with yearly cumulative precipitation below normal (11.17 inches)
  - data collected November-May, seven monitoring events
  - inundated December-April
  - inundation range from 0.0013-0.049 acres, mean 0.031 acres
  - depth range 5-16 cm, mean 9.4 cm
  - pH range 7.05-7.29, mean 7.17

  - temperature range 18.77°-24.5° C, mean 21.6° C
  - dissolved oxygen range 9.35-9.55 mg/L, mean 9.45 mg/L
  - turbidity range 590-821 FNU, mean 706 FNU
- 2013-2014 (Tetra Tech, 2015)
  - Even in a consecutive drought year, Pond 30C held a small amount of water late in the rain season. Water quality data had a slightly acidic pH, high dissolved oxygen, high temperature, and moderate turbidity in April.
  - drought year with yearly cumulative precipitation below normal (9.33 inches)
  - data collected December-June, six monitoring events
  - inundated from March-April
  - inundation range 0.01-0.02 acres, mean 0.015 acres
  - depth range 3-7 cm, mean 5 cm
  - pH 6.3 in April
  - temperature 26.5° C in April
  - dissolved oxygen 9.5 mg/L in April
  - turbidity 345 FNU in April
- 2014-2015 (Burleson, 2015)
  - In another drought year with below normal precipitation, Pond 30C held water between December and March. Water quality data had a slightly acidic pH, high dissolved oxygen, high temperature, and moderate turbidity in April.
  - early storms yielded above normal cumulative precipitation which fell below normal by February (14.35 inches yearly total)
  - data collected December-May, five monitoring events
  - inundated in December-March
  - inundation recorded only in March, 0.03 acres
  - depth range 10-~43 cm, mean ~24 cm
  - no water quality data were collected
- 2015-2016
  - In a consecutive drought year with cumulative precipitation above normal, Pond 30C held water through May. It was likely connected to Pond 30A early in the rain season. Water quality results had a neutral to slightly alkaline pH, normal temperature, moderate dissolved oxygen and low to moderate turbidity. It should be noted that data collection did not start with the first storms or first inundation. Maximum inundation could have been missed.
  - drought year with cumulative precipitation above normal (21.21 inches)
  - data collected April-June, four monitoring events
  - inundated from April-May
  - inundation range from 0.050-0.129 acres, mean 0.095 acres
  - depth range from 15-28 cm, mean 22 cm
  - pH range 6.67-7.61, mean 7.15
  - temperature range 14.44°-23.32° C, mean 18.68° C
  - dissolved oxygen range 0.45-6.10 mg/L, mean 3.07 mg/L
  - turbidity range 26.1-199.0 FNU, mean 127.0 FNU

4.1.5.4 Discussion

Remediation activities that occurred in 2011 in the Pond 30 historic inundation area have affected hydrologic function, but it is unclear if this impact is detrimental. Ponds 30B and 30C were created

during soil remediation activities in 2011 and now occur within the historic inundation area of Pond 30. They are deeper depressions than Pond 30 which affect the timing and extent of ponding during the rain year. For example, in the 2012-2013 drought-year, both Ponds 30B and 30C held several centimeters of water while Pond 30A stayed dry. Pond 30A is the portion of the historic Pond 30 not including 30B and 30C. Pond 30 remediation success criteria are measured against DQOs outlined in the Wetland Plan (Burleson, 2008). Hydrology objectives are that remediated vernal pools hold sufficient water to support CTS and fairy shrimp habitat, and that the historical hydrologic function is not affected by the remediation. It was assumed that vernal pools with a depth of 50 cm or greater in March achieved the CTS and fairy shrimp success criteria through the water year if data from previous months was not available.

Sufficient depths were achieved for both CTS and fairy shrimp during Pond 30 baseline conditions. Sufficient CTS depths, based on the assumption stated in Section 4.1, were achieved for year 5 post-remediation for Pond 30A, but not for Ponds 30B and 30C. Sufficient fairy shrimp depths were achieved in year 5 for Pond 30A and 30B, but not for 30C. During baseline in 1999-2000, Pond 30A, and areas corresponding to Ponds 30B and 30C were connected through inundation, while they were disconnected for most of the year 5 monitoring in 2015-2016. Baseline depths were generally similar to year 5 (maximum depth 1998-1999 = 53 cm, maximum depths 2015-2016: 30A = 50 cm, 30B = 25 cm, 30C = 28 cm). While maximum depths were similar, inundation areas were considerably different: 3.6 acres in 1998-1999 and 0.75 in 2015-2016. This discrepancy is most likely associated with either differences in methodologies or the disparate precipitation patterns of preceding years. Methodology for maximum depth in 1998-1999 was to wade into the vernal pool and estimate the deepest point. It is possible that the deepest point was not accurately reported. In contrast, the 2015-2016 methodology for maximum depth is to measure the value from a permanent staff gage. The year prior to baseline was an El Nino year, resulting in precipitation amounts considerably above normal, so a large inundation area is not surprising. The four years prior to year 5 were drought years all below normal precipitation.

For years 2, 3 and 4, sufficient depths were met for fairy shrimp in some years for some vernal pools, but CTS depths were not met during any of these years for any vernal pool. Fairy shrimp depths were achieved at Pond 30B and 30C in year 2 (2012-2013), and for Pond 30C in year 4 (2014-2015). Pond 30A did not meet fairy shrimp criteria for any of these years.

Reference Ponds 5, 56, 101 East (East) and 101 East (West) experienced similar rates of depth criteria successes in years that they were monitored (Table 4-2). All of these vernal pools met CTS and fairy shrimp depth criteria for year 5 post remediation. None of them were monitored during the baseline year and cannot be assessed against success criteria during that year. Of the reference pools, Pond 56 was the only vernal pool that did meet CTS criteria and fairy shrimp criteria which occurred for years 2 and 4. Pond 5 did not meet CTS or fairy shrimp criteria in years 2 or 3. Pond 101 East (East) did not meet CTS or fairy shrimp criteria for years 2, 3, or 4. Pond 101 East (West) did not meet CTS or fairy shrimp success criteria during year 4.

Table 4-2. Comparison of Ponds 30A, 30B, and 30C to Reference Ponds for CTS and Fairy Shrimp Depth Requirements

Monitoring Year	Vernal Pool	CTS Depth Requirements		Fairy Shrimp Depth Requirements	
		Met	Not Met	Met	Not Met
Year 2	30A		●		●
	30B		●	●	
	30C		●	●	
	5		●		●
	56	●		●	
	101 East (East)		●		●
Year 3	30A		●		●
	30B		●		●
	30C		●		●
	5		●		●
	101 East (East)		●		●
Year 4	30A		●		●
	30B		●		●
	30C		●	●	
	56	●		●	
	101 East (East)		●		●
Year 5	30A	●		●	
	30B		●	●	
	30C		●		●
	5	●		●	
	56	●		●	
	101 East (East)	●		●	
	101 East (West)	●		●	

The Pond 30 inundation area in baseline was considerably larger than Ponds 30A, 30B and 30C in year 5. Variability in ponding across years can be expected within vernal pools. Ponds 30A, 30B and 30C were connected during the baseline (1998-1999) year, which experienced cumulative precipitation values slightly below a normal rain year. However, the preceding year experienced very strong El Nino conditions (based on the Oceanic Nino Index) with cumulative precipitation considerably above normal, which could have influenced the recorded inundation area the following year in baseline (NWS NOAA, 2015; Null, 2017). Inundation area just prior to remediation in 2009-2010, a moderate El Nino, was also larger than year 5 with connectivity between the sub-vernal pools. Conversely, the 2006-2007 rain year was a weak El Nino with below normal rainfall volumes and resulted in no ponding at Pond 30.

During times when full inundation is expected, it is unlikely remediation affects the ability of the vernal pool to completely fill. During times of lower inundation such as year 5, ponding patterns have likely changed since Ponds 30B and 30C are deeper than prior to remediation. In year 5, three distinct vernal

pools within Pond 30 were observed. These pools may have simply been one vernal pool prior to remediation in similar rain years. Since inundation data for such a condition was not collected, this is not assessable.

Reference Ponds 5, 56, 101 East (East) and 101 East (West) can be considered for comparison. Reference vernal pool inundations during baseline were more similar to their 2015-2016 inundations than were the baseline inundations of Pond 30. However, reference vernal pool baselines occurred in 2006-2007, instead of 1998-1999, the Pond 30 baseline year. While 1998-1999 was a moderate La Nina year, the preceding year was a very strong El Nino with abnormally large amounts of precipitation. In contrast the 2006-2007 rain year was a weak El Nino preceded by a rain year that exhibited neither El Nino nor La Nina conditions. Despite being a weak El Nino, the 2006-2007 precipitation year yielded below normal rainfall. Pond 30 held no water during the 2006-2007 rain year. As such, it is not unreasonable that the 1998-1999 Pond 30 inundations were larger than the 2006-2007 or 2015-2016 Pond 30 inundations.

Water quality conditions in Pond 30 were variable depending on the parameter, the specific sub-vernal pool, and the time of year. Turbidity values in year 2, 3, and 5 are higher than in baseline. This is especially notable for Ponds 30B and 30C. The year 5 turbidity range is 14.4-199.0 FNU across all three sub-vernal pools, while baseline values ranged between 3-5 NTU. Pond 30B turbidity was recorded as 606 FNU in year 2, and 476 FNU in year 3. Similarly, Pond 30C turbidity was recorded as 590-821 FNU in year 2, and 345 FNU in year 3. This is not surprising, as Ponds 30B and 30C were much less vegetated, and their bottoms were mostly covered with barren soil. Baseline and year 5 pH values were generally similar, and ranged between 6.23-7.61. Temperature and dissolved oxygen values were not recorded in baseline, and do not appear outside of normal range in year 5. Turbidity readings at Pond 30B and 30C may have been affected by sediment run-off from HA 28 soil remediation area. This does not appear to have changed other water quality values; yet explicit examination is difficult since data gaps exist. Erosion issues at HA28 were addressed in 2016 and are currently stable.

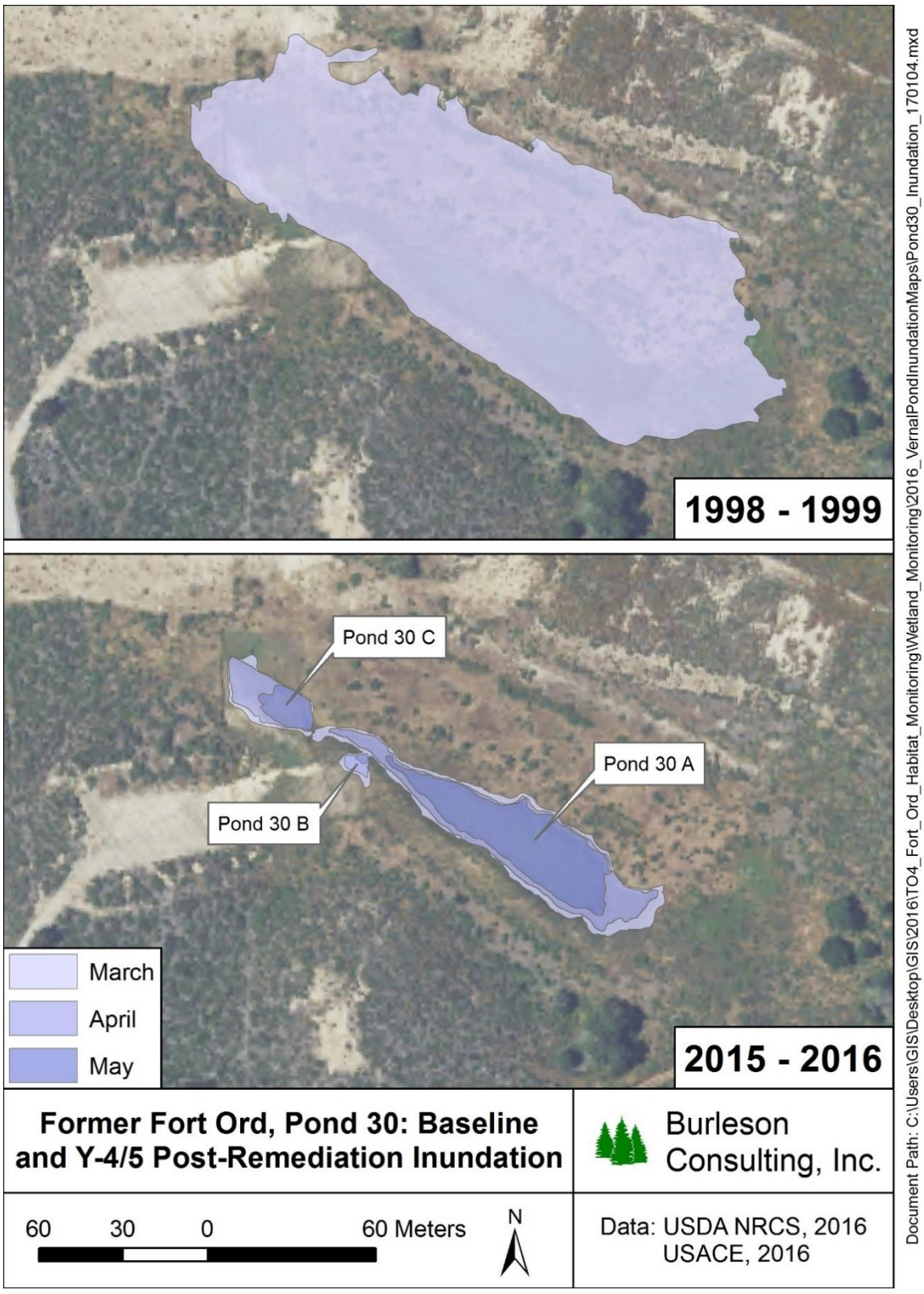

Figure 4-7. Pond 30 (A, B and C) Inundations for 1998-1999 and 2015-2016 for a Comparison of Baseline and Four Years After Fire Retardant and Five Years After Lead Remediation.

4.1.6 Pond 56

Pond 56 was monitored five years between 2007 and 2016. It is a reference vernal pool and no remediation has occurred here (see Table E-8, Appendix E). Figure 4-8 illustrates historic and current inundation areas.

- 2006-2007 (Shaw, 2008)
  - In a below normal water-year, Pond 56 was inundated from December through May with a maximum inundation of 0.46 acres. The water quality results indicate a neutral pH and a relatively low turbidity.
  - cumulative precipitation was below normal (10.13 inches)
  - data collected December-May, five monitoring events
  - inundated for all monitoring events
  - inundation only collected in March as a maximum, 0.46 acres
  - depth range 18-60 cm, mean 40 cm
  - pH 6.78 in March
  - turbidity 9.8 FNU in March
- 2012-2013 (Tetra Tech, 2014)
  - In a below normal water-year, Pond 56 was inundated from December through April with a maximum inundation of 0.3 acres. The water quality results indicate a slightly acidic pH, low temperature and low turbidity.
  - drought year with cumulative precipitation below normal (11.17 inches)
  - data collected November-May, seven monitoring events
  - inundated in December-April
  - inundation range from 0.002-0.30 acres, mean 0.15 acres
  - depth range 20-46 cm, mean 34 cm
  - pH 6.31 in March
  - temperature 11.9° C in March
  - dissolved oxygen 2.48 mg/L in March
  - turbidity 22.7 FNU in March
- 2013-2014 (Tetra Tech, 2015)
  - In a dry consecutive drought year with below normal cumulative precipitation, Pond 56 held water briefly in April.
  - consecutive drought year with cumulative precipitation of 9.33 inches
  - data collected December-June, six monitoring events
  - inundated in April
  - inundation 0.00045 acres in April
  - depth 10 cm in April
  - no water quality data were collected
- 2014-2015 (Burleson *et al.*, 2016)
  - In a dry consecutive drought year with below normal cumulative precipitation, Pond 56 held water during monitoring events in March and April. The maximum inundation was 0.42. Pond 56 likely held water earlier in the water-year however; the vernal pool was only monitored March-May.
  - early storms created above normal conditions which later fell yielding cumulative precipitation below normal (14.35 inches)
  - data collected March-May, three monitoring events
  - inundated in March and April

  - inundation range 0.27-0.42 acres, mean 0.35 acres
  - depth range 42-56 cm, mean 49 cm
  - pH 6.2 in April
  - temperature 21.1° C in April
  - dissolved oxygen 5.8 mg/L in April
  - turbidity 153 FNU in April
- 2015-2016
  - In a consecutive drought year with cumulative precipitation above normal, Pond 56 held water from April-August. Water quality results had a slightly acidic to neutral pH, normal temperature, low to very high dissolved oxygen with a moderate mean value, and generally low turbidity except for one moderate observation. It should be noted that data collection did not start with the first storms or inundation. Maximum inundation could have been missed.
  - drought year with cumulative precipitation above normal (21.21 inches)
  - data collected April-September, seven monitoring events
  - inundated from April-August
  - inundation range from 0.189-5.167 acres, mean 2.56 acres
  - depth range from 40-125 cm, mean 88 cm
  - pH range 6.16-6.67, mean 6.48
  - temperature range 16.03°-20.76° C, mean 17.68° C
  - dissolved oxygen range 0.50-10.56 mg/L, mean 4.39 mg/L
  - turbidity range 16.3-375 FNU, mean 89.7 FNU

In below normal precipitation years, Pond 56 is likely to range from 10-60 cm in depth with a maximum inundation of approximately 0.5 acres or less. No data were collected at Pond 56 for normal precipitation years. However, it is a reasonable assumption that normal precipitation years could result in maximum depths averaging approximately 90 cm and maximum inundations averaging approximately 2-3 acres. In above normal precipitation years, Pond 56 could have a maximum depth of up to approximately 125 cm and a maximum inundation of up to approximately 5 acres.

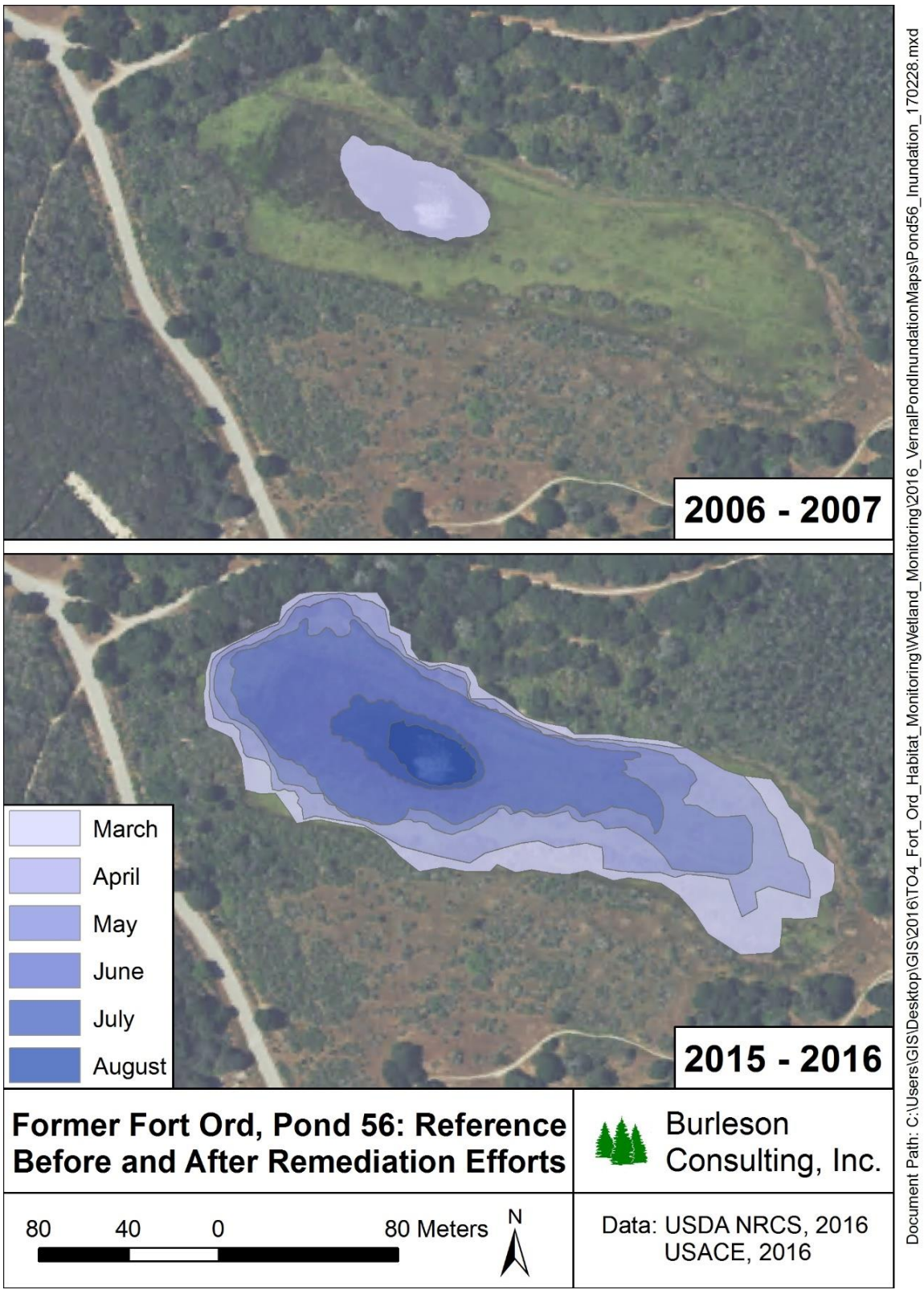

Figure 4-8. Pond 56 Inundations for 2006-2007 and 2015-2016 for Reference. This Vernal Pool Received No Remediation.

4.1.7 Pond 101 East (West)

Pond 101 East was monitored seven years between 2001 and 2016. It is a reference vernal pool and no remediation has occurred there (see Table E-9 and E-10, Appendix E). Figure 4-9 illustrates historic and current inundation areas. Pond 101 East can be separated most years into two water bodies. In last year as well as this year's reports Pond 101 East was separated into Pond 101 East (West) and Pond 101 East (East). In the reports previous to 2014-2015 and 2015-2016, Pond 101 East (East) is sometimes referred to as the east pool while Pond 101 East (West) is referred to as the middle pool.

- 2000-2001 (Harding ESE, 2002)
  - In a year with early storms followed by below normal precipitation, Pond 101 East (West) was recorded as inundated 0.10 acres in February
  - early storms with cumulative precipitation below normal (15.52 inches)
  - data collected in February
  - inundated for one monitoring event, 0.10 acres
  - no water quality data collected
- 2006-2007 (Shaw, 2008)
  - In a below normal water-year, Pond 101 East (West) was not inundated
  - cumulative precipitation was a below normal (10.13 inches)
  - no water quality data collected specifically for 101 East (West)
- 2014-2015 (Burleson *et al.*, 2016)
  - In a dry consecutive drought year with below normal precipitation, Pond 101 East (West) did not hold water.
  - early storms pushed early cumulative precipitation above normal while total yearly cumulative precipitation fell below normal (14.35 inches)
  - data collected March to May, three monitoring events
  - dry in all monitoring events
  - no water quality data collected
- 2015-2016
  - In a consecutive drought year with cumulative precipitation above normal, Pond 101 East (West) held water from April-June. Water quality results had a slightly acidic to neutral pH, normal temperature, low to moderate dissolved oxygen, and low to moderate turbidity. It should be noted that data collection did not start with the first storms or inundation. Maximum inundation could have been missed.
  - drought year with cumulative precipitation above normal (21.21 inches)
  - data collected April-July, five monitoring events
  - inundated from April-June
  - inundation range from 0.066-1.893 acres, mean 0.706 acres
  - depth range from 20-70 cm, mean 51 cm
  - pH range 6.22-6.67, mean 6.47
  - temperature range 13.95°-23.28° C, mean 19.34° C
  - dissolved oxygen range 0.00-6.40 mg/L, mean 3.18 mg/L
  - turbidity range 5.7-525 FNU, mean 203 FNU

In below normal precipitation years, Pond 101 East (West) is likely to have maximum inundations that range from 0-0.2 acres. No depths were recorded during below normal water-years for Pond 101 East (West) but it is reasonable to assume that depths would not exceed approximately 45 cm. This is the

case since Pond 101 East (East) does not generally exceed 45 cm during below normal years, and typically has similar, or slightly higher, depths compared to Pond 101 East (West). No data were collected at Pond 101 East (West) for normal precipitation years. However, it is a reasonable assumption that normal precipitation years could result in maximum depths averaging approximately 50 cm and maximum inundations averaging approximately 1 acre. In above normal precipitation years, Pond 101 East (West) could have maximum depths of up to 70 cm or more and a maximum inundation of up to 2 acres or more.

4.1.8 Pond 101 East (East)

- 2000-2001 (Harding ESE, 2002)
  - In a year with early storms followed by below normal precipitation, Pond 101 East (East) was recorded as inundated from February through May with a maximum inundation of 1.47 acres. The water quality results indicate a slightly acidic to neutral pH.
  - early storms with cumulative precipitation below normal (15.52 inches)
  - data collected in February-May
  - inundated for all monitoring events
  - inundation range 0.24-1.61 acres, mean 0.92 acres
  - depth range 2-18 cm, mean 11.3 cm
  - water quality data was collected twice, pH 6.3-6.81, mean 6.56
- 2006-2007 (Shaw, 2008)
  - In a below normal water-year, Pond 101 East (East) was inundated only in the month of March. The water quality results indicated a slightly alkaline pH.
  - cumulative precipitation was below normal (10.13 inches)
  - data collected from December-June, 6 monitoring events
  - inundated only in March to 0.32 acres and 20 cm depth
  - inundation area was not recorded
  - pH 7.61
- 2012-2013 (Tetra Tech, 2014)
  - In a dry consecutive drought year with below normal cumulative precipitation, Pond 101 East (East) is thought to have held water briefly in January. It is unconfirmed if the brief inundation was at Pond 101 East (West) or 101 East (East) since the data were documented under Pond 101 East, with no further signification of East or West.
  - consecutive drought year with cumulative precipitation below normal (11.17 inches)
  - data collected November-May, seven monitoring events
  - inundated in January, 0.075 acres
  - depth 11 cm in January
  - no water quality data collected
- 2013-2014 (Tetra Tech, 2015)
  - In a dry consecutive drought year with below normal cumulative precipitation, Pond 101 East (East) did not hold water the entire year.
  - consecutive drought year with cumulative precipitation below normal (9.33 inches)
  - data collected December-June, six monitoring events
  - dry in all monitoring events
  - no water quality data collected

- 2014-2015 (Burleson *et al.*, 2016)
  - In a dry consecutive drought year with below normal cumulative precipitation, Pond 101 East (East) did not hold water.
  - consecutive drought year with early storms above normal and cumulative precipitation slightly below normal (14.35 inches)
  - data collected March to May, three monitoring events
  - dry in all monitoring events
  - no water quality data collected
- 2015-2016
  - In a consecutive drought year with cumulative precipitation above normal, Pond 101 East (East) held water from April-June. Water quality results indicated a slightly acidic to neutral pH, normal temperatures, moderate to high dissolved oxygen and moderate turbidity. It should be noted that data collection did not start with the first storms or inundation. Maximum inundation could have been missed.
  - drought year with cumulative precipitation above normal (21.21 inches)
  - data collected April-July, five monitoring events
  - inundated from April-June
  - inundation range from 1.226-3.244 acres, mean 2.592 acres
  - depth range from 32-68 cm, mean 56 cm
  - pH range 6.38-7.07, mean 6.60
  - temperature range 17.09°-22.97° C, mean 21.35° C
  - dissolved oxygen range 4.36-7.93 mg/L, mean 6.43 mg/L
  - turbidity range 106-553 FNU, mean 227 FNU

In below normal precipitation years, Pond 101 East (East) is likely to range from 0-45 cm in depth with a maximum inundation of 0-1.5 acres. In normal precipitation years, Pond 101 East (East) is likely to have a maximum of approximately 50 cm and a maximum inundation of approximately 2 acres. In above normal precipitation years, Pond 101 East (East) could have maximum depths of up to 70 cm or more and a maximum inundation of up to 3 acres or more.

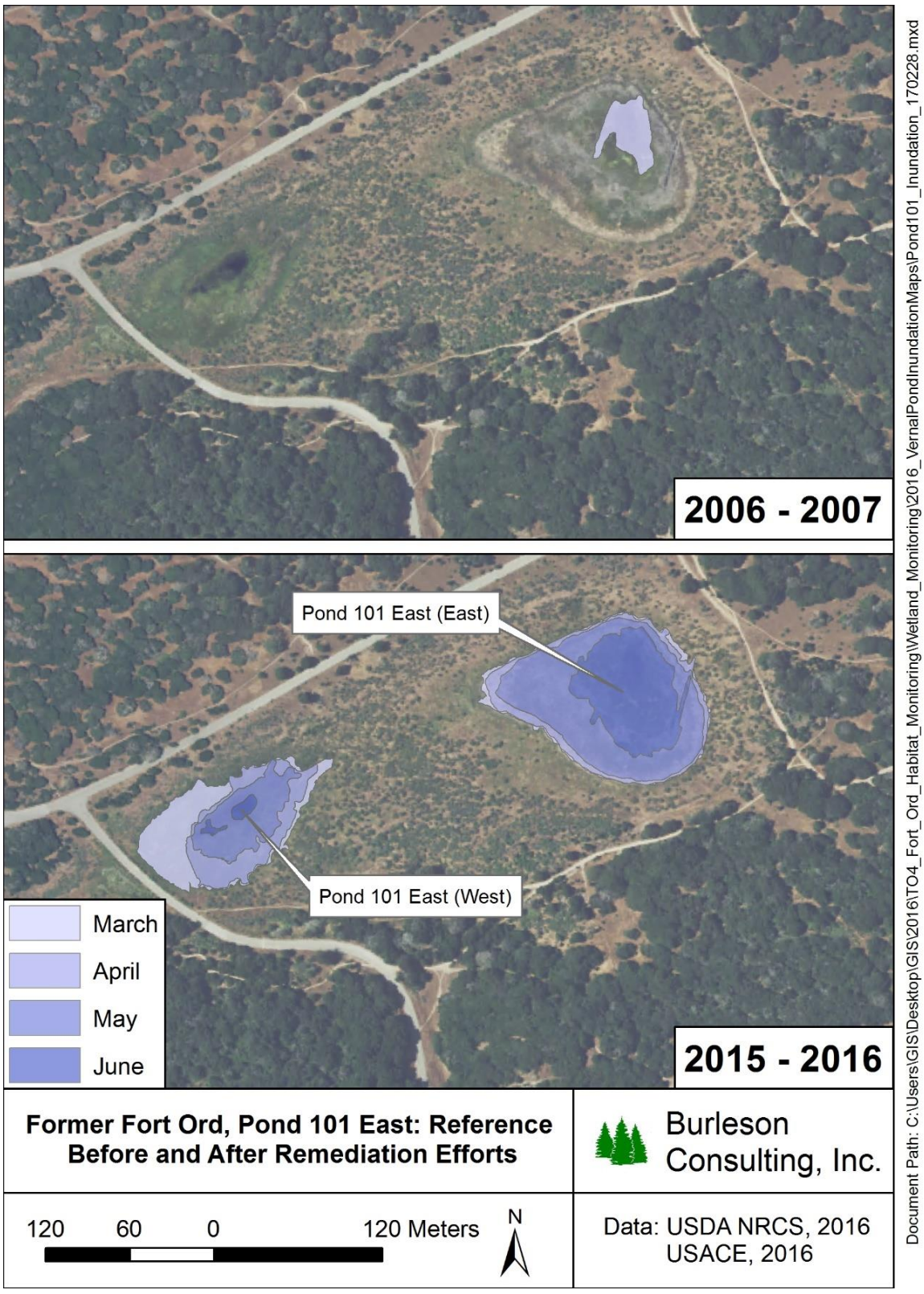

Figure 4-9. Pond 101 East(West) and Pond 101 East (East) for 2006-2007 and 2015-2016 for Reference. This Vernal Pool Received No Remediation.

4.2 Vegetation Monitoring

Most vernal pools are in the baseline year of vegetation sampling, while others are in year two, four, or five. Data analyses will be performed and presented in future annual reports when more data have been collected, providing more meaningful results. Ponds 8, 10, 18, 30A, 30B and 30C were post-remediation in 2016. Results of vegetation monitoring within each of these vernal pools are discussed below with a comparison to the baseline data and reference vernal pools and a discussion of the data quality objective (DQO). DQOs for wetland vegetation outlined in the Wetland Plan (Burleson, 2006) identify that the disturbed wetland should have the following characteristics by the end of the last year of monitoring:

- A number of native wetland species present in the pool or pond comparable to the number present in the pool or pond before MEC and contaminated soils removal or in control wetlands, and
- A relative dominance of native wetland species in the pool or pond comparable to the relative dominance in the pool or pond before MEC and contaminated soil removal or in control wetlands.

In order to evaluate whether each vernal pool has met the DQOs, the following parameters are analyzed for each vernal pool:

- Absolute percent vegetative cover,
- Species richness (number of species),
- Native plant species richness (number of native species),
- Relative percent native species cover,
- Wetland plant species richness (number of facultative or wetter species),
- Relative percent wetland plant cover, and
- Species composition.

4.2.1 Pond 8

Baseline vegetation data was collected at Pond 8 in 2000[3] (HLA, 2000). Data was collected along two transects (232 and 241 feet long) using 0.25 m^2 quadrats placed at 10 to 20-foot intervals, alternating from the right to left side of the transect. The transects crossed the entire vernal pool in a north-south direction. Because this data was collected using a slightly different methodology than was used in 2016 and individual strata were not identified and evaluated during this survey, the 2016 data for all strata were lumped in order to compare to the baseline data. No baseline data was taken at reference vernal pools in 2000. As such, comparison with reference vernal pools cannot be conducted to provide an analysis of any regional changes.

Table 4-3 shows the absolute percent vegetative cover observed during the baseline survey and the 2016 follow-up survey. The absolute vegetative cover observed in 2016 is comparable to the baseline. However, this does not consider the adjacent wetland that has formed as a result of the soil excavation. The majority of the adjacent wetland area is bare ground; however, the area is beginning to revegetate

[3] Please note that Pond 8 is identified as “Waterbody 52” in HLA, 2000.

with wetland plants. It is likely that this area did not hold any water during the first four years following disturbance and that 2016 was the first year that wetland plants were able to begin establishing themselves. As such, continued inundation in future years is likely to result in the increase in vegetative cover by wetland species.

Table 4-3. Absolute Percent Cover at Pond 8

Year	Vegetative Cover	Thatch/Bare Ground
2000	98.4%	11%
2016	82.3%	17.5%

During the 2000 survey, 39 plant species were recorded on the transects. In 2016, at total of 49 species were recorded within the historic basin. Table 4-4 shows the number of native and non-native species identified during each survey and Table 4-5 shows the relative percent cover of native and non-native species.

Table 4-4. Native and Non-Native Species Richness at Pond 8

Year	Native	Non-Native	Unidentified
2000	30	8	1
2016	30	17	2

Table 4-5. Relative Percent Cover of Native and Non-Native Plants at Pond 8

Year	Native	Non-Native	Unidentified
2000	76.5%	22.3%	1.2%
2016	77.0%	23.0%	0%

The data show that the number of native species within Pond 8 has stayed the same, while the number of non-native species has more than doubled. The increased number of non-native species may be due to the extended drought period experienced between these two surveys. The year 2000 was within a wet period in the region while 2016 was the fifth year of a historic drought. Because Pond 8 did not hold water for a significant number of years preceding the 2016 survey, it is likely that non-native species were able to move into the portions of the vernal pool that, under normal conditions, would be too wet to support them. However, the relative percent cover of both native and non-native species has stayed the same. As such, although there has been an increase in the number of non-native species, they do not comprise significantly more cover than was observed in 2000 and no substantial change has occurred as a result of the soil remediation.

In 2000, 27 wetland plants and 12 non-wetland plants were observed along the transects. In 2016, 25 wetland plants and 24 non-wetland plants were observed on the transects. Table 4-6 shows the number of wetland and non-wetland species identified during each survey and Table 4-7 shows the relative percent cover of wetland and non-wetland species. Wetland species are categorized into the following: obligate wetland (OBL), facultative (FAC), facultative wetland (FACW), facultative upland (FACU), obligate upland (UPL), or not listed (NL).

Table 4-6. Wetland and Non-Wetland Species Richness at Pond 8

Year	OBL	FACW	FAC	FACU	UPL	NL
2000	9	12	6	7	1	4
2016	8	12	5	11	2	11

Table 4-7. Relative Percent Cover of Wetland and Non-Wetland Species at Pond 8

Year	OBL	FACW	FAC	FACU	UPL	NL
2000	43.6%	29.7%	5.0%	19.6%	0.5%	1.6%
2016	71.6%	1.3%	22.8%	4.1%	0%	0.2%

The data show that the number of wetland species within Pond 8 has stayed the same, while the number of non-wetland species has doubled. Similar to the increase in non-native species discussed above, the increased number of non-wetland species may be due to the extended drought period experienced between these two surveys. However, although there has been an increase in the number of non-wetland species, the relative percent cover of non-wetland species has substantially decreased, and subsequently the relative percent cover of wetland species has substantially increased. This is a positive change from the baseline.

A complete comparison of species composition observed during the surveys at Pond 8 in 2000 and 2016 can be found in Appendix H. Figure 4-10 is a subset of this comparison that compares species observed with a 2% cover or greater. The data show that in both 2000 and 2016, the dominant species by far was pale spike rush (*Eleocharis macrostachya)*. Smooth goldfields (*Lasthenia glaberrima)*, alkali mallow (*Malvella leprosa)*, and bugle hedge nettle (*Stachys ajugoides)* were also dominant in both years. In 2000, nine species were present at a 2% cover or higher that were not observed on the transects in 2016. Italian rye grass (*Festuca perennis*) was observed in 2000; however, the percent cover of this species was substantially higher in 2016. While the species composition appears to have shifted, this may actually be a result of the differing data collection methodologies. In 2000, two long transects that crossed the entire vernal pool were used to collect data, while in 2016, transects were located in the most homogenous portions of the identified strata. For this reason, it is likely that a higher number of species were "picked up" during the survey in 2000 than in 2016. Therefore, because the most dominant species are the same between the years, the observed differences in species composition are not substantial.

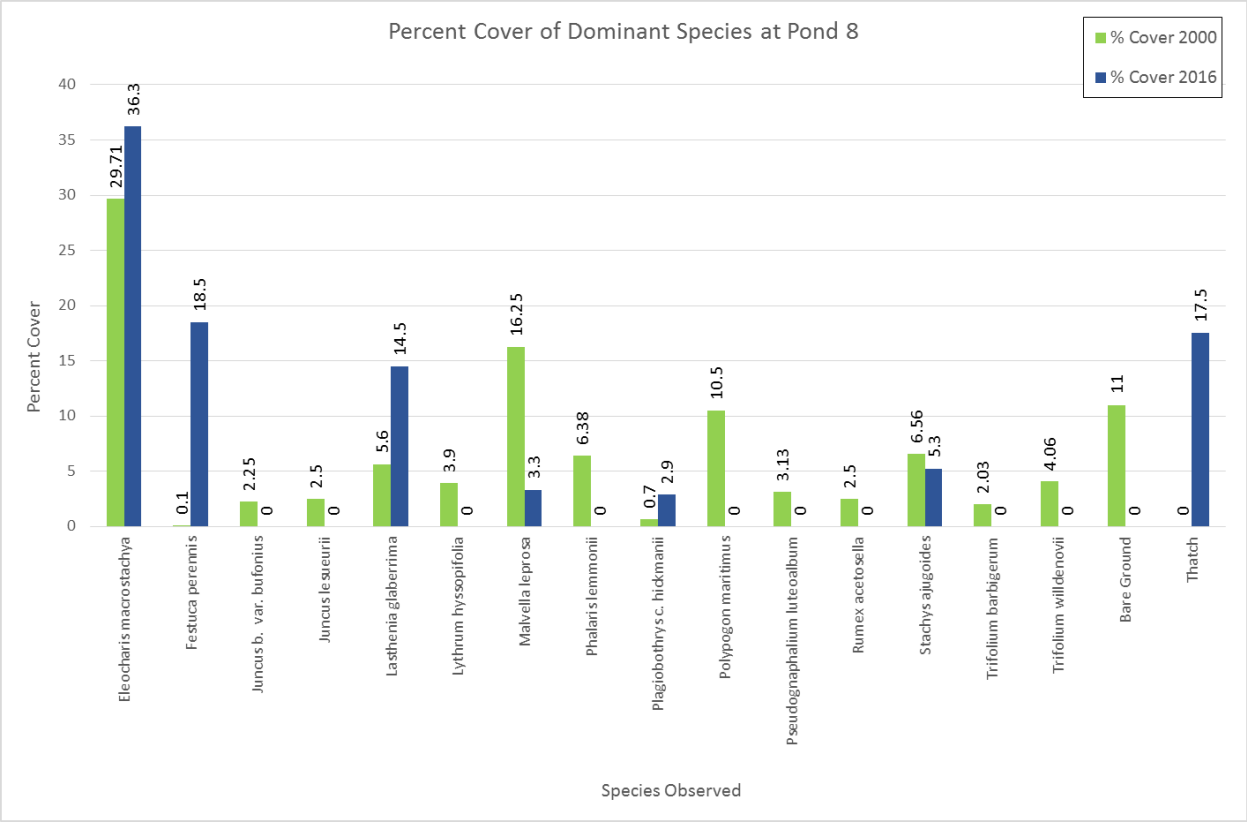

Figure 4-10. Percent Cover of Dominant Species at Pond 8

Based on this analysis, the number and relative dominance of native wetland species within Pond 8 is comparable to the number and relative dominance prior to soil remediation and the DQO for wetland vegetation has been met; no further wetland vegetation surveys are recommended.

4.2.2 Pond 10

Baseline vegetation data for Pond 10 was collected in 2007 (Shaw, 2008). Data was along a single 150-foot transect, using a 0.25 m^2 quadrat placed at 10-foot intervals, alternating left and right sides. A single transect was used due to the homogeneity of the vegetation. Because this data was collected using a slightly different methodology than was used in 2016 and individual strata were not identified and evaluated during this survey, the 2016 data for all strata were lumped in order to compare to the baseline data. Baseline data was also collected at two reference vernal pools in 2007: Ponds 5 and 56. For these vernal pools, sampling was conducted in three different zones using a one-meter quadrat.

Table 4-8 shows the absolute percent vegetative cover observed during the baseline survey and the 2016 follow-up survey. The absolute vegetative cover observed in 2016 is substantially higher than the baseline. This is the likely result of the five years of historic drought the region has experienced between the two surveys. During normal to wet years, Pond 10 can hold water well into summer and even throughout the entire year. As such, vegetation is precluded in the areas that are inundated for an extended period of time, creating significant bare areas. Although Pond 10 held water during most of the years between the surveys, the hydroperiod was not sufficient during that time to preclude vegetation growth in the typically bare areas. It is unlikely that the change in absolute percent vegetative cover is a result of soil remediation activities in the area.

Table 4-8. Absolute Percent Cover at Pond 10

Year	Vegetative Cover	Thatch/Bare Ground
2007	26.4%	73.3%
2016	91.8%	8.5%

During the 2007 survey, a total of 18 species were recorded within Pond 10. In 2016 a total of 66 species were recorded. Table 4-9 shows the number of native and non-native species identified during each survey at Pond 10 and Table 4-10 shows the relative percent cover of native and non-native species identified on the transects.

Table 4-9. Native and Non-Native Species Richness at Pond 10

Year	Native	Non-Native	Unidentified
2007	11	7	0
2016	36	29	1

Table 4-10. Relative Percent Cover of Native and Non-Native Plants at Pond 10

Year	Native	Non-Native	Unidentified
2007	99.0%	1.0%	0%
2016	92.1%	7.8%	0.1%

The data show that the number of native and non-native species within Pond 10 has more than tripled from what was recorded during the baseline survey. This substantial increase is likely due, in part, to a difference in survey area. The baseline report (Shaw, 2008) does not give any indication of the extent of the survey area; however, the 2016 survey was conducted to the top of the man-made berm. It is possible that the 2016 survey captured more species that occur along the fringe and within the identified upland areas (6% of the historic basin). Additionally, as described above, the extended drought between surveys has facilitated vegetation growth in areas of the vernal pool that are likely bare in typical to wet years. The relative percent cover of both native and non-native species has stayed reasonably the same. Although there has been an increase in the number of non-native species, they do not comprise significantly more cover than was observed in 2007 and no substantial change has occurred as a result of the adjacent soil remediation.

The baseline report does not include a full list of the 18 species observed within Pond 10 in 2007; however, five wetland plants and one non-wetland plant were observed along the transect. In 2016, 30 wetland plants and 36 non-wetland plants were identified within the historic basin; 12 wetland plants and nine non-wetland plants were observed on the transects. Table 4-11 shows the number of wetland and non-wetland species identified during each survey and Table 4-12 shows the relative percent cover of wetland and non-wetland species. Wetland species are categorized into the following: obligate wetland (OBL), facultative (FAC), facultative wetland (FACW), facultative upland (FACU), obligate upland (UPL), or not listed (NL).

Table 4-11. Wetland and Non-Wetland Species Richness at Pond 10

Year	OBL	FACW	FAC	FACU	UPL	NL
2007[4]	3	1	1	1	0	0
2016	7	12	11	14	4	18

Table 4-12. Relative Percent Cover of Wetland and Non-Wetland Species at Pond 10

Year	OBL	FACW	FAC	FACU	UPL	NL
2000	66.7%	32.3%	0.5%	0.5%	0%	0%
2016	53.2%	25.2%	15.1%	0.4%	0.6%	5.4%

The data show that the relative percent cover of wetland species within Pond 10 in 2016 is comparable to the baseline. Similar to the increase in non-native species discussed above, the increased number of non-wetland species may be due to the extended drought period experienced between these two surveys, as well as differing data collection methodologies. In 2007, a single long transect was located within a mostly homogeneous area of the vernal pool. As such, very few species were observed along the transect. In 2016, transects were located in the most homogenous portions of the identified strata. For this reason, it is likely that a higher number of species were "picked up" during the survey in 2016 than in 2007, particularly non-wetland species present within the "fringe" strata. Although there has been an increase in the number of non-wetland species, the relative percent cover of wetland species remains very high and the change is not substantial.

A complete comparison of species composition observed during the surveys at Pond 10 in 2007 and 2016 can be found in Appendix H. Figure 4-11 is a subset that compares species observed with a 2% cover or greater. The data show that in both 2007 and 2016, the dominant species were pale spike rush (*Eleocharis macrostachya)* and brown-headed rush (*Juncus phaeocephalus)*. In 2007 pale spike rush was observed at approximately 12% cover, while in 2016 the cover was approximately 96%. This increase in cover for pale spike rush is consistent with the observations made at Pond 5 in 2007 and 2016 where pale spike rush increased from approximately 42% cover to approximately 78% cover in stratum 1 (or "zone 1" as it is identified in Shaw, 2008). In 2016, eight species were present at a 2% cover or higher that were not observed on the transect in 2007. As discussed above, these changes are likely due to the reduced hydroperiod of the vernal pool during the previous five years of drought, which facilitated vegetation growth in typically bare areas of the vernal pool, and is not a result of the adjacent soil remediation. Therefore, because the most dominant species are the same between the years, the observed differences in species composition are not substantial.

[4] The baseline report (Shaw, 2008) does not include a complete list of species observed at Pond 10 in 2007. As such, only the species observed along the transect are included within the table. However, the table includes all of the species observed in 2016 within the historic basin, not just on the transects.

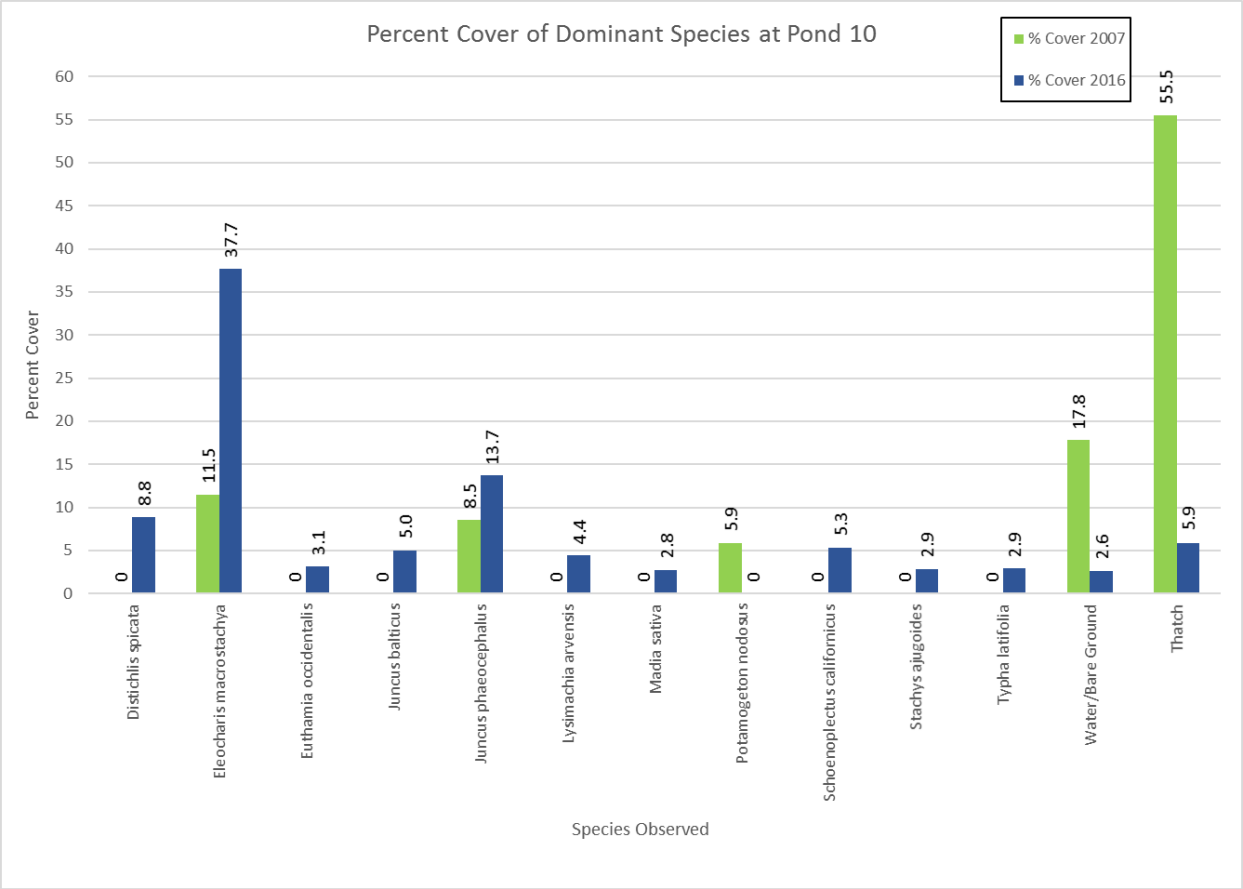

Figure 4-11. Percent Cover of Dominant Species at Pond 10

One additional year of vegetation monitoring is required within Pond 10; however, based on the analysis above, the number and relative dominance of native wetland species within Pond 10 four years following soil remediation is comparable to the number and relative dominance prior to soil remediation and the observed changes are likely due to regional drought conditions and differing data collection methodologies, not the soil remediation activities.

4.2.3 Pond 30 (A/B/C)

As identified above, Ponds 30B and 30C were created as a result of the 2011 soil remediation excavation and are distinguished from Pond 30A by the abrupt change in elevation where the excavation occurred. As such, Ponds 30B and 30C did not exist prior to 2011 and historic data for these individual vernal pools does not exist. However, these vernal pools are depressions within a hydrologically connected basin, as identified above in the hydrology discussion section 4.1.5. In the context of evaluating impacts following soil remediation activities, the data for all three vernal pools have been lumped.

Baseline vegetation data was collected at Pond 30 in 1999[5] (HLA, 1999). Data was collected along four transects between 80 and 102 feet long using 0.25 m^2 quadrats placed at 10 to 20-foot intervals, alternating from the right to left side of the transect. However, the four transects are located outside of the historic basin within which transects were placed in 2016. As such, the data collected as baseline is

[5] Please note that Pond 30A is identified as "Waterbody 47" in HLA, 1999.

not directly comparable to the data collected five years following soil remediation. The reason for the substantial difference in transect locations is due to the fact that the above average precipitation fell in the 1997-1998 rain year and the inundation level of Pond 30 was well above normal (see Figure 4-7). Pond 30 likely held water at this increased level throughout the summer and into the 1999 monitoring period, and transects were placed in more upland areas that are not typically inundated. Conversely, below average precipitation fell in the five years preceding the 2016 surveys and the region experienced a historic drought. Pond 30 dried completely in 2016 and transects were placed within areas that were inundated in 1999.

The differences in sampling location is easily expressed in the comparison species observed with a 2% cover or greater between the two monitoring years, as show in Figure 4-12. Because the baseline transects were placed almost completely outside of the area surveyed in 2016 and were further from the wettest portion of the vernal pool, the dominant species observed in 1999 were less hydrophytic than those observed in 2016. For example, in 2016, pale spike rush was the dominant species observed; however this species was only observed at less than 1% cover in 1999; the likely cause of this is that the area typically dominated by pale spike rush was completely inundated during the 1999 survey. A complete comparison of species composition observed during the surveys at Pond 30 in 1999 and 2016 can be found in Appendix H.

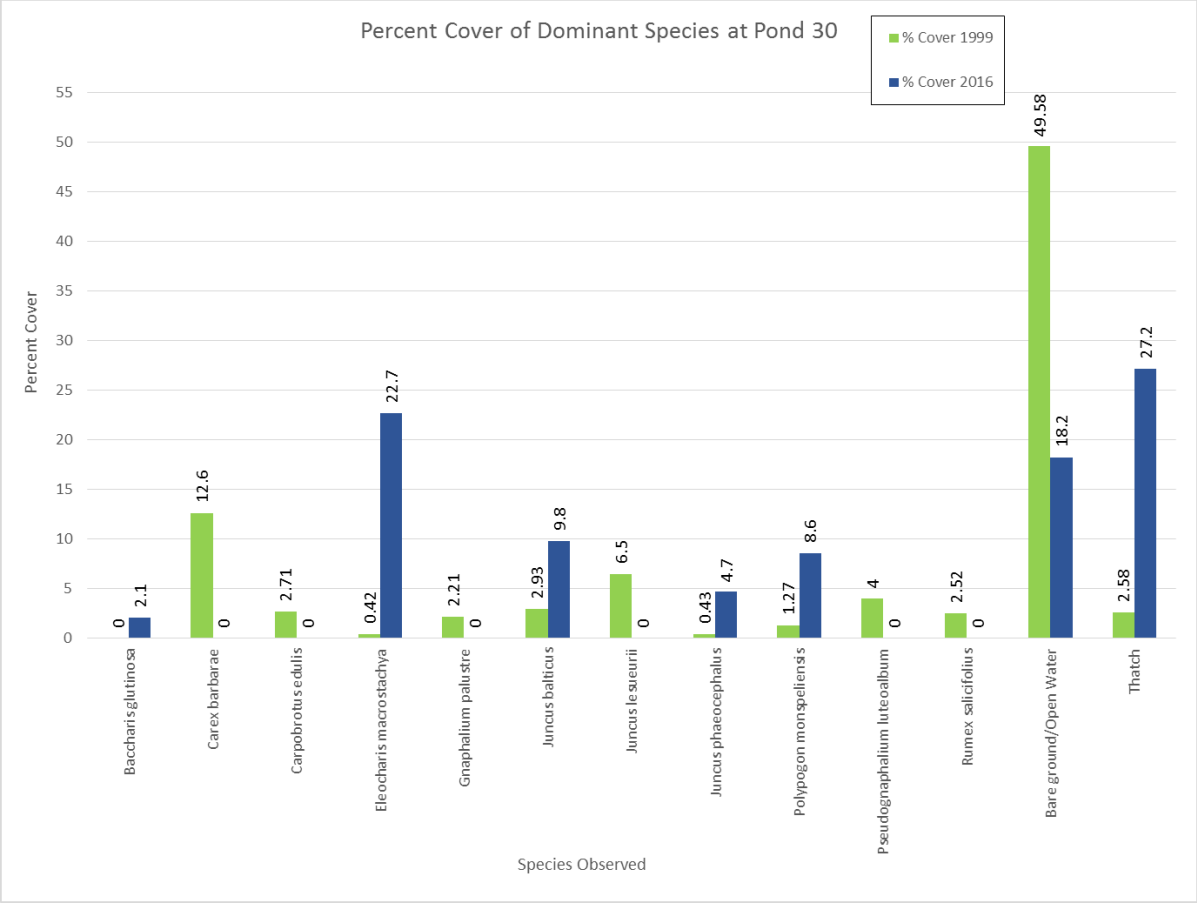

Figure 4-12. Percent Cover of Dominant Species at Pond 30

The differences in sampling location area also expressed in the percent relative cover of wetland species observed in the two years (Table 4-13). Relative cover of obligate wetland plants was substantially greater in 2016, while relative cover of facultative wetland plants was substantially greater in 1999. Wetland species are categorized into the following: obligate wetland (OBL), facultative (FAC), facultative wetland (FACW), facultative upland (FACU), obligate upland (UPL), or not listed (NL).

Table 4-13. Relative Percent Cover of Wetland and Non-Wetland Species at Pond 30

Year	OBL	FACW	FAC	FACU	UPL	NL
1999	1.8%	35.0%	39.3%	11.7%	0.5%	11.7%
2016	48.1%	48.7%	1.7%	0.8%	0.1%	0.6%

Baseline data was taken at reference vernal pools in 1999; however, none of these vernal pools were sampled in 2016. Therefore, a direct comparison with reference vernal pools over the entire monitoring period cannot be conducted to provide an analysis of any regional changes. However, some comparisons with reference vernal pool data from 2016 can be made to identify similar characteristics between disturbed and undisturbed vernal pools.

In 2016, at total of 65 species were recorded within the Pond 30 historic basin. Table 4-14 shows the number of native and non-native species identified in 2016 within each of the individual vernal pools (30A, B, and C), within the entire basin of Pond 30, and within the reference vernal pools. The native and non-native species richness at Pond 30 is comparable to the reference vernal pools, and in fact, Pond 30 has a substantially greater number of native species than several of the reference vernal pools. Additionally, the native and non-native species richness within each of the individual vernal pools is comparable to the reference vernal pools.

Table 4-14. Native and Non-Native Species Richness in 2016

Vernal Pool	Native	Non-Native	Unidentified
30A	26	17	1
30B	19	11	0
30C	31	15	1
30	40	24	1
5	23	17	0
56	26	14	1
101 East (east)	33	25	0
101 East (west)	19	17	1

In 2016, 29 wetland plants and 28 non-wetland plants were observed at Pond 30. Table 4-15 shows the number of wetland and non-wetland species identified in 2016 within each of the individual vernal pools, within the entire basin of Pond 30, and within the reference vernal pools. The wetland and non-wetland species richness at Pond 30 is comparable to the reference vernal pools, and in fact, Pond 30 has a substantially greater number of wetland species than several of the reference vernal pools. Additionally, the wetland and non-wetland species richness within each of the depressions is comparable to the reference vernal pools.

Table 4-15. Wetland and Non-Wetland Species Richness in 2016

Vernal Pool	OBL	FACW	FAC	FACU	UPL	NL
30A	6	8	9	8	3	10
30B	4	11	4	5	1	5
30C	6	10	6	13	1	11
30	8	11	10	15	3	0
5	7	7	9	7	0	10
56	8	5	5	10	0	13
101 East (East)	10	15	9	10	1	13
101 East (West)	5	8	4	8	1	11

Follow-up data collected in 2015 at Pond 30C can be evaluated to identify any trends that can be seen over two years of monitoring[6]. Additionally, data collected at Ponds 30C and 30B in 2016 can be compared to Pond 30A to evaluate if the revegetation of the excavated areas is comparable to the intact vegetation at the main vernal pool (30A).

Table 4-16 shows the absolute percent vegetative cover observed during the 2015 and 2016 follow-up surveys at Pond 30C and the 2016 survey at Ponds 30A and 30B. The absolute vegetative cover observed at Pond 30C in 2016 is substantially higher than was observed in 2015. This is a result of the increase inundation at Pond 30C in 2016, which facilitated vegetation growth in stratum 3, as discussed above. The absolute percent cover of vegetation at Ponds 30B and 30C is nearly the same as Pond 30C.

Table 4-16. Absolute Percent Cover at Ponds 30C and 30B

Vernal Pool	Year	Vegetative Cover	Thatch/ Bare Ground
30A	2016	59.8%	40.4%
30B	2016	51.5%	50.0%
30C	2016	50.0%	50.7%
	2015	28.2%	70.7%

During the 2015 survey, a total of 31 species were recorded within Pond 30C. In 2016, a total of 42 species were recorded at Pond 30A, 30 species were recorded at Pond 30B and 47 species were recorded at Pond 30C. Table 4-17 shows the number of native and non-native species identified during the 2015 and 2016 surveys at Pond 30C and 2016 survey at Ponds 30A and 30B. Table 4-18 shows the relative percent cover of native and non-native species identified on the transects. The data show an increasing trend in the number and relative cover of native species within Pond 30C between 2015 and 2016. These numbers are not substantially different than what was observed in Pond 30A. The data also show that the native and non-native species richness at Pond 30B is comparable to Pond 30C in 2015. It is likely that vegetation recovery in Pond 30B is slower than in Pond 30C as Pond 30B was not inundated in 2015, which precluded the amount of growth that was observed in 30C. This may have also resulted in the higher relative percent cover of non-native species within Pond 30B. Although the number of native species observed was higher, the percent cover of rabbit-foot grass observed on the transects resulted in lower native cover.

[6] Ponds 30A and 30B were not surveyed in 2015 and no comparison of strata can be made.

Table 4-17. Native and Non-Native Species Richness at Ponds 30A, B, and C

Vernal Pool	Year	Native	Non-Native	Unidentified
30A	2016	26	17	1
30B	2016	19	11	0
30C	2016	31	15	1
	2015	20	11	0

Table 4-18. Relative Percent Cover of Native and Non-Native Plants at Ponds 30A, B, and C

Vernal Pool	Year	Native	Non-Native	Unidentified
30A	2016	96.9%	2.9%	0.1%
30B	2016	41.4%	58.6%	0.0%
30C	2016	84.7%	14.7%	0.0%
	2015	68.2%	29.9%	0.0%

Table 4-19 shows the number of wetland and non-wetland species identified during each survey and Table 4-20 shows the relative percent cover of wetland and non-wetland species. The data show an increasing trend in the number and relative cover of wetland species within Pond 30C between 2015 and 2016. Additionally, the number and relative cover of wetland species observed at Ponds 30B and 30C in 2016 is comparable to that observed at Pond 30A in 2016.

Table 4-19. Wetland and Non-Wetland Species Richness at Ponds 30A, B, and C

Vernal Pool	Year	OBL	FACW	FAC	FACU	UPL	NL
30A	2016	2	7	2	3	1	1
30B	2016	3	6	0	1	0	0
30C	2016	6	4	2	1	0	2
	2015	3	5	1	1	1	4

Table 4-20. Relative Percent Cover of Wetland and Non-Wetland Species at Ponds 30A, B, and C

Vernal Pool	Year	OBL	FACW	FAC	FACU	UPL	NL
30A	2016	57.6%	39.3%	2.0%	0.8%	0.1%	0.1%
30B	2016	23.3%	75.1%	0.0%	1.3%	0.0%	0.0%
30C	2016	51.3%	44.7%	2.3%	0.3%	0.0%	1.3%
	2015	11.4%	58.7%	15.0%	0.4%	0.4%	14.2%

In 2015, three strata were identified at Pond 30C (Burleson et. al 2016). No data was collected from stratum 3 since it was characterized by bare ground. In 2016, only two strata were identified at Pond 30C. This was a result of the previously bare ground in stratum 3 revegetating with the same suite of species as were found in stratum 2 species in 2015. The absolute percent cover of stratum 1 was the same in both 2015 and 2016. From 2015 to 2016, the absolute percent cover of stratum 2 increased by the amount of cover that was observed in stratum 3 in 2015 (31%). The increased vegetation within this area is likely due to increased inundation of Pond 30C in 2016, facilitating vegetation growth. The absolute percent cover of each stratum in 2015 and 2016 is presented in Table 4-21 for comparison.

Table 4-21. Comparison of Strata at Pond 30C for 2015 and 2016

Stratum	Absolute % Cover of Wetland	
	2015	2016
1	20%	20%
2	49%	80%
3	31%	0%

A complete comparison of species composition observed during the surveys at Pond 30C in 2015 and 2016 can be found in Appendix H. Figure 4-13 is a subset of this comparison that compares species observed with a 2% cover or greater. The data show that in both 2015 and 2016, the dominant species was brown-headed rush (*Juncus phaeocephalus*). Pale spike rush (*Eleocharis macrostachya*) was also a dominant species in 2016; however, this species was only observed at a 2.8% cover in 2016. As such, the data show an increase in wetland species, as described above and a decrease in the less hydrophytic vegetation, such as smooth cat's-ear and salt grass.

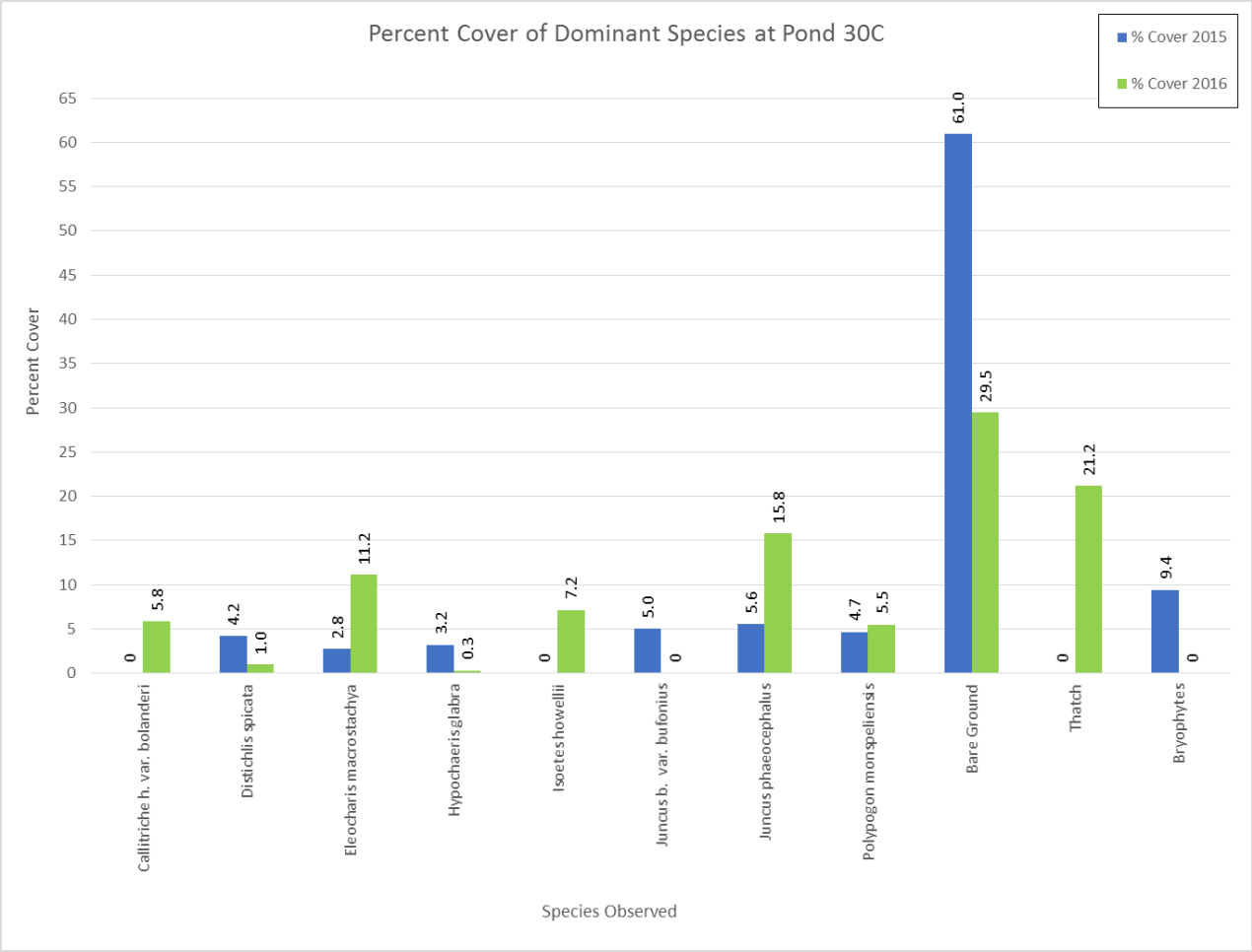

Figure 4-13. Percent Cover of Dominant Species at Pond 30C

Aerial images available on Google Earth Pro (Google, 2016) for the year prior to the baseline survey in 1999 and the intervening years prior to the excavation in 2011 provide insight into the dynamics at Pond 30. An aerial image from September 1998 shows that Pond 30 was inundated beyond the historic basin

as mapped in 2016. However, aerial images from December 2005 and May 2006 show inundation consistent with the historic basin mapped in 2016. Additionally, during this time, the density of shrubs outside of the historic basin but within the 1998 inundated area begins to increase. This shows that the vegetation within the larger basin is directly tied to natural hydrologic and climatologic changes in the area. This is likely a cyclic shift where successive above average rainfall fills the vernal pool beyond the historic basin and kills many of the dominant upland species that surround the historic basin, then during successive normal or drought years, the upland vegetation begins to grown and increase in density until the next period of extended above average rainfall.

Based on the analysis above, the number and relative dominance of native wetland species within Ponds 30A, B, and C five years following soil remediation is likely comparable to the number and relative dominance prior to soil remediation. Although the 2016 data is not directly comparable to the baseline data due to differing sampling methods resulting from extremely different hydrologic and climatologic variances between the survey years, comparison with reference vernal pool show that the richness of native wetland plants at Pond 30 is not substantially different than vernal pools in unimpacted areas and aerial images show that the historic basin identified in 2016 is consistent with the area typically inundated in average rainfall years. The soil remediation followed by five years of historic drought has resulted in the sparsely vegetated Pond 30B and Pond 30C areas. However, the revegetation trends observed between 2015 and 2016 at Pond 30C suggest that the impacted areas are recovering from excavation. There is no evidence to suggest that this area would not continue along this trajectory.

4.2.4 Pond 18

Baseline vegetation data was collected at Pond 18 in 1998[7] (HLA, 1999). Data was collected along one 179-foot transect using 0.25 m^2 quadrats placed at 10 to 20-foot intervals, alternating from the right to left side of the transect. The transect bisected the entire vernal pool in northwest to southeast direction. Because this data was collected using a slightly different methodology than was used in 2016 and individual strata were not identified and evaluated during this survey, the 2016 data for all strata were lumped in order to compare to the baseline data. As identified above for Pond 30, baseline data was also taken at reference vernal pools in 1999; however, none of these vernal pools were sampled in 2016. As such, direct comparison with reference vernal pools over the entire monitoring period cannot be conducted to provide an analysis of any regional changes. However, some comparisons with reference vernal pool data from 2016 can be made to identify similar characteristics between disturbed and undisturbed vernal pools.

Table 4-22 shows the absolute percent vegetative cover observed during the baseline survey and the 2016 follow-up survey. The absolute vegetative cover observed in 2016 is comparable to the baseline.

Table 4-22. Absolute Percent Cover at Pond 18

Year	Vegetative Cover	Thatch/Bare Ground
1999	73.4%	27.1%
2016	63.7%	33.1%

During the 1999 survey, 30 plant species were recorded on the transects. In 2016, at total of 65 species were recorded within the historic basin. Table 4-23 shows the number of native and non-native species

[7] Please note that Pond 18 is identified as “Waterbody 50” in HLA, 1999.

identified during each survey and Table 4-24 shows the relative percent cover of native and non-native species.

Table 4-23. Native and Non-Native Species Richness at Pond 18

Year	Native	Non-Native	Unidentified
2000	17	12	1
2016	35	28	2

Table 4-24. Relative Percent Cover of Native and Non-Native Plants at Pond 18

Year	Native	Non-Native	Unidentified
2000	87.9%	10.8%	1.4%
2016	70.5%	29.5%	0%

The data show that the number of native and non-native species within Pond 18 has nearly doubled. The relative percent cover non-native species has also increased by approximately 20%. The increased number and relative cover of non-native species may be due to the extended drought period experienced between these two surveys. 1998 was within a wet period in the region while 2016 was the fifth year of a historic drought. With multiple consecutive drought years and no inundation observed in the 2014-2015 water year, it is likely that Pond 18 did not hold much water for a significant number of years preceding the 2016 survey (see Figure 4-2; Table E-4, Appendix E). This could explain how non-native species were able to move into the portions of the vernal pool that, under normal precipitation conditions, would be too wet to support them. However, the relative cover of native species in 2016 was still substantially higher than the relative cover of non-native species.

In 1999, 17 wetland plants and 13 non-wetland plants were observed along the transects. In 2016, 30 wetland plants and 35 non-wetland plants were observed on the transects. Table 4-25 shows the number of wetland and non-wetland species identified during each survey and Table 4-26 shows the relative percent cover of wetland and non-wetland species. Wetland species are categorized into the following: obligate wetland (OBL), facultative (FAC), facultative wetland (FACW), facultative upland (FACU), obligate upland (UPL), or not listed (NL).

Table 4-25. Wetland and Non-Wetland Species Richness at Pond 18

Year	OBL	FACW	FAC	FACU	UPL	NL
1999	7	5	5	9	0	4
2016	10	10	10	13	4	18

Table 4-26. Relative Percent Cover of Wetland and Non-Wetland Species at Pond 18

Year	OBL	FACW	FAC	FACU	UPL	NL
2000	43.6%	29.7%	5.0%	19.6%	0.5%	1.6%
2016	71.6%	1.3%	22.8%	4.1%	0%	0.2%

The data show that the number of wetland and non-wetland species within Pond 18 has more than doubled. Similar to the increase in non-native species discussed above, the increased number of non-wetland species may be due to the extended drought period experienced between these two surveys. Although there has been an increase in the number of non-wetland species, the relative percent cover

of non-wetland species has substantially decreased, and subsequently the relative percent cover of wetland species has substantially increased. This is a positive change from the baseline.

A complete comparison of species composition observed during the surveys at Pond 18 in 1999 and 2016 can be found in Appendix H. Figure 4-14 is a subset of this comparison that compares species observed with a 2% cover or greater. The data show that in both 1999 and 2016, pale spike rush (*Eleocharis macrostachya)* and beardless wild-rye (*Elymus triticoides*) were dominant species; however, brown-headed rush (*Juncus phaeocephalus)* was also dominant in 1999, but was not found on the transects in 2016. While the species composition appears to have shifted, this may actually be a result of the differing data collection methodologies. In 1999, a single long transect that bisected the entire vernal pool were used to collect data, while in 2016, transects were located in the most homogenous portions of the identified strata. For this reason, it is likely that different species were "picked up" during the survey in 1999 than in 2016. Therefore, because the most dominant species are the same between the years, the observed differences in species composition are not substantial.

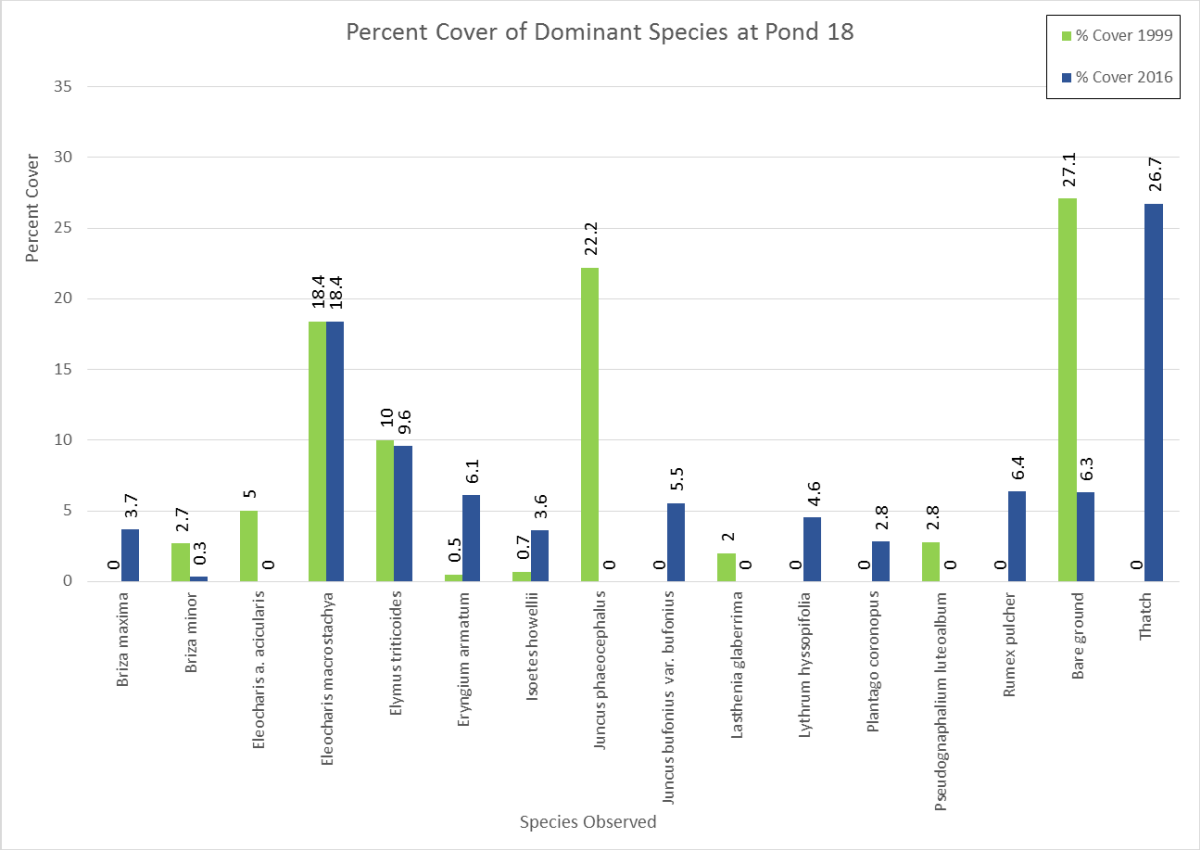

Figure 4-14. Percent Cover of Dominant Species at Pond 18

Based on the analysis above, Pond 18 appears to support a dominance of native plant species and a substantial amount of wetland plants two years following remediation. This resource will continue to be monitored until year 5 following mastication.

4.2.5 Contra Costa Goldfields

The area of Contra Costa goldfields at Pond 3 North increased from approximately 0.04 acre to 0.13 acre between 2015 (Burleson *et al.*, 2016) and 2016. The range in density decreased from 10% to 60% in 2015 to 5% to 40% in 2016. There was no remediation work conducted within the watershed of Pond 3 North between monitoring events, thus this change reflects natural fluctuation.

4.2.6 Vernal Pool Bent Grass

During the vegetation survey at Pond 44, vernal pool bent grass (*Agrostis lacuna vernalis*) was identified for the first time at that pool. Vernal pool bent grass is listed as a 1B-1 seriously endangered plant in California by California Native Plant Society (CNPS, 2013). It was first identified and described as a new species in 2011 and only occurs at vernal pools in Monterey County (Peterson *et al*., 2011). Vernal pool bent grass has been documented at Machine Gun Flats, Little Moab area, and Butterfly Valley on former Fort Ord. The Pond 44 documentation expanded the current known range. The identification of the species was confirmed by Botanists David Styer, Bruce Delgado, and Dr. Ellen Dean of UC Davis. The Army will continue to monitor for this species during vegetation monitoring events at the vernal pools that may be affected by remediation activities and the reference vernal pools.

4.3 Wildlife Monitoring

Most vernal pools were in the baseline year of wildlife monitoring, while others are in year two, four, or five. Vernal pools in the baseline year of monitoring will be discussed in future reports. Ponds 8, 10, 18, 30A, 30B and 30C were post-remediation in 2016. Reference and post-remediation wildlife monitoring results are discussed below with a comparison to the baseline data and reference vernal pools and a discussion of the data quality objective (DQO). One objective of the Wetland Plan is to ensure that vernal pools that supported CTS and fairy shrimp prior to remediation activities continue to support those species following such activities (Burleson, 2008). This objective is measured based of the presence or absence of wildlife. When this standard is met, the remediated vernal pool would be considered meeting successful wetland function.

4.3.1 Pond 8

Pond 8 received lead remediation in 2011 and in 2016 is at year 5 of post remediation monitoring. Based on the Wetland Plan, areas that received remediation need to be assessed for the impact to wildlife and their respective habitat. The DQO for wildlife requires that CTS and fairy shrimp populations achieve the same demography between year 5 and baseline years. This objective is evaluated by comparing year 5 to baseline and Pond 8 to reference vernal pools when necessary.

Baseline wildlife data were collected at Pond 8 in 1992, 2000[8], and 2010 prior to soil remediation activities (USACE and Jones and Stokes, 1992; HLA, 2000; Shaw, 2011). Fairy shrimp were detected in 1992 and 2010 but not in 2000. CTS larvae were not detected in any baseline years. However, one adult was observed in 2010. Table 4-27 shows historic wildlife survey results.

The only wildlife survey that occurred post-remediation was in 2016. Wildlife surveys were not conducted in 2013 and 2014 as there was not sufficient inundation. Five CTS larvae and no fairy shrimp were observed in 2016. The CTS larvae were found within a small depression in the middle of the vernal pool that was still holding water at the time of the survey; however, because the larvae were very small, it is unlikely that they were able to successfully transform before the vernal pool dried completely. Tail

[8] Please note that Pond 8 is identified as “Waterbody 52” in HLA, 2000.

clips were collected from these larvae by Dr Brad Shaffer from UCLA for genetic analysis. However, other amphibian species (Pacific treefrog and western toad) were able to successfully breed within Pond 8 in 2016.

Table 4-27. Historic Wildlife Survey Results for Pond 8

Sampling Year	CTS Larvae Abundance (# Individuals)	Fairy Shrimp Abundance (# Individual)
1992	0	1-10
2000	0	0
2010	0	1-10
2016	5	0

CTS surveys indicate that the DQO was met. CTS were present in year 5 monitoring but were absent in baseline. 2016 was the first year that CTS were observed within Pond 8, indicating that Pond 8 CTS habitat resources may have expanded. This could be associated with rainfall patterns. The precipitation data shows that past surveys were conducted during years with less than normal rainfall and that precipitation in 2016 was above normal (see Figures 4-1 and Figure 4-2).

Fairy shrimp surveys indicate that the DQO was not met. Fairy shrimp were absent in year 5 monitoring but were present in baseline. It is possible that fairy shrimp are still present within Pond 8, but were not detected in 2016. Two possible reasons for no detection may be: 1) surveys were only able to be conducted from the water's edge due to safety concerns and fairy shrimp may have been present further from the edges than could be reached, and 2) the timing of the surveys may have been too late to detect fairy shrimp; previous surveys that resulted in detection of fairy shrimp were conducted in January through March per the USFWS surveys guidance, while surveys in 2016 were conducted March through May. Wildlife surveys have been postponed till March to avoid disturbance to potential CTS eggs.

4.3.2 Pond 10

Pond 10 received lead remediation in 2012 and 2016 is year 4 of post remediation monitoring.

Baseline wildlife data were collected at Pond 10 in 1992 and 2007 prior to soil remediation activities (USACE and Jones and Stokes, 1992; Shaw, 2008). Fairy shrimp were not detected. However, CTS larvae were observed. The 1992 data do not indicate the number of larvae detected; however, in 2007 CTS larvae were abundant (>101 individuals) within Pond 10.

Post-remediation surveys were conducted in 2013, 2014, and 2016 (Tetra Tech, 2014; Tetra Tech, 2015; Burleson *et al*., 2016). In 2013, the number of CTS larvae captured ranged from 59 to 421 over the three surveys. In 2014, the number of CTS larvae captured ranged from 0 to 4 over the three surveys (the difference in CTS larvae captured was likely due to a change in methodology; in 2014 biologists were not allowed to enter the vernal pool). In 2016, the number of CTS larvae ranged from 29 to greater than 101 over the three surveys. Table 4-28 provides a summary of this information. Pond 10 will continue to be monitored and will be compared to baseline following the year 5 monitoring.

Table 4-28. Historic Wildlife Survey Results for Pond 10

Sampling Year	CTS Larvae Abundance (# Individuals)	Fairy Shrimp Abundance (# Individual)
1992	Present	0
2007	>101	0
2013	59-421*	>101
2014	0-4*	6
2016	29->101*	>101

4.3.3 Pond 30 (A/B/C)

Pond 30 received lead remediation in 2011 and application of fire retardant in 2012. In 2016, Pond 30 is at year 5 and year 4 of post remediation monitoring. Based on the Wetland Plan, areas that received remediation need to be assessed for the impact to wildlife and their respective habitat. The DQO for wildlife requires that CTS and fairy shrimp populations achieve the same demography between year 5 and baseline years. This objective is evaluated by comparing year 5 to baseline and Pond 30 to reference vernal pools when necessary.

Baseline wildlife data were collected at Pond 30 in 1999[9] and 2010 prior to soil remediation activities (HLA, 1999; Shaw, 2011). Fairy shrimp and CTS were not detected in 1999 or 2010 (see Table 4-28).

Ponds 30B and 30C were not surveyed at this time because they did not exist. These vernal pools were created as a result of remediation activities conducted in 2011. As a result, no pre-remediation monitoring data exists for Ponds 30B or 30C.

Post-remediation wildlife surveys were conducted in 2016 at Pond 30A. In 2016, a total of 74 CTS larvae were detected (see Table 4-29). Wildlife surveys were not conducted in 2013, 2014, and 2015 as there was not sufficient inundation (Tetra Tech, 2014; Tetra Tech 2015; Burleson *et al*., 2016). No fairy shrimp were detected in Pond 30A.

Table 4-29. Historic Wildlife Survey Results for Pond 30A (pre-remediation Pond 30)

Sampling Year	CTS Larvae Abundance (# Individuals)	Fairy Shrimp Abundance (# Individual)
1999	0	0
2010	0	0
2016	74	0

Post-remediation wildlife surveys were conducted at Pond 30B in 2016 but no CTS were detected (see Table 4-30). Wildlife surveys were not conducted in 2013, 2014, and 2015 as there was not sufficient inundation (Tetra Tech, 2014; Tetra Tech, 2015; and Burleson *et al.*, 2016).

Table 4-30. Historic Wildlife Survey Results for Pond 30B

Sampling Year	CTS Larvae Abundance (# Individuals)	Fairy Shrimp Abundance (# Individual)
2016	0	0

Post-remediation wildlife surveys were conducted in 2013, 2014 and 2016 at Pond 30C. There were 21 CTS individuals detected at Pond 30C in 2013, no CTS were observed in 2014, and a range of 15-30 CTS larvae were observed in the 2016 surveys (Tetra Tech, 2014; Tetra Tech, 2015). Table 4-31 provides a

[9] Please note that Pond 30A is identified as "Waterbody 47" in HLA, 1999.

summary of this information. Wildlife surveys were not conducted in 2015 as there was not sufficient inundation (Burleson *et al.*, 2016). No fairy shrimp were detected in Pond 30C.

In 2013, the Pond 30C dried quickly (in April) and CTS larvae were stranded in the remnant puddles within boot prints. The stranded individuals died and were collected for tissues samples for DNA analysis at the Department of Ecology and Evolutionary Biology at the University of California, Los Angeles.

Table 4-31. Historic Wildlife Survey Results for Pond 30C

Sampling Year	CTS Larvae Abundance (# Individuals)	Fairy Shrimp Abundance (# Individual)
2013	21	0
2014	0	0
2016	15-30	0

Ponds 30B and 30C are new depressions within Pond 30 that resulted from soil remediation in the area, as described above. The data collected between 2013 and 2016 show that CTS are using Pond 30C as a breeding resource; although, in below normal rain years, this vernal pool likely does not support sufficient inundation for CTS to breed successfully. Additionally, it is unlikely that Pond 30 prior to the soil remediation would have been sufficiently inundated to support successful CTS breeding in below normal rain years. Ponds 30A and 30C supported successful CTS breeding in 2016, a rain year only slightly above normal. As such, both Ponds 30B and 30C are likely to support successful CTS breeding in normal to above normal rain years. Pond 30B may also support CTS breeding in normal to above normal years when all three of the depressions are hydrologically connected for an extended period of time; however, at this time CTS do not appear to attempting to breed within this pool. There is no evidence to suggest that Pond 30B would act as a population sink for CTS.

CTS surveys indicate that the DQO was met. CTS were present in year 5 monitoring but were absent in baseline. 2013 was the first year that CTS were observed within Pond 30C and 2016 was the first year that CTS were observed in Pond 30A. These results indicate that at Pond 30A and Pond 30C CTS habitat resources may have expanded. These vernal pools support CTS breeding five years after soil remediation.

Fairy shrimp surveys indicate that the DQO was met. Fairy shrimp were absent in year 5 monitoring and baseline. The conditions observed five years after soil remediation are consistent with baseline conditions.

4.3.4 Pond 18

A large portion of the Pond 18 watershed was masticated in 2014 and in 2016 is at year 2 of post remediation monitoring.

Baseline wildlife data were collected at Pond 18 in 1992 and 1998 prior to mastication (USACE and Jones and Stokes, 1992 and HLA, 1999). Fairy shrimp and CTS were not detected. No CTS or fairy shrimp were detected in 2016. Table 4-32 provides a summary of this information. This vernal pool will continue to be monitored until year 5. Table 4-31 provides a summary of this information.

Table 4-32. Historic Wildlife Survey Results for Pond 18

Sampling Year	CTS Larvae Abundance (# Individuals)	Fairy Shrimp Abundance (# Individual)
1992	0	0
1998	0	0
2016	0	0

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APPENDIX A

Water Quality Results and Inundation Area by Pond

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Table A-1. Hydrology Results for Baseline Monitoring for Pond 3 North on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
3/31/2016	11:48	6.75	18.40	5.61	56.7	54	0.218
4/18/2016	9:27	6.12	15.50	3.67	45.4	45	0.108
5/9/2016	8:23	6.28	15.56	2.11	9.6	29	0.069
6/7/2016	10:30	6.07	18.71	3.88	24.2	16	0.025
7/7/2016						DRY	0.000

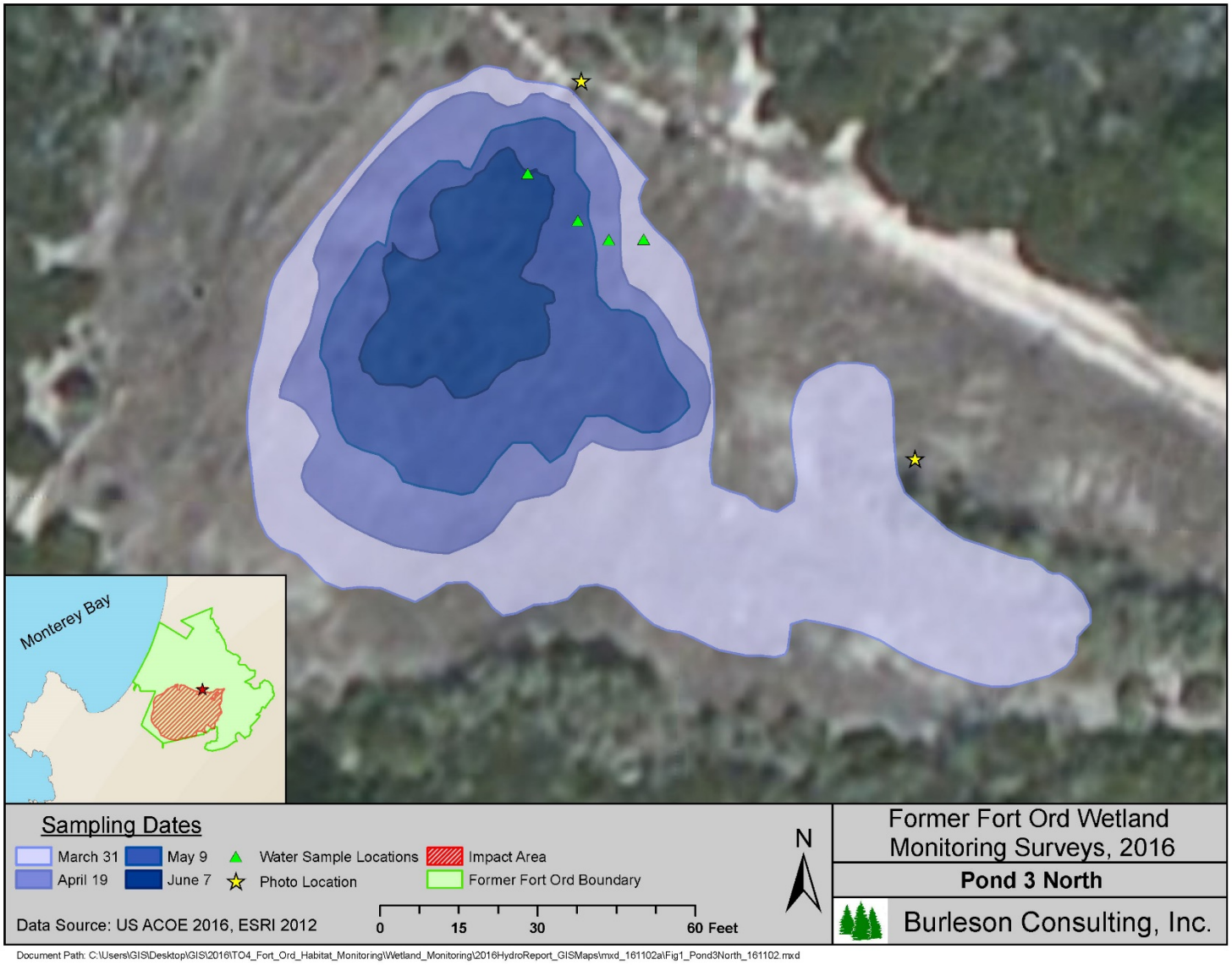

Figure A-1. Map of Pond 3 North on Former Fort Ord, 2016

Table A-2. Hydrology Results for Baseline Monitoring for Pond 3 South on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
3/31/2016	11:58	7.00	16.42	9.87	12.2	30	0.519
4/18/2016	9:37	6.38	14.44	4.00	10.2	30	0.412
5/9/2016	8:27	6.39	13.85	1.31	4.0	11	0.005
6/7/2016						DRY	0.000

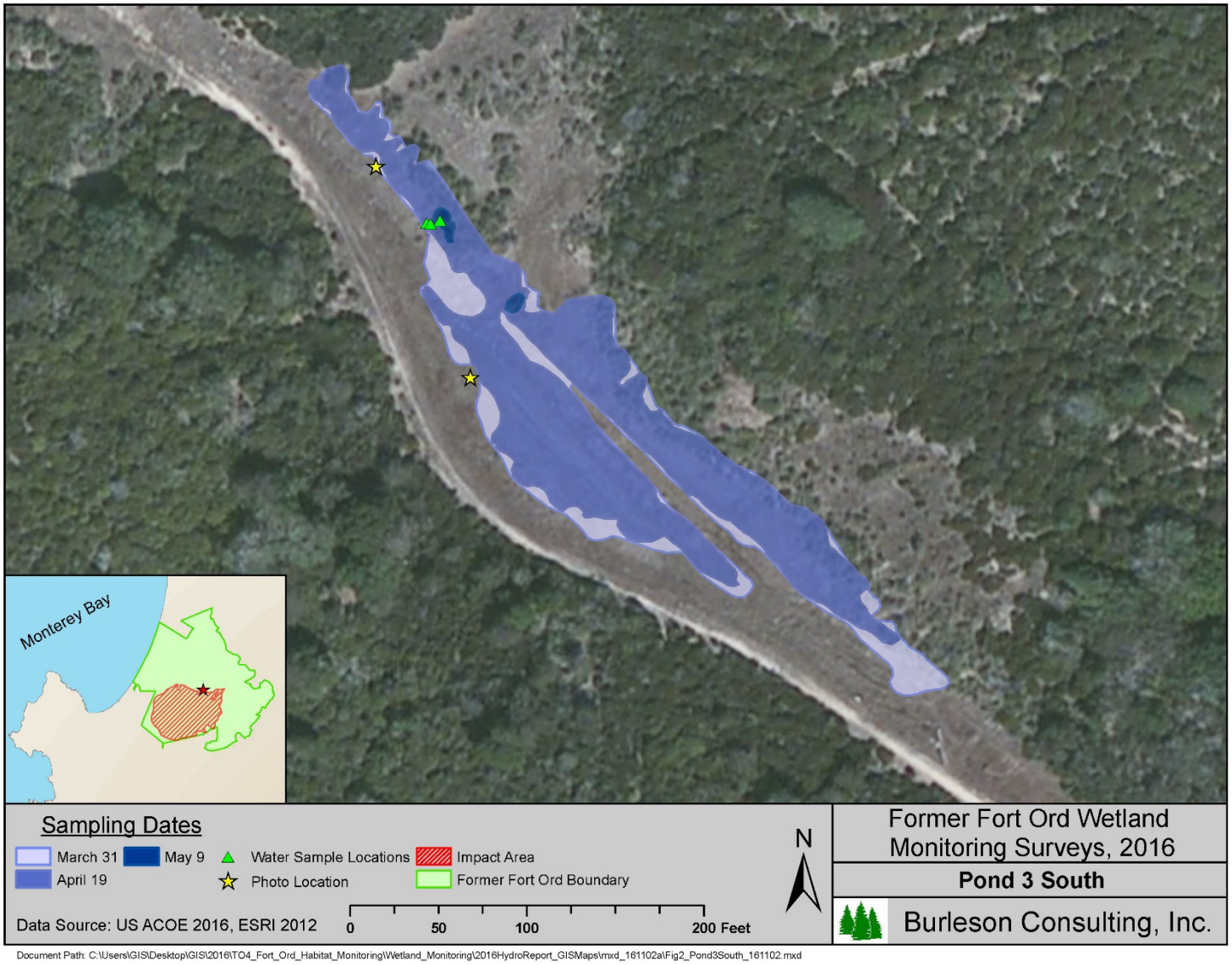

Figure A-2. Map of Pond 3 South on Former Fort Ord, 2016

Table A-3. Hydrology Results for Reference Monitoring for Pond 5 on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/5/2016	16:54	6.41	25.06	6.91	63.4	no gauge, ~100	5.325
4/19/2016	14:29	6.51	20.27	5.73	23.8	no gauge, ~100	5.139
5/9/2016	13:25	6.45	17.99	7.3	19.6	no gauge, ~100	4.862
6/8/2016	15:07	6.48	21.32	0.34	17.7	no gauge, ~80	4.437
7/7/2016	14:28	6.37	23.01	6.65	83.2	no gauge, ~60	3.190
8/10/2016	10:09	6.85	16.37	0.97	295	4	0.358
9/12/2016						DRY	0.000

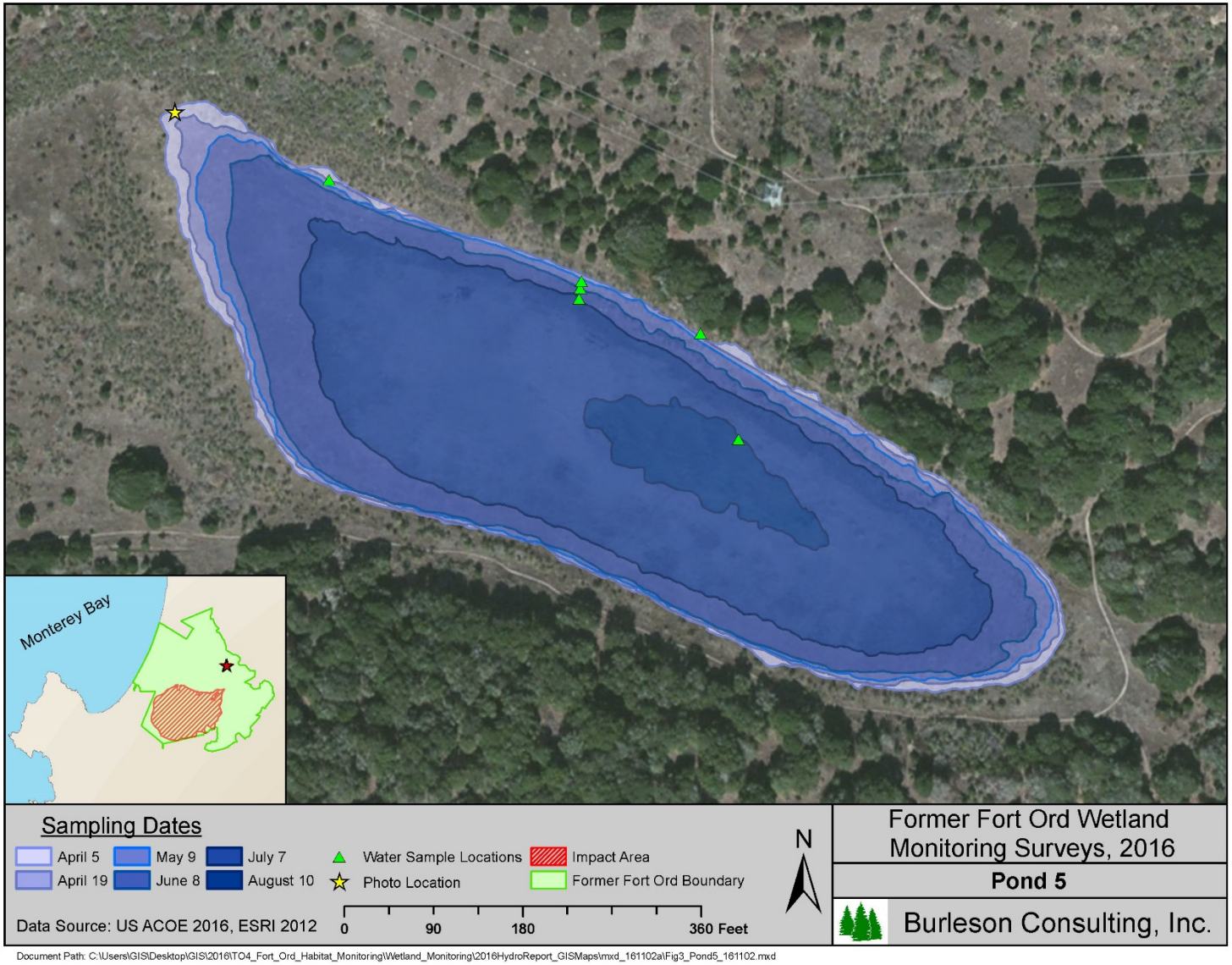

Figure A-3. Map of Pond 5 on Former Fort Ord, 2016

Table A-4. Hydrology Results for Lead Remediation Year 5 Monitoring for Pond 8 on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/5/2016	13:28	7.11	13.88	1.97	8.3	62	0.062
4/18/2016	16:12	7.12	15.28	1.51	12.5	22	0.041
5/10/2016	11:56	7.47	16.55	1.55	55.9	12	0.020
6/8/2016						DRY	0.000

Table A-5. Hydrology Results for Lead Remediation Year 5 Monitoring for the Adjacent Remediated Scrape Area at Pond 8 on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/5/2016	13:51	7.81	25.72	4.34	53.8	62*	0.062*
4/18/2016	16:27	8.57	27.93	7.57	52	22*	0.041*
5/10/2016	11:59	7.80	20.85	7.08	64.8	12*	0.020*
6/8/2016						DRY	0.000

*Pond 8 inundated surface area was combined for Pond 8 and Pond8B

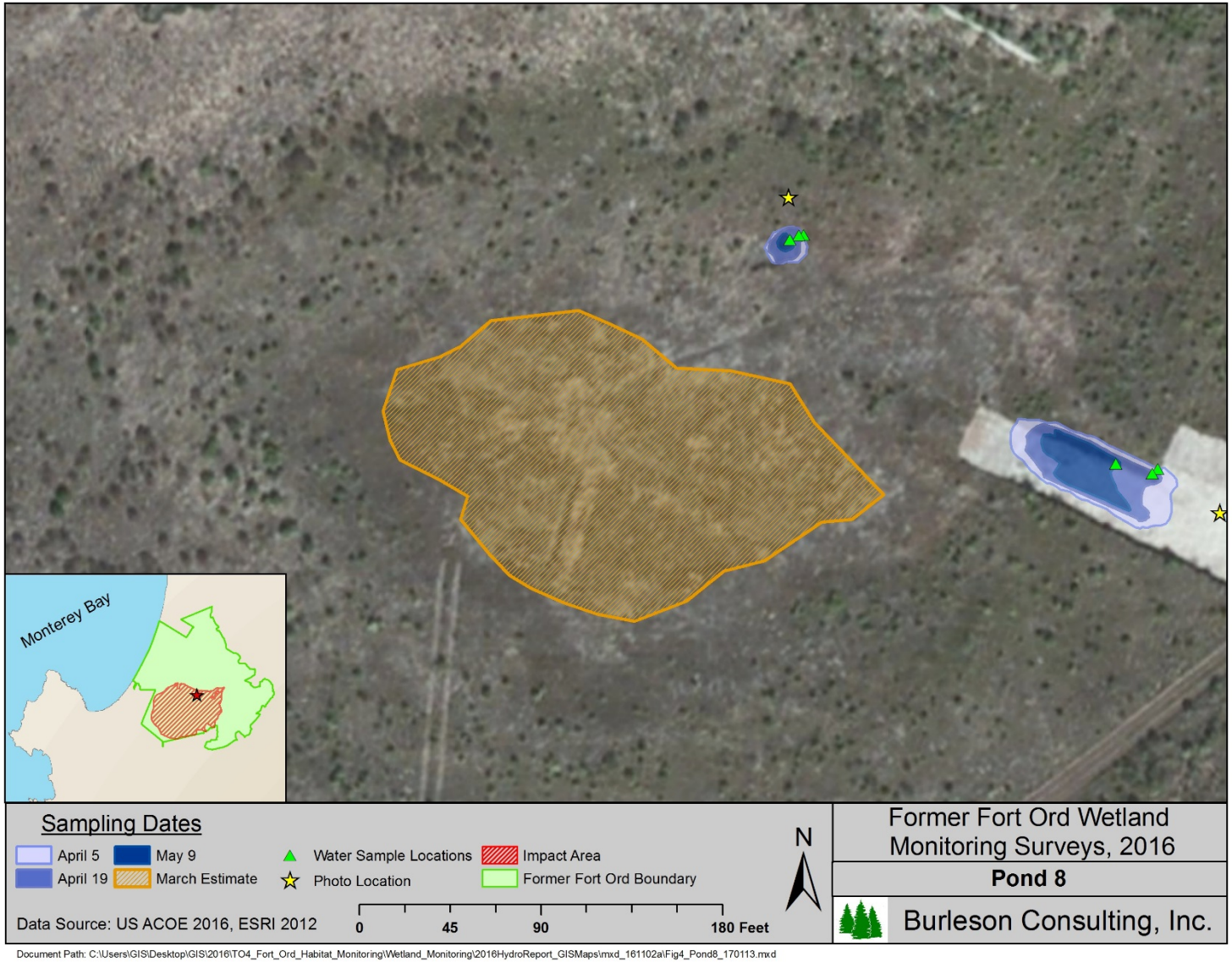

Figure A-4. Map of Pond 8 on Former Fort Ord, 2016

Table A-5. Hydrology Results for Lead Remediation Year 4 Monitoring for Pond 10 on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/5/2016	12:43	7.03	14.46	8.72	134.0	no gauge visible, ~100	6.196
4/18/2016	11:58	6.91	16.24	5.56	100.0	no gauge visible, ~100	5.916
5/10/2016	12:21	7.00	16.85	3.9	89.6	no gauge visible, ~100	5.805
6/8/2016	12:00	7.13	21.18	5.69	47	no gauge visible, ~100	5.628
7/7/2016	9:54	7.3	18.23	6.66	61.5	84	5.270
8/10/2016	11:02	8.29	18.71	5.44	398	58	3.033
9/12/2016	10:00	7.35	18.4	0.51	410	54	1.704
10/11/2016	10:20	7.48	15.32	2.4	118	34	1.392

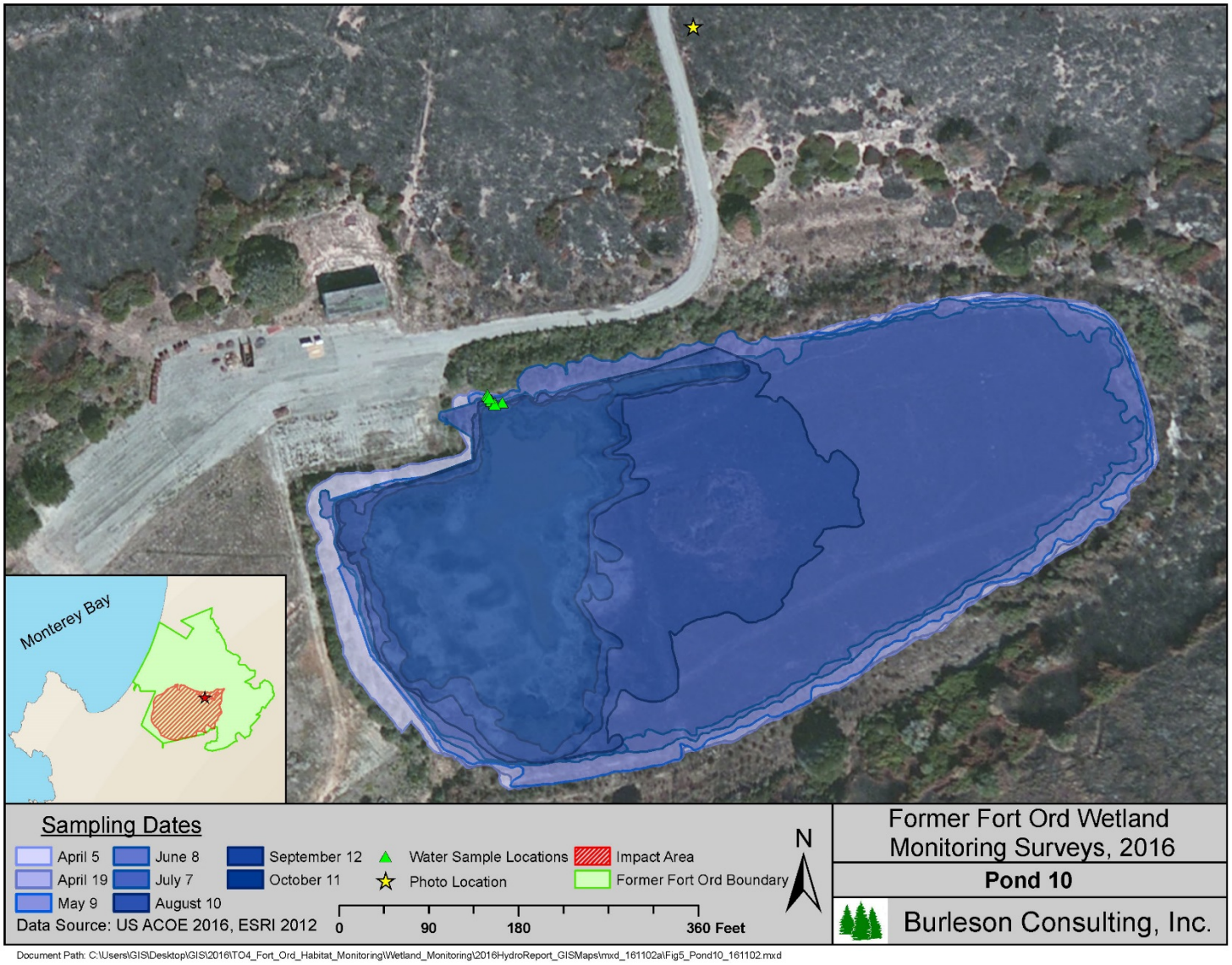

Figure A-5. Map of Pond 10 on Former Fort Ord, 2016

Table A-6. Hydrology Results for Baseline Monitoring for Pond 14 on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/5/2016	11:58	6.56	14.89	3.88	64.0	45	0.135
4/18/2016	13:37	6.44	18.63	3.71	83.3	40	0.092
5/10/2016	10:29	6.69	15.39	4.74	158	26	0.078
6/8/2016						DRY	0.000

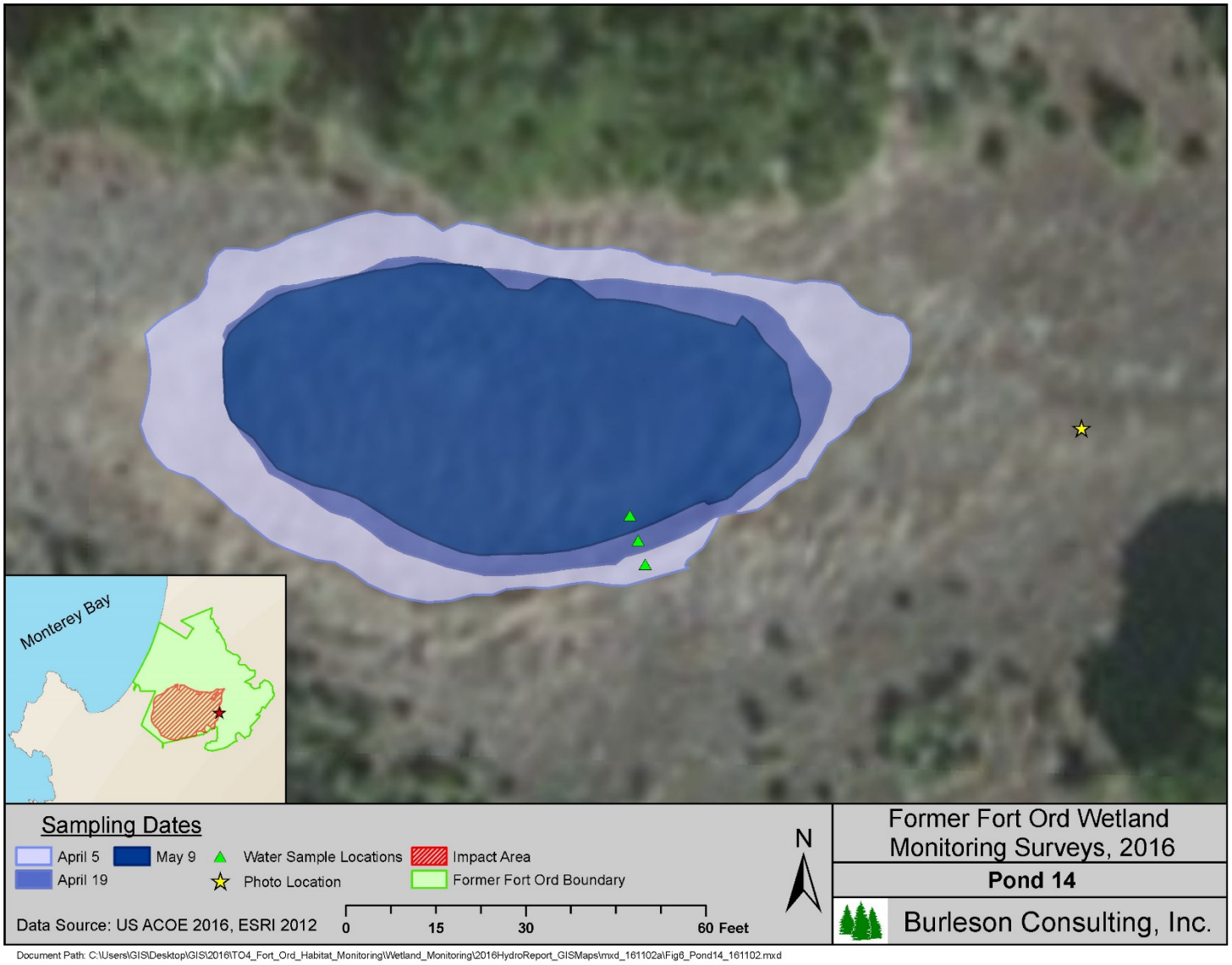

Figure A-6. Map of Pond 14 on Former Fort Ord, 2016

Table A-7. Hydrology Results for Mastication Year 2 Monitoring for Pond 18 on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/5/2016	10:59	6.36	13.88	0.50	111.0	38	0.265
4/18/2016	14:21	6.50	18.14	0.85	178.0	36	0.180
5/10/2016	10:56	6.26	15.46	1.2	155	34	0.125
6/8/2016	10:40	6.05	20.8	4.36	34.1	9	0.006
7/7/2016						DRY	0.000

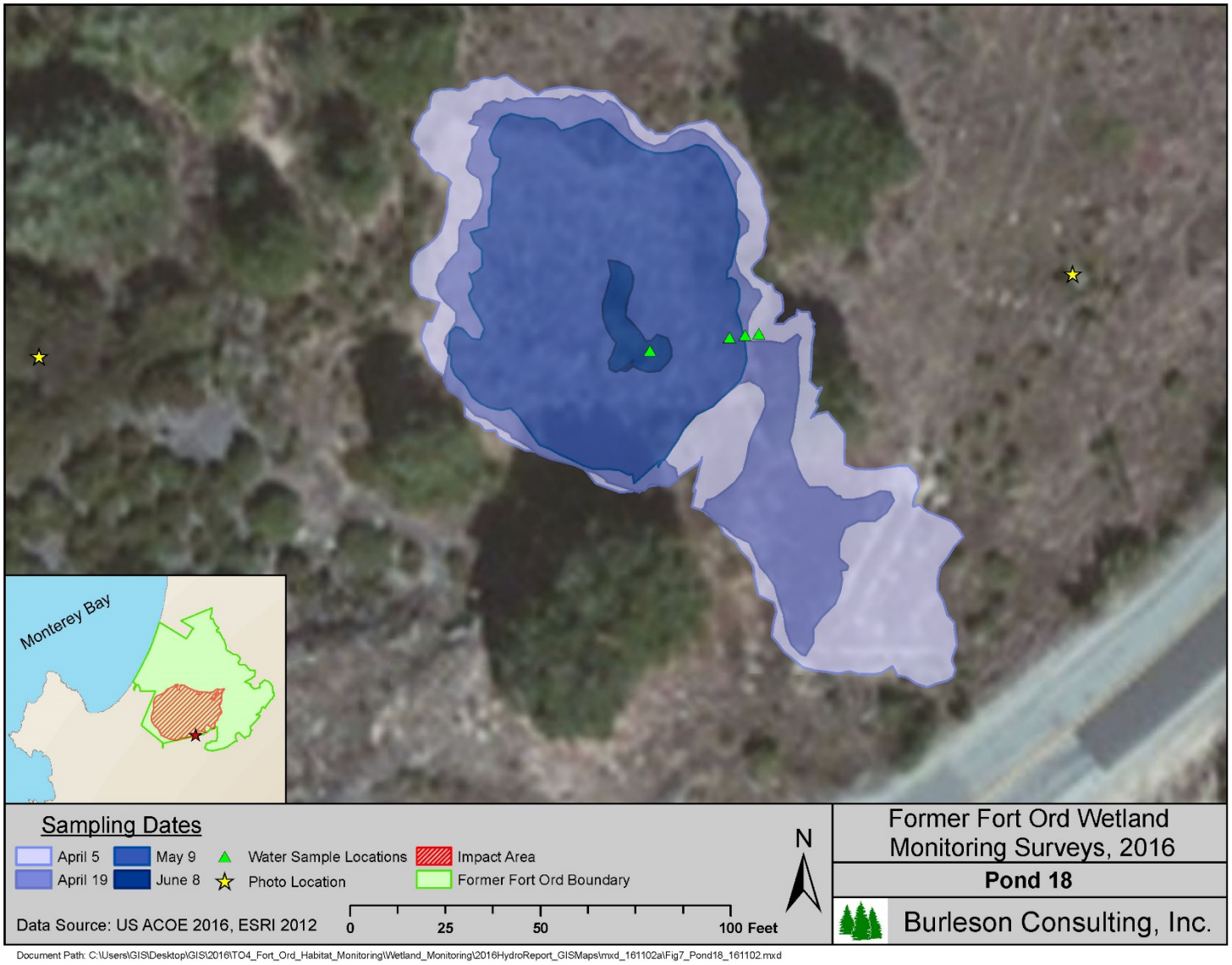

Figure A-7. Map of Pond 18 on Former Fort Ord, 2016

Table A-8. Hydrology Results for Lead Remediation Year 5, and Fire Retardant Year 4 Monitoring for Pond 30A on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/5/2016	10:02	6.53	13.86	1.32	14.4	50	0.618
4/18/2016	15:05	6.38	15.39	2.37	168.0	40	0.484
5/10/2016	11:13	6.23	15.66	0.13	99.5	20	0.335
6/8/2016						DRY	0.000

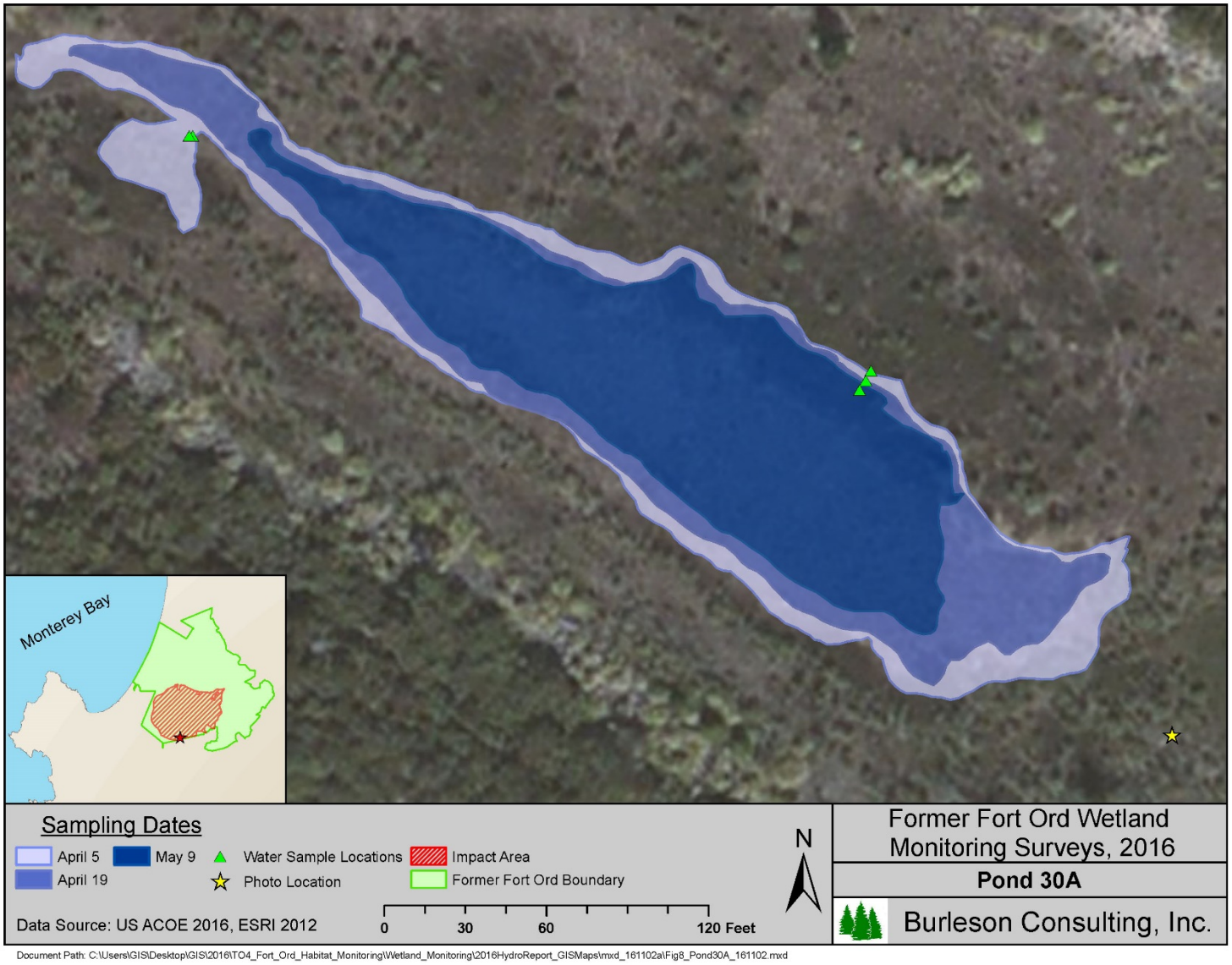

Figure A-8. Map of Pond 30A on Former Fort Ord, 2016

Table A-9. Hydrology Results for Lead Remediation Year 5, and Fire Retardant Year 4 Monitoring for Pond 30B on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/5/2016						Connected with Pond 30A	
4/18/2016	15:19	7.29	25.23	4.05	28.2	25	0.012
5/10/2016	11:17	6.98	17.22	6.31	83.8	6	0.003
6/8/2016						DRY	0.000

Figure A-9. Map of Pond 30B on Former Fort Ord, 2016

Table A-10. Hydrology Results for Lead Remediation Year 5, and Fire Retardant Year 4 Monitoring for Pond 30C on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/5/2016	9:46	7.17	14.44	2.65	26.1	28	0.129
4/18/2016	15:24	6.67	23.32	0.45	199.0	23	0.107
5/10/2016	11:21	7.61	18.27	6.1	156	15	0.050
6/8/2016						DRY	0.000

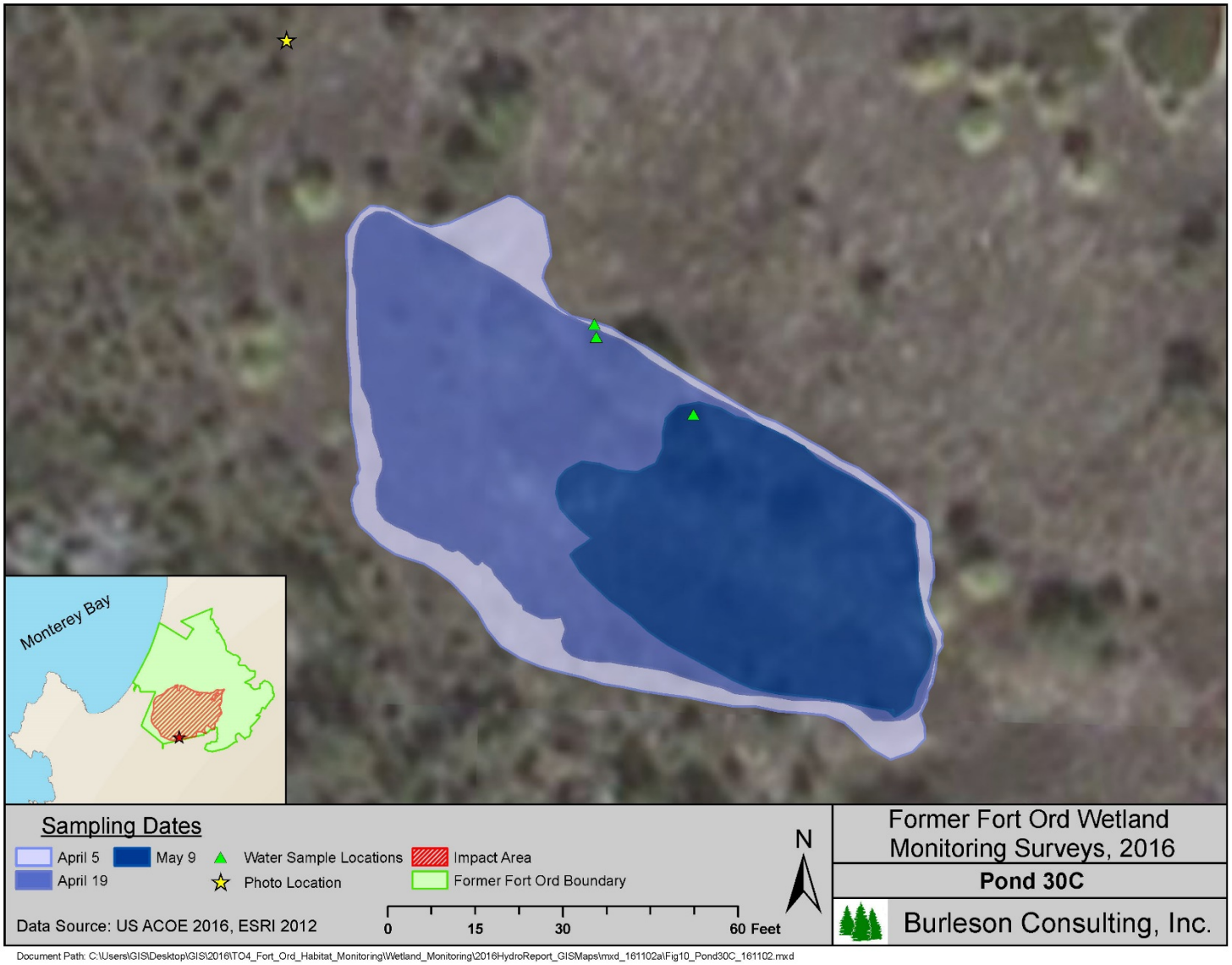

Figure A-10. Map of Pond 30C on Former Fort Ord, 2016

Table A-11. Hydrology Results for Baseline Monitoring for Pond 35 on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
3/31/2016	10:31	6.76	17.76	0.00	230.0	5	0.001
4/18/2016						DRY	0.000

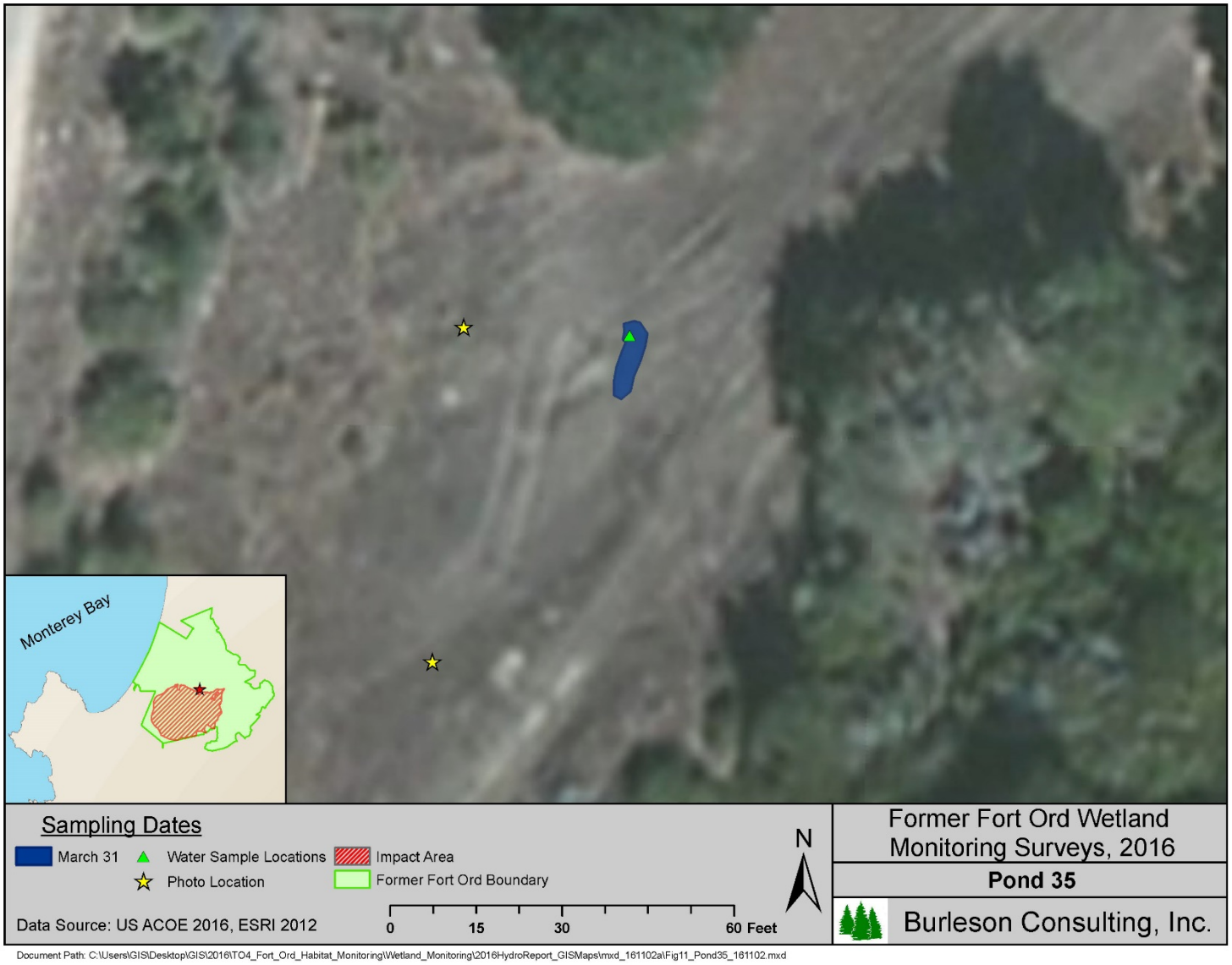

Figure A-11. Map of Pond 35 on Former Fort Ord, 2016

Table A-12. Hydrology Results for Baseline Monitoring for Pond 39 on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
3/31/2016	11:03	6.31	13.85	2.25	177.0	8	0.028
4/18/2016	8:53	6.37	11.31	2.29	23.8	6	0.005
5/9/2016						DRY	0.000

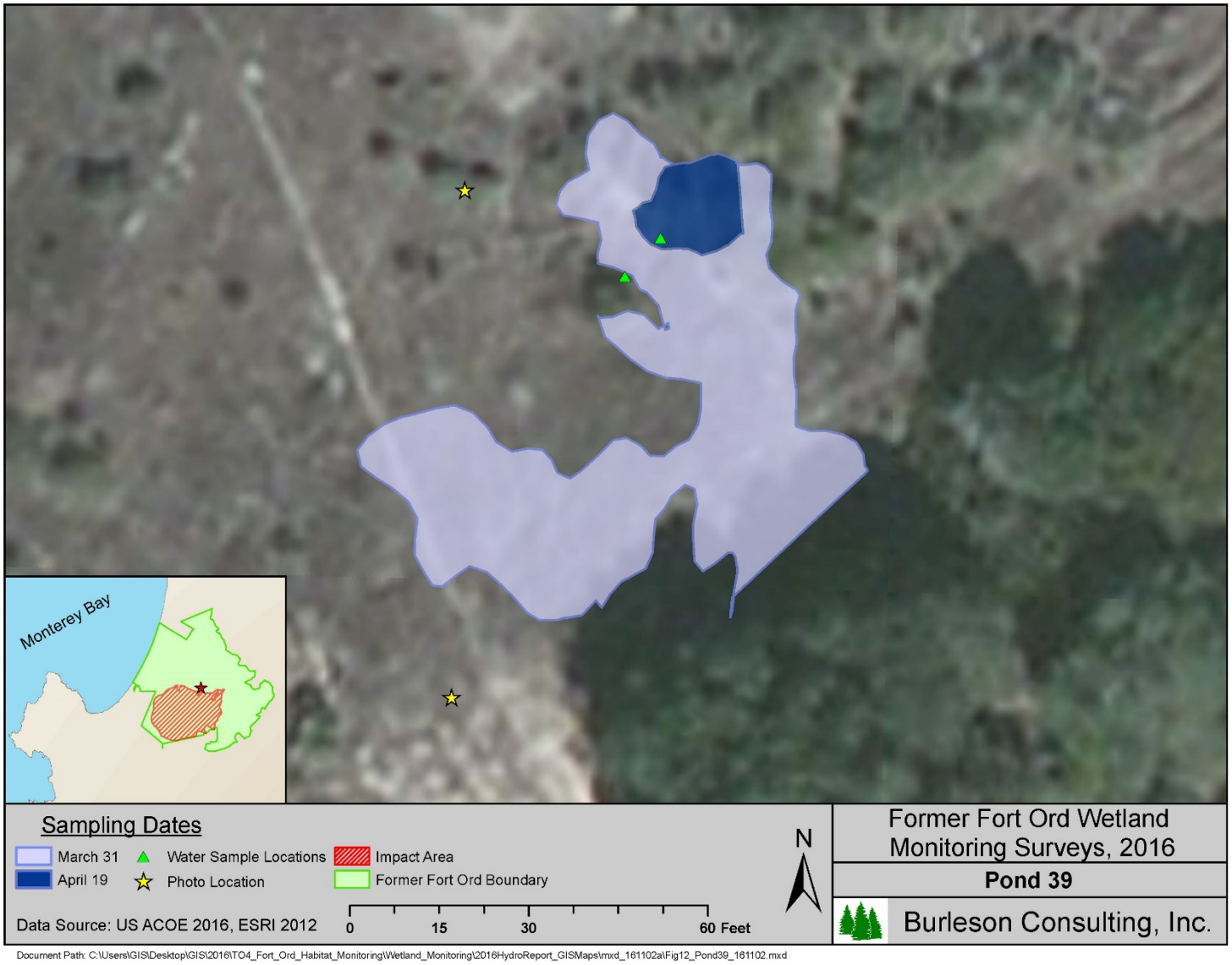

Figure A-12. Map of Pond 39 on Former Fort Ord, 2016

Table A-13. Hydrology Results for Baseline Monitoring for Pond 40 South on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
3/31/2016	11:30	6.71	16.59	0.08	84.6	20	0.081
4/18/2016						DRY	0.000

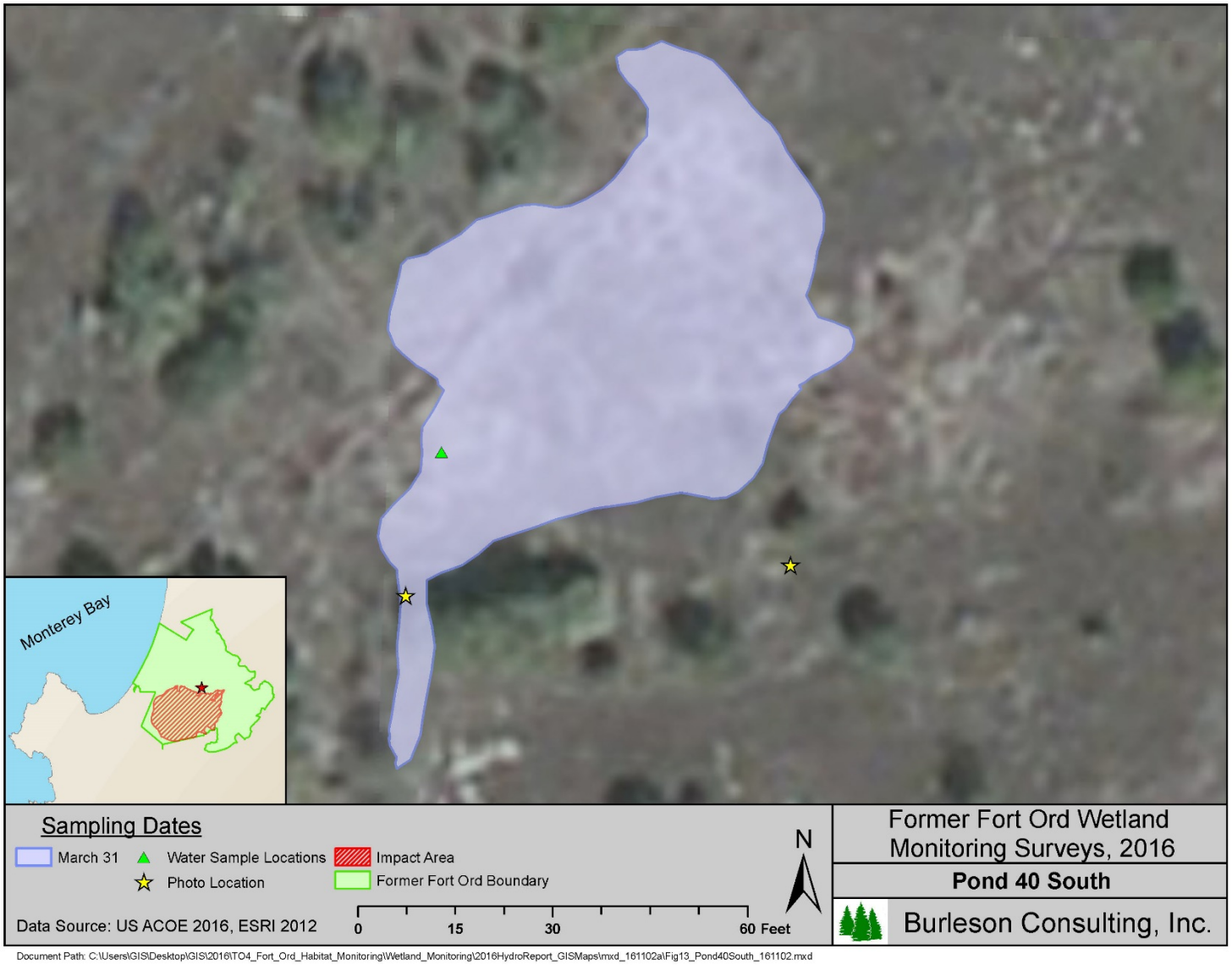

Figure A-13. Map of Pond 40 South on Former Fort Ord, 2016

Table A-14. Hydrology Results for Baseline Monitoring for Pond 41 on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/4/2016	9:42	6.56	12.64	2.40	124.0	60	1.439
4/18/2016	10:39	6.73	14.73	1.58	15.8	46	1.281
5/9/2016	8:25	6.79	15.01	1.75	54.3	34	0.333
6/7/2016						DRY	0.000

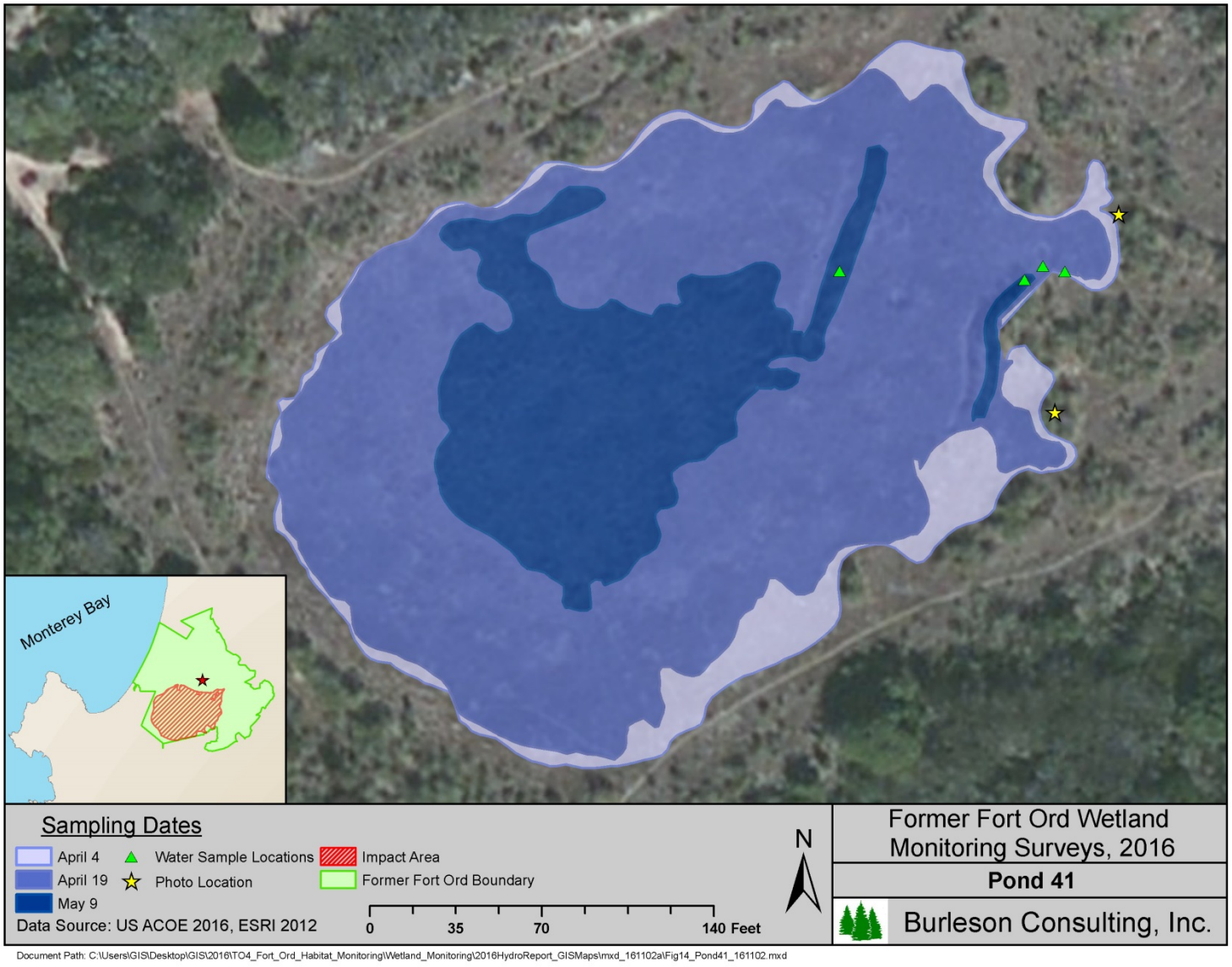

Figure A-14. Map of Pond 41 on Former Fort Ord, 2016

Table A-15. Hydrology Results for Baseline Monitoring for Pond 43 on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/4/2016	10:34	6.46	15.35	4.56	33.5	18	0.020
4/18/2016						DRY	0.000

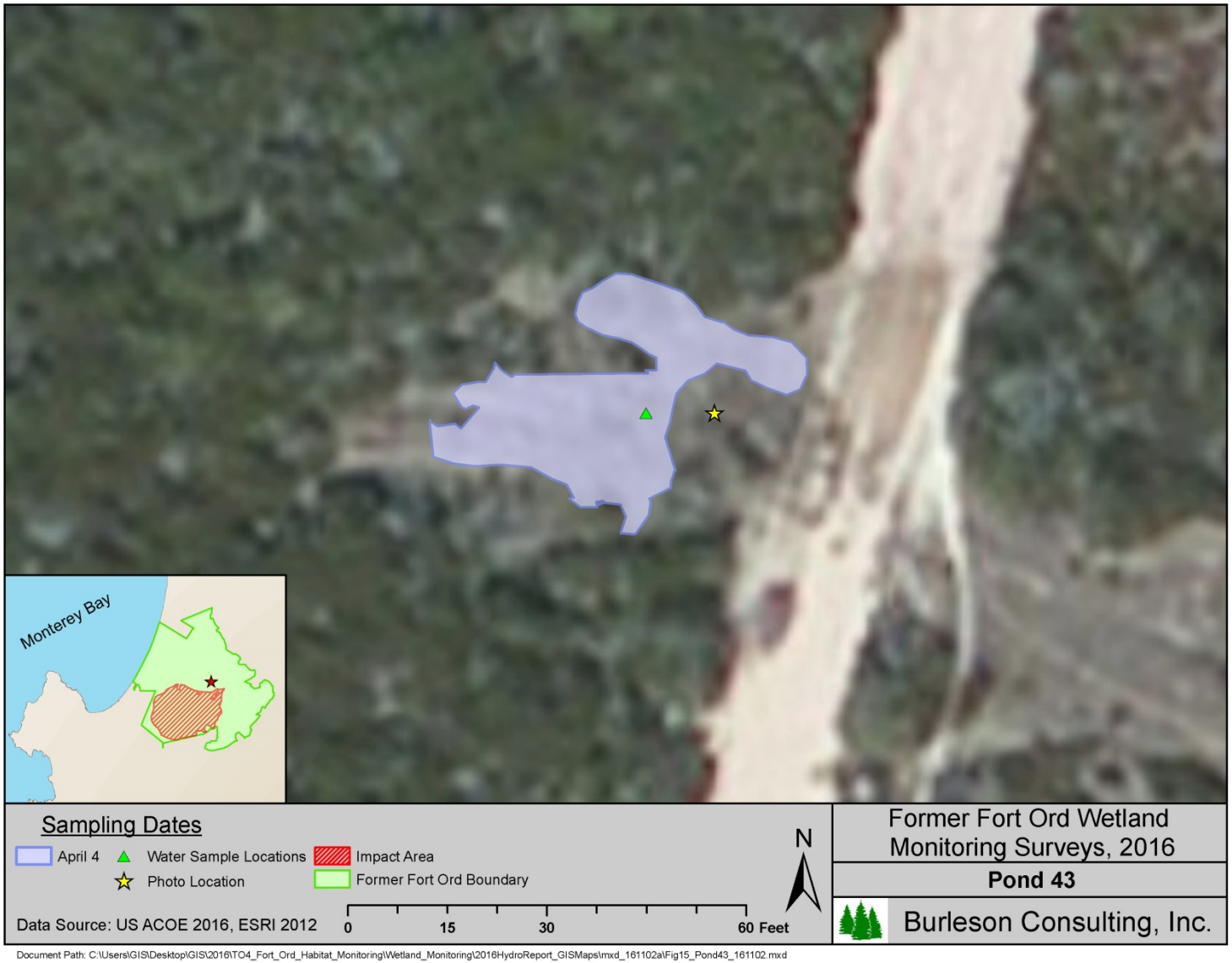

Figure A-15. Map of Pond 43 on former Fort Ord, 2016

Table A-16. Hydrology Results for Baseline Monitoring for Pond 44 on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/4/2016	10:12	6.54	16.94	5.34	23.0	0 @ gauge, 8.9 max	0.031
4/18/2016						DRY	0.000

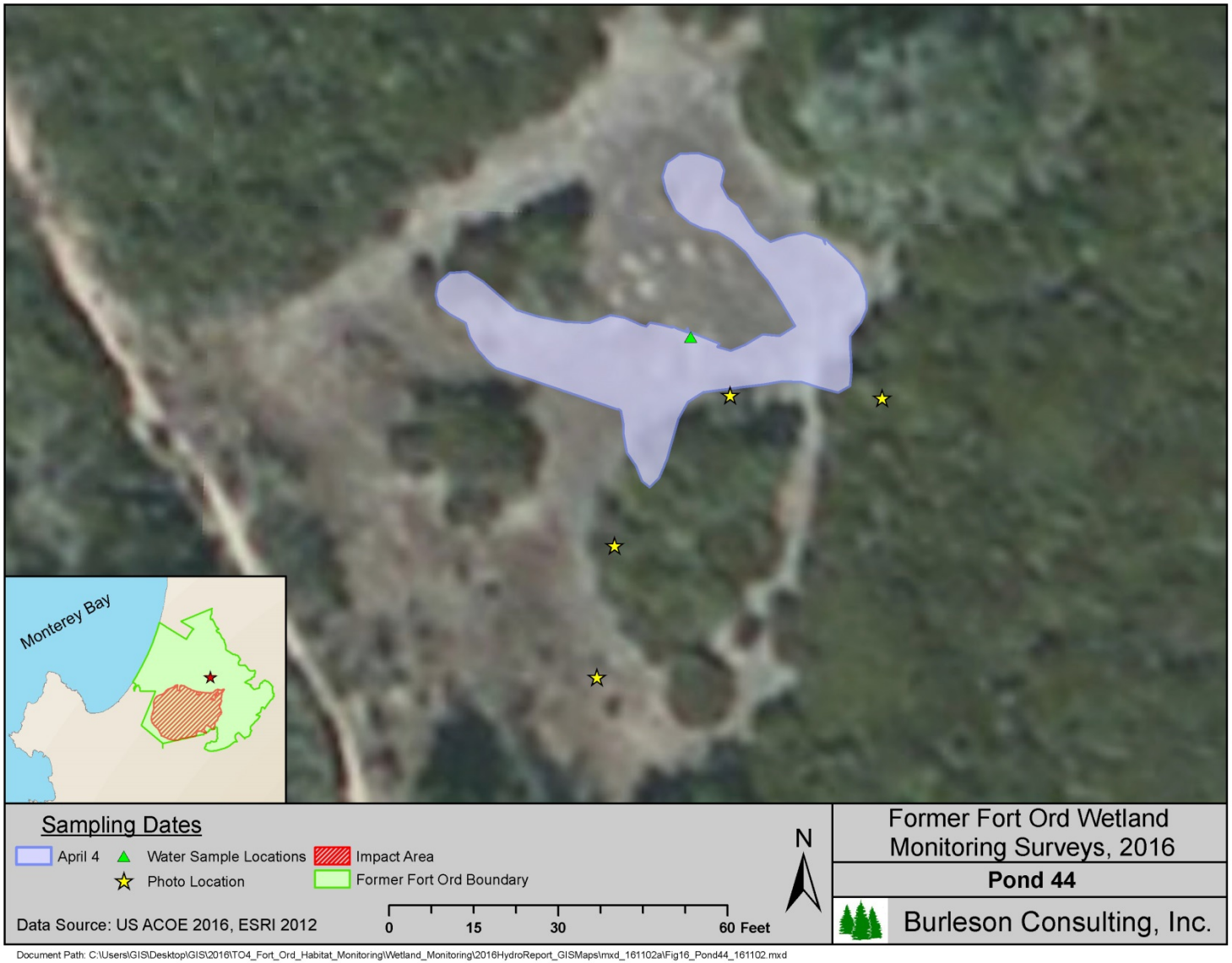

Figure A-16. Map of Pond 44 on former Fort Ord, 2016

Table A-17. Hydrology Results for Baseline Monitoring for Pond 56 on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/4/2016	10:55	6.54	16.27	0.50	28.6	125	5.167
4/18/2016	11:23	6.67	18.90	2.23	375.0	120	4.206
5/10/2016	9:28	6.63	16.09	3.24	16.9	100	3.110
6/7/2016	13:08	6.16	20.76	3.55	57.4	80	2.287
7/8/2016	11:15	6.23	18.04	6.27	44	60	0.419
8/10/2016	9:05	6.64	16.03	10.56	16.3	40	0.189
9/12/2016						DRY	0.000

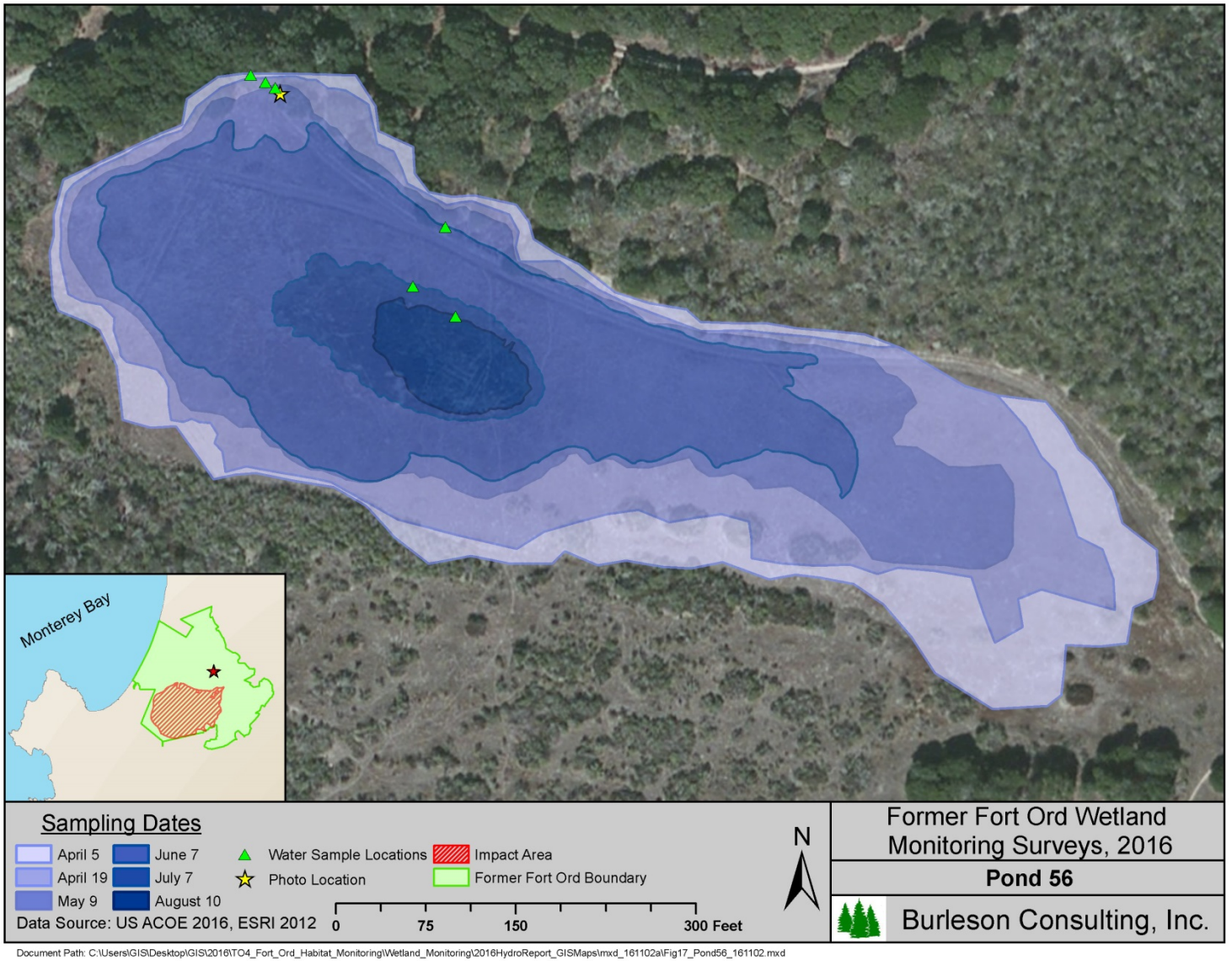

Figure A-17. Map of Pond 56 on Former Fort Ord, 2016

Table A-18. Hydrology Results for Baseline Monitoring for Pond 60 on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/4/2016	11:33	6.35	15.03	0.00	7.6	130	2.646
4/18/2016	12:30	6.39	18.27	2.64	51.0	110	2.571
5/10/2016	10:01	6.36	15.75	2.16	27.2	80	2.435
6/7/2016	14:00	6.18	22.5	3.66	46.8	80	2.132
7/7/2016	11:53	6.58	20.15	4.61	70.3	62	1.040
8/10/2016	9:28	6.32	26.38	10.86	246	38	0.221
9/12/2016	11:00	7.41	19.34	3.68	415	12	0.014
10/11/2016	9:08					DRY	0.000

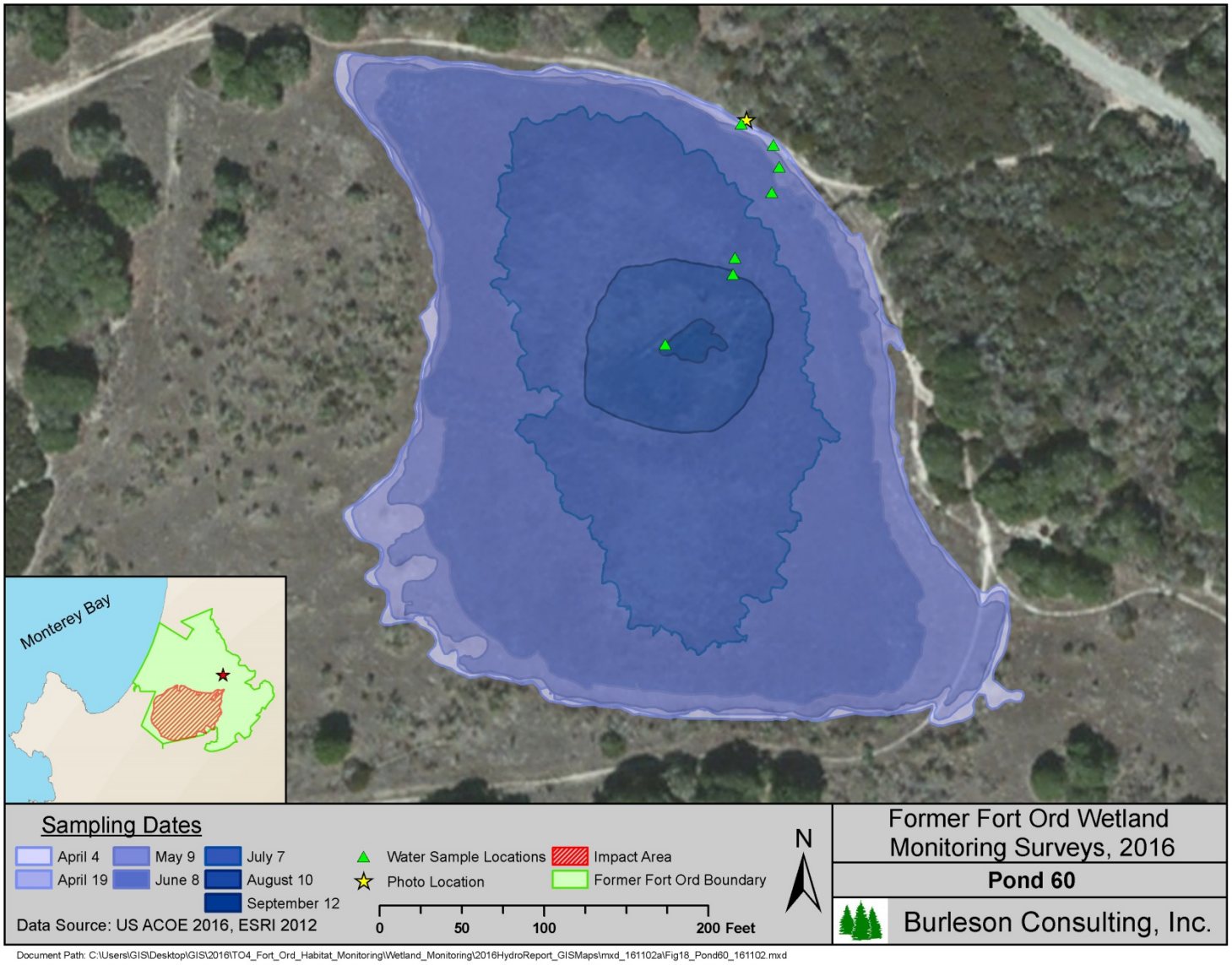

Figure A-18. Map of Pond 60 on Former Fort Ord, 2016

Table A-19. Hydrology Results for Baseline Monitoring for Pond 101 West on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/5/2016	17:32	6.53	14.85	0.00	36.7	43	0.090
4/18/2016	17:30	6.45	17.46	0.00	354.0	33	0.053
5/9/2016						DRY	0.000

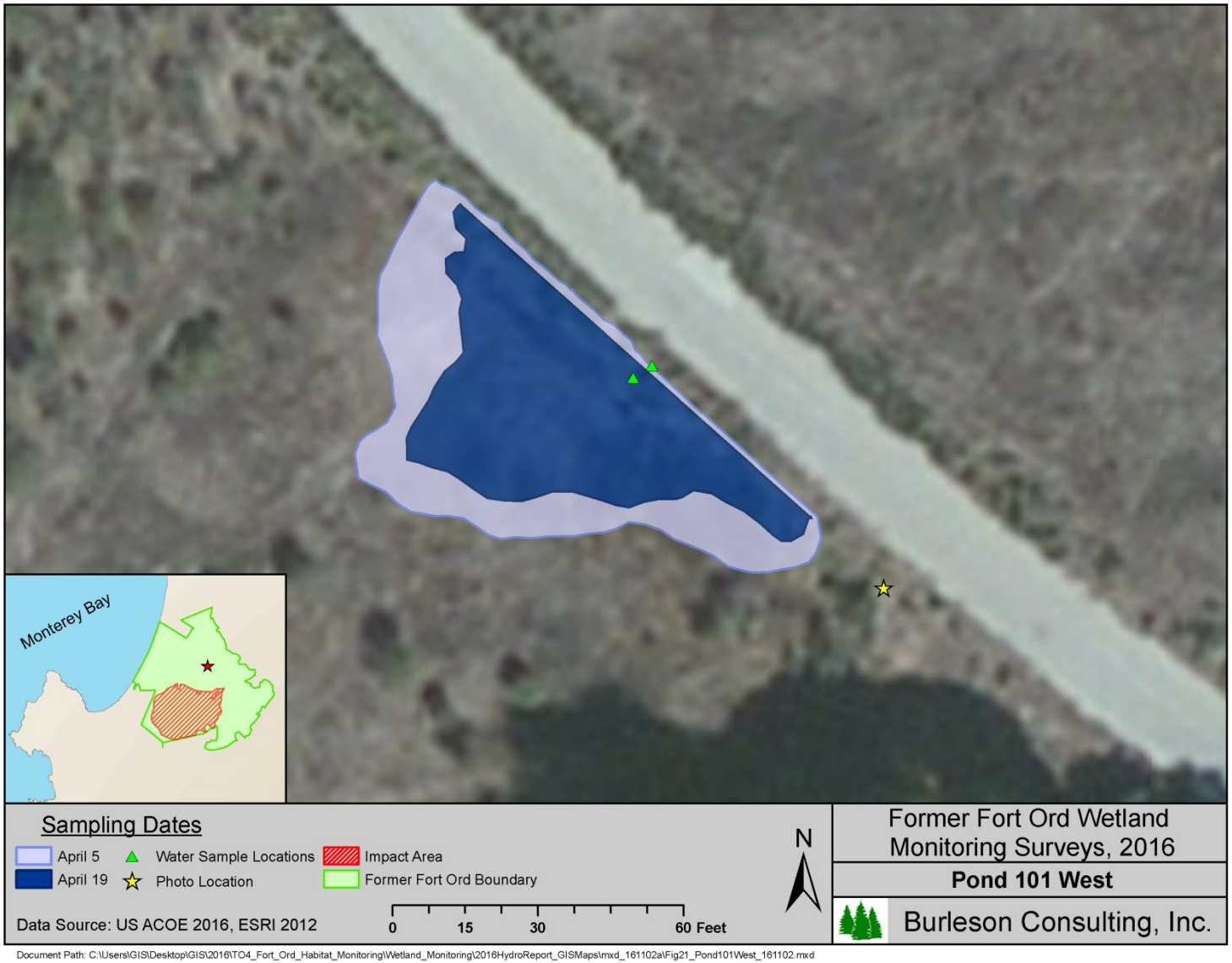

Figure A-19. Map of Pond 101 West on Former Fort Ord, 2016

Table A-20. Hydrology Results for Reference Monitoring for Pond East (West) on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/5/2016	15:03	6.43	13.95	0.00	5.7	70	1.893
4/18/2016	17:24	6.67	23.28	6.4	204.0	58	0.199
5/9/2016	14:24	6.22	17.22	2.9	77.1	54	0.665
6/8/2016	13:40	6.55	22.9	3.42	525	20	0.066
7/7/2016						DRY	0.000

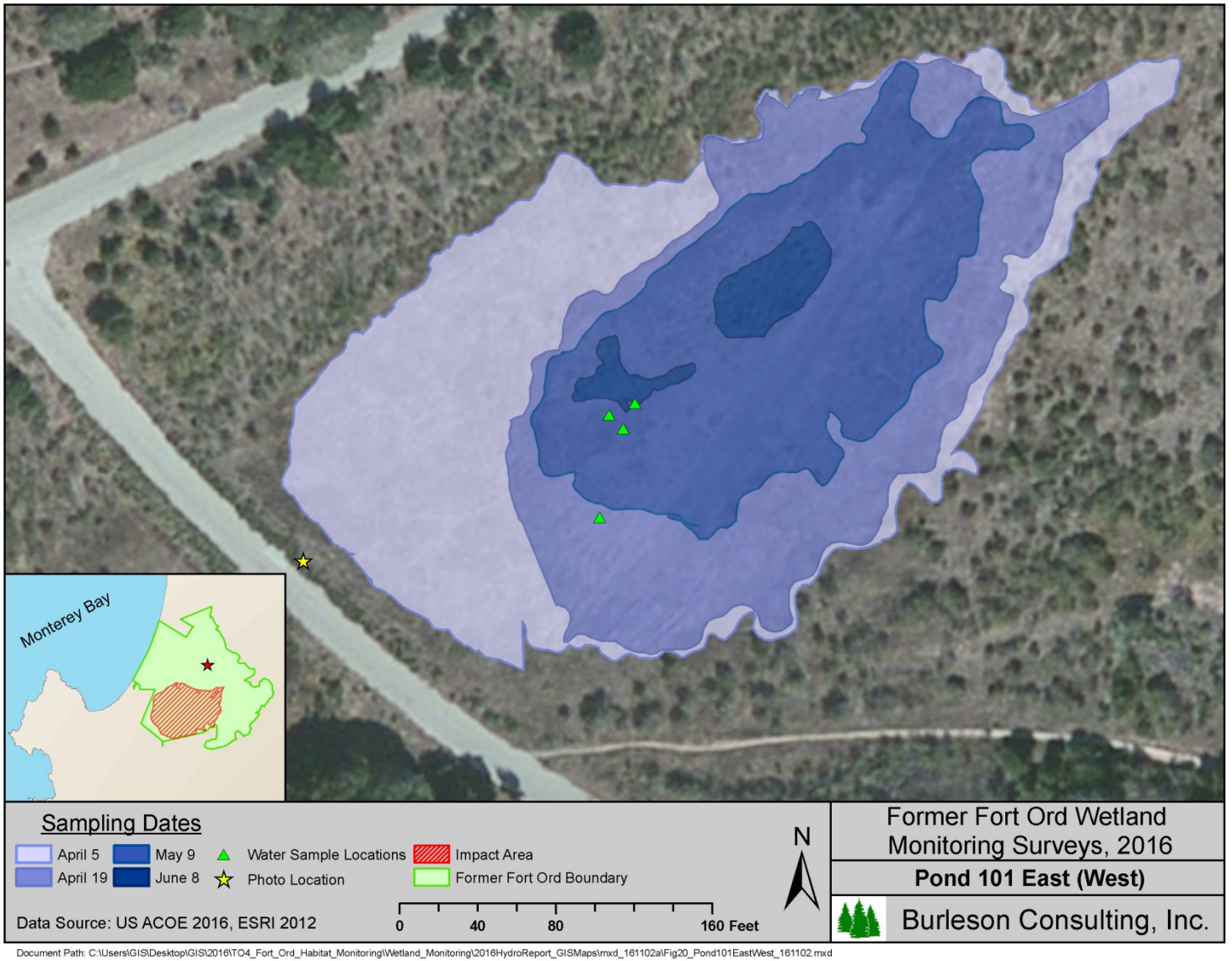

Figure A-20. Map of Pond 101 East (West) on Former Fort Ord, 2016

Table A-21. Hydrology Results for Reference Monitoring for Pond 101 East (East) on Former Fort Ord, 2016

Date	Time	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
4/5/2016	15:46	6.44	17.09	7.93	138.0	68	3.244
4/18/2016	17:11	6.38	22.72	6.50	112.0	68	3.132
5/9/2016	14:04	7.07	22.97	6.92	106	55	2.765
6/8/2016	13:55	6.49	22.63	4.36	553	32	1.226
7/7/2016						DRY	0.000

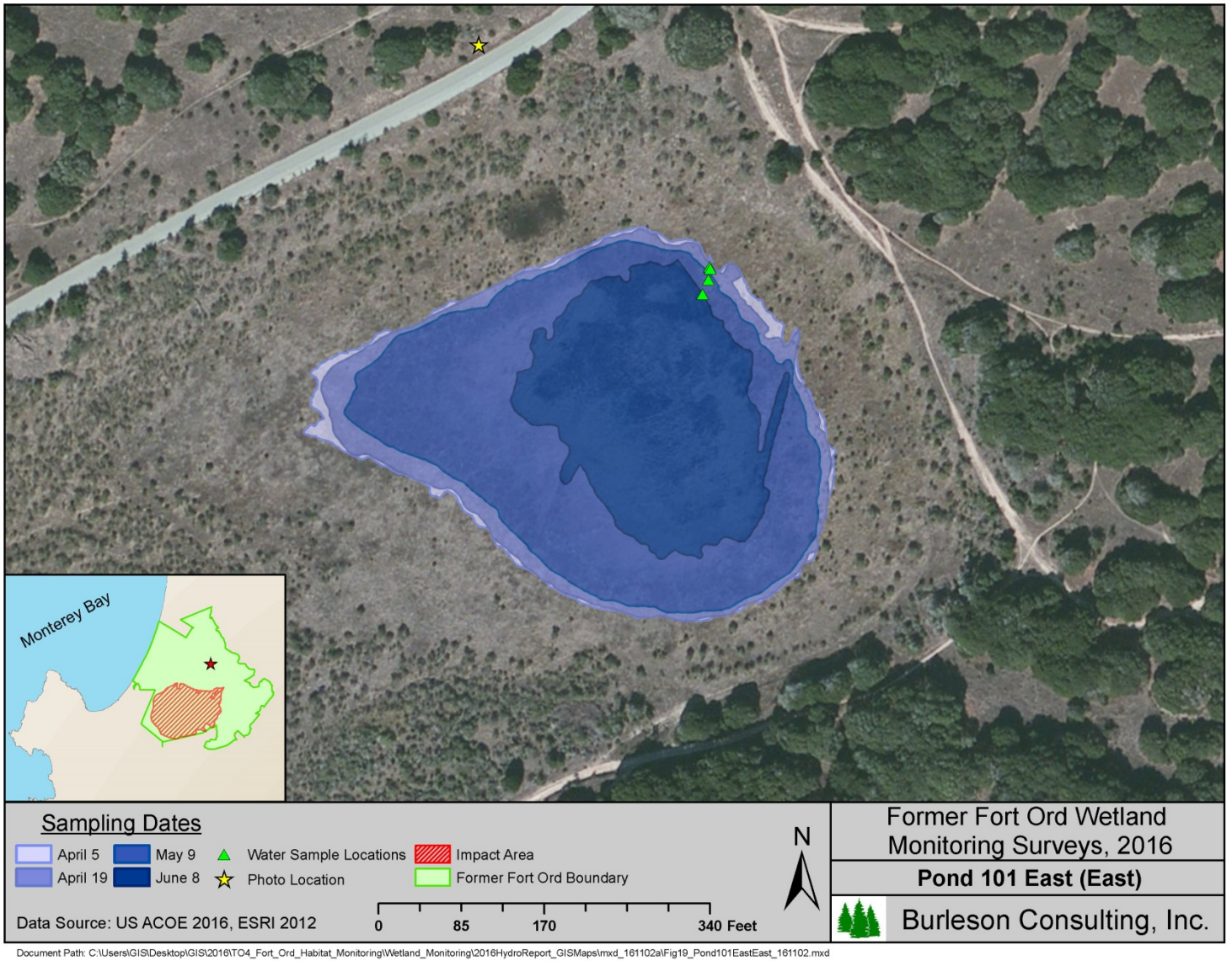

Figure A-21. Map of Pond 101 East (East) on Former Fort Ord, 2016

3N=30 N in data logger ↖ incorrectly entered

( )= out of range

Page: __of__

Fort Ord

WATER QUALITY MONITORING

Date: 3/31, 4/4, 4/5, 2016 Weather Conditions: partial sun, some clouds breezy Personnel: Shawn Wagoner Kayln Christianson

Location	Time	pH	Temperature (C)	Specific Cond. (µS/cm)	D/O (mg/L)	Turbidity (FNU)	Comments
Pond 3 North (0.16 ac) 3/31	11:48	6.75	18.40		5.61	56.7	depth: 54 cm
Pond 3 South (0.69 ac) 3/31	11:58	7.00	16.42		9.87	12.2	depth: 30 cm correction no gage
Pond 5 (reference pond, 4.8 ac) 4/5	16:54	6.41	25.06		6.91	63.4	~100cm unable to read gage
Pond 8 (3.9 ac) 4/5	13:28	7.11	13.88		1.97	8.3	depth 62 cm
Pond 10 (2.6 ac) 4/5	12:43	7.03	14.46		8.72	134	~100 cm gauge submerged
Pond 14 (0.1 ac) 4/5	11:58	6.56	14.89		3.88	64.0	depth: 45cm
Pond 18 (0.22 ac) 4/5	10:59	6.36	13.88		0.50	111	depth: 38 cm
Ponds 30 (6.27 ac total) 4/5	10.02	6.53	13.86		1.32	14.4	depth: 50 cm
Pond 30B							DRY
Pond 30C 4/5	9:46	7.17	14.44		2.65	26.1	depth: 11 inches = 28 cm
Pond 35 (0.36 ac) 3/31	10:31	6.76	17.76		(0.00)	230	depth: 5 cm
Pond 39 (0.24 ac) 3/31	11:03	6.21	13.85		2.25	177	depth: 8cm @ gauge, max = 66cm
Pond 40 South (0.5 ac) 3/31	11:30	6.71	16.59		0.08	84.6	depth: 20 cm
Pond 41 (1.7 ac) 4/4	9:42	6.56	12.64		2.40	124	depth: 60cm
Pond 43 (0.17 ac) 4/4	10:34	6.46	15.35		4.56	33.5	depth: 18cm
Pond 44 (0.19 ac) 4/4	10:12	10.52	16.94		5.34	23.0	depth: 0 cm @ gauge, max 8.9cm
Pond 56 (1.5 ac) 4/4	10:55	6.53	16.27		0.50	28.6	depth: 125cm → notes on back
Pond 60 (1.9 ac) 4/4	11:33	6.35	15.03		0.00	7.6	depth: 130 cm
Pond 101 East (East) (reference pond, 5.6 ac)	15:46	6.44	17.09		7.93	138	depth: 68 cm
Pond 101 East (West)	15:03	6.43	13.95		0.00	5.7	depth: 70 cm
Pond 101 West (0.1 ac)	17.32	6.53	14.85		0.00	36.7	depth: 43 cm

Figure A-22. Example field data collection sheet

FIELD INSTRUMENT CALIBRATION RECORD **Fort Ord**

Calibration Code:		Sheet of
Employee Performing Calibration: Kayla Christianson		
Instruments:	**Standards:**	**Lot Number and Expiration Date:**
(1) pH meter	pH = 7.00	0115 05/2021
(2) pH meter	pH = 4.00	
(3) pH meter	pH = 10.00	
(4) pH meter	pH = 6.86 (Blue)	
(5) Specific conductance meter	5,000 µS/cm (Blue)	
(6) Specific conductance meter	_____ µS/cm	
(7)		
(8)		
(9)		
(10)		
(11)		

Instrument Calibration Data

Date	Time	Standard Solution	Response As Found	Response As Left	Solution Temp. (C)			Notes
10/11/2016	9:55	HI98280	6.87	6.83				
	11:30			6.84				

Review ***Action***

Site Manager/Project Manager Date

09/09/16 11:30 AM

Figure A-23. Example probe calibration sheet for Hannah Instruments 9829 Multiparameter meter

APPENDIX B

Vegetation Transect Data

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POND 3 South

Date	4/26/2016, 5/16/16, 6/13/16
Surveying Personnel	Jami Davis, Patric Krabacher, Josh Harwayne, Kayti Christianson, Shawn Wagoner, Chris Bronny

Vegetation Type	%Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

5/16/16: Standing water - wait to conduct transects
6/13/16: Pond dry, no soil saturation at surface

Transect #	Transect Length	Relative %Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
1	10m	20%	ERAR	10	ERAR	10	ERAR	15	ERAR	75	ERAR	25	MALE	1
			PLCHh	4	PLCHh	4	PLCHh	2	ELMA	5	PLCHh	5	ERAR	10
			MALE	1	ELMA	25	POMO	2	JUPH	2	ELMA	25	PLCHh	2
			ELMA	30	POMO	5	ELMA	40	PLCHh	1	DISP	3	POMO	10
			TH	50	CRAQ	1	CRAQ	1	TH	15	CRAQ	1	ELMA	30
			BG	5	TH	10	TH	5			TH	30	TH	15
					BG	45	BG	35					BG	35
			TOTAL	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***98***	***TOTAL***	***89***	***TOTAL***	***103***

Transect #	Transect Length	Relative %Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
2	10M	38%	JUPH	50	FEMY	25	MALE	10	BRMI	10	LYHY	10	JUBUb	30
			POMO	10	JUPH	35	POMO	8	JUPH	40	BRTEt	1	JUPH	40
			FEMY	1	ERAR	15	JUPH	30	FEPE	30	JUPH	75	LYHY	10
			LYHY	8	LYHY	3	LYHY	25	FEMY	10	FEPE	10	Juncus sp.	2
			MALE	2	POMO	1	JUBUb	10	LYHY	10	BRMI	2	BRMI	1
			JUBUb	15	FEPE	5	BRMI	2			MALE	2	MALE	2
			PLCHh	1	BRTEt	1	FEMY	5					DACA	1
			BG	10	MALE	3	CAAM	2					POMO	5
			TH	5	DACA	1	TH	5					BG	5
					TH	2								
					BG	2								
			TOTAL	***102***	***TOTAL***	***93***	***TOTAL***	***97***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***96***

Transect #	Transect Length	Relative %Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
3	10M	35%	MAGR	2	AICA	15	PLCO	10	ALSA	2	JUPH	10	FEMY	30
			JUBUb	30	PLCO	10	ERAR	10	JUBUb	15	ERAR	30	LYHY	20
			PLCO	20	HYGL	1	JUBUb	5	BRMI	1	LYHY	20	JUBUb	35
			LYHY	1	ALSA	2	DACA	25	JUPH	1	JUBUb	20	ALSA	5
			BRHO	1	MAGR	1	LYAR	10	PLCO	5	BG	20	JUPH	5
			JUCA	1	TRAN	5	AICA	15	CAAM	15			HYGL	2
			ALSA	15	JUBUb	5	MAGR	1	ERAR	5			ERAR	2
			BG	30	TH	10	JUCA	1	LYHY	1				
			FEMY	1	BG	20	TRAN	1	FEMY	5				
					DACA	20	FEMY	5	AICA	5				
					LYAR	10	JUPH	15	ZEDA	2				
									DACA	40				
			TOTAL	***101***	***TOTAL***	***99***	***TOTAL***	***98***	***TOTAL***	***97***	***TOTAL***	***100***	***TOTAL***	***99***

Transect #	Transect Length	Relative %Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
4	10M	5%	MAEX	2	FEPE	60	GEDI	1	JUPH	10	MALE	5	FEPE	85
			BRMI	10	PSTE	1	LYHY	8	FEPE	85	JUPH	10	LYHY	1
			LYAR	2	MALE	5	FEPE	85	MAGR	5	MAGR	10	MALE	4
			MALE	2	GEDI	1	MALE	3			FEPE	75	JUPH	5
			FEPE	30	BG	10	HYGL	5						
			FEMY	40	MAGR	20								
			TOTAL	***86***	***TOTAL***	***97***	***TOTAL***	***102***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***95***

Complete Species List

Scientific Name	Common Name	Species Code
Achillea millefolium	common yarrow	
Acmispon americanus	Spanish lotus	
Aira caryophyllea	silver hair-grass	AICA
Allium hickmanii	Hickman's onion	
Alopecurus saccatus	Pacific foxtail	ALSA
Avena barbata	slender oat	
Baccharis pilularis	coyote bush	
Briza minor	small quaking grass	BRMI
Brodiaea terrestris ssp. *terrestris*	dwarf brodiaea	BRTEt
Bromus diandrus	ripgut brome	
Bromus hordeaceus	soft chess	
Callitriche heterophylla var. *bolanderi*	Bolander's water starwort	
Callitriche marginata	California water starwort	
Calochortus splendens	splendid mariposa lily	
Castilleja ambigua	Johnny nip	CAAM
Cicendia quadrangularis	timwort	
Cotula coronopifolia	brass buttons	
Crassula aquatica	water pygmy	CRAQ
Crassula connata	pygmy-weed	
Danthonia californica	California oatgrass	DACA
Distichlis spicata	salt grass	DISP
Eleocharis macrostachya	pale spike-rush	ELMA
Erodium botrys	long-beaked filaree	
Erodium cicutarium	red-stemmed filaree	
Eryngium armatum	coast eryngo (coyote thistle)	ERAR
Festuca microstachys	small fescue	
Festuca myuros	rattail sixweeks grass	FEMY
Festuca perenne	Italian ryegrass	FEPE
Logfia gallica	narrow-leaved filago	
Gamochaeta ustulata	purple cudweed	
Geranium dissectum	cut-leaved geranium	GEDI
Hordeum brachyantherum	meadow barley	
Horkelia cuneata	wedge-leaved horkelia	
Hypochaeris glabra	smooth cat's-ear	HYGL
Isolepis cernua	low bulrush	
Juncus bufonius var. *bufonius*	common toad rush	JUBUb
Juncus bufonius var. *occidentalis*	round-fruited toad rush	JUBUo
Juncus capitatus	leafybract dwarf rush	JUCA
Juncus kelloggii	Kellogg's dwarf rush	
Juncus occidentalis	western rush	
Juncus sp.	rush	
Lysimachia arvensis	scarlet pimpernel	LYAR
Lythrum hyssopifolia	grass poly	LYHY
Madia exigua	small tarweed	MAEX
Madia gracilis	slender tarweed	MAGR
Malvella leprosa	alkali mallow	MALE
Microseris paludosa	marsh microseris	
Petrorhagia dubia	hairy pink	
Phalaris lemmonii	Lemmon's canary grass	
Plagiobothrys chorisianus hickmanii	Hickman's popcorn flower	PLCHh
Plantago coronopus	cut-leaved plantain	PLCO
Plantago erecta	California plantain	
Pogogyne zizyphoroides	Sacramento pogogyne	
Polypogon monspeliensis	Mediterranean beard grass	POMO
Psilocarphus tenellus	slender wooly-heads	PSTE
Ranunculus californicus	California buttercup	
Rumex acetosella	sheep sorrel	
Rumex crispus	curly dock	
Sidalcea malviflora	checkerbloom	
Silene gallica	windmill pink	
Sisyrinchium bellum	blue-eyed grass	
Taraxia ovata	suncups	
Trifolium angustifolium	narrow-leaved clover	TRAN
Trifolium depauperatum	cowbag clover	
Trifolium dubium	little hop clover	
Trifolium microcephalum	maiden-head clover	
Trifolium variegatum	white-tipped clover	
Triglochin scilloides	flowering quillwort	
Zeltnera davyi	Davy's centuary	ZEDA

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 5

Date	9/21/2016, 9/22/2016
Surveying Personnel	Jami Davis, Shaelyn Hession

Vegetation Type	%Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

Pond dry at time of survey. Strata 6 was too desiccated to conduct transect surveys - mostly grasses - some flowers still visible enough to determine species, but not enough to discern in quadrats. Species present in strata six included DISP, BRHO, BRMA, AICA RUAC MAGR, BRMI, RUCR, BAPI (dying/dead)

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
1	10m	26%	ELMA	90	ELMA	90	ELMA	85	ELMA	80	ELMA	75	ELMA	50
			TH	10	TH	10	TH	15	TH	20	TH	25	TH	50
			TOTAL	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
2	10m	32%	ELMA	30	ELMA	35	ELMA	25	ELMA	30	ELMA	25	ELMA	30
			DISP	20	DISP	40	DISP	30	DISP	40	DISP	30	DISP	30
			TH	50	TH	25	TH	40	TH	30	TH	40	TH	35
			MALE	1	MALE	3	MALE	2	MALE	1	MALE	2	CRTR	2
											CRTR	1		
			TOTAL	***101***	***TOTAL***	***103***	***TOTAL***	***97***	***TOTAL***	***101***	***TOTAL***	***98***	***TOTAL***	***97***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
3	10	38%	ELMA	7	JUPH	5	DISP	1	STAJ	3	ELMA	40	ELMA	20
			JUPH	2	ELMA	10	CRTR	20	ISHO	65	CRTR	10	CRTR	10
			CRTR	15	CRTR	25	JUPH	1	TH	15	DISP	15	STAJ	1
			ISHO	70	ISHO	35	MALE	2	CRTR	20	STAJ	1	ISHO	50
			TH	10	TH	25	STAJ	1			ISHO	7	TH	20
							ELMA	2			TH	30		
							TH	3						
							ISHO	70						
			TOTAL	***104***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***103***	***TOTAL***	***103***	***TOTAL***	***101***

Complete Species List

Scientific Name	Common Name	Species Code
Achillea millefolium	common yarrow	
Achillea millefolium	common yarrow	
Aira caryophyllea	silvery hair-grass	
Avena barbata	slender oat	
Baccharis pilularis	coyote brush	
Baccharis salicifolia	mule fat	
Briza maxima	rattlesnake grass	
Briza minor	small quaking-grass	
Bromus diandrus	ripgut brome	
Bromus hordeaceus	soft chess	
Callitriche heterophylla var. bolanderi	Bolander's water starwort	
Cressa truxillensis	alkali weed	CRTR
Danthonia californica	California oatgrass	
Distichlis spicata	salt grass	DISP
Eleocharis macrostachya	pale spike rush	ELMA
Erechtites glomeratus	cut-leaved fireweed	
Erodium moschatum	white-stemmed filaree	
Eryngium armatum	coyote thistle	
Euthamia occidentalis	western goldenrod	
Festuca myuros	rattail sixweek fescue	
Geranium dissectum	cut-leaved geranium	
Hypochaeris glabra	smooth cat's-ear	
Isoetes howellii	Howell's quillwort	ISHO
Juncus bufonius var. bufonius	common toad rush	
Juncus phaeocephalus	brown-headed rush	JUPH
Luzula comosa	Pacific woodrush	
Lysimachia arvensis	scarlet pimpernel	
Lythrum hyssopifolia	grass poly	
Malvella leprosa	alkali mallow	MALE
Nuttallanthus texanus	blue toad flax	
Phalaris lemmonii	Lemmon's canary-grass	
Plagiobothrys chorisianus hickmanii	Hickman's popcorn flower	
Plantago coronopus	cut-leaved plantain	
Pseudognaphalium luteoalbum	weedy cudweed	
Quercus agrifolia	coast live oak	
Rubus ursius	California blackberry	
Rumex crispus	curly dock	
Sonchus asper	prickly sow-thistle	
Stachys ajugoides	bugle hedge-nettle	STAJ
Toxicodendron diversilobum	poison oak	
Triglochin scilloides	flowering quillwort	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 8

Date	4/27/2016, 5/17/16, 5/25/16
Surveying Personnel	Jami Davis, Shawn Wagoner, Chris Bronny

Vegetation Type	%Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

5/25/16: Pond dry, soil surface saturation only at lowest point near staff gauge. Area mapped at Strata 1 in south-east corner is a mosaic of Strata 1 & 2 that can't be mapped at this scale (strata 1 area without any smaller strata 2 polygons within it). L-shaped excavation area adjacent to pond holds water and was mapped at the approximate water line at corner to make a rectangular shape.

Transect #	Transect Length	Relative %Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
1	10m	40%	FEPE	1	ELMA	45	HOBR	1	LAGL	25	ELMA	30	ELMA	25
			MALE	3	MALE	10	LAGL	25	ELMA	50	LAGL	25	HOBR	3
			LAGL	25	LAGL	20	ELMA	40	PLCHh	7	MALE	9	LAGL	25
			PLCHh	5	PLCHh	8	PLCHh	4	MALE	3	PLCHh	4	MALE	10
			ELMA	50	FEPE	1	MALE	3	TH	15	TH	35	PLCHh	2
			HOBR	1	TH	15	TH	25					TH	35
			TH	15										
			TOTAL	***100***	***TOTAL***	***99***	***TOTAL***	***98***	***TOTAL***	***100***	***TOTAL***	***103***	***TOTAL***	***100***

Transect #	Transect Length	Relative %Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
2	10m	60%	FEPE	96	FEPE	44	FEPE	15	FEPE	25	STAJ	25	RUCR	2
			GEDI	1	STAJ	2	LAGL	10	HOBR	2	FEPE	20	HOBR	3
			MALE	2	HOBR	1	ELMA	50	LAGL	15	LAGL	3	STAJ	35
			STAJ	1	RUCR	1	HOBR	1	PLCHh	1	PLCHh	1	ELMA	25
					PLCHh	1	PLCHh	1	ELMA	40	ELMA	30	FEPE	20
					LAGL	1	TH	27	TH	10	HOBR	1	PLCHh	1
					ELMA	50					TH	20	GEDI	1
													TH	13
			TOTAL	***100***	***TOTAL***	***100***	***TOTAL***	***104***	***TOTAL***	***93***	***TOTAL***	***100***	***TOTAL***	***100***

Transect #	Transect Length	Relative %Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
3	10m	N/A (adjacent wetland)	CYER	2	CYER	1	CYER	2	CYER	1	JUBA	1	DISP	1
			JUBUb	2	JUBUb	1	Poaceae sp.	1	DISP	1	CYER	1	CYER	1
			JUPH	5	BG	93	JUBUb	1	JUBUb	1	JUBUb	3	PLCHh	1
			Poaceae sp.	2	TH	5	TH	2	TH	1	Poaceae sp.	1	JUBUb	1
			unknown 1	1			BG	94	BG	96	BG	94	TH	1
			BG	87									BG	95
			TH	1										
			TOTAL	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***

Complete Species List

Scientific Name	Common Name	Species Code
Acmispon americanus	Spanish lotus	
Aira caryophyllea	silvery hair-grass	
Baccharis pilularis	coyote bush	
Bromus diandrus	ripgut brome	
Bromus hordeaceus	soft chess	
Callitriche heterophylla var. bolanderi	Bolander's water starwort	
Callitriche marginata	California water starwort	
Carex sp.	sedge	
Cirsium vulgare	bull thistle	
Cyperus eragrostis	tall cyperus (nut sedge)	CYER
Distichlis spicata	salt grass	DISP
Eleocharis macrostachya	pale spikerush	ELMA
Elymus glaucus	blue wild-rye	
Erodium botrys	long-beaked filaree	
Erodium cicutarium	red-stemmed filaree	
Eryngium armatum	coyote thistle	
Euthamia occidentalis	western goldenrod	
Festuca myuros	rattail sixweek fescue	
Festuca perennis	Italian rye-grass	FEPE
Gamochaeta ustulata	purple cudweed	
Geranium dissectum	cut-leaved geranium	GEDI
Heterotheca grandiflora	telegraphweed	
Hordeum brachyantherum	northern barley	
Hordeum brachyantherum	meadow barley	HOBR
Horkelia cuneata	wedge-leaved horkelia	
Hypochaeris radicata	hairy cat's-ear	
Juncus balticus	Baltic rush	
Juncus bufonius var. bufonius	common toad rush	JUBUb
Juncus phaeocephalus	brown-headed rush	JUPH
Lasthenia glaberrima	smooth goldfields	LAGL
Lupinus bicolor	miniature lupine	
Lupinus nanus	sky lupine	
Lythrum hyssopifolia	grass poly	
Malvella leprosa	alkali mallow	MALE
Phalaris lemmonii	Lemmon's canary-grass	
Plagiobothrys chorisianus hickmanii	Hickman's popcorn flower	PLCHh
Plantago coronopus	cut-leaved plantain	
Rumex acetosella	sheep sorrel	
Rumex crispus	curly dock	RUCR
Rumex salicifolia	willow dock	
Salix lasiolepis	Arroyo willow	
Stachys ajugoides	bugle hedge-nettle	STAJ
Trifolium barbarum	bearded clover	
Trifolium dubium	little hop clover	
Trifolium microcephalum	maidenhead clover	
Trifolium variegatum	white-tipped clover	
Triglochin scilloides	flowering quillwort	
Vicia sativa	spring vetch	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 10

Date	4/27/2016, 9/10/2016
Surveying Personnel	Jami Davis, Shawn Wagoner, Chris Bronny; Jami Davis, Kayti Christianson, Shaelyn Hession

Vegetation Type	%Cover	Species	Notes
Emergent Vegetation	8	Smartweed; ELMA, TYLA	
Floating Vegetation	0		
Submerged Vegetation	N/A		submerged veg observed at waters edge- unable to determine cover due to turbidity
Open Water	16		

Notes

A total of three transects were completed - transect numbers coincide with the stratum they were placed in; therefore, because transects were not placed in strata 1 or 2, there is no transect 1 or 2. Strata I and 2 were visually assessed.

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
3	10	55%	ELMA	88	ELMA	85	ELMA	100	ELMA	100	ELMA	100	ELMA	100
			DISP	10	JUPH	1								
			JUPH	2	DISP	15								
			TOTAL	***100***	***TOTAL***	***101***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
4	10	8%	STAJ	5	EUOC	8	LYHY	2	DISP	10	HYGL	5	ELMA	10
			JUPH	50	JUPH	70	EUOC	15	STAJ	10	STAJ	10	DISP	50
			DISP	10	DISP	5	JUPH	50	ELMA	20	DISP	20	JUPH	10
			EUOC	25	PSLU	2	DISP	30	POMO	2	EUOC	5	POMO	1
			ELMA	5	ELMA	8	STAJ	4	JUPH	30	JUPH	20	STAJ	15
			PLCO	1	STAJ	5	PSLU	1	LYAR	5	LYAR	2	LYAR	3
			POMO	1	HYGL	2			PLCO	5	PLCO	10	PLCO	2
			PSLU	5	LYAR	1			TH	20	RUAC	1	RUAC	3
			HYGL	1							PSLU	2	Vicia sp.	1
			RUAC	1							ELMA	10	TH	5
			LYAR	1							TH	10		
			TOTAL	***105***	***TOTAL***	***101***	***TOTAL***	***102***	***TOTAL***	***102***	***TOTAL***	***95***	***TOTAL***	***100***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
5	5	4%	MASA	12	ACAM	10	HEGR	25
			MAEL	2	MASA	30	LYAR	30
			LYAR	5	LYAR	10	MASA	5
			LYHY	15	JUBA	25	JUBA	15
			AVBA	1	TH	25	ERCA	2
			JUBA	45			LYHY	1
			TH	20			AVBA	1
							TH	20
			TOTAL	***100***	***TOTAL***	***100***	***TOTAL***	***99***

Complete Species List

Scientific Name	Common Name	Species Code
Acmispon americanus	Spanish lotus	ACAM
Aira caryophyllea	silvery hair-grass	
Avena barbata	slender wild oat	AVBA
Baccharis glutinosa	marsh baccharis	
Baccharis pilularis	coyote bush	
Bromus diandrus	ripgut brome	
Bromus hordeaceus	soft chess	
Bromus madritensis	foxtail chess	
Carex barbarae	Santa Barbara sedge	
Carex tumulicola	foothill sedge	
Carpobrotus edulis	iceplant (hottentot fig)	
Cirsium occidentale var. *occidentale*	cobwebby thistle	
Cirsium vulgare	bull thistle	
Cyperus eragrostis	tall cyperus (nut sedge)	
Distichlis spicata	salt grass	DISP
Eleocharis macrostachya	pale spike rush	ELMA
Elymus glaucus	blue wild-rye	
Erechtites glomeratus	cut-leaved fireweed	
Erigeron canadensis	horseweed	ERCA
Eryngium armatum	coast eryngo	
Euthamia occidentalis	Western goldenrod	EUOC
Festuca myuros	rattail sixweeks grass	
Festuca perenne	Italian rye grass	
Gamochaeta ustulata	purple cudweed	
Genista monspessulana	French broom	
Geranium dissectum	cut-leaf geranium	
Heteromeles arbutifolia	toyon	
Hypochaeris glabra	smooth cat's-ear	HYGL
Hypochaeris radicata	hairy cat's-ear	
Isoetes howellii	Howell's quillwort	
Isolepis cernua	low bulrush	
Juncus balticus	Baltic rush	JUBA
Juncus bufonius var. bufonius	common toad rush	
Juncus capitatus	leafy bract dwarf-rush	
Juncus phaeocephalus	brown-headed rush	JUPH
Lemna sp.	duckweed	
Luzula comosa	Pacific wood rush	
Lysimachia arvensis	scarlet pimpernel	LYAR
Lythrum hyssopifolia	grass poly	LYHY
Madia elegans	common tarweed	MAEL
Madia sativa	coast tarweed	MASA
Medicago polymorpha	bur clover	
Plantago coronopus	cut-leaved plantain	PLCO
Polypogon monspeliensis	rabbit-foot grass	POMO
Pseudognaphalium luteoalbum		PSLU
Quercus agrifolia	coast live oak	
Rubus ursinus	California blackberry	
Rumex acetosella	sheep sorrel	
Rumex conglomeratus	clustered dock	
Rumex conglomeratus	clustered dock	
Rumex crispus	curly dock	
Rumex salicifolius	willow dock	
Schoenoplectus californicus	California bulrush	SCCA
Silybum marianum	milk thistle	
Sisyrinchium bellum	blue-eyed grass	
Sonchus asper	prickly sow-thistle	
Sonchus oleraceus	common sow-thistle	
Stachys ajugoides	bugle hedge-nettle	STAJ
Taraxia ovata	sun cups	
Toxicodendron diversilobum	poison oak	
Trifolium dubium	little hop clover	
Trifolium microcephalum	maidenhead clover	
Trifolium variegatum	white-tipped clover	
Typha latifolia	broad-leaved cattail	TYLA
Vicia sativa	spring vetch	
Vicia sp.	vetch	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 14

Date	4/27/2016, 5/17/16, 5/25/16
Surveying Personnel	Jami Davis, Shaelyn Hession, Josh Harwayne, Shawn Wagoner, Chris Bronny

Vegetation Type	%Cover	Species	Notes
Emergent Vegetation	1	ELMA	
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

5/17/16: still very wet
5/25/16: VERY small area of water in Strata 1

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
1	10m	16%	ELMA	45	ELMA	40	ELMA	55	ELMA	40	ELMA	50	ELMA	55
			BG	55	BG	60	BG	45	BG	60	BG	50	BG	45
			TOTAL	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
2	5m	8%	PHLE	10	PLHE	2	ELTR	2
			ELMA	30	ELTR	1	PLHE	1
			ELTR	2	ELMA	40	ELMA	50
			AL	60	MALE	5	AL	20
			MALE	1	AL	50	TH	25
					unknown 1	1		
			TOTAL	***103***	***TOTAL***	***99***	***TOTAL***	***98***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
3	10m	37%	JUPH	50	JUPH	50	JUPH	40	JUPH	35	JUPH	40	JUPH	35
			GEDI	1	ELTR	15	ELTR	10	ELTR	15	ELTR	5	ELTR	3
			ELTR	2	BRHO	1	GEDI	1	TH	40	AICA	1	RACA	1
			BRTEt	1	GEDI	1	BRHO	1	AL	10	BRHO	1	BG	5
			BRHO	1	TH	35	HYGL	1			PLCHh	1	TH	55
			TH	45			TH	45			BRMI	1		
											TH	50		
			TOTAL	***100***	***TOTAL***	***102***	***TOTAL***	***98***	***TOTAL***	***100***	***TOTAL***	***99***	***TOTAL***	***99***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
4	10m	38%	FEPE	93	FEPE	75	FEPE	40	FEPE	60	FEPE	70	FEPE	70
			MALE	5	BRTEt	2	MALE	5	MALE	15	MALE	15	ELTR	5
			BRTEt	1	MALE	8	ELTR	1	BRTEt	4	CHPO	3	MALE	5
			JUPH	1	BRHO	5	HOBR	1	HYGL	1	ELTR	2	BRTEt	1
					TH	10	BRHO	1	TH	20	TH	10	TH	20
							BRTEt	1						
							BRMI	1						
							unknown 1	1						
							TH	50						
			TOTAL	***100***	***TOTAL***	***100***	***TOTAL***	***101***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***101***

Complete Species List

Scientific Name	Common Name	Species Code
Achillea millefolium	common yarrow	
Aira caryophyllea	silvery hair-grass	AICA
Avena barbata	slender oat	
Baccharis pilularis	coyote bush	
Briza minor	small quaking-grass	BRMI
Brodiaea terrestris ssp. terrestris	dwarf brodiaea	BRTEt
Bromus diandrus	ripgut brome	
Bromus hordeaceus	soft chess	BRHO
Castilleja densiflora	denseflower owl's-clover	
Castilleja exserta	purple owl's-clover	
Chlorogalum pomeridianum	soap plant	CHPO
Danthonia californica	California oatgrass	
Diplacus aurantiacus	sticky monkeyflower	
Eleocharis macrostachya	pale spikerush	ELMA
Elymus glaucus	blue wild-rye	
Elymus triticoides	beardless wild-rye	ELTR
Erechtites glomeratus	cut-leaved fireweed	
Erodium cicutarium	red-stemmed filaree	
Festuca myuros	rattail sixweek fescue	
Festuca perennis	Italian rye grass	FEPE
Gamochaeta ustulata	purple cudweed	
Geranium dissectum	cut-leaved geranium	GEDI
Hordeum brachyantherum	meadow barley	HOBR
Hypochaeris glabra	smooth cat's-ear	HYGL
Juncus bufonius var. bufonius	common toad rush	
Juncus effusus	common rush	
Juncus phaeocephalus	brown-headed rush	JUPH
Luzula comosa	Pacific wood rush	
Lythrum hyssopifolia	grass poly	
Malvella leprosa	alkali mallow	MALE
Microseris douglasii ssp. tenella	Douglas' microseris	
Microseris paludosa	marsh microseris	
Phalaris lemmonii	Lemmon's canary-grass	PHLE
Plagiobothrys chorisianus hickmanii	Hickman's popcorn flower	PLCHh
Ranunculus californicus	California buttercup	RACA
Rumex acetosella	sheep sorrel	
Rumex crispus	curly dock	
Sisyrinchium bellum	blue-eyed grass	
Sonchus asper	prickly sow-thistle	
Trifolium microcephalum	maidenhead clover	
Trifolium variegatum	whit-tipped clover	
Triteleia ixioides	golden brodiaea (pretty face)	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes
AL	Algal mat

POND 18

Date	4/27/2016, 5/17/16, 6/13/16
Surveying Personnel	Jami Davis, Patric Krabacher, Josh Harwayne, Kayti Christianson, Shawn Wagoner, Chris Bronny

Vegetation Type	%Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

6/13/16: Pond dry, some soil moisture in Strata 1, but not saturated

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
1	5m	19%	ELMA	80	ELMA	80	ELMA	95
			BG	20	TRSC	2	BG	5
			TH	1	BG	15	TH	1
					TH	2		
			TOTAL	***101***	***TOTAL***	***99***	***TOTAL***	***101***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
2	10m	22%	ELMA	15	ELMA	15	ELMA	20	ELTR	60	ELMA	65	ELTR	2
			ELTR	20	ELTR	15	ELTR	65	TH	35	ELTR	5	TH	70
			TH	65	TH	60	TH	10	BG	5	TH	25	BG	25
							BG	5			BG	5		
			TOTAL	***100***	***TOTAL***	***90***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***97***

Transect #	Transect Length	Relative %Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
3	10m	43%	RUPU	25	ERAR	25	ELMA	5	ISHO	20	LYHY	40	LYHY	30
			ERAR	60	RUPU	25	RUPU	40	RUPU	20	RUPU	4	JUBUb	25
			ELTR	2	HECU	2	ELTR	1	ERAR	15	ISHO	10	ISCE	12
			BG	15	ISHO	20	ERAR	10	PLCHh	2	PLCHh	2	TODI	1
			TH	2	ELMA	10	LYHY	1	LYHY	1	FEMY	1	RUAC	1
					TH	20	TH	30	TH	40	BRMA	1	BRMI	2
					BG	5	ISHO	15	BG	2	BRHO	1	ELTR	2
							BG	2			BRMI	1	FEMY	2
											JUBUb	1	RUPU	1
											HECU	1	BG	1
											ELTR	1	TH	20
											ELMA	1		
											ISCE	1		
											TH	30		
											BG	4		
			TOTAL	***104***	***TOTAL***	***107***	***TOTAL***	***104***	***TOTAL***	***100***	***TOTAL***	***99***	***TOTAL***	***97***

Transect #	Transect Length	Relative % Cover Of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
4	5m	15%	LYHY	8	PLCO	30	PLCO	20
			MAGR	1	BRMA	30	BRMA	25
			ACAM	3	LYHY	1	AICA	1
			BRMA	10	AICA	1	ACAM	2
			JUBUb	70	RUAC	1	BRMI	1
			BRMI	1	ACAM	1	JUBUb	3
			PLCO	1	BRMI	1	RUAC	2
			FEMY	1	BRHO	1	MAGR	1
			TH	5	TH	30	FEMY	1
					AVBA	1	SIGA	1
							BRHO	1
							LYHY	1
							LYAR	1
							AVBA	1
							TH	35
							BG	5
			TOTAL	***100***	***TOTAL***	***97***	***TOTAL***	***101***

Complete Species List

Scientific Name	Common Name	Species Code
Achillea millefolium	common yarrow	
Acmispon americanus	Spanish lotus	ACAM
Aira caryophyllea	silvery hair-grass	
Avena barbata	slender wild oat	AVBA
Baccharis pilularis	coyote bush	
Briza maxima	rattlesnake grass	BRMA
Briza minor	small quaking-grass	BRMI
Bromus diandrus	ripgut brome	
Bromus hordeaceus	soft chess	BRHO
Bromus madritensis	Foxtail chess	
Callitriche heterophylla var. bolanderi	Bolander's water starwort	
Callitriche marginata	California water starwort	
Carduus pycnocephalus	Italian thistle	
Carex sp.		
Cerastium fontanum ssp. vulgare	mouse-eared chickweed	
Cerastium glomeratum	sticky mouse-ear chickweed	
Cotula coronopifolia	brass buttons	
Danthonia californica	California oatgrass	
Drymocallis glandulosa	sticky cinquefoil	
Eleocharis macrostachya	pale spikerush	ELMA
Elymus glaucus	blue wild-rye	
Elymus triticoides	beardless wild-rye	ELTR
Elymus triticoides	beardless wild-rye	
Epilobium brachycarpum	panicled willow-herb	
Erechtites glomeratus	cut-leaved fireweed	
Erodium botrys	long-beaked filaree	
Eryngium armatum	coyote thistle	ERAR
Euthamia occidentalis	Western goldenrod	
Festuca myuros	rattail sixweek fescue	FEMY
Galium aparine	goose-grass	
Galium californicum	California bedstraw	
Gamochaeta ustulata	purple cudweed	
Geranium dissectum	cut-leaved geranium	
Heliotropium curassavicum	Chinese pusley	HECU
Heteromeles arbutifolia	toyon	
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	
Hypochaeris glabra	smooth cat's ear	
Isoetes howellii	Howell's quillwort	ISHO
Isolepis cernua	low bulrush	ISCE
Juncus bufonius var. bufonius	common toad rush	JUBUb
Juncus effusus	common rush	
Juncus occidentalis	western rush	
Juncus phaeocephalus	brown-headed rush	
Lasthenia glaberrima	smooth lasthenia (rayless goldfield)	
Lathyrus angulatus	angled pea	
Luzula comosa	Pacific wood rush	
Lysimachia arvensis	scarlet pimpernel	LYAR
Lythrum hyssopifolia	grass poly	LYHY
Madia gracilis	slender tarweed	MAGR
Plagiobothrys chorisianus hickmanii	Hickman's popcorn flower	PLCHh
Plantago coronopus	cut-leaved plantain	PLCO
Poa sp.	bluegrass	
Polypogon monspeliensis	rabbit-foot grass	
Quercus agrifolia	coast live oak	RUAC
Rubus ursinus	California blackberry	
Rumex acetosella	sheep sorrel	
Rumex pulcher	fiddle dock	RUPU
Silene gallica	windmill pink	SIGA
Sisyrinchium bellum	blue-eyed grass	
Sonchus asper	prickly sow-thistle	
Toxicodendron diversilobum	poison oak	TODI
Trifolium barbigerum	bearded clover	
Trifolium dubium	small hop clover	
Trifolium hirtum	rose clover	
Trifolium variegatum	white-tipped clover	
Triglochin scilloides	flowering quillwort	TRSC

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 30A

Date	5/5/16, 5/17/16, 6/13/16
Surveying Personnel	Jami Davis, Patric Krabacher, Josh Harwayne, Kayti Christianson, Chris Bronny

Vegetation Type	%Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

6/13/16: Pond dry, no soil saturation at surface. Ponds 30A, B, & C are all part of the same system; however, Ponds 30B & C were depressions created by excavation that now hold water.

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
1	10m	62%	RUCR	3	ELMA	70	RUCR	1	MALE	2	RUCR	1	RUCR	1
			ELMA	90	RUCR	1	ELMA	50	RUCR	5	BG	15	ELMA	60
			TH	10	TH	30	BG	5	POMO	1	TH	20	BG	10
							TH	40	ELMA	50	ELMA	65	TH	30
									TH	40				
			TOTAL	***103***	***TOTAL***	***101***	***TOTAL***	***96***	***TOTAL***	***98***	***TOTAL***	***101***	***TOTAL***	***101***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
2	5m	2%	BAGL	5	BAGL	30	BAGL	15
			ELMA	20	SCCA	10	SCCA	10
			CYER	2	TH	60	TH	75
			POMO	1				
			SCCA	10				
			TH	30				
			BG	35				
			TOTAL	***103***	***TOTAL***	***100***	***TOTAL***	***100***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
3	5m	37%	JUBA	65	JUBA	70	ELMA	5
			RUCR	1	LYAR	1	JUPH	15
			LYHY	1	BRHO	1	JUBA	45
			ELMA	2	RUTR	1	RUTR	2
			ACAM	1	FEMY	1	BRHO	1
			TH	30	unknown comp #2	1	FEMY	1
					TH	25	TH	30
			TOTAL	***100***	***TOTAL***	***100***	***TOTAL***	***99***

Complete Species List

Scientific Name	Common Name	Species Code
Acmispon americanus	Spanish lotus	ACAM
Acmispon parviflorus	small-flowered lotus	
Agoseris grandiflora	large-flowered agoseris	
Avena barbata	slender oat	
Baccharis glutinosa	marsh baccharis	BAGL
Baccharis pilularis	coyote brush	
Briza minor	small quaking grass	
Bromus carinatus	California brome	
Bromus hordeaceus	soft chess	BRHO
Bromus madritensis	red brome	
Cyperus eragrostis	tall cyperus (nut sedge)	CYER
Distichlis spicata	salt grass	
Drymocallis glandulosa	sticky cinquefoil	
Eleocharis macrostachya	pale spike rush	ELMA
Elymus glaucus	blue wild rye	
Erechtites glomeratus	cut-leaved fireweed	
Festuca myuros	rattail sixweek fescue	FEMY
Gamochaeta ustulata	purple cudweed	
Geranium dissectum	cut-leaved geranium	
Hypochaeris glabra	smooth cat's-ear	
Hypochaeris radicata	hairy cat's-ear	
Isolepis cernua	low bulrush	
Juncus balticus	Baltic rush	JUBA
Juncus phaeocephalus	brown-headed rush	JUPH
Luzula comosa	Pacific wood rush	
Lysimachia arvensis	scarlet pimpernel	LYAR
Lythrum hyssopifolia	grass poly	LYHY
Malvella leprosa	alkali mallow	MALE
Microseris paludosa	marsh microseris	
Phalaris lemmonii	Lemmon's canary-grass	
Polypogon monspeliensis	rabbit-foot grass	POMO
Rubus ursinus	California blackberry	
Rumex acetosella	sheep sorrel	
Rumex crispus	curly dock	RUCR
Rumex transitorius	willow dock	RUTR
Schoenoplectus californicus	California bulrush	SCCA
Sisyrinchium bellum	blue-eyed grass	
Sonchus asper	prickly sow-thistle	
Stachys ajugoides	bugle hedge nettle	
Trifolium dubium	small hop clover	
Trifolium microcephalum	maidenhead clover	
Triglochin scilloides	flowering quillwort	
Vicia sativa	spring vetch	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 30B

Date	5/5/16, 5/17/16, 6/13/16
Surveying Personnel	Jami Davis, Patric Krabacher, Josh Harwayne, Kayti Christianson, Chris Bronny

Vegetation Type	%Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

6/13/16: Pond dry, no soil saturation at surface. Ponds 30A, B, & C are all part of the same system; however, Ponds 30B & C were depressions created by excavation that now hold water.

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
1	5m	28%	POMO	15	ELMA	30	ELMA	30
			JUBA	30	JUBA	25	TH	10
			LYHY	1	POMO	5	BG	60
			ELMA	5	LYHY	1	POMO	1
			ISCE	1	ISCE	1		
			TH	15	TH	15		
			BG	35	BG	25		
			TOTAL	***102***	***TOTAL***	***102***	***TOTAL***	***101***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
2	5m	72%	POMO	55	POMO	45	POMO	50
			JUBUb	2	SALA	1	LYHY	1
			LYHY	1	HYRA	2	HYRA	1
			HYRA	1	LYHY	1	JUPH	1
			PLCO	1	JUBUb	1	BG	10
			TH	10	JUPH	1	TH	40
			BG	30	TH	15		
					BG	35		
			TOTAL	***100***	***TOTAL***	***101***	***TOTAL***	***103***

Complete Species List

Scientific Name	Common Name	Species Code
Achillea millefolium	common yarrow	
Acmispon americanus	Spanish lotus	
Acmispon parviflorus	small-flowered lotus	
Baccharis glutinosa	marsh baccharis	
Baccharis pilularis	coyote brush	
Bromus carinatus	California brome	
Bromus hordeaceus	soft chess	
Cyperus eragrostis	tall cyperus (nut sedge)	
Eleocharis macrostachya	pale spike rush	ELMA
Festuca myuros	rattail sixweek fescue	
Gamochaeta ustulata	purple cudweed	
Hypochaeris glabra	smooth cat's-ear	
Hypochaeris radicata	hairy cat's-ear	HYRA
Isolepis cernua	low bulrush	ISCE
Juncus balticus	Baltic rush	JUBA
Juncus bufonius var. bufonius	common toad rush	JUBUb
Juncus phaeocephalus	brown-headed rush	JUPH

Scientific Name	Common Name	Species Code
Lysimachia arvensis	scarlet pimpernel	
Lythrum hyssopifolia	grass poly	LYHY
Phalaris lemmonii	Lemmon's canary-grass	
Plantago coronopus	cut-leaved plantain	PLCO
Polypogon monspeliensis	rabbit-foot grass	POMO
Rubus ursinus	California blackberry	
Rumex crispus	curly dock	
Rumex transitorius	willow dock	
Salix lasiolepis	Arroyo willow	SALA
Sisyrinchium bellum	blue-eyed grass	
Sonchus asper	prickly sow-thistle	
Stachys ajugoides	bugle hedge nettle	
Trifolium hirtum	rose clover	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 30C

Date	5/5/16, 5/17/16, 6/13/16
Surveying Personnel	Jami Davis, Patric Krabacher, Josh Harwayne, Kayti Christianson, Chris Bronny

Vegetation Type	% Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

6/13/16: Pond dry, no soil saturation at surface. Ponds 30A, B, & C are all part of the same system; however, Ponds 30B & C were depressions created by excavation that now hold water. Transects and photo point from 2015 relocated with GPS. Some JUPH continues upslope outside of the basin; however, this is associated with seeping from the hillside, not the inundated portion of the pond.

Transect #	Transect Length	Relative % Cover Of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
1	5m	20%	ELMA	20	ISCE	1	DISP	2
			ISHO	10	ELMA	12	ELMA	35
			ISCE	2	CAHEb	20	ISCE	1
			CAHEb	3	DISP	2	CAHEb	10
			BG	40	ISHO	5	TRSC	1
			TH	25	BG	60	BG	30
					TH	2	TH	20
			TOTAL	***100***	***TOTAL***	***102***	***TOTAL***	***99***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
2	5m	80%	JUPH	30	LYHY	2	PLCO	3
			PLCO	2	JUPH	25	JUPH	40
			POMO	10	POMO	8	POMO	15
			DISP	1	ISHO	3	LYAR	1
			LYHY	1	unknown 1	1	unknown 1	1
			HECU	1	TH	50	ISCE	1
			HYGL	1	BG	10	CAHEb	2
			TH	20	CYER	1	ISHO	25
			BG	35	DISP	1	TH	10
					HYGL	1	BG	2
			TOTAL	***101***	***TOTAL***	***102***	***TOTAL***	***100***

Complete Species List

Scientific Name	Common Name	Species Code
Achillea millefolium	common yarrow	
Acmispon americanus	Spanish lotus	
Acmispon glaber	deerweed	
Acmispon parviflorus	small-flowered lotus	
Aira caryophyllea	silvery hair-grass	
Artemisia douglasiana	mugwort	
Baccharis glutinosa	marsh baccharis	
Baccharis pilularis	coyote brush	
Bromus diandrus	ripgut brome	
Bromus hordeaceus	soft chess	
Callitriche heterophylla var. bolanderi	Bolander's water starwort	CAHEb
Cortaderia jubata	jubata grass	
Cyperus eragrostis	tall cyperus (nut sedge)	CYER
Distichlis spicata	salt grass	DISP
Eleocharis macrostachya	pale spike rush	ELMA
Eleocharis macrostachya	pale spike rush	
Elymus glaucus	blue wild rye	
Festuca myuros	rattail sixweek fescue	
Gamochaeta ustulata	purple cudweed	
Geranium dissectum	cut-leaved geranium	
Heliotropium curassavicum	Chinese pusley	HECU
Horkelia cuneata	wedge-leaved horkelia	
Hypochaeris glabra	smooth cat's-ear	HYGL
Hypochaeris radicata	hairy cat's-ear	
Isoetes howellii	Howell's quillwort	ISHO
Isolepis cernua	low bulrush	ISCE
Juncus balticus	Baltic rush	
Juncus bufonius var. bufonius	common toad rush	
Juncus phaeocephalus	brown-headed rush	JUPH
Lupinus bicolor	miniature lupine	
Luzula comosa	Pacific wood rush	
Lysimachia arvensis	scarlet pimpernel	LYAR
Lythrum hyssopifolia	grass poly	LYHY
Plantago coronopus	cut-leaved plantago	
Plantago coronopus	cut-leaved plantain	PLCO
Polypogon monspeliensis	rabbit-foot grass	POMO
Rubus ursinus	California blackberry	
Rubus ursinus	California blackberry	
Rumex acetosella	sheep sorrel	
Rumex transitorius	willow dock	
Salix lasiolepis	Arroyo willow	
Salix lasiolepis	Arroyo willow	
Silene gallica	windmill pink	
Sisyrinchium bellum	blue-eyed grass	
Toxicodendron diversilobum	poison oak	
Trifolium albopurpureum	rancheria clover	
Trifolium gracilentum	pinpoint clover	
Trifolium microcephalum	maidenhead clover	
Triglochin scilloides	flowering quillwort	TRSC
Verbena lasiostachys var. *lasiostachys*	western vervain	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 35

Date	5/5/16, 5/16/16, 5/18/16
Surveying Personnel	Jami Davis, Shaelyn Hession, Josh Harwayne, Kayti Christianson, Shawn Wagoner, Chris Bronny

Vegetation Type	%Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

5/18/2016: Pond dry, no saturation at soil surface

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
1	10m	28%	PLCO	65	ELMA	1	PLCO	35	PLCO	25	PLCO	20	PLCO	30
			PLCHh	10	PLCHh	15	PLCHh	35	PLCHh	60	LYHY	2	PLCHh	40
			LYHY	2	PLCO	50	COCO	1	LYHY	2	PLCHh	55	ELMA	5
			TH	20	PSTE	1	ELMA	6	ELMA	3	DEDA	1	LYHY	1
			ELMA	1	GAUS	1	LYHY	3	TH	10	ELMA	5	TH	25
			PSTE	1	COCO	1	PSTE	1			TH	20	COCO	1
			COCO	1	HYGL	2	TH	20						
			GAUS	1	LYHY	1	GAUS	1						
					TH	30								
			TOTAL	***101***	***TOTAL***	***102***	***TOTAL***	***102***	***TOTAL***	***100***	***TOTAL***	***103***	***TOTAL***	***102***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
2	10m	39%	LYHY	1	DEDA	1	PLCO	20	PLCO	15	PLCO	20	PLCO	25
			PLCO	25	LYHY	1	LYHY	1	PSTE	1	TH	65	TH	40
			TH	40	PLCO	25	PSTE	1	BG	25	BG	15	BG	35
			BG	30	PSTE	1	TH	40	TH	60				
			PSTE	1	TH	25	BG	40						
					BG	50								
			TOTAL	***97***	***TOTAL***	***103***	***TOTAL***	***102***	***TOTAL***	***101***	***TOTAL***	***100***	***TOTAL***	***100***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
3	10m	33%	HOMUg	8	HOMUg	10	HOBR	40	HOBR	40	HOBR	35	HOBR	40
			PLCO	25	DEDA	10	DEDA	3	TH	60	FEPE	8	PSTE	1
			DEDA	45	PLCO	20	PLCO	3			TH	60	TH	60
			PLCHh	1	HOBR	25	TH	35						
			TH	20	TH	35	BG	20						
			LYHY	1										
			TOTAL	***100***	***TOTAL***	***100***	***TOTAL***	***101***	***TOTAL***	***100***	***TOTAL***	***103***	***TOTAL***	***101***

Complete Species List

Scientific Name	Common Name	Species Code
Avena barbata	slender oat	
Brodiaea terrestris ssp. terrestris	dwarf brodiaea	
Bromus hordeaceus	soft chess	
Cotula coronopifolia	brass buttons	COCO
Crassula aquatica	water pygmy	
Cyperus eragrostis	tall cyperus (nut sedge)	
Danthonia californica	California oatgrass	
Deschampsia danthonioides	annual hair grass	DEDA
Eleocharis macrostachya	pale spike rush	ELMA
Elymus glaucus	blue wild-rye	
Erodium cicutarium	red-stemmed filaree	
Erodium moschatum	white-stemmed filaree	
Eryngium armatum	coyote thistle	
Festuca myuros	rattail sixweek fescue	
Festuca perenne	Italian rye grass	FEPE
Gamochaeta ustulata	purple cudweed	GAUS
Geranium dissectum	cut-leaved geranium	
Heliotropium curassavicum	Chinese pusley	
Hordeum brachyantherum	meadow barley	HOBR
Hordeum murinum ssp. gussoneanum	Mediterranean barley	HOMUg
Hypochaeris glabra	smooth cat's-ear	HYGL
Juncus bufonius var. bufonius	common toad rush	
Juncus occidentalis	western rush	
Juncus phaeocephalus	brown-headed rush	
Lythrum hyssopifolia	grass poly	LYHY
Plagiobothrys chorisianus hickmanii	Hickman's popcorn flower	PLCHh
Plantago coronopus	cut-leaved plantain	PLCO
Polygonum sp.	knotweed	
Psilocarphus tenellus	slender wooly-heads	PSTE
Rumex acetosella	sheep sorrel	
Rumex crispus	curly dock	
Rumex salicifolius	willow dock	
Taraxia ovata	sun cups	
Trifolium dubium	little hop clover	
Triglochin scilloides	flowering quillwort	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 39

Date	4/26/2016, 5/16/16, 5/18/16
Surveying Personnel	Jami Davis, Shaelyn Hession, Josh Harwayne, Kayti Christianson, Shawn Wagoner, Chris Bronny

Vegetation Type	% Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

5/18/16: pond dry, no soil saturation at surface

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
1	5m	5%	JUPH	15	ISCE	1	ELMA	70
			PLCHh	5	ELMA	20	TH	25
			ISCE	65	TRSC	25	BG	15
			TH	10	BG	50		
			ERAR	1	TH	4		
			TOTAL	***96***	***TOTAL***	***100***	***TOTAL***	***110***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
2	5m	8%	FEPE	20	ERAR	45	JUPH	20
			LYHY	15	JUPH	15	ERAR	30
			BRTEt	2	HOMAg	2	FEPE	15
			PLCO	5	LYHY	2	LYHY	1
			HOMAg	5	DEDA	3	JUBUb	2
			TH	30	FEPE	1	TH	20
			BG	20	BG	10	BG	5
					TH	20		
			TOTAL	***97***	***TOTAL***	***98***	***TOTAL***	***93***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
3	10m	87%	FEPE	20	HYGL	15	JUOC	10	unknown comp	30	JUOC	3	TRAN	20
			BRHO	6	AVBA	1	unknown comp	45	GEDI	1	AICA	3	unknown comp	2
			STCE	5	unknown comp	5	PLCO	2	FEPE	10	unknown comp	25	PLCO	10
			HYGL	5	LYAR	1	FEPE	15	PLCO	25	PLCO	20	FEPE	20
			Unknown comp	4	FEPE	5	BAPI	2	BRMI	1	BRHO	5	BRTEt	3
			GEDI	1	STCE	1	GEDI	1	JUOC	5	FEPE	10	TRIX	1
			Vicia sp.	3	Trifolium sp.	2	BRMI	1	Vicia sp.	1	HYGL	1	AICA	1
			ERBO	1	GEDI	1	BRHO	1	BRHO	1	TH	30	BRMI	1
			TH	55	TH	60	TH	23	DACA	1			HYGL	5
					BG	10			TH	25			TH	37
			TOTAL	***100***	***TOTAL***	***101***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***97***	***TOTAL***	***100***

Complete Species List

Scientific Name	Common Name	Species Code
Acaena californica	California acaena	
Aira caryophyllea	silvery hair-grass	AICA
Avena barbata	slender wild oat	AVBA
Baccharis pilularis	coyote bush	BAPI
Briza minor	small quaking-grass	BRMI
Brodiaea terrestris ssp. terrestris	dwarf brodiaea	BRTEt
Bromus diandrus	ripgut brome	
Bromus hordeaceus	soft chess	BRHO
Calochortus albus	globe lily	
Castilleja ambigua	Johnny-nip	
Cotula coronopifolia	Brass buttons	
Crassula aquatica	water pygmy	
Danthonia californica	California oat grass	DACA
Deschampsia danthonioides	annual hair grass	DEDA
Eleocharis macrostachya	pale spike-rush	ELMA
Eleocharis sp.		
Erodium botrys	long-stemmed filaree	ERBO
Erodium cicutarium	red-stemmed filaree	
Erodium moschatum	White-stemmed filaree	
Eryngium armatum	coyote thistle	ERAR
Festuca myuros	rattail sixweek fescue	
Festuca perenne	Italian rye grass	FEPE
Gamochaeta ustulata	purple cudweed	
Geranium dissectum	cut-leaved geranium	GEDI
Hordeum brachyantherum	meadow barley	
Hordeum depressum	low barley	
Hordeum marinum ssp. gussoneanum	Mediterranean barley	HOMAg
Hypochaeris glabra	smooth cat's-ear	HYGL
Isoetes howellii	Howell's quillwort	
Isolepis cernua	keeled bulrush	ISCE
Juncus balticus	Baltic rush	
Juncus bufonius var. bufonius	common toad rush	JUBUb
Juncus occidentalis	western rush	JUOC
Juncus phaeocephalus	brown-headed rush	JUPH
Lupinus bicolor	miniature lupine	
Lysimachia arvensis	scarlet pimpernel	LYAR
Lythrum hyssopifolia	grass poly	LYHY
Madia exigua	small tarweed	
Microseris paludosa	marsh microseris	
Plagiobothrys chorisianus hickmanii	Hickman's popcorn flower	PLCHh
Plantago coronopus	cut-leaved plantain	PLCO
Plantago erecta	California plantain	
Pogogyne zizyphoroides	Sacramento pogogyne	
Psilocarphus tenellus	slender wooly-heads	
Quercus agrifolia	coast live oak	
Ranunculus californicus	California buttercup	
Rumex crispus	curly dock	
Rumex salicifolia	willow dock	
Sisyrinchium bellum	blue-eyed grass	
Sonchus asper	prickly sow-thistle	
Stipa cernua	nodding needle grass	STCE
Taraxia ovata	sun cups	
Toxicodendron diversilobum	poison oak	
Trifolium angustifolium	narrow-leaved clover	TRAN
Trifolium depauperatum	cowbag clover	
Trifolium dubium	little hop clover	
Trifolium sp.	clover	
Triglochin scilloides	Flowering quillwort	TRSC
Triteleia ixioides	golden brodiaea	TRIX
Vicia sp.	vetch	
	unknown comp	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 40S

Date	4/26/2016, 5/16/16, 5/18/16
Surveying Personnel	Jami Davis, Shaelyn Hession, Josh Harwayne, Shawn Wagoner, Chris Bronny

Vegetation Type	%Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

5/18/16: Pond dry, no soil saturation at surface

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
1	5m	9%	PLCO	20	PLCO	10	PLCO	5
			PLCHh	15	ELMA	30	PLCHh	5
			LYHY	1	PLCHh	20	ELMA	35
			ELMA	15	BG	25	BG	20
			JUBUb	1	TH	15	TH	35
			BG	30				
			TH	20				
			TOTAL	***102***	***TOTAL***	***100***	***TOTAL***	***100***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
2	5M	26%	JUPH	35	JUPH	40	ERBO	5
			ERBO	5	TRAN	1	JUPH	25
			FEMY	20	ERBO	15	PLCO	12
			AICA	1	AICA	1	LYHY	1
			BRMI	1	BRMI	1	FEMY	15
			PLCO	5	PLCO	5	BRMI	2
			VISA	1	BRHO	2	BRHO	2
			TH	30	HYGL	5	TH	30
					FEMY	2	BG	5
					TH	30		
					BG	5		
			TOTAL	***98***	***TOTAL***	***107***	***TOTAL***	***97***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
3	10M	65%	FEPE	60	PLCO	25	RUAC	15	VISA	5	FEPE	70	FEPE	80
			JUPH	1	FEPE	45	VISA	1	FEPE	25	JUPH	1	BRHO	10
			BRTEt	2	HYGL	1	FEPE	35	FEMY	1	BRDI	5	GEDI	1
			GEDI	3	BRHO	1	FEMY	10	BRHO	1	VISA	1	TH	10
			unknown comp	2	GEDI	1	JUPH	1	BRDI	3	GEDI	1		
			VISA	1	FEMY	10	GEDI	1	RUAC	2	TH	22		
			TH	30	uknown comp	2	unknown comp	3	JUPH	15				
					TH	15	TH	35	TH	50				
			TOTAL	***99***	***TOTAL***	***100***	***TOTAL***	***101***	***TOTAL***	***102***	***TOTAL***	***100***	***TOTAL***	***101***

Complete Species List

Scientific Name	Common Name	Species Code
Aira caryophyllea	silvery hair-grass	AICA
Baccharis pilularis	coyote bush	
Bromus diandrus	ripgut grass	BRDI
Bromus hordeaceus	soft chess	BRHO
Briza minor	small quaking-grass	BRMI
Brodiaea terrestris ssp. terrestris	dwarf brodaeia	BRTEt
Danthonia californica	California oatgrass	
Eleocharis macrostachya	pale spike-rush	ELMA
Erodium botrys	long-stemmed filaree	ERBO
Eryngium armatum	coyote thistle	
Festuca myuros	rattail sixweek fescue	FEMY
Festuca perenne	Italian rye grass	FEPE
Geranium dissectum	cut-leaved geranium	GEDI
Hypochaeris glabra	smooth cat's ear	HYGL
Juncus bufonius var. *bufonius*	common toad rush	JUBUb
Juncus occidentalis	western rush	
Juncus phaeocephalus	brown-headed rush	JUPH
Lythrum hyssopifolia	grass poly	LYHY
Plagiobothrys chorisianus hickmanii	Hickman's popcorn flower	PLCHh
Plantago coronopus	cut-leaved plantain	PLCO
Rumex acetosella	sheep sorrel	RUAC
Rumex crispus	curly dock	
Rumex salicifolia	willow dock	
Sisyrinchium bellum	blue-eyed grass	
Trifolium angustifolium	narrow-leaved clover	TRAN
Vicia sativa	spring vetch	VISA
	unknown comp	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 41

Date	4/26/2016, 5/16/16, 6/13/16
Surveying Personnel	Jami Davis, Patric Krabacher, Josh Harwayne, Kayti Christianson, Shawn Wagoner, Chris Bronny

Vegetation Type	%Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

6/13/16: Pond dry, no soil saturation at surface

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
1	10m	29%	LAGL	45	LGAL	40	ELMA	20	ELMA	40	ISHO	15	POMO	2
			MALE	10	ELMA	15	MALE	25	MALE	12	PLCHh	35	ISHO	25
			ELMA	10	MALE	5	PLCHh	1	PLCHh	1	ELMA	2	LAGL	60
			TH	30	PLCHh	1	ISHO	15	TH	40	MALE	1	STAJ	5
			BG	5	TH	35	TH	40	BG	5	POMO	1	PLCHh	2
					BG	5	BG	5			LAGL	5	ELMA	10
											TH	25	MALE	2
											STAJ	1		
			TOTAL	***100***	***TOTAL***	***101***	***TOTAL***	***106***	***TOTAL***	***98***	***TOTAL***	***85***	***TOTAL***	***106***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
2	10m	52%	PLCHh	10	STAJ	40	POMO	3	ELMA	15	STAJ	35	STAJ	25
			STAJ	20	POMO	5	MALE	15	ELCHh	15	ELMA	30	ELMA	15
			ELMA	10	PLCHh	50	ELMA	5	POMO	2	MALE	20	TH	40
			ISHO	30	TH	2	STAJ	25	STAJ	45	TH	15	MALE	20
			LAGL	1			PLCHh	30	TH	25	PLCHh	1		
			TH	15			ISHO	15						
			MALE	15			TH	12						
							LAGL	2						
			TOTAL	***101***	***TOTAL***	***97***	***TOTAL***	***107***	***TOTAL***	***102***	***TOTAL***	***101***	***TOTAL***	***100***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
3	10m	27%	ERAR	15	ERAR	15	MALE	20	BG	60	MALE	2	HYGL	3
			JUPH	30	MALE	10	JUPH	40	JUPH	30	ERAR	4	ERMO	15
			MALE	5	JUPH	55	ERAR	15	STAJ	3	RUCR	2	BRHO	2
			TH	50	TH	20	STAJ	1	ERAR	10	JUPH	60	LYHY	1
							TH	20			TH	30	FEMY	1
													MALE	2
													JUPH	40
													TH	30
													MASA	4
			TOTAL	***100***	***TOTAL***	***100***	***TOTAL***	***96***	***TOTAL***	***103***	***TOTAL***	***98***	***TOTAL***	***98***

Complete Species List

Scientific Name	Common Name	Species Code
Achillea millefolium	common yarrow	
Briza minor	small quaking-grass	
Bromus hordeaceus	soft chess	BRHO
Callitriche heterophylla var. bolanderi	Bolander's water starwort	
Cotula coronopifolia	brass buttons	
Danthonia californica	California oatgrass	
Eleocharis macrostachya	pale spikerush	ELMA
Ercitites glomeratus	cut-leaved fireweed	
Erodium moschatum	white-stemmed filaree	ERMO
Eryngium armatum	coyote thistle	ERAR
Festuca myuros	rattail sixweeks grass	FEMY
Geranium dissectum	cut-leaved geranium	
Hypochaeris glabra	smooth cat's-ear	HYGL
Isoetes howellii	Howell's quillwort	ISHO
Isolepis cernua	low bulrush	
Juncus balticus	Baltic rush	
Juncus phaeocephalus	brown-headed rush	JUPH
Lasthenia glaberrima	smooth lasthenia (rayless goldfield)	LAGL
Lythrum hyssopifolia	grass poly	LYHY
Madia sativa	coast tarweed	MASA
Malvella leprosa	alkali mallow	MALE
Phalaris lemmonii	Lemmon's canary-grass	
Plagiobothrys chorisianus hickmanii	Hickman's popcorn flower	PLCHh
Polypogon monspeliensis	rabbit-foot grass	POMO
Rumex acetosella	sheep sorrel	
Rumex crispus	curly dock	RUCR
Stachys ajugoides	bugle hedge-nettle	STAJ
Triglochin scilloides	flowering quillwort	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 43

Date	4/26/16, 5/16/16, 5/25/16
Surveying Personnel	Jami Davis, Shaelyn Hession, Josh Harwayne, Shawn Wagoner, Chris Bronny

Vegetation Type	%Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

5/25/16: Pond dry, no soil saturation at surface

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
1	10m	19%	POZI	20	PLCHh	30	PLCHh	20	PLCHh	15	PLCHh	50	PLCHh	20
			DEDA	10	POZI	25	JUPH	3	JUPH	3	POZI	10	ERAR	10
			JUPH	20	JUPH	5	ERAR	10	DEDA	1	DEDA	1	POZI	25
			ERAR	18	ERAR	5	DEDA	3	POZI	5	JUPH	1	PSTE	1
			PHCHh	1	DEDA	3	POMO	30	POMO	1	POMO	1	DEDA	1
			POMO	1	POMO	1	POMO	2	PSTE	2	PSTE	1	JUPH	1
			PSTE	1	LYHY	1	PSTE	1	ERAR	2	ERAR	1	POMO	1
			BG	10	PSTE	1	BG	10	BG	10	BG	15	unknown 1	1
			TH	25	BG	20	TH	15	TH	50	TH	20	BG	20
					TH	10							TH	20
			TOTAL	***106***	***TOTAL***	***101***	***TOTAL***	***94***	***TOTAL***	***89***	***TOTAL***	***100***	***TOTAL***	***100***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
2	5m	50%	LYHY	12	BAPI	15	JUPH	40
			JUBUb	20	JUBUb	45	SIBE	1
			PLCHh	1	POMO	2	LYHY	8
			POMO	1	JUPH	10	ERAR	12
			MAGR	10	ERAR	5	PLCHh	1
			POZI	1	PLCHh	1	PSTE	1
			JUCA	5	PSTE	1	POMO	1
			HYGL	4	DACA	3	DEDA	1
			CACO	5	JUCA	3	JUBUb	1
			FEMY	3	LYHY	10	POZI	5
			DACA	1	HYGL	1	BG	10
			JUPH	1	POZI	1	TH	15
			SIBE	1	BG	5		
			BRMI	1				
			PSTE	1				
			BG	5				
			TH	25				
			TOTAL	***97***	***TOTAL***	***102***	***TOTAL***	***96***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
3	5m	27%	AICA	2	Acmispon sp.	30	MAGR	50
			FEMY	5	JUPH	4	AICA	2
			MAGR	25	MAGR	25	FEMY	5
			LYAR	1	AICA	3	HYGL	1
			Acmispon sp.	5	JUBUb	3	LYAR	5
			DACA	10	FEMY	1	JUBUb	2
			JUPH	1	DACA	8	ZEDA	1
			LYHY	1	LYAR	2	Acmispon sp.	2
			JUBUb	1	BG	25	BRMI	1
			JUCA	1	TH	10	DACA	1
			BG	20			BG	10
			TH	30			TH	15
							CR	5
			TOTAL	***102***	***TOTAL***	***111***	***TOTAL***	***100***

Complete Species List

Scientific Name	Common Name	Species Code
Acmispon sp.	lotus	Acmispon sp.
Aira caryophyllea	silvery hair-grass	AICA
Baccharis pilularis	coyote bush	BAPI
Briza minor	small quaking grass	BRMI
Brodiaea terrestris ssp. terrestris	dwarf brodiaea	
Cicendia quadrangularis	timwort	
Callitriche marginata	California water starwort	
Camissonia contorta	contorted sun cup	CACO
Danthonia californica	California oat grass	DACA
Deschampsia danthonioides	annual hair grass	DEDA
Drymocallis glandulosa	sticky cinquefoil	
Eleocharis macrostachya	pale spikerush	
Eryngium armatum	Coyote thistle	ERAR
Festuca myuros	rattail sixweeks grass	FEMY
Horkelia cuneatus	wedge-leaved horkelia	
Hypochaeris glabra	smooth cat's-ear	HYGL
Juncus bufonius var. bufonius	common toad rush	JUBUb
Juncus capitatus	dwarf rush	JUCA
Juncus effusus	common rush	
Juncus phaeocephalus	brown-headed rush	JUPH
Luzula comosa	Pacific wood rush	
Lysimachia arvensis	scarlet pimpernel	LYAR
Lythrum hyssopifolia	grass poly	LYHY
Madia gracilis	slender tarweed	MAGR
Microseris paludosa	Marsh microseris	
Plagiobothrys chorisianus hickmanii	Hickman's popcorn flower	PLCHh
Pogogyne zizyphoroides	Sacramento pogogyne	POZI
Polypogon monspeliensis	rabbit-foot grass	POMO
Psilocarphus tenellus	slender wooly-heads	PSTE
Sisyrinchium bellum	Blue-eyed grass	SIBE
Sonchus asper	prickly sow-thistle	
Taraxia ovata	suncups	
Crassula aquatica	water pygmy	
Zeltnera davyi	Davy's centuary	ZEDA
	unknown 1	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes
CR	Cryptogrammic crust

POND 44

Date	5/5/16, 5/16/16, 5/18/16
Surveying Personnel	Jami Davis, Shaelyn Hession, Josh Harwayne, Kayti Christianson, Shawn Wagoner, Chris Bronny

Vegetation Type	%Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

5/18/16: Pond dry, no soil saturation at surface

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
1	10m	60%	BRTEt	1	BRTEt	2	DEDA	20	JUPH	15	BRTEt	2	POMO	20
			TRDU	1	PLCHh	1	POMO	30	POMO	15	ERAR	30	ERAR	40
			JUPH	5	ERAR	30	LYHY	4	POZI	2	POMO	7	PLCHh	1
			PSTE	2	DACA	15	POZI	3	LYHY	5	LYHY	4	LYHY	1
			LYHY	2	BRHO	1	PLCHh	3	PLCHh	5	ELMA	30	POZI	1
			POMO	2	LHYH	2	BRTEt	1	ERAR	25	PSTE	1	AGLAv	4
			ERAR	11	BRMI	1	ERAR	25	TRDU	1	POZI	2	DEDA	1
			JUBUb	5	TRDU	1	JUBUb	1	AGLAv	1	DEDA	2	JUBUb	2
			DACA	15	POZI	2	PSTE	9	ELMA	20	AGLAv	2	ELMA	5
			ALSA	1	PSTE	3	TRDU	1	BG	10	JUBUb	20	JUCA	1
			AGLAv	1	JUBUb	15	BG	5			TH	5	BG	25
			BG	40	JUCA	1								
			TH	15	GEDI	1								
					POMO	1								
					AGLAv	1								
					FEMY	2								
					TH	20								
			TOTAL	***101***	***TOTAL***	***99***	***TOTAL***	***102***	***TOTAL***	***99***	***TOTAL***	***105***	***TOTAL***	***101***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
2	5m	17%	LYHY	10	LYAR	1	JUBUb	40
			CACO	6	JUBUb	50	CAAT	1
			PLCHh	1	POMO	1	BRMI	1
			JUBUb	40	ZEMU	1	LYHY	10
			POZI	10	LYHY	2	FEMY	5
			POMO	3	AICA	1	ZEMU	1
			JUCA	1	FEMY	2	AICA	1
			MAEX	1	PSTE	3	MAEX	1
			ZEMU	1	CAAT	1	PSTE	2
			FEMY	2	ERAR	15	LYAR	1
			MAGR	1	MAEX	1	POMO	1
			PSTE	3	BG	25	BG	35
			BG	20				
			TOTAL	***99***	***TOTAL***	***103***	***TOTAL***	***99***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
3	5m	7%	ERBO	15	BAPI	5	BAPI	3
			PLCO	10	PLCO	15	LUCO	2
			AICA	5	TRDU	15	DACA	10
			TRDU	1	JUOC	1	GEDI	1
			BRMI	1	BRTEt	1	TRDU	5
			unknown comp	25	BRHO	1	JUBUb	10
			BRDI	1	unknown comp	10	unknown comp	35
			FEMY	15	BRMI	1	AICA	1
			ACPA	1	BRDI	1	ERBO	1
			HYGL	5	DACA	15	ACPA	2
			BG	5	ERAR	10	ALSA	1
			TH	20	GEDI	1	FEMY	1
					CACO	4	PLCO	3
					AICA	1	TH	25
					TH	20		
					BG	5		
			TOTAL	***104***	***TOTAL***	***106***	***TOTAL***	***100***

Complete Species List

Scientific Name	Common Name	Species Code
Acmispon parviflorus	small-flowered lotus	ACPA
Agrostis lacuna-vernalis	vernal-pool bent grass	AGLAv
Aira caryophyllea	silvery hair-grass	AICA
Baccharis pilularis	coyote bush	BAPI
Briza maxima	rattlesnake grass	
Briza minor	small quaking-grass	BRMI
Brodiaea terrestris ssp. Terrestris	dwarf brodiaea	BRTEt
Bromus diandrus	ripgut brome	BRDI
Bromus hordeaceus	soft chess	BRHO
Camissonia contorta	contorted suncup	CACO
Castilleja attenuata	valley tassels	CAAT
Cicendia quadrangularis	timwort	
Danthonia californica	California oatgrass	DACA
Deschampsia danthonioides	annual hair grass	DEDA
Eleocharis macrostachya	pale spike rush	ELMA
Erodium botrys	long-stemmed filaree	ERBO
Eryngium armatum	coyote thistle	ERAR
Festuca myuros	rattail sixweek fescue	FEMY
Alopecurus saccatus	Pacific foxtail	ALSA
Geranium dissectum	cut-leaved geranium	GEDI
Horkelia cuneata	wedge-leaved horkelia	
Hypochaeris glabra	smooth cat's-ear	HYGL
Juncus balticus	Baltic rush	
Juncus bufonius var. bufonius	common toad rush	JUBUb
Juncus capitatus	leafy bract dwarf rush	JUCA
Juncus occidentalis	western rush	JUOC
Juncus phaeocephalus	brown-headed rush	JUPH
Luzula comosa	pacific wood rush	LUCO
Lysimachia arvensis	scarlet pimpernel	LYAR
Lythrum hyssopifolia	grass poly	LYHY
Madia exigua	small tarweed	MAEX
Madia gracilis	slender tarweed	
Microseris paludosa	marsh microseris	
Plagiobothrys chorisianus hickmanii	Hickman's popcorn flower	PLCHh
Plantago coronopus	cut-leaved plantain	PLCO
Plantago erecta	California plantain	
Pogogyne zizyphoroides	Sacramento pogogyne	POZI
Polypogon monspeliensis	rabbit-foot grass	POMO
Psilocarphus tenellus	slender wooly-heads	PSTE
Sisyrinchium bellum	blue-eyed grass	
Taraxia ovata	suncups	
Trifolium barbarum	bearded clover	
Trifolium depauperatum	cowbag clover	
Trifolium dubium	little hop clover	TRDU
Trifolium microcephalum	maidenhead clover	
Trifolium variegatum	white-tipped clover	
Zeltnera muehlenbergii	Monterey Centaury	ZEMU

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 56

Date	4/26/2016, 9/20/2016
Surveying Personnel	Jami Davis, Shawn Wagoner, Chris Bronny

Vegetation Type	% Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
1	10	4%	MALE	20	MALE	5	MALE	20	MALE	8	MALE	15	MALE	2
			ELMA	50	ELMA	70	ELMA	20	ELMA	60	ELMA	20	ELMA	40
			BG	20	BG	20	BG	55	BG	22	BG	5	BG	1
			TH	10	TH	5	TH	5	TH	10	TH	60	TH	55
			TOTAL	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***98***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
2	10	6%	ELMA	85	ELMA	70	ELMA	60	ELMA	70	ELMA	60	ELMA	35
			DISP	10	DISP	5	DISP	15	DISP	10	DISP	20	DISP	25
			RUAC	1	TH	25	TH	20	TH	10	TH	15	TH	25
			BG	5			BG	5	BG	10	BG	5	BG	15
			TOTAL	***101***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***100***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
3	10	12%	ELMA	40	ELMA	50	ELMA	5	DISP	40	DISP	25	DISP	25
			DISP	30	DISP	20	JUPH	50	JUPH	25	JUPH	45	JUPH	25
			JUPH	10	RUCR	2	DISP	25	ELMA	5	ELMA	1	ELMA	20
			TH	20	TH	25	TH	20	TH	30	TH	30	TH	30
							BG	2						
			TOTAL	***100***	***TOTAL***	***97***	***TOTAL***	***102***	***TOTAL***	***100***	***TOTAL***	***101***	***TOTAL***	***100***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
4	10	50%	POMO	20	STAJ	30	ELMA	1	POMO	10	STAJ	25	STAJ	3
			STAJ	20	POMO	5	DISP	2	JUPH	60	POMO	20	POMO	20
			ELMA	5	JUPH	60	POMO	5	STAJ	5	DISP	5	ERAR	5
			DISP	15	DISP	2	STAJ	15	DISP	10	JUPH	50	LYHY	1
			JUPH	30	ELMA	3	JUPH	60	TH	15	ELMA	2	JUPH	60
			TH	10	TH	10	TH	20			TH	5	DISP	1
													ELMA	2
													TH	10
			TOTAL	***100***	***TOTAL***	***110***	***TOTAL***	***103***	***TOTAL***	***100***	***TOTAL***	***107***	***TOTAL***	***102***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
5	10	22%	JUPH	35	JUPH	55	JUPH	60	JUPH	40	JUPH	30	JUPH	50
			MALE	10	MALE	5	MALE	3	ERAR	2	MALE	10	DISP	7
			ERAR	2	ISCE	10	POMO	1	MALE	10	ERAR	3	MALE	10
			BG	35	ERAR	3	LYHY	1	LYHY	1	ISCE	15	ISHO	15
			TH	10	BG	20	ERAR	4	ISHO	5	DISP	1	ERAR	5
			ISCE	5	TH	5	ISCE	15	POMO	1	LYHY	1	LYHY	1
			ISHO	5	ISHO	1	TH	15	BG	35	ISHO	7	TH	3
			LYHY	1	LYHY	1	BG	2	TH	5	TH	15	BG	7
											BG	15		
			TOTAL	*103*	*TOTAL*	*100*	*TOTAL*	*101*	*TOTAL*	*99*	*TOTAL*	*97*	*TOTAL*	*98*

Complete Species List

Scientific Name	Common Name	Species Code
Achillea millefolium	common yarrow	
Avena barbata	slender oat	
Baccharis pilularis	coyote bush	
Briza maxima	rattlesnake grass	
Briza minor	small quaking-grass	
Brodiaea terrestris ssp. terrestris	dwarf brodiaea	
Bromus diandrus	ripgut brome	
Bromus hordeaceus	soft chess	
Calochortus splendens	splendid mariposa lily	
Castilleja sp.		
Danthonia californica	California oatgrass	
Diplacus aurantiacus	sticky monkeyflower	
Distichlis spicata	salt grass	DISP
Eleocharis macrostachya	pale spikerush	
Elymus glaucus	blue wild-rye	
Erodium botrys	long-beaked filaree	
Erodium cicutarium	red-stemmed filaree	
Eryngium armatum	coyote thistle	ERAR
Festuca myuros	rattail sixweek fescue	
Festuca perennis	Italian rye grass	FEPE
Horkelia cuneata	wedge-leaved horkelia	
Hypochaeris glabra	smooth cat's-ear	
Isoetes howellii	Howell's quillwort	ISHO
Isolepis carinata	keeled bulrush	
Isolepis cernua	low bulrush	ISCE
Juncus bufonius	common toad rush	
Juncus phaeocephalus	brown-headed rush	JUPH
Luzula comosa	Pacific woodrush	
Lythrum hyssopifolia	grass poly	LYHY
Malvella leprosa	alkali mallow	MALE
Microseris paludosa	marsh microseris	
Plagiobothrys chorisianus hickmanii	Hickman's popcorn flower	
Polypogon monspeliensis	Rabbit-foot grass	POMO
Ranunculus californicus	common buttercup	
Rumex acetosella	sheep sorrel	
Rumex crispus	curly dock	RUCR
Sidalcea malviflora	checkerbloom	
Stachys ajugoides	bugle hedge-nettle	STAJ
Stipa cernua	nodding needlegrass	
Taraxia ovata	suncups	
Triglochin scilloides	flowering quillwort	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 101 West

Date	5/5/16, 5/16/16, 5/25/16, 6/13/16
Surveying Personnel	Jami Davis, Patric Krabacher, Josh Harwayne, Kayti Christianson, Chris Bronny

Vegetation Type	% Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

5/16/16: pond dry, no soil saturation at surface - bare areas present at deepest portion
5/25/16: bare areas identified on 5/16/16 observed to have vegetation beginning to germinate throughout - decision made to wait to survey until plants are more developed
6/13/16: bare areas determined to be the same suite of species as strata 1 identified on 5/16/16

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
1	10m	56%	RUCR	5	RUCR	2	POMO	5	ROCU	2	HECU	5	POMO	2
			PLCHh	55	PLCHh	65	EUOC	15	EUOC	5	PLCHh	15	HECU	15
			ELMA	20	LAGL	10	PLCHh	35	PLCHh	15	ROCU	10	ELMA	10
			POMO	1	LYHY	2	RUCR	1	ELMA	2	POMO	2	RUCR	2
			LAGL	5	GAPU	5	ROCU	2	HECU	1	GAPU	2	ROCU	1
			BG	10	ELMA	10	HECU	2	LAGL	10	PLCO	2	LAGL	40
			TH	5	EUOC	2	COCO	2	TH	65	ELMA	5	PLCHh	10
					TH	10	LAGL	25			LAGL	25	TH	25
							TH	15			COCO	2		
											SOAS	1		
											TH	5		
											BG	20		
			TOTAL	***101***	***TOTAL***	***106***	***TOTAL***	***102***	***TOTAL***	***100***	***TOTAL***	***94***	***TOTAL***	***105***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
2	10m	44%	PLCO	35	PLCO	25	FEPE	40	FEPE	30	FEPE	30	MASA	1
			JUPH	35	FEPE	55	DISP	8	HOBR	10	HOBR	30	LYHY	10
			FEPE	3	RUCR	1	PLCO	4	DISP	3	RUCR	3	POMO	1
			DISP	4	PLCHh	1	HOBR	1	RUCR	1	DISP	15	BRMI	1
			LYHY	1	FEMY	1	HYGL	2	LYHY	1	LYHY	1	RUAC	3
			FEMY	1	POMO	1	PLCHh	1	PLCO	1	TH	15	HOBR	45
			PLCHh	1	DISP	3	TH	40	TH	50			FEPE	2
			ELMA	10	LYHY	1							PLCHh	1
			TH	15	BRMI	1							TH	35
					JUBUo	1								
					TH	10								
			TOTAL	***105***	***TOTAL***	***100***	***TOTAL***	***96***	***TOTAL***	***96***	***TOTAL***	***94***	***TOTAL***	***99***

Complete Species List

Scientific Name	Common Name	Species Code
Avena barbata	slender oat	
Briza maxima	rattlesnake grass	
Briza minor	small quaking-grass	BRMI
Bromus hordeaceus	soft chess	
Cotula coronopifolia	brass buttons	COCO
Cyperus eragrostis	tall cyperus (nut sedge)	
Danthonia californica	California oatgrass	
Distichlis spicata	salt grass	DISP
Eleocharis macrostachya	pale spike-rush	ELMA
Euthamia occidentalis	grass-leaved western goldenrod	EUOC
Festuca myuros	rattail sixweek fescue	FEMY
Festuca perenne	Italian rye grass	FEPE
Galium aparine	goose grass	
Gamochaeta ustulata	purple cudweed	GAUS
Geranium dissectum	cut-leaved geranium	
Heliotropium curassavicum	Chinese pusley	HECU
Hordeum brachyantherum	meadow barley	HOBR
Hypochaeris glabra	smooth cat's-ear	
Isolepis cernua	low bulrush	
Juncus bufonius var. bufonius	common toad rush	
Juncus bufonius var. occidentalis	round-fruited toad rush	JUBUo
Juncus phaeocephalus	brown-headed rush	
Lasthenia glaberrima	smooth lasthenia (rayless goldfield)	LAGL
Lysimachia arvensis	scarlet pimpernel	
Lythrum hyssopifolia	grass poly	LYHY
Madia sativa	coast tarweed	MASA
Melilotus indica	small melilot	
Plagiobothrys chorisianus hickmanii	Hickman's popcorn flower	PLCHh
Plantago coronopus	cut-leaved plantain	PLCO
Polypogon monspeliensis	Rabbit-foot grass	POMO
Rorippa curvisiliqua	western yellow cress	
Rumex acetosella	sheep sorrel	
Rumex crispus	curly dock	RUCR
Rumex salicifolius	willow dock	
Silene gallica	windmill pink	
Sonchus asper	prickly sow-thistle	SOAS
Toxicodendron diversilobum	poison oak	
Trifolium barbarum	bearded clover	
Trifolium dubium	little hop clover	
Trifolium variegatum	white-tipped clover	
Triglochin scilloides	flowering quillwort	
Vicia sativa	spring vetch	
	silver sheath knotweed	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 101 East (West)

Date	5/5/16, 7/19/16
Surveying Personnel	Jami Davis, Shaelyn Hession, Kayti Christianson

Vegetation Type	% Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

7/19/16: Pond dry, no soil saturation at surface.

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
1	10m	13%	MALE	5	ALSA	1	ALSA	1	POAV	10	ELMA	10	ELMA	5
			GAUS	70	POAV	8	POAV	5	ROCU	15	ROCU	10	GAUS	20
			POAV	5	MALE	3	ELMA	1	GAUS	35	MALE	20	MALE	5
			ROCU	5	GAUS	60	POMO	1	MALE	10	GAUS	30	ROCU	5
			ISHO	3	ROCU	1	ROCU	3	ELMA	1	TRSC	3	ISHO	5
			ELMA	2	TH	2	GAUS	35	BG	30	POAV	3	POAV	5
			BG	7	BG	25	BG	55	TH	1	BG	20	LYHY	1
			TH	2			TH	1			TH	5	HECU	1
													TH	20
													BG	40
			TOTAL	***99***	***TOTAL***	***100***	***TOTAL***	***102***	***TOTAL***	***102***	***TOTAL***	***101***	***TOTAL***	***107***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
2	10m	37%	ELMA	80	RUCR	5	ELMA	55	ELMA	70	ELMA	65	ELMA	20
			TH	20	ELMA	40	MALE	10	TH	20	LYHY	5	GAUS	1
					TH	35	RUCR	5	BG	10	MALE	5	ISHO	5
					BG	20	TH	30			RUCR	5	POAV	1
							BG	5			TH	2	ROCU	1
											BG	15	TH	10
											ROCU	1	BG	65
											POAV	2		
			TOTAL	***100***	***TOTAL***	***100***	***TOTAL***	***105***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***103***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
3	10m	12%	HYGL	3	LYHY	2	LYHY	5	HYGL	3	DISP	30	HECU	6
			PLCHh	1	FEPE	10	GAUS	5	LYHY	1	FEPE	5	LYHY	5
			LYHY	3	GAUS	1	POMO	1	ELMA	8	STAJ	2	FEPE	15
			GAUS	2	HYGL	1	DISP	25	HECU	10	HECU	8	SOAS	1
			MALE	3	ISHO	60	SOAS	1	GAUS	2	GAUS	2	GAUS	1
			FEPE	1	BG	25	FEPE	1	ISHO	70	LYHY	3	AGAV	2
			ISHO	30			BG	30	BG	5	BG	5	ISHO	65
			POMO	1			ISHO	30	AGAV	2	TH	45	unknown grass 2	1
			ERAR	8									DISP	1
			BG	50									BG	5
			TOTAL	***102***	***TOTAL***	***99***	***TOTAL***	***98***	***TOTAL***	***101***	***TOTAL***	***100***	***TOTAL***	***102***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
4	10m	22%	BAPI	3	LYHY	2	BRHO	1	DISP	40	HECU	5	HYGL	1
			LYHY	30	MASA	15	LYHY	5	MASA	40	MASA	20	MASA	40
			MASA	12	DISP	55	MASA	30	HECU	3	LYHY	15	DISP	1
			FEMY	5	FEPE	10	DISP	25	LYHY	2	DISP	50	JUBUb	20
			DISP	5	GAUS	1	DACA	1	TH	15	BRMI	1	LYHY	30
			BRHO	10	FEMY	1	FEMY	1			TH	5	TH	1
			HECU	5	BRHO	1	TH	32			BG	5	BH	10
			JUBUb	2	TH	18	BG	5						
			BRDI	1	BG	2								
			TH	15										
			BG	10										
			TOTAL	***98***	***TOTAL***	***105***	***TOTAL***	***100***	***TOTAL***	***100***	***TOTAL***	***101***	***TOTAL***	***103***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
5	10m	15%	FEPE	70	FEPE	80	MALE	3	LYHY	1	FEPE	45	BRMI	2
			LYHY	3	MALE	12	FEPE	95	MALE	1	FEMY	45	FEPE	50
			MALE	15	BG	10	FEMY	5	FEPE	78	BG	2	FEMY	35
			FEMY	15	MAGR	1			FEMY	15	TH	10	BG	15
									BRMI	1			LYHY	1
									BG	5				
			TOTAL	***103***	***TOTAL***	***103***	***TOTAL***	***103***	***TOTAL***	***101***	***TOTAL***	***102***	***TOTAL***	***103***

Complete Species List

Scientific Name	Common Name	Species Code
Agrostis avenacea	pacific bent grass	AGAV
Aira caryophyllea	silvery hair-grass	
Alopecurus saccatus	Pacific foxtail	ALSA
Avena barbata	slender oat	
Baccharis pilularis	coyote bush	
Briza maxima	rattlesnake grass	
Briza minor	small quaking-grass	
Bromus diandrus	ripgut grass	
Bromus hordeaceus	soft chess	BRHO
Callitriche heterophylla var. bolanderi	Bolander's water starwort	
Cotula coronopifolia	brass buttons	
Cyperus eragrostis	tall cyperus (nut sedge)	
Danthonia californica	California oatgrass	DACA
Distichlis spicata	salt grass	DISP
Eleocharis macrostachya	pale spike-rush	ELMA
Erodium cicutarium	red-stemmed filaree	
Eryngium armatum	coyote thistle	ERAR
Euthamia occidentalis	western goldenrod	
Festuca myuros	rattail sixweek fescue	
Festuca perennis	Italian rye grass	
Gamochaeta ustulata	purple cudweed	GAUS
Geranium dissectum	cut-leaved geranium	
Heliotropium curassavicum	Chinese pusley	HECU
Hordeum brachyantherum	meadow barley	
Hypochaeris glabra	smooth cat's-ear	HYGL
Hypochaeris glabra	smooth cat's-ear	
Isoetes howellii	Howell's quillwort	ISHO
Juncus balticus	Baltic rush	
Juncus bufonius var. bufonius	common toad rush	
Juncus patens	spreading rush	
Lupinus arboreus	yellow bush lupine	
Lupinus bicolor	miniature lupine	
Lupinus nanus	sky lupine	
Lysimachia arvensis	scarlet pimpernel	
Lythrum hyssopifolia	grass poly	LYHY
Madia sativa	coast tarweed	MASA
Malvella leprosa	alkali mallow	MALE
Petunia parviflora	wild petunia	
Phalaris lemmonii	Lemmon's canary-grass	
Plagiobothrys chorisianus hickmanii	Hickman's popcorn flower	PLCHh
Plantago coronopus	cut-leaved plantain	
Plantago lanceolata	English plantain	
Polygonum aviculare ssp. depressum	common knotweed	POAV
Polypogon monspeliensis	rabbit-foot grass	POMO
Rorippa curvisiliqua	western yellowcress	ROCU
Rumex acetosella	sheep sorrel	
Rumex crispus	curly dock	
Rumex salicifolia	willow dock	
Salix lasiolepis	Arroyo willow	
Sonchus asper	prickly sow-thistle	SOAS
Stachys ajugoides	bugle hedge-nettle	
Trifolium angustifolium	narrow-leaved clover	
Trifolium barbarum	bearded clover	
Trifolium depauperatum	cowbag clover	
Trifolium dubium	little hop clover	
Trifolium microcephalum	maidenheaded clover	
Trifolium variegatum	white-tipped clover	
Triglochin scilloides	flowering quillwort	TRSC
Vicia sativa	spring vetch	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

POND 101 East (East)

Date	5/5/16, 7/19/16
Surveying Personnel	Jami Davis, Shaelyn Hession, Kayti Christianson

Vegetation Type	%Cover	Species	Notes
Emergent Vegetation	0		
Floating Vegetation	0		
Submerged Vegetation	0		
Open Water	0		

Notes

7/19/16: Pond dry, no soil saturation at surface.

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3	
			Species	%	Species	%	Species	%
1	5m	0.4%	MALE	2	MALE	15	RUCR	2
			JUME	5	JUME	20	JUME	2
			ALSA	1	RUCR	5	ELMA	8
			RUCR	1	ALSA	1	ALSA	2
			GAUS	1	TH	5	MALE	3
			ROCU	1	BG	55	BG	85
			TH	5				
			BG	85				
			TOTAL	***101***	***TOTAL***	***101***	***TOTAL***	***102***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
2	10m	48%	ELMA	85	ELMA	70	ELMA	98	ELMA	85	POMO	7	ELMA	75
			TH	10	RUCR	5	TH	2	MALE	1	ELMA	98	MALE	2
			BG	5	MALE	2			TH	10	MALE	7	BG	20
					BG	20			BG	5			TH	5
					TH	5								
			TOTAL	***100***	***TOTAL***	***102***	***TOTAL***	***100***	***TOTAL***	***101***	***TOTAL***	***112***	***TOTAL***	***102***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
3	10m	44%	MALE	12	RUAC	4	AGAV	2	SOAS	5	BRDI	15	RUAC	3
			RUAC	5	MALE	20	RUAC	2	RUAC	3	RUAC	3	PSLU	4
			BRDI	2	LYHY	1	ELMA	5	BRDI	25	MALE	20	MALE	18
			ELMA	40	ELMA	15	MALE	40	MALE	15	SOAS	2	BRDI	3
			ROCU	1	TH	60	SOAS	1	TH	55	ROCU	2	ELMA	1
			HYGL	2	BG	1	TH	50			LYHY	1	SOAS	2
			TH	32							TH	55	TH	70
			BG	5										
			TOTAL	***99***	***TOTAL***	***101***	***TOTAL***	***100***	***TOTAL***	***103***	***TOTAL***	***98***	***TOTAL***	***101***

Transect #	Transect Length	Relative % Cover of Wetland	Quadrat #1		Quadrat #2		Quadrat #3		Quadrat #4		Quadrat #5		Quadrat #6	
			Species	%	Species	%	Species	%	Species	%	Species	%	Species	%
4	10m	8%	LYHY	5	JUBA	40	PSLU	5	LYHY	5	LYHY	15	RUSA	2
			GAUS	18	LYHY	1	MASA	10	MALE	2	ROCU	2	JUBA	70
			RUSA	3	MALE	1	JUBA	30	RUSA	10	JUBA	25	TH	30
			JUBA	45	TH	40	LYHY	1	JUBA	60	RUSA	15	LYHY	1
			TH	20	BG	15	MALE	1	TH	25	GAUS	20	PSLU	1
			BG	10	MASA	2	BG	25			MASA	2	MASA	1
					GAUS	1	TH	30			SOAS	2		
											BG	5		
											TH	15		
			TOTAL	***101***	***TOTAL***	***100***	***TOTAL***	***102***	***TOTAL***	***102***	***TOTAL***	***101***	***TOTAL***	***105***

Complete Species List

Scientific Name	Common Name	Species Code
Acmispon americanus	Spanish lotus	
Agrostis avenacea	Pacific Islands Bent Grass	AGAV
Avena barbata	slender wild oat	
Baccharis pilularis	coyote bush	
Bromus diandrus	ripgut brome	BRDI
Bromus carinatus	California brome	
Bromus hordeaceus	soft chess	
Callitriche heterophylla var. bolanderi	Bolander's water starwort	
Cirsium vulgare	bull thistle	
Festuca perenne	Italian rye grass	
Eleocharis macrostachya	pale spike rush	ELMA
Erechtites glomeratus	cut-leaved fireweed	
Erodium cicutarium	red-stemmed filaree	
Euthamia occidentalis	western goldenrod	
Festuca myuros	rattail sixweek fescue	
Gamochaeta ustulata	purple cudweed	GAUS
Geranium dissectum	cut-leaved geranium	
Heliotropium curassavicum	Chinese pusley	
Hordeum brachyantherum	meadow barley	
Hypochaeris glabra	smooth cat's-ear	HYGL
Hypochaeris radicata	hairy cat's-ear	
Juncus bufonius var. bufonius	common toad rush	
Juncus falcatus	sickle-leaved rush	JUFA
Juncus mexicanus	Mexican rush	JUME
Juncus phaeocephalus	brown-headed rush	
Lythrum hyssopifolia	grass poly	LYHY
Madia sativa	coast tarweed	MASA
Malvella leprosa	alkali mallow	MALE
Polypogon monspeliensis	rabbit-foot grass	POMO
Pseudognaphalium luteoalbum	weedy cudweed	PSLU
Pseudognaphalium sp.	cudweed	
Rorippa curvisiliqua	western yellowcress	ROCU
Rumex acetosella	sheep sorrel	RUAC
Rumex crispus	curly dock	RUCR
Rumex salicifolius	willow-leaved dock	RUSA
Sonchus asper	prickly sow-thistle	SOAS
Triglochin scilloides	flowering quillwort	

Groundcover Codes	
BG	Bare Ground
TH	Thatch/Duff/Algae
BR	Bryophytes

APPENDIX C

Strata Cover by Pond

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POND 3S			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	20%	JUPH	0.3
		MALE	0.3
		CRAQ	0.5
		DISP	0.5
		POMO	2.8
		PLCHh	3.0
		BG	20.0
		TH	20.8
		ERAR	24.2
		ELMA	25.8
		TOTAL	**98.3**
2	38%	JUPH	45.0
		LYHY	11.0
		JUBUb	9.2
		FEPE	7.5
		FEMY	6.8
		POMO	4.0
		MALE	3.2
		BG	2.8
		BRMI	2.5
		TH	2.0
		BRTEt	0.3
		DACA	0.3
		CAAM	0.3
		Juncus sp.	0.3
		PLCHh	0.2
		TOTAL	**95.5**

POND 3S			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
3	35%	BRHO	0.2
		BRMI	0.2
		JUCA	0.3
		ZEDA	0.3
		HYGL	0.5
		MAGR	0.7
		TRAN	1.0
		TH	1.7
		CAAM	2.5
		LYAR	3.3
		ALSA	4.0
		JUPH	5.2
		AICA	5.8
		FEMY	6.8
		LYHY	7.0
		PLCO	7.5
		ERAR	7.8
		BG	11.7
		DACA	14.2
		JUBUb	18.3
		TOTAL	**99.0**
4	5%	MAEX	0.3
		PSTE	0.2
		LYAR	0.3
		GEDI	0.3
		HYGL	0.8
		LYHY	1.5
		BRMI	1.7
		BG	1.7
		MALE	3.2
		JUPH	4.2
		MAGR	5.8
		FEMY	6.7
		FEPE	70.0
		TOTAL	**96.7**
Upland	2%	N/A	N/A

POND 5			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	26%	ELMA	78.3
		TH	21.7
		Total	**100.0**
2	32%	ELMA	29.2
		DISP	31.7
		TH	36.7
		MALE	1.5
		CRTR	0.7
		Total	**99.7**
3	38%	ELMA	13.2
		JUPH	1.3
		CRTR	16.7
		ISHO	49.5
		TH	17.2
		DISP	2.7
		MALE	0.3
		STAJ	1.0
		Total	**101.8**
4	4%	DISP	N/A
		FEPE	N/A
		BRMA	N/A
		RUCR	N/A
		BAPI	N/A
		BRMI	N/A
		AICA	N/A
		RUAC	N/A
		MAGR	N/A

POND 8			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	40%	FEPE	0.3
		MALE	6.3
		LAGL	24.2
		PLCHh	5.0
		ELMA	40.0
		HOBR	0.8
		TH	23.3
		Total	**100.0**
2	60%	RUCR	0.5
		HOBR	1.3
		STAJ	10.5
		ELMA	32.5
		FEPE	36.7
		PLCHh	0.8
		GEDI	0.3
		TH	11.7
		MALE	0.3
		LAGL	4.8
		Total	**99.5**
Adjacent Wetland	N/A	CYER	1.3
		JUBUb	1.5
		JUPH	0.8
		Poaceae sp.	0.7
		unknown 1	0.2
		BG	93.2
		TH	1.7
		DISP	0.3
		PLCHh	0.2
		JUBA	0.2
		Total	**100.0**

POND 10			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	24%	Cattail	50.0
		Water/BG	40.0
		ELMA	10.0
		Total	**100.0**
2	3%	Bulrush	90.0
		BG	5.0
		ELMA	5.0
		Total	**100.0**
3	55%	ELMA	95.5
		DISP	4.2
		JUPH	0.5
		Total	**100.2**
4	8%	STAJ	8.2
		JUPH	38.3
		DISP	20.8
		EUOC	8.8
		ELMA	8.8
		PLCO	3.0
		POMO	0.7
		PSLU	1.7
		HYGL	1.3
		RUAC	0.8
		LYAR	2.0
		LYHY	0.3
		TH	5.8
		Vicia sp.	0.2
		Total	**100.8**
5	4%	MASA	15.7
		MAEL	0.7
		LYAR	15.0
		LYHY	5.3
		AVBA	0.7
		JUBA	28.3
		TH	21.7
		ACAM	3.3
		HEGR	8.3
		COCA	0.7
		Total	**99.7**
Upland	6%	N/A	N/A

POND 14			
Stratum	**Relative %Cover of Wetland**	**Species**	**% Cover**
1	16%	ELMA	47.5
		BG	52.5
		Total	**100.0**
2	8%	PHLE	4.3
		ELMA	40.0
		ELTR	1.7
		AL	43.3
		MALE	2.0
		TH	8.3
		unknown 1	0.3
		Total	**100.0**
3	37%	JUPH	41.7
		GEDI	0.5
		ELTR	8.3
		BRTEt	0.2
		BRHO	0.7
		TH	45.0
		HYGL	0.2
		AL	1.7
		AICA	0.2
		PLCHh	0.2
		BRMI	0.2
		RACA	0.2
		BG	0.8
		Total	**99.7**
4	38%	FEPE	68.0
		MALE	8.8
		BRTEt	1.5
		JUPH	0.2
		BRHO	1.0
		TH	18.3
		ELTR	1.3
		HOBR	0.2
		BRMI	0.2
		unknown 1	0.2
		HYGL	0.2
		CHPO	0.5
		Total	**100.3**

POND 18			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	19%	ELMA	85
		BG	13
		TH	1
		TRSC	1
		Total	**100**
2	22%	ELMA	19
		ELTR	28
		TH	44
		BG	7
		Total	**98**
3	43%	RUPU	19
		ERAR	18
		ELTR	1
		BG	5
		TH	24
		LYHY	12
		ISHO	11
		PLCHh	1
		FEMY	1
		BRMA	0
		BRHO	0
		BRMI	1
		JUBUb	4
		HECU	1
		ELMA	3
		ISCE	2
		TODI	0
		RUAC	0
		Total	**102**

POND 18			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
4	15%	LYHY	3
		MAGR	1
		ACAM	2
		BRMA	22
		JUBUb	24
		BRMI	1
		PLCO	17
		FEMY	1
		TH	23
		AICA	1
		RUAC	1
		BRHO	1
		AVBA	1
		SIGA	0
		LYAR	0
		BG	2
		Total	**99**
Upland	1%		

POND 30A			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	62%	RUCR	2.0
		ELMA	64.2
		TH	28.3
		BG	5.0
		MALE	0.3
		POMO	0.2
		Total	**100.0**
2	2%	BADO	16.7
		ELMA	6.7
		CYER	0.7
		POMO	0.3
		SCCA	10.0
		TH	55.0
		BG	11.7
		Total	**101.0**
3	37%	JUBA	60.0
		RUCR	0.3
		LYHY	0.3
		ELMA	2.3
		ACAM	0.3
		TH	28.3
		LYAR	0.3
		BRHO	0.7
		RUTR	1.0
		FEMY	0.7
		unk comp 2	0.3
		JUPH	5.0
		Total	**99.7**

POND 30B			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	28%	POMO	7.0
		JUBA	18.3
		LYHY	0.7
		ELMA	21.7
		ISCE	0.7
		TH	13.3
		BG	40.0
		Total	**101.7**
2	72%	POMO	50.0
		JUBUb	1.0
		LYHY	1.0
		HYRA	1.3
		PLCO	0.3
		TH	21.7
		BG	25.0
		SALA	0.3
		JUPH	0.7
		Total	**101.3**

POND 30C			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	20%	ELMA	22.3
		ISHO	5.0
		ISCE	1.3
		CAHEb	11.0
		BG	43.3
		TH	15.7
		DISP	1.3
		TRSC	0.3
		Total	**100.3**
2	80%	JUPH	31.7
		PLCO	1.7
		POMO	11.0
		DISP	0.7
		LYHY	1.0
		HECU	0.3
		HYGL	0.7
		TH	26.7
		BG	15.7
		ISHO	9.3
		unk 1	0.7
		CYER	0.3
		LYAR	0.3
		CAHEb	0.7
		ISCE	0.3
		Total	**101.0**

POND 35			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	28%	PLCO	37.5
		PLCHh	35.8
		LYHY	1.8
		TH	20.8
		ELMA	3.5
		PSTE	0.5
		COCO	0.7
		GAUS	0.5
		HYGL	0.3
		DEDA	0.2
		Total	**101.7**
2	39%	LYHY	0.5
		PLCO	21.7
		TH	45.0
		BG	32.5
		PSTE	0.7
		DEDA	0.2
		Total	**100.5**
3	33%	HOMUg	3.0
		PLCO	8.0
		DEDA	9.7
		PLCHh	0.2
		TH	45.0
		LYHY	0.2
		HOBR	30.0
		BG	3.3
		FEPE	1.3
		PSTE	0.2
		Total	**100.8**

POND 39			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	5%	JUPH	5.0
		PLCHh	1.7
		ISCE	22.0
		TH	13.0
		ERAR	0.3
		ELMA	30.0
		TRSC	8.3
		BG	21.7
		Total	**102.0**
2	8%	FEPE	12.0
		LYHY	6.0
		BRTEt	0.7
		PLCO	1.7
		HOMAg	2.3
		TH	23.3
		BG	11.7
		ERAR	25.0
		JUPH	11.7
		DEDA	1.0
		JUBUb	0.7
		Total	**96.0**
3	87%	FEPE	13.3
		BRHO	2.2
		STCE	1.0
		HYGL	4.3
		uknown comp	18.5
		Vicia sp.	0.7
		ERBO	0.2
		TH	38.3
		AVBA	0.2
		LYAR	0.2
		Trifolium sp.	0.3
		BG	1.7
		JUOC	3.0
		PLCO	9.5
		BAPI	0.3
		GEDI	0.7
		BRMI	0.5
		DACA	0.2
		AICA	0.7
		TRAN	3.3
		BRTEt	0.5
		TRIX	0.2
		Total	**99.7**

POND 40S			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	9%	PLCO	11.7
		PLCHh	13.3
		LYHY	0.3
		ELMA	26.7
		JUBUb	0.3
		BG	25.0
		TH	23.3
		Total	**100.7**
2	26%	JUPH	33.3
		ERBO	8.3
		FEMY	12.3
		AICA	0.7
		BRMI	1.3
		PLCO	7.3
		VISA	0.3
		TH	30.0
		TRAN	0.3
		BRHO	1.3
		HYGL	1.7
		BG	3.3
		LYHY	0.3
		Total	**100.7**
3	65%	FEPE	52.5
		JUPH	3.0
		BRTEt	0.3
		GEDI	1.2
		unknown comp	1.2
		VISA	1.3
		TH	27.0
		PLCO	4.2
		HYGL	0.2
		FEMY	3.5
		RUAC	2.8
		BRHO	2.0
		BRDI	1.3
		Total	**100.5**

POND 41			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	29%	LAGL	25.0
		MALE	9.2
		ELMA	16.2
		TH	28.3
		BG	3.3
		PLCHh	6.7
		ISHO	9.2
		POMO	0.5
		STAJ	1.0
		Total	**99.3**
2	52%	PLCHh	17.7
		STAJ	31.7
		ELMA	12.5
		ISHO	7.5
		LAGL	0.5
		TH	18.2
		MALE	11.7
		POMO	1.7
		Total	**101.3**
3	27%	ERAR	9.8
		JUPH	42.5
		MALE	6.5
		TH	25.0
		STAJ	0.7
		BG	10.0
		RUCR	0.3
		HYGL	0.5
		ERMO	2.5
		BRHO	0.3
		LYHY	0.2
		FEMY	0.2
		MASA	0.7
		Total	**99.2**
Upland	3%	N/A	N/A

POND 101 West			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	56%	RUCR	1.7
		PLCHh	32.5
		ELMA	7.8
		POMO	1.7
		LAGL	19.2
		BG	5.0
		TH	20.8
		LYHY	0.3
		GAUS	1.2
		EUOC	3.7
		ROCU	2.5
		HECU	3.8
		COCO	0.7
		PLCO	0.3
		SOAS	0.2
		Total	**101.3**
2	44%	PLCO	10.8
		JUPH	5.8
		FEPE	26.7
		DISP	5.5
		LYHY	2.3
		FEMY	0.3
		PLCHh	0.7
		ELMA	1.7
		TH	27.5
		RUCR	0.8
		POMO	0.3
		BRMI	0.3
		JUBUo	0.2
		HOBR	14.3
		HYGL	0.3
		MASA	0.2
		RUAC	0.5
		Total	**98.3**

POND 41			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	29%	LAGL	25.0
		MALE	9.2
		ELMA	16.2
		TH	28.3
		BG	3.3
		PLCHh	6.7
		ISHO	9.2
		POMO	0.5
		STAJ	1.0
		Total	**99.3**
2	52%	PLCHh	17.7
		STAJ	31.7
		ELMA	12.5
		ISHO	7.5
		LAGL	0.5
		TH	18.2
		MALE	11.7
		POMO	1.7
		Total	**101.3**
3	27%	ERAR	9.8
		JUPH	42.5
		MALE	6.5
		TH	25.0
		STAJ	0.7
		BG	10.0
		RUCR	0.3
		HYGL	0.5
		ERMO	2.5
		BRHO	0.3
		LYHY	0.2
		FEMY	0.2
		MASA	0.7
		Total	**99.2**
Upland	3%	N/A	N/A

POND 101 West			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	56%	RUCR	1.7
		PLCHh	32.5
		ELMA	7.8
		POMO	1.7
		LAGL	19.2
		BG	5.0
		TH	20.8
		LYHY	0.3
		GAUS	1.2
		EUOC	3.7
		ROCU	2.5
		HECU	3.8
		COCO	0.7
		PLCO	0.3
		SOAS	0.2
		Total	**101.3**
2	44%	PLCO	10.8
		JUPH	5.8
		FEPE	26.7
		DISP	5.5
		LYHY	2.3
		FEMY	0.3
		PLCHh	0.7
		ELMA	1.7
		TH	27.5
		RUCR	0.8
		POMO	0.3
		BRMI	0.3
		JUBUo	0.2
		HOBR	14.3
		HYGL	0.3
		MASA	0.2
		RUAC	0.5
		Total	**98.3**

POND 43			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	19%	POZI	14.2
		DEDA	3.2
		JUPH	5.5
		ERAR	7.7
		PLCHh	22.7
		POMO	6.2
		PSTE	1.2
		BG	14.2
		TH	23.3
		LYHY	0.2
		unk 1	0.2
		Total	**98.3**
2	50%	LYHY	10.0
		JUBUb	22.0
		PLCHh	1.0
		POMO	1.3
		MAGR	3.3
		POZI	2.3
		JUCA	2.7
		HYGL	1.7
		CACO	1.7
		FEMY	1.0
		DACA	1.3
		JUPH	17.0
		SIBE	0.7
		BRMI	0.3
		PSTE	1.0
		BG	6.7
		TH	13.3
		BAPI	5.0
		ERAR	5.7
		DEDA	0.3
		Total	**98.3**

POND 43			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
3	27%	AICA	2.3
		FEMY	3.7
		MAGR	33.3
		LYAR	2.7
		Acmispon sp.	12.3
		DACA	6.3
		JUPH	1.7
		LYHY	0.3
		JUBUb	2.0
		JUCA	0.3
		BG	18.3
		TH	18.3
		ZEDA	0.3
		BRMI	0.3
		CR	1.7
		HYGL	0.3
		Total	**104.3**
Upland	3%	N/A	N/A

POND 44			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	60%	BRTEt	1.0
		TRDU	0.7
		JUPH	3.3
		PSTE	2.5
		LYHY	3.0
		POMO	12.5
		ERAR	26.8
		JUBUb	7.2
		DACA	5.0
		ALSA	0.2
		AGLAv	1.5
		BG	13.3
		TH	6.7
		PLCHh	1.7
		BRHO	0.2
		BRMI	0.2
		POZI	1.7
		JUCA	0.3
		GEDI	0.2
		FEMY	0.3
		DEDA	3.8
		ELMA	9.2
		Total	**101.2**
2	17%	LYHY	7.3
		CACO	2.0
		PLCHh	0.3
		JUBUb	43.3
		POZI	3.3
		POMO	1.7
		JUCA	0.3
		MAEX	1.0
		ZEMU	1.0
		FEMY	3.0
		MAGR	0.3
		PSTE	2.7
		BG	26.7
		LYAR	0.7
		AICA	0.7
		CAAT	0.7
		BRMI	0.3
		ERAR	5.0
		Total	**100.3**

POND 44			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
3	7%	ACPA	1.0
		AICA	2.3
		BAPI	2.7
		BG	3.3
		BRDI	0.7
		BRHO	0.3
		BRMI	0.7
		BRTEt	0.3
		CACO	1.3
		DACA	8.3
		ERAR	3.3
		ERBO	5.3
		FEMY	5.3
		ALSA	0.3
		GEDI	0.7
		HYGL	1.7
		JUBUb	3.3
		JUOC	0.3
		LUCO	0.7
		PLCO	9.3
		TH	21.7
		TRDU	7.0
		unknown comp	23.3
		Total	**103.3**
Upland	16%	N/A	N/A

POND 101 East (west)			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	13%	MALE	7.2
		GAUS	41.7
		POAV	6.0
		ROCU	6.5
		ISHO	1.3
		ELMA	3.2
		BG	29.5
		TH	5.2
		ALSA	0.3
		POMO	0.2
		LYHY	0.2
		HECU	0.2
		TRSC	0.5
		Total	**101.8**
2	37%	ELMA	55.0
		TH	19.5
		RUCR	2.5
		BG	19.2
		MALE	2.5
		LYHY	0.8
		ROCU	0.3
		POAV	0.5
		GAUS	0.2
		ISHO	0.8
		Total	**101.3**
3	12%	HYGL	1.2
		PLCHh	0.2
		LYHY	3.2
		GAUS	2.2
		MALE	0.5
		FEPE	5.3
		ISHO	42.5
		POMO	0.3
		ERAR	1.3
		BG	20.0
		DISP	9.3
		SOAS	0.3
		HECU	4.0
		AGAV	0.7
		STAJ	0.3
		ALSA	0.2
		TH	7.5
		ELMA	1.3
		Total	**100.3**

POND 101 East (west)			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
4	22%	BAPI	0.5
		LYHY	14.0
		MASA	26.2
		FEMY	1.2
		DISP	29.3
		BRHO	2.0
		HECU	2.2
		JUBUb	3.7
		BRDI	0.2
		TH	14.3
		BG	5.3
		FEPE	1.7
		DACA	0.2
		GAUS	0.2
		BRMI	0.2
		HYGL	0.2
		Total	**101.2**
5	15%	FEPE	69.7
		LYHY	0.8
		MALE	5.2
		FEMY	19.2
		BG	5.3
		MAGR	0.2
		BRMI	0.5
		TH	1.7
		Total	**102.5**

POND 101 East (east)			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	0.4%	MALE	6.7
		JUME	9.0
		ALSA	1.3
		RUCR	2.7
		GAUS	0.3
		ROCU	0.3
		TH	3.3
		BG	75.0
		ELMA	2.7
		Total	**101.3**
2	48%	ELMA	85.2
		RUCR	0.8
		MALE	2.0
		BG	8.3
		TH	5.3
		POMO	1.2
		Total	**102.8**
3	44%	MALE	20.8
		RUAC	3.3
		BRDI	7.5
		ELMA	10.2
		ROCU	0.5
		HYGL	0.3
		TH	53.7
		BG	1.0
		LYHY	0.3
		AGAV	0.3
		SOAS	1.7
		PSLU	0.7
		Total	**100.3**
4	8%	LYHY	4.7
		GAUS	6.5
		RUSA	5.0
		JUBA	45.0
		TH	26.7
		BG	9.2
		MALE	0.7
		MASA	2.5
		PSLU	1.0
		ROCU	0.3
		SOAS	0.3
		Total	**101.8**

POND 56			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
1	4%	MALE	11.7
		ELMA	43.3
		BG	20.5
		TH	24.2
		Total	**99.7**
2	6%	ELMA	63.3
		DISP	14.2
		RUAC	0.2
		BG	6.7
		TH	15.8
		Total	**100.2**
3	12%	ELMA	20.2
		DISP	27.5
		JUPH	25.8
		TH	25.8
		RUCR	0.3
		BG	0.3
		Total	**100.0**
4	50%	POMO	13.3
		STAJ	16.3
		ELMA	2.2
		DISP	5.8
		JUPH	53.3
		TH	11.7
		ERAR	0.8
		LYHY	0.2
		Total	**103.7**
5	22%	JUPH	45.0
		MALE	8.0
		ERAR	3.2
		BG	19.0
		TH	8.8
		ISCE	5.0
		ISHO	5.5
		LYHY	1.0
		POMO	0.3
		DISP	1.3
		Total	**97.2**

POND 56			
Stratum	**Relative % Cover of Wetland**	**Species**	**% Cover**
6	3%	MALE	N/A
		BRMA	N/A
		FEPE	N/A
		BRHO	N/A
		LYHY	N/A
		PLCO	N/A
		STAJ	N/A
Upland	3%	N/A	N/A

APPENDIX D

Site Photos

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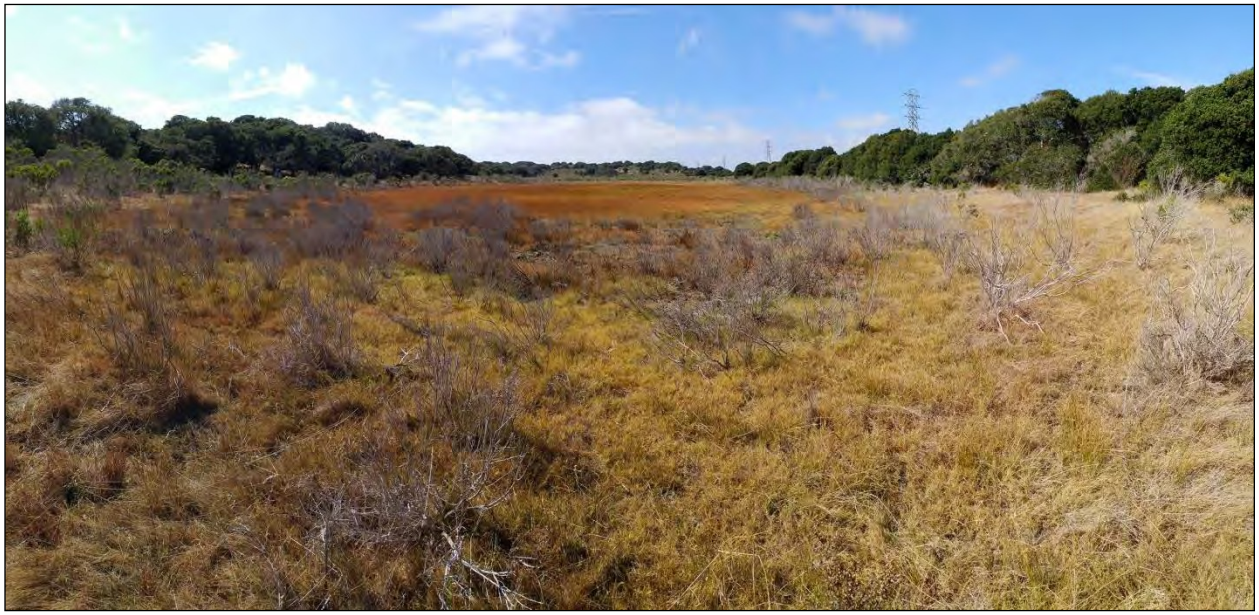
Pond 3 South: Photo Point 1 on 6-13-2016

Pond 3 South: Photo Point 2 on 6-13-2016

Pond 5: Photo Point 1 on 9-21-2016



Pond 5: Photo Point 2 on 9-21-2016

Pond 8: Photo Point 1 on 5-25-2016

Pond 8: Excavation Area Photo Point on 5-25-2016

Pond 10: Photo Point 1 on 9-20-2016

Pond 10: Photo Point 2 on 9-20-16-2016

Pond 14: Photo Point 1 on 5-25-2016

Pond 18: Photo Point 1 on 6-14-2016

Pond 18: Photo Point 2 on 6-14-2016

Pond 30A: Photo Point 1 on 6-14-

Pond 30B: Photo Point 1 on 6-14-2016

Pond 30C: Photo Point 1 on 6-14-

Pond 35: Photo Point 1 on 5-18-2016

Pond 35: Photo Point 2 on 5-18-16-2016

Pond 39: Photo Point 1 on 5-18-2016

Pond 39: Photo Point 2 on 5-18-2016

Pond 40 South: Photo Point 1 on 5-18-

Pond 40 South: Photo Point 2 on 5-18-2016

Pond 41: Photo Point 1 on 6-13-2016

Pond 41: Photo Point 2 on 6-13-2016

Pond 43: Photo Point 1 on 5-25-2016

Pond 43: Photo Point 2 on 5-25-16-2016

Pond 44: Photo Point 1 on 5-18-2016

Pond 56: Photo Point 1 on 9-20-2016

Pond 56: Photo Point 2 on 9-20-2016

Pond 101 East (West): Photo Point 1 on 7-19-2016

Pond 101 East (East): Photo Point 1 on 7-19-2016

Pond 3N: Photo Point 1 on 5-09-2016

Pond 3N: Photo Point 2 on 5-09-2016

Pond 60: Photo Point 1 on 7-07-2016

Pond 60: Photo Point 2 on 9-12-2016

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APPENDIX E

Historic Hydrology Monitoring Results for Reference and Remediated Ponds

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Table E-1. Historic Hydrology Results for Pond 5 (reference) on Former Fort Ord from 1993-2016

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity	Depth (cm)	Inundated Surface Area (acres)
1993-1994	3/29/1994	-	17.00	-	-	31	2.750
	4/13/1994	-	20.00	-	-	20	
1994-1995	1/11/1995	-	16.00	-	-	28	0.170
	1/26/1995	-	14.00	-	-	43	0.520
	2/10/1995	-	15.00	-	-	51	0.500
	2/24/1995	-	13.00	-	-	51	0.520
	3/10/1995	-		-	-	76	1.720
	3/24/1995	-	22.00	-	-	>100	6.890
1995-1996	1/3/1996	-	-	-	-	DRY	-
	1/18/1996	-	-	-	-	5	-
	1/31/1996	-	-	-	-	5	-
	2/14/1996	-	-	-	-	15	-
	2/29/1996	-	-	-	-	28	-
	3/14/1996	-	-	-	-	38	-
	3/28/1996	-	-	-	-	38	-
	4/11/1996	-	-	-	-	15	-
	4/25/1996	-	-	-	-	13	-
	5/9/1996	-	-	-	-	DRY	-
2006-2007	12/1/2006	-	-	-	-	0	-
	1/23/2007	-	-	-	-	0	-
	3/6/2007	7.2	-	-	5.1 (NTU)	17	1.58
2012-2013	11/26/2012	-	-	-	-	0	-
	12/19/2012	-	-	-	-	0	0.011
	1/22/2013	-	-	-	-	11	0.910
	2/25/2013	-	-	-	-	DRY	0
	3/15/2013	-	-	-	-	DRY	0
	4/12/2013	-	-	-	-	DRY	0
	5/10/2013	-	-	-	-	DRY	0
2013-2014	12/11/2013	-	-	-	-	DRY	0
	2/18/2014	-	-	-	-	DRY	0
	3/17/2014	-	-	-	-	DRY	0
	4/7/2014	-	-	-	-	DRY	0
	5/6/2014	-	-	-	-	DRY	0
	6/3/2014	-	-	-	-	DRY	0
2015-2016	4/5/2016	6.41	25.06	6.91	63.4 (FNU)	no gauge, ~100	5.325
	4/19/2016	6.51	20.27	5.73	23.8 (FNU)	no gauge, ~100	5.139
	5/9/2016	6.45	17.99	7.30	19.6 (FNU)	no gauge ~100	4.862
	6/8/2016	6.48	21.32	0.34	17.7 (FNU)	no gauge, ~80	4.437
	7/7/2016	6.37	23.01	6.65	83.2 (FNU)	no gauge, ~60	3.190
	8/10/2016	6.85	16.37	0.97	295.0 (FNU)	4	0.358
	9/12/2016	-	-	-	-	DRY	0

Table E-2. Historic Hydrology Results for Pond 8 (remediated) on Former Fort Ord from 1999-2016

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity	Depth (cm)	Inundated Surface Area (acres)
1999-2000	Jan	-	-	-	-	36	0.290
	Feb	-	-	-	-	76	0.870
	Mar	5.74	-	-	45.7 (NTU)	76	1.060
	June	-	-	-	-	DRY	0
2006-2007	Dec	-	-	-	-	DRY	0
	Jan	-	-	-	-	DRY	0
	Feb	-	-	-	-	DRY	0
	Mar	-	-	-	-	DRY	0
	Apr	-	-	-	-	DRY	0
	May	-	-	-	-	DRY	0
2009-2010	-	-	-	-	-	-	3.900
2012-2013	11/26/2012	-	-	-	-	DRY	0
	12/19/2012	-	-	-	-	8	0.000045
	1/22/2013	-	-	-	-	17	0.000229
	2/25/2013	-	-	-	-	DRY	0
	3/15/2013	-	-	-	-	DRY	0
	4/12/2013	-	-	-	-	DRY	0
	5/10/2013	-	-	-	-	DRY	0
2013-2014	12/11/2014	-	-	-	-	DRY	0
	2/18/2014	-	-	-	-	DRY	0
	3/17/2014	-	-	-	-	DRY	0
	4/7/2014	-	-	-	-	Damp	-
	5/6/2014	-	-	-	-	DRY	0
	6/3/2014	-	-	-	-	DRY	0
2015-2016	4/5/2016	7.11	13.88	1.97	8.3 (FNU)	62	0.062
	4/18/2016	7.12	15.28	1.51	12.5 (FNU)	22	0.041
	5/10/2016	7.47	16.55	1.55	55.9 (FNU)	12	0.020
	6/8/2016	-	-	-	-	DRY	0

Table E-3. Historic Hydrology Results for Pond 10 (remediated) on Former Fort Ord from 1998-2016

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity	Depth (cm)	Inundated Surface Area (acres)
1998-1997	Jun	7.45	-	-	3.5 inches (Secchi disk reading)	-	-
	Aug	-	-	-	-	-	5.600
2006-2007	Dec	-	-	-	-	-	-
	Jan	-	-	-	-	50	-
	Feb	-	-	-	-	-	-
	Mar	7.71	-	-	461.0 (NTU)	85	2.08
	Apr	-	-	-	-	-	-
	May	-	-	-	-	-	-
	Jun	-	-	-	-	-	-
2012-2013	11/26/2012	-	-	-	-	damp	0
	12/19/2012	-	-	-	-	54	2.060
	1/22/2013	-	-	-	-	66	4.990
	2/25/2013	7.07	9.72	9.82	642.0 (NTU)	64	4.860
	3/15/2013	7.04	16.50	8.98	633.0 (NTU)	60	4.430
	4/12/2013	-	-	-	-	51	1.900
	5/10/2013	-	-	-	-	40	1.530
2013-2014	12/11/2014	-	-	-	-	DRY	
	2/18/2014	-	-	-	-	4	0.050
	3/17/2014	-	-	-	-	47	1.770
	4/7/2014	6.6	22.00	9.30	378.0 (NTU)	53	2.030
	5/6/2014	-	-	-	-	41	1.060
	6/3/2014	-	-	-	-	29	1.330
2015-2016	4/5/2016	7.03	14.46	8.72	134.0 (FNU)	gauge submerged, ~100	6.196
	4/18/2016	6.91	16.24	5.56	100.0 (FNU)	no gauge visible, ~100 cm	5.916
	5/10/2016	7.00	16.85	3.90	89.6 (FNU)	no gauge visible, ~100 cm	5.805
	6/8/2016	7.13	21.18	5.69	47.0 (FNU)	no gauge visible, ~100 cm	5.628
	7/7/2016	7.3	18.23	6.66	61.5 (FNU)	84	5.270
	8/10/2016	8.29	18.71	5.44	398.0 (FNU)	58	3.033
	9/12/2016	7.35	18.40	0.51	410.0 (FNU)	54	1.704
	10/11/2016	7.48	15.32	2.40	118.0 (FNU)	34	1.392

Table E-4. Historic Hydrology Results for Pond 18 (formerly 50, remediated) on Former Fort Ord from 1998-2016

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity	Depth (cm)	Inundated Surface Area (acres)
1998-1999	Jan	-	-	-	-	DRY	0.000
	Feb	-	-	-	-	24	0.090
	Mar	6.50	-	-	10-50 (NTU)	31	0.202
	Apr	6.94	-	-	6.0 (NTU)	31	0.202
2014-2015	2/24/2015	-	-	-	-	>0	-
	3/18/2015	-	-	-	-	DRY	0.000
	4/16/2015	-	-	-	-	DRY	0.000
	5/28/2015	-	-	-	-	DRY	0.000
2015-2016	4/5/2016	6.36	13.88	0.50	111.0 (FNU)	38	0.265
	4/18/2016	6.50	18.14	0.85	178.0 (FNU)	36	0.180
	5/10/2016	6.26	15.46	1.20	155.0 (FNU)	34	0.125
	6/8/2016	6.05	20.80	4.36	34.1 (FNU)	9	0.006
	7/7/2016	-	-	-	-	DRY	0.000

Table E-5. Historic Hydrology Results for Pond 30 A (formerly pond 47, remediated) on Former Fort Ord from 1998-2016

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity	Depth (cm)	Inundated Surface Area (acres)
1998-1999	Jan	6.64	-	-	5.0 (NTU)	46	1.150
	Feb	-	-	-	-	51	1.290
	Mar	6.40	-	-	<5.0 (NTU)	53	3.573
	Apr	7.53	-	-	3.0 (NTU)	53	3.573
2006-2007	Dec	-	-	-	-	DRY	-
	Jan	-	-	-	-	DRY	-
	Feb	-	-	-	-	DRY	-
	Mar	-	-	-	-	DRY	-
	Apr	-	-	-	-	DRY	-
	May	-	-	-	-	DRY	-
	Jun	-	-	-	-	DRY	-
2009-2010	-	-	-	-	-	-	6.270
2012-2013	11/26/2012	-	-	-	-	DRY	-
	12/19/2012	-	-	-	-	DRY	-
	1/22/2013	-	-	-	-	DRY	-
	2/25/2013	-	-	-	-	DRY	-
	3/15/2013	-	-	-	-	DRY	-
	4/12/2013	-	-	-	-	DRY	-
2013-2014	5/10/2013	-	-	-	-	DRY	-
	12/11/2014	-	-	-	-	DRY	-
	2/18/2014	-	-	-	-	DRY	-
	3/17/2014	-	-	-	-	DRY	-
	4/7/2014	-	-	-	-	DRY	-
	5/6/2014	-	-	-	-	DRY	-
2014-2015	6/3/2014	-	-	-	-	DRY	-
	11/25/2014-12/5/2014	-	-	-	-	-	-
	12/22/2014-12/23/2014	-	-	-	-	-	-
	2/24/2015	-	-	-	-	22	-
	3/18/2015	-	-	-	-	DRY	0.000
	4/16/2015	-	-	-	-	DRY	0.000
	5/28/2015	-	-	-	-	DRY	0.000
2015-2016	4/5/2016	6.53	13.86	1.32	14.4 (FNU)	50	0.618
	4/18/2016	6.38	15.39	2.37	168.0 (FNU)	40	0.484
	5/10/2016	6.23	15.66	0.13	99.5 (FNU)	20	0.335
	6/8/2016	-	-	-	-	DRY	-

Table E-6. Historic Hydrology Results for Pond 30 B (remediated) on Former Fort Ord from 2012-2016

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity	Depth (cm)	Inundated Surface Area (acres)
2012-2013	11/26/2012	-	-	-	-	DRY	0.000
	12/19/2012	-	-	-	-	~6*	0.009
	1/22/2013	-	-	-	-	~10*	0.006
	2/25/2013	6.9	19.27	9.66	606.0 (NTU)	~10*	0.006
	3/15/2013	-	-	-	-	8	0.002
	4/12/2013	-	-	-	-	DRY	0.000
	5/10/2013	-	-	-	-	DRY	0.000
2013-2014	12/11/2014	-	-	-	-	DRY	0.000
	2/18/2014	-	-	-	-	DRY	0.000
	3/17/2014	-	-	-	-	1	0.00009
	4/7/2014	7.0	24.40	8.80	476.0 (NTU)	3	0.010
	5/6/2014	-	-	-	-	DRY	0.000
	6/3/2014	-	-	-	-	DRY	0.000
2014-2015	11/25/2014-12/5/2014	-	-	-	-	~10	0.002
	12/22/2014-12/23/2014	-	-	-	-	-	-
	2/24/2015	-	-	-	-	~2	0.0002
	3/18/2015	-	-	-	-	5	0.0007
	4/16/2015	-	-	-	-	DRY	0.000
	5/28/2015	-	-	-	-	DRY	0.000
2015-2016	4/5/2016	-	-	-	-	Connected with Pond 30A	
	4/18/2016	7.29	25.23	4.05	28.2 (FNU)	25	0.012
	5/10/2016	6.98	17.22	6.31	83.8 (FNU)	6	0.003
	6/8/2016	-	-	-	-	DRY	0.000

*did not measure exact depth

Table E-7. Historic Hydrology Results for Pond 30 C (remediated) on Former Fort Ord from 1998-2016

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity	Depth (cm)	Inundated Surface Area (acres)
1998-1999	Jan	6.64**	-	-	5.0** (NTU)	46**	1.150**
	Feb	-	-	-	-	51**	1.290**
	Mar	6.40**	-	-	<5.0** (NTU)	53**	3.573**
	Apr	7.53**	-	-	3.0** (NTU)	53**	3.573**
2006-2007	Dec	-	-	-	-	DRY	-
	Jan	-	-	-	-	DRY	-
	Feb	-	-	-	-	DRY	-
	Mar	-	-	-	-	DRY	-
	Apr	-	-	-	-	DRY	-
	May	-	-	-	-	DRY	-
	Jun	-	-	-	-	DRY	-
2009-2010	-	-	-	-	-	-	6.270
2012-2013	11/26/2012	-	-	-	-	DRY	0
	12/19/2012	-	-	-	-	~6*	0.040
	1/22/2013	-	-	-	-	~10*	0.049
	2/25/2013	7.05	18.77	9.55	590.0 (NTU)	~10*	0.036
	3/15/2013	7.29	24.5	9.35	821.0 (NTU)	16	0.029
	4/12/2013	-	-	-	-	5	0.0013
	5/10/2013	-	-	-	-	DRY	0.000
2013-2014	12/11/2014	-	-	-	-	DRY	0.000
	2/18/2014	-	-	-	-	DRY	0.000
	3/17/2014					3	0.010
	4/7/2014	6.30	26.5	9.50	345.0 (NTU)	7	0.020
	5/6/2014	-	-	-	-	DRY	0.000
	6/3/2014	-	-	-	-	DRY	0.000
2014-2015	12/22/2014-12/23/2014	-	-	-	-	~43	-
	2/24/2015	-	-	-	-	~20	-
	3/18/2015	-	-	-	-	10	0.030
	4/16/2015	-	-	-	-	0	0.000
	5/28/2015	-	-	-	-	0	0.000
2015-2016	4/5/2016	7.17	14.44	2.65	26.1 (FNU)	28	0.129
	4/18/2016	6.67	23.32	0.45	199.0 (FNU)	23	0.107
	5/10/2016	7.61	18.27	6.10	156.0 (FNU)	15	0.050
	6/8/2016	-	-	-	-	DRY	0.000

*did not measure exact depth

**measured as a part of Pond 30A

Table E-8. Historic Hydrology Results for Pond 56 (reference) on Former Fort Ord from 2006-2016

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity	Depth (cm)	Inundated Surface Area (acres)
2006-2007	12/1/2006	-	-	-	-	18	-
	1/23/2007	-	-	-	-	26	-
	3/6/2007	6.78			9.8 (NTU)	60	0.46
	4/9/2007	-	-	-	-	54	-
	5/7/2007	-	-	-	-	43	-
2012-2013	11/26/2012	-	-	-	-	DRY	0.000
	12/19/2012	-	-	-	-	24	0.050
	1/22/2013	-	-	-	-	46	0.300
	2/25/2013	-	-	-	-	43	0.220
	3/15/2013	6.31	11.90	2.48	22.7 (NTU)	39	0.180
	4/12/2013	-	-	-	-	20	0.002
	5/10/2013	-	-	-	-	DRY	0.000
2013-2014	12/11/2013	-	-	-	-	DRY	0.000
	2/18/2014	-	-	-	-	DRY	0.000
	3/17/2014	-	-	-	-	DRY	0.000
	4/7/2014	-	-	-	-	10	0.00045
	5/6/2014	-	-	-	-	DRY	0.000
	6/3/2014	-	-	-	-	DRY	0.000
2014-2015	3/18/2015	-	-	-	-	56	0.420
	4/16/2015	6.20	21.10	5.80	153.0 (NTU)	42	0.270
	5/28/2016	-	-	-	-	DRY	0.000
2015-2016	4/4/2016	6.54	16.27	0.50	28.6 (FNU)	125	5.167
	4/18/2016	6.67	18.90	2.23	375.0 (FNU)	120	4.206
	5/10/2016	6.63	16.09	3.24	16.9 (FNU)	100	3.110
	6/7/2016	6.16	20.76	3.55	57.4 (FNU)	80	2.287
	7/8/2016	6.23	18.04	6.27	44.0 (FNU)	60	0.419
	8/10/2016	6.64	16.03	10.56	16.3 (FNU)	40	0.189
	9/12/2016	-	-	-	-	DRY	0.000

Table E-9. Historic Hydrology Results for Pond 101 East (West) (reference) on Former Fort Ord from 2000-2016

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity	Depth (cm)	Inundated Surface Area (acres)
2000-2001	Jan	-	-	-	-	-*	-
	Feb	-	-	-	-	36*	0.11
	Mar	-	-	-	-	>46*	0.14
	Apr	-	-	-	-	>5*	-
	May	-	-	-	-	-*	-
2006-2007	-	-	-	-	-	-	0.000
2014-2015	3/18/2015	-	-	-	-	DRY	0.000
	4/16/2015	-	-	-	-	DRY	0.000
	5/28/2015	-	-	-	-	DRY	0.000
2015-2016	4/5/2016	6.43	13.95	0.00	5.7 (FNU)	70	1.893
	4/18/2016	6.67	23.28	6.40	204.0 (FNU)	58	0.199
	5/9/2016	6.22	17.22	2.90	77.1 (FNU)	54	0.665
	6/8/2016	6.55	22.90	3.42	525.0 (FNU)	20	0.066
	7/7/2016	-	-	-	-	DRY	0.000

* In 2000-2001, depths recorded for Waterbody 53, which includes the currently named ponds of Pond 101 West, 101 East (West), and 101 East (East). It is unknown which pond was sampled for depth.

Table E-10. Historic Hydrology Results for Pond 101 East (East) (reference) on Former Fort Ord from 2000-2016

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity	Depth (cm)	Inundated Surface Area (acres)
2000-2001	Jan	-	-	-	-	-*	-
	Feb	-	-	-	-	36*	1.47
	Mar	6.30	-	-	-	>46*	1.26
	Apr	6.81	-	-	-	>5*	-
	May	-	-	-	-	-*	-
2006-2007	Dec	-	-	-	-	DRY	0.000
	Jan	-	-	-	-	DRY	0.000
	Feb	-	-	-	-	-	-
	Mar	7.61	-	-	6.1 (NTU)	20	0.32
	Apr	-	-	-	-	DRY	0.000
	May	-	-	-	-	DRY	0.000
	Jun	-	-	-	-	DRY	0.000
2012-2013	11/26/2012	-	-	-	-	DRY*	0.000
	12/19/2012	-	-	-	-	DRY*	0.000
	1/22/2013	-	-	-	-	11*	0.075
	2/25/2013	-	-	-	-	DRY*	0.000
	3/15/2013	-	-	-	-	DRY*	0.000
	4/12/2013	-	-	-	-	DRY*	0.000
	5/10/2013	-	-	-	-	DRY*	0.000
2013-2014	12/11/2014	-	-	-	-	DRY*	0.000
	2/18/2014	-	-	-	-	DRY*	0.000
	3/17/2014	-	-	-	-	DRY*	0.000
	4/7/2014	-	-	-	-	DRY*	0.000
	5/6/2014	-	-	-	-	DRY*	0.000
	6/3/2014	-	-	-	-	DRY*	0.000
2014-2015	3/18/2015	-	-	-	-	DRY	0.000
	4/16/2015	-	-	-	-	DRY	0.000
	5/28/2015	-	-	-	-	DRY	0.000
2015-2016	4/5/2016	6.44	17.09	7.93	138.0 (FNU)	68	3.244
	4/18/2016	6.38	22.72	6.50	112.0 (FNU)	68	3.132
	5/9/2016	7.07	22.97	6.92	106.0 (FNU)	55	2.765
	6/8/2016	6.49	22.63	4.36	553.0 (FNU)	32	1.226
	7/7/2016	-	-	-	-	DRY	0.000

* In 2000-2001, depths recorded for Waterbody 53, which includes the currently named ponds of Pond 101 West, 101 East (West), and 101 East (East). It is unknown which pond was sampled for depth.

APPENDIX F

Vegetation Species Richness of Native and Non-Native Species by Vernal Pool

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Pond 3S			
Stratum	**Native**	**Non-Native**	**Unknown**
1	7	1	0
2	7	5	1
3	8	10	0
4	5	7	0
Basin Total	45	24	1

Pond 30A			
Stratum	**Native**	**Non-Native**	**Unknown**
1	2	2	0
2	4	1	0
3	4	6	1
Basin Total	26	17	1

Pond 5			
Stratum	**Native**	**Non-Native**	**Unknown**
1	1	0	0
2	4	0	0
3	7	0	0
4	3	6	0
Basin Total	23	17	0

Pond 30B			
Stratum	**Native**	**Non-Native**	**Unknown**
1	3	2	0
2	3	4	0
Basin Total	19	11	0

Pond 8			
Stratum	**Native**	**Non-Native**	**Unknown**
1	5	1	0
2	6	3	0
Adj. Wetland	6	0	2
Basin Total	30	17	2

Pond 30C			
Stratum	**Native**	**Non-Native**	**Unknown**
1	6	0	0
2	7	5	1
Basin Total	31	15	1

Pond 10			
Stratum	**Native**	**Non-Native**	**Unknown**
1	2	0	0
2	2	0	0
3	3	0	0
4	5	7	1
5	6	3	0
Basin Total	36	29	1

Pond 35			
Stratum	**Native**	**Non-Native**	**Unknown**
1	5	4	0
2	2	2	0
3	4	4	0
Basin Total	19	15	1

Pond 14			
Stratum	**Native**	**Non-Native**	**Unknown**
1	1	0	0
2	4	0	1
3	5	5	0
4	6	4	1
Basin Total	27	15	1

Pond 39			
Stratum	**Native**	**Non-Native**	**Unknown**
1	6	0	0
2	5	4	0
3	6	11	3
Basin Total	36	21	4

Pond 18			
Stratum	**Native**	**Non-Native**	**Unknown**
1	2	0	0
2	2	0	0
3	9	7	0
4	3	11	0
Basin Total	35	28	2

Pond 40S			
Stratum	**Native**	**Non-Native**	**Unknown**
1	3	2	0
2	1	10	0
3	2	9	1
Basin Total	11	15	1

Pond 41			
Stratum	**Native**	**Non-Native**	**Unknown**
1	6	1	0
2	6	1	0
3	5	6	0
Basin Total	16	12	0

Pond 101 West			
Stratum	**Native**	**Non-Native**	**Unknown**
1	7	6	0
2	7	9	0
Basin Total	22	21	0

Pond 43			
Stratum	**Native**	**Non-Native**	**Unknown**
1	6	2	1
2	12	6	0
3	5	7	1
Basin Total	24	9	2

Pond 101 East (West)			
Stratum	**Native**	**Non-Native**	**Unknown**
1	8	3	0
2	5	3	0
3	10	6	0
4	7	7	0
5	2	4	0
Basin Total	33	25	0

Pond 44			
Stratum	**Native**	**Non-Native**	**Unknown**
1	12	8	0
2	10	7	0
3	10	10	1
Basin Total	32	15	1

Pond 56			
Stratum	**Native**	**Non-Native**	**Unknown**
1	2	2	0
2	2	1	0
3	3	1	0
4	5	2	0
5	6	2	0
6	2	5	0
Basin Total	26	14	1

Pond 101 East (East)			
Stratum	**Native**	**Non-Native**	**Unknown**
1	6	1	0
2	2	2	0
3	4	6	0
4	7	2	0
Basin Total	19	17	1

APPENDIX G

Wetland Plants by Indicator Category for Each Vernal Pool

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Number of Wetland Plants Observed at Vernal Pools in 2016							
Pond	**OBL**	**FACW**	**FAC**	**FACU**	**UPL**	**NL**	**Total**
3 South	12	12	10	13	2	20	69
5	7	7	9	7	0	10	40
8	8	12	5	11	2	11	49
10	7	12	11	14	4	18	66
14	3	6	9	12	0	13	43
18	10	10	10	13	4	18	65
30A	6	8	9	8	3	10	44
30B	4	11	4	5	1	5	30
30C	6	10	6	13	1	11	47
30 (combined)	8	11	10	15	3	0	47
39	10	12	8	8	1	22	61
40 South	3	7	3	7	0	7	27
41	10	5	2	6	0	5	28
43	7	7	7	4	0	10	35
44	6	10	8	7	1	16	48
56	8	5	5	10	0	13	41
101 West	8	11	7	10	1	6	43
101 East (west)	10	15	9	10	1	13	58
101 East (east)	5	8	4	8	1	11	37

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APPENDIX H

Species Composition of Follow-Up Monitoring for Vernal Pools

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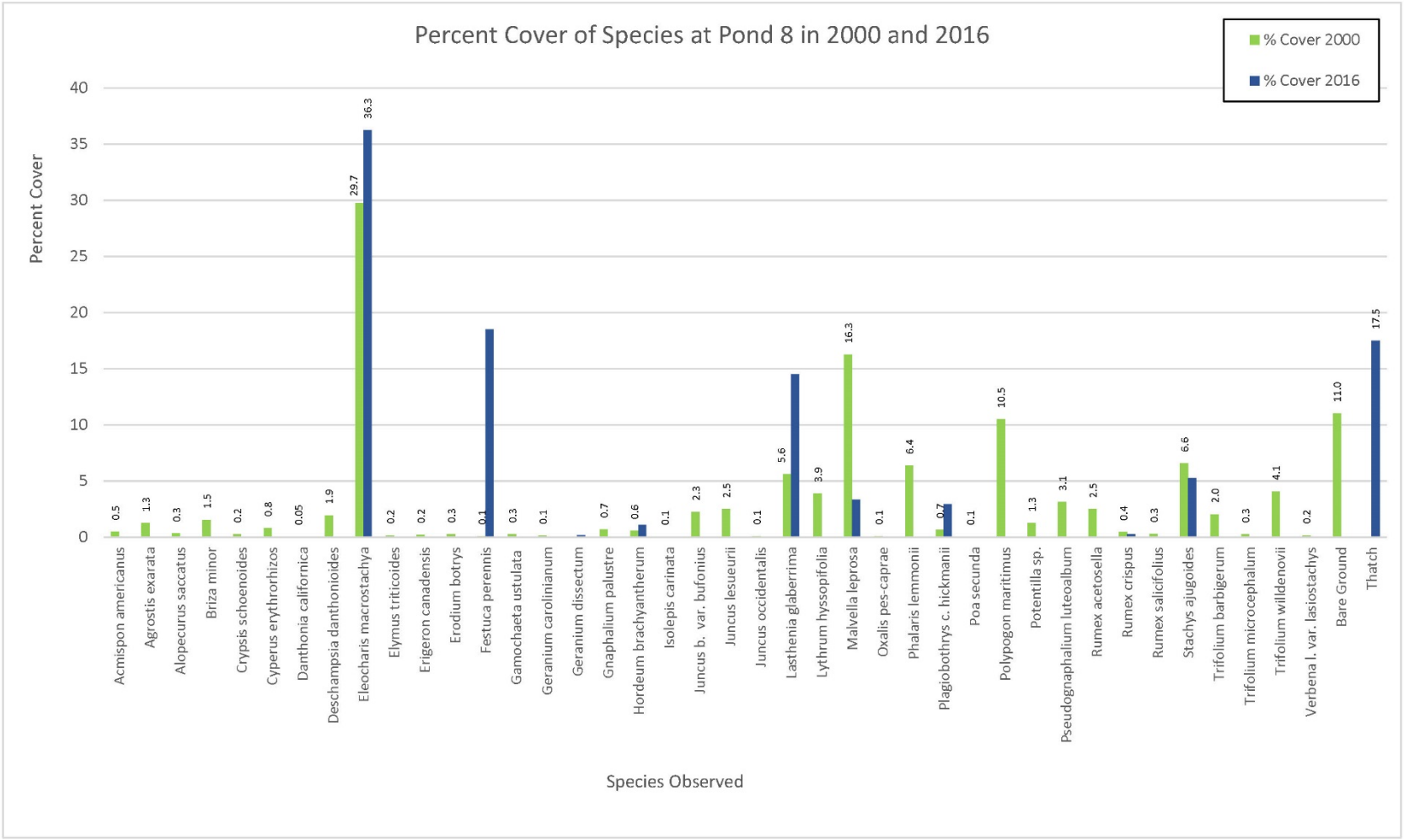

Figure H-1. Comparison Graph of Percent Cover by Species for Pond 8

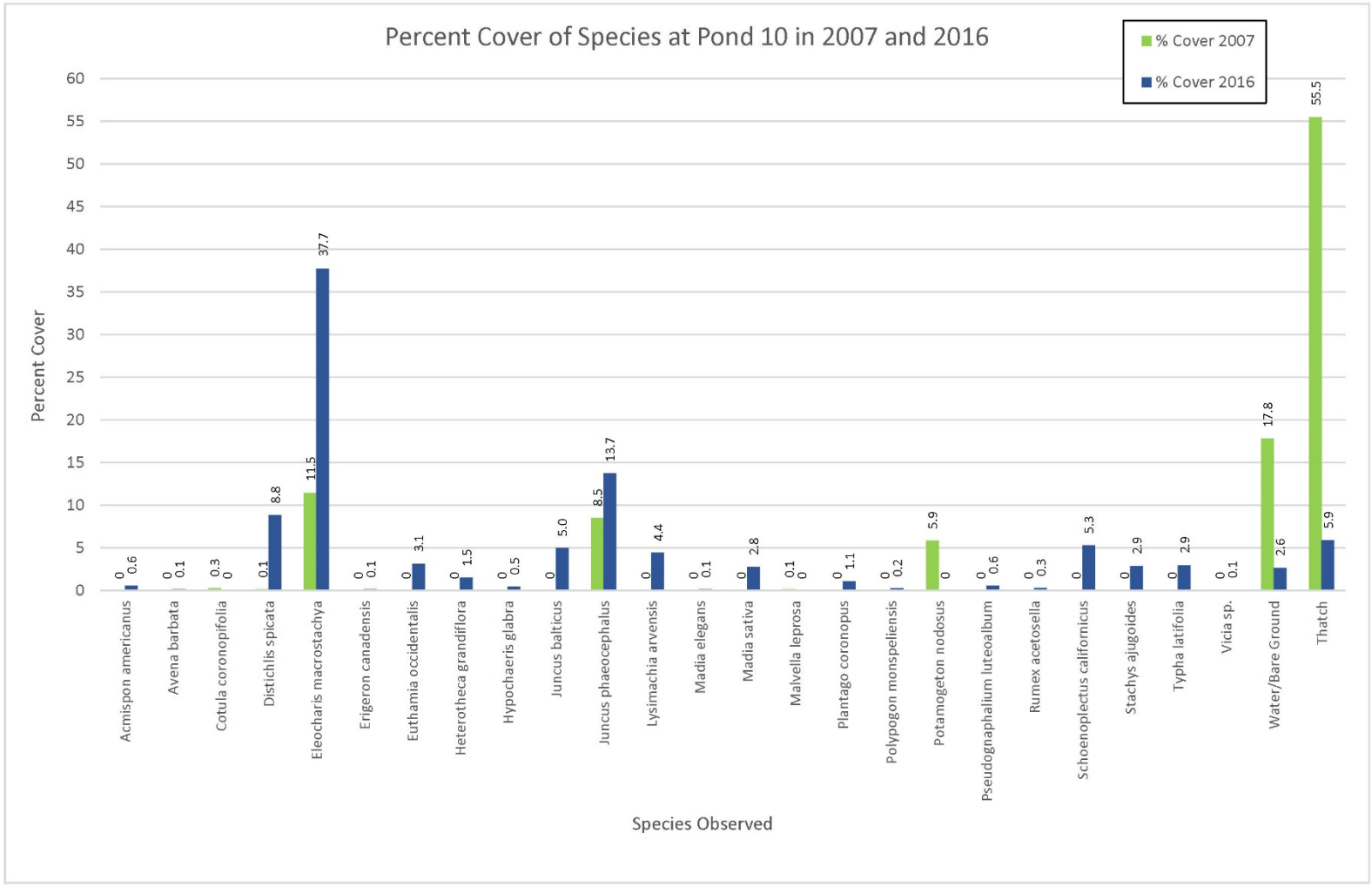

Figure H-2. Comparison Graph of Percent Cover by Species for Pond 10

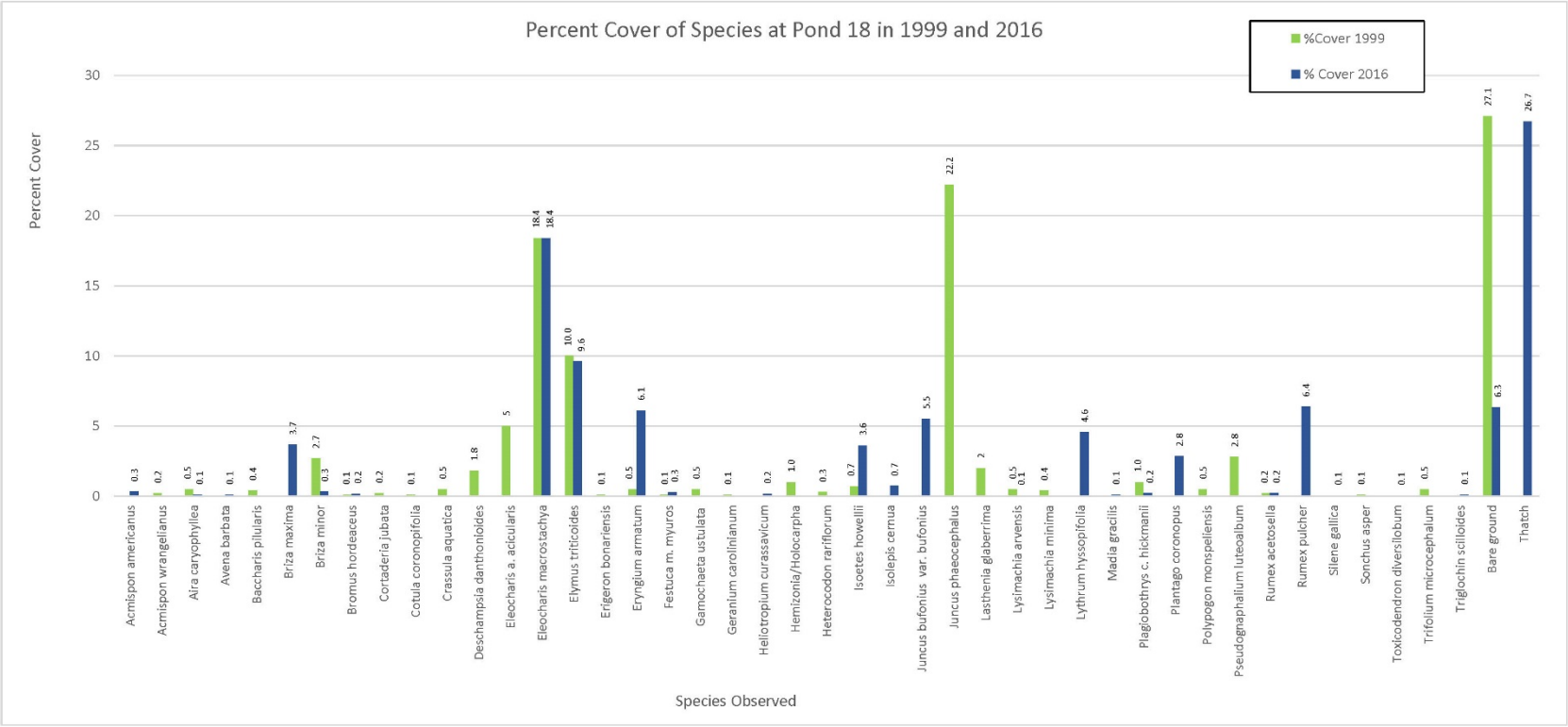

Figure H-3. Comparison Graph of Percent Cover by Species for Pond 18

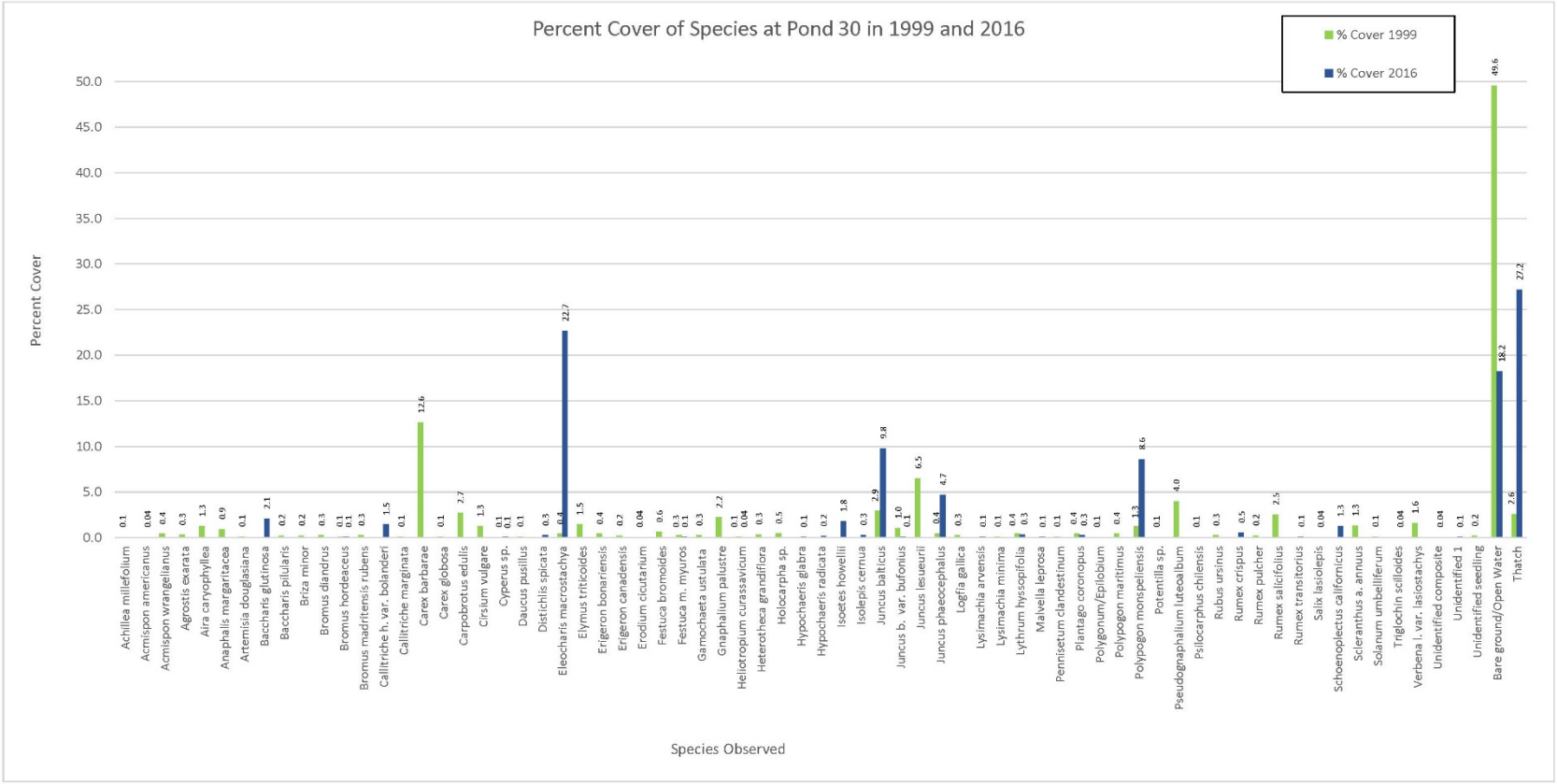

Figure H-4. Comparison Graph of Percent Cover by Species for Pond 30 (combined)