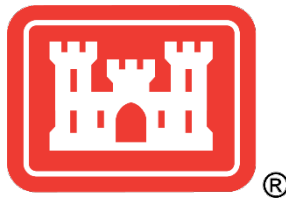


**2021 ANNUAL REPORT  
WETLAND HYDROLOGY AND WATER QUALITY MONITORING  
FORMER FORT ORD, CALIFORNIA**

**Prepared for:**



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## APPENDICES

- A** WATER QUALITY RESULTS AND INUNDATED AREA FOR VERNAL POOLS BY MONTH
- B** HISTORIC HYDROLOGY MONITORING RESULTS
- C** SITE PHOTOS

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**ACRONYMS AND ABBREVIATIONS**

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BRAC	Base Realignment and Closure
Burleson	Burleson Consulting, Inc.
Chenega	Chenega Tri-Services, LLC.
CTS	California Tiger Salamander
cm	centimeter(s)
DQO	Data Quality Objective
fairy shrimp	California Fairy Shrimp
FNU	Formazin Nephelometric Unit
HLA	Harding Lawson and Associates
HMP	Habitat Management Plan
MEC	Munitions and Explosives of Concern
m	meter(s)
mg/L	milligram(s) per liter
NCDC	National Climatic Data Center
NOAA	National Oceanic and Atmospheric Administration
NWSFO	National Weather Service Forecast Office
PBO	Programmatic Biological Opinion
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
Wetland Plan	Wetland Monitoring and Restoration Plan for Munitions and Contaminated Soil Remediation

# 1 INTRODUCTION

The United States Army (Army) is required to conduct baseline and follow-up wetland monitoring at former Fort Ord, and to evaluate if vernal pools were affected by remediation activities, as described in the *Installation-wide Multispecies Habitat Management Plan (HMP)*, and the *Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California* (PBO) (USACE, 1997; USFWS, 2017). Wetland monitoring includes three types of monitoring: hydrology and water quality, vegetation, and wildlife. The United States Army Corps of Engineers (USACE) contracted Chenega Tri-Services (Chenega) to conduct hydrology and water quality monitoring in the 2021 water year and this report describes the methods and results of those efforts. Vegetation and wildlife monitoring were performed by another contractor and are reported elsewhere (Burlleson, 2022).

**Table 1-1. 2020-2021 Monitoring Status of Vernal Pools on Former Fort Ord**

Index	Vernal Pool	Monitoring Status
1	Pond 5	Reference
2	Pond 101 East (East)	Reference
3	Pond 997	Reference
4	Pond 75	Baseline
5	Pond 74	Year 3 Post Mastication
6	Pond 101 East (West)	Year 3 Post Mastication
7	Pond 101 West	Year 3 Post Mastication
8	Pond 3 North	Year 3 Post Subsurface munitions remediation
9	Pond 3 South	Year 3 Post Subsurface munitions remediation
10	Pond 16	Year 3 Post Subsurface munitions remediation
11	Pond 35	Year 3 Post Subsurface munitions remediation
12	Pond 39	Year 3 Post Subsurface munitions remediation
13	Pond 40 South	Year 3 Post Subsurface munitions remediation
14	Pond 41	Year 3 Post Subsurface munitions remediation
15	Pond 42	Year 3 Post Subsurface munitions remediation
16	Pond 43	Year 3 Post Subsurface munitions remediation
17	Pond 44	Year 3 Post Subsurface munitions remediation
18	Pond 54	Year 3 Post Subsurface munitions remediation
19	Pond 60	Year 3 Post Subsurface munitions remediation
20	Pond 61	Year 3 Post Subsurface munitions remediation
21	Pond 73	Year 3 Post Subsurface munitions remediation

Vernal pools are evaluated against success criteria identified in the HMP, PBO, and the *Wetland Monitoring and Restoration Plan for Munitions and Contaminated Soil Remedial Activities at Former Fort Ord* (Wetland Plan, Burlleson, 2006). The PBO outlines specific success criteria for the state and federally threatened central California population of California Tiger Salamander (CTS) and the federally

endangered Contra Costa Goldfields (CCG). It states that reestablishment of these species will be considered successful if, at the end of monitoring, wetland function, wildlife usage, wetland plant cover, diversity and dominance, and CCG abundance are directly comparable to the conditions before remediation. These assessments are conducted using performance standards which are evaluated for vernal pool depth, inundation, vegetation, water quality, and wildlife using Data Quality Objectives (DQO) described in the Wetland Plan. This report provides assessment of performance standards of hydrological conditions and inundation area (DQOs 1 and 2), and partial assessment of wildlife usage (DQOs 1 and 4), while assessment of performance standards for plant cover and species diversity (DQO 3) and wildlife usage (DQO 5) are presented in a separate report (Burleson, 2022).

Vernal pools selected for the monitoring include those which had at least 50 percent of their watershed burned or masticated, those that had masticated vegetation within their basin, and those which were disturbed by subsurface munitions remediation activities. Vernal pools assessed in 2021 water year included three reference ponds 5, 101 East (East), 997; one baseline pond 75, and 17 remediated ponds 74, 101 East (West), 101 West, 3 North, 3 South, 16, 35, 39, 40 South, 41, 42, 43, 44, 54, 60, 61, and 73 (Table 1-1). Ponds 74, 101 East (West), and 101 West, were in their third and final year of required follow up monitoring, and assessment of their performance standards is based on results from all three years. The remaining 14 remediated vernal pools will continue to be monitored in the future.

## 2 SITE DESCRIPTION

Former Fort Ord is located in the northwestern part of Monterey County, California, on the boundary of Monterey Bay, approximately 80 miles south of San Francisco. Fort Ord was established in 1917 as a military training base for infantry troops. In January 1991, the U.S. Secretary of Defense announced the closure of the base. In October 1996, portions of the property were transferred to the Bureau of Land Management (BLM). In April 2012, Fort Ord National Monument (FONM) was established by proclamation of the President of the United States, which includes lands managed by BLM and the Army.

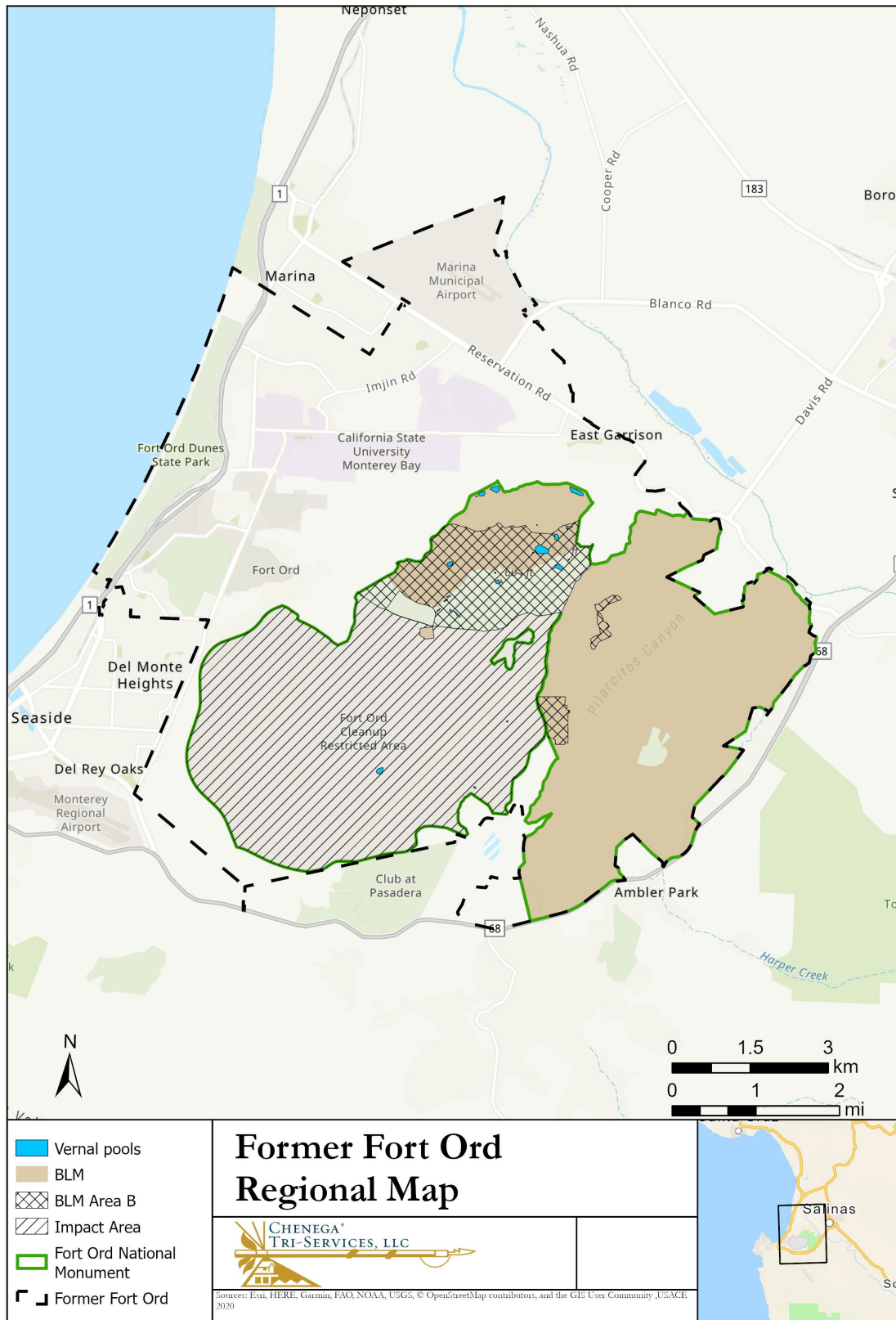
FONM comprises 14,658 acres of primarily coast live oak woodland, maritime chaparral, and annual grasslands. The area managed by BLM contains the northern, eastern, and south-eastern portion of FONM, while the area managed by the Army contains central, western, and south-western portion and includes the Impact Area and part of BLM Area B (Figure 2-1).

The area's maritime climate is characterized by cool, overcast, foggy summers, and cool rainy winters, with the warmest days generally occurring in late summer and early fall. In the 2021 water year (Oct 2020 to Sept 2021), the Monterey area received only 44% of normal cumulative precipitation which was the lowest amount in the past 30 years (Naval Postgraduate School Department of Meteorology, 2021; Figure 2-2). Precipitation during the fall months was very low, and there was only one significant rain event in late January during 2021 water year. February, which historically receives second largest amount of precipitation, was very dry. Overall, the period of precipitation was short; initial precipitation occurred in November and the last significant rain events occurred in late March (Figure 2-3).

Vernal pools are internally drained basins in low-lying grassland areas that collect rainfall and surface runoff. Water accumulates in these depressions because of an impervious soil layer that prevents infiltration of water into the soil profile. The frequency and duration of this seasonal inundation varies among vernal pools, depending on the size of the basin and its watershed, soil depth to the impervious

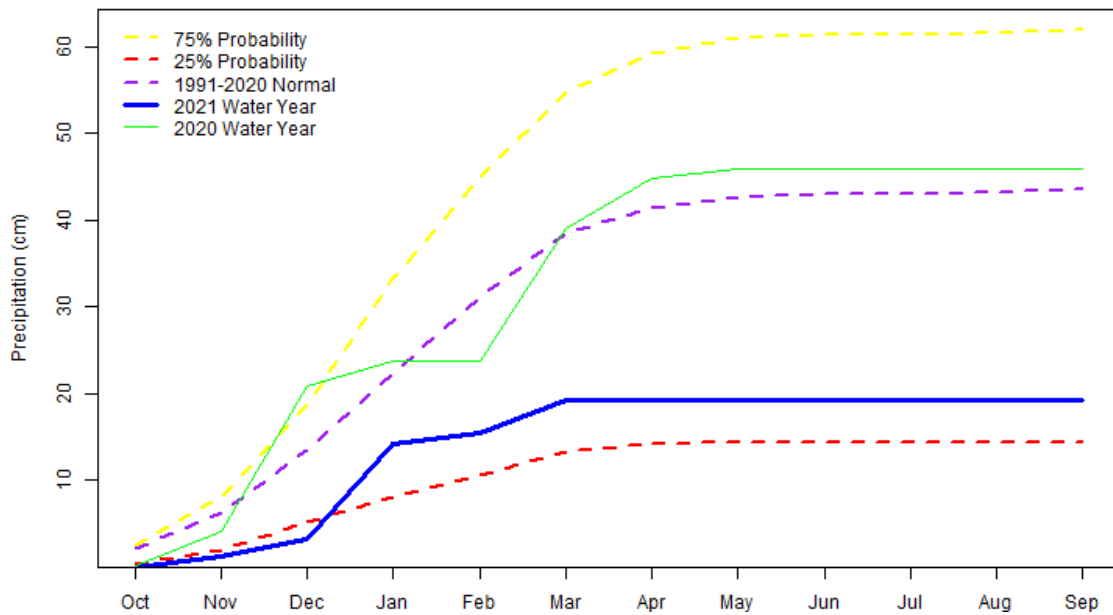
layer, and patterns of rainfall. Vernal pools provide habitat for plants and wildlife adapted to complete their life cycle under the extreme conditions of winter and spring inundation and summer and fall desiccation. Two listed species occur in Fort Ord vernal pools; the state and federally threatened central California population of California Tiger Salamander (*Ambystoma californiense*), and the federally endangered Contra Costa Goldfields (*Lasthenia conjugens*). California fairy shrimp (*Linderiella occidentalis*) also occurs in Fort Ord vernal pools, and it is one of the species listed in the HMP.

Fort Ord vernal pools are most common in areas containing Antioch soils in isolated grassland patches within a matrix of maritime chaparral and oak woodlands. All but three of the vernal pools monitored in 2021 water year are located in the northern portion of FONM, while Ponds 16, 54, and 75 are located in the southern section inside the Impact Area (Figure 2-4).

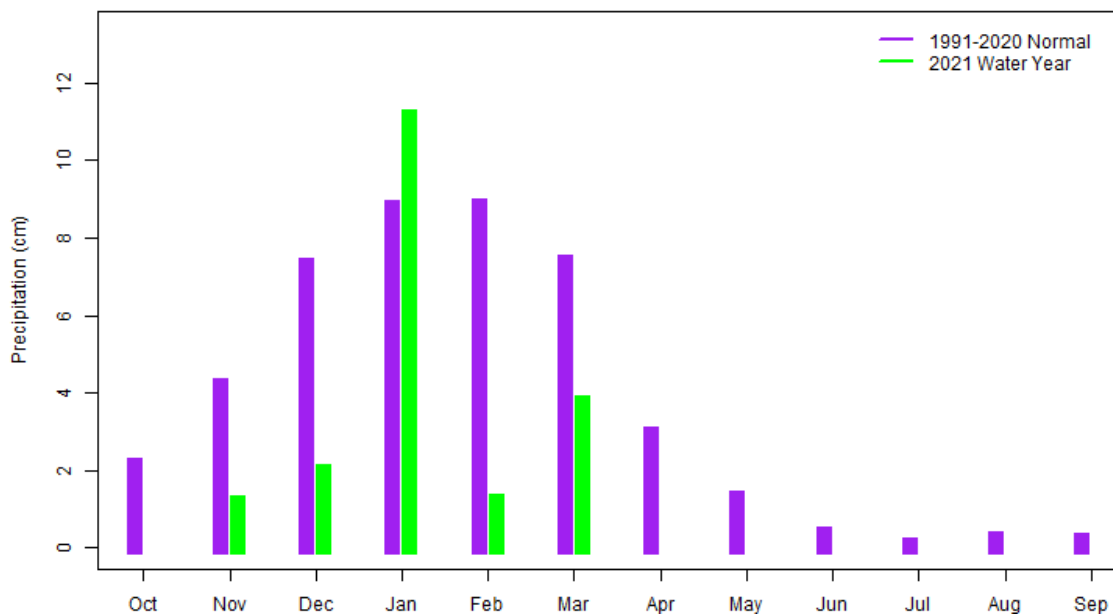


**Figure 2-1.** Location Map of Vernal Pools on Former Fort Ord

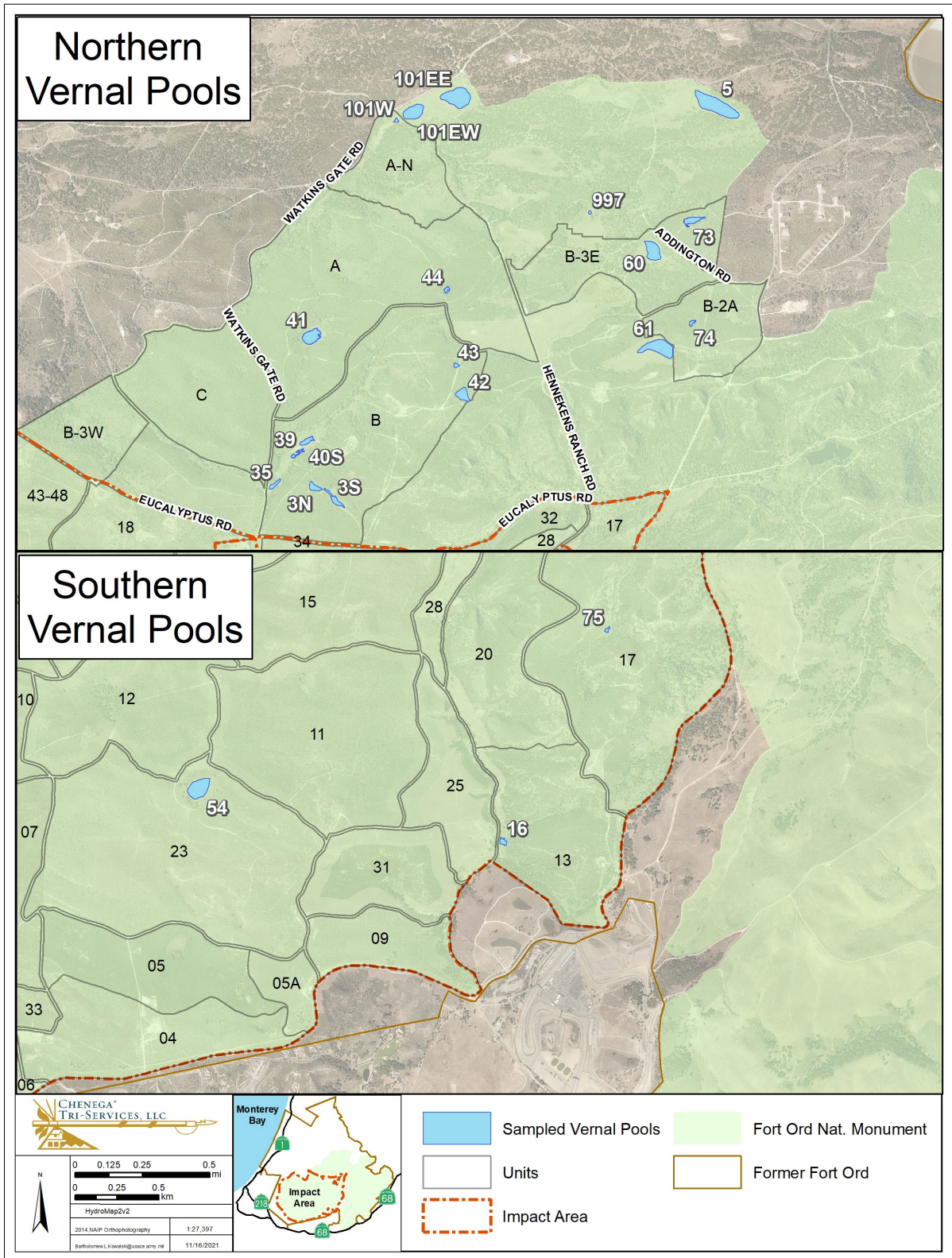




**Figure 2-2.** Cumulative Monthly Precipitation for the 2021 Water Year compared to the 30-Year Normal (mean 1991-2020), the 2020 Water Year, and the 25% and 75% Probabilities (NPS, 2021; National Climatic Data Center [NCDC] and National Oceanic and Atmospheric Administration [NOAA], 2021)



**Figure 2-3.** Monthly Precipitation for the 2021 Water-Year, and Normal Monthly Precipitation (NPS, 2021; National Climatic Data Center [NCDC] and National Oceanic and Atmospheric Administration [NOAA], 2021)



**Figure 2-4.** Location Map of Ponds 5, 101 East (East), 997, 75, 74, 101 East (West), 101 West, 41, 3 North, 3 South, 16, 39, 40 South, 43, 35, 42, 44, 54, 60, 61, 73.

### 3 METHODS

Sampling methods for wetland vegetation monitoring and aquatic surveys were consistent with the PBO and the Wetland Plan (USFWS, 2017; Burleson, 2006). Vernal pools must be monitored for baseline condition prior to any remedial activities such as prescribed burns, mastication, excavation, or artificial draining (USFWS, 2017). As described in the PBO, the Army conducts two years of pre-activity larval CTS sampling, to the extent possible, in the ponds where more than 50 percent of the watershed is likely going to be affected by remedial actions; or subsurface remediation activities are expected within the vernal pool basin (USFWS, 2017). Historical accounts of all surveys are presented in Appendix B.

Vernal pools are then monitored following remedial activities for 3 to 5 years depending on the type and level of disturbance. Post-burn monitoring occurs in vernal pools if more than 50 percent of the watershed of a vernal pool is affected and is conducted annually for the first three years following a burn (USFWS, 2017). The same standard is applied to vernal pools where more than 50 percent of the watershed was masticated, but no mastication of vegetation occurred within the inundation area. If vegetation is mowed within the inundation area, the vernal pool is monitored for vegetation in the first, third, and fifth years following mastication (Burleson, 2006). Vernal pools where subsurface munitions remediation activities disturbed less than 10 square feet and were shallower than four feet deep are monitored in the first, third, and fifth years following remediation, whereas vernal pools with greater and/or deeper disturbance are monitored annually for five years following remediation (Burleson, 2006). In cases of vernal pools where more than one type of remedial activity occurred, the most stringent monitoring frequency is followed. Three reference vernal pools that were not remediated were monitored for comparison: Ponds 5, 101 East (East), and 997.

In 2016, vegetation within watershed and basin of Pond 16 was masticated. In 2017, vegetation within watersheds of Ponds 35, 42, 44, 60, 61, and 73 was masticated. In the same year, vegetation within watersheds of Ponds 3 North, 3 South, 39, 40 South, 42, and 43 was burned. Vegetation within basins of Ponds 101 East (West), and Pond 101 West was partially masticated in 2018. Also, in 2018, Ponds 3 North, 3 South, 16, 35, 39, 40 North, 40 South, 41, 42, 43, 44, 60, 61, and 73 were investigated for geophysical anomalies that potentially represented munitions and explosives of concern (MEC) items, and subsurface munitions remediation was performed in all of those ponds except for Pond 40 North, which did not have any geophysical anomalies present (Kemron, 2020a). Subsurface munitions remediation was also conducted in Pond 54 in early 2019 as part of subsurface investigation of large anomalies in Unit 23 (Kemron, 2020b). Partial mastication of vegetation within Pond 74 watershed occurred in 2017, but the vernal pool wasn't discovered until the remaining surrounding vegetation was masticated within Unit B-2A in January of 2019. Inundation extent, vegetation, and wildlife surveys occurred following the discovery of the vernal pool in 2019.

In 2021 water year, Pond 75 was monitored for baseline, ponds 74, 101 East (West), and 101 West were monitored for year 3 post mastication, and ponds 3 North, 3 South, 16, 35, 39, 40 South, 41, 42, 43, 44, 54, 60, 61, and 73 were monitored for year 3 post-subsurface munitions remediation. A summary of monitored ponds and their monitoring status is presented in Table 1-1.

#### 3.1 Hydrology Monitoring

Vernal pools were surveyed at least once a month but in many instances additional monitoring was conducted. Depth measurements at some of the vernal pools were also recorded opportunistically while conducting other field activities. Earlier in the season, surveys were generally timed to occur after major precipitation events. As the vernal pools started to dry out later in the season, some of them were

visited more frequently than once a month to get a more accurate timing of when they dried out completely. Gauge depth readings were taken during all visits, while area of inundation was measured approximately once per month. When vernal pools were deep enough, water quality metrics of pH, turbidity, temperature, dissolved oxygen, and conductivity were measured at the same time as inundation area. Although conductivity is not a required water quality parameter per wetland plan and PBO, it was recorded since it was one of the default metrics measured by the water quality probe, but data available for comparison is from 2020 water year only. Water quality data were collected using a YSI Pro-DSS Multi-parameter Meter. The meter was calibrated prior to each data collection event. Monitoring ceased at the beginning of September or when vernal pools became completely dry, whichever came first. These sampling methods are consistent with the PBO (USFWS, 2017) and the Wetland Plan (Burleson, 2006). Water quality data were collected at mid-pool and mid-depth in all vernal pools. The staff gauge is generally located at the deepest point of the vernal pool, and mid-pool was therefore considered the location of the staff gauge, regardless of the variable vernal pool perimeter. Mid-depth was dependent on the depth of the vernal pool during the time of monitoring. Recommendations to collect mid-pool, mid-depth data necessitated entry into the vernal pool. All the vernal pools monitored in 2021 were deemed safe to enter by the Base Realignment and Closure (BRAC) office except for ponds 54 and 75, which were accessed with a UXO escort (Kemron, 2020).

During water quality surveys care was taken to ensure the probe was completely submerged in water, and when that wasn't possible due to insufficient depth of water in the vernal pool, this was noted. The pH, temperature, turbidity, dissolved oxygen, and conductivity were logged and recorded on the field data sheet. The dissolved oxygen probe within the Pro DSS Multi-parameter Meter utilizes optical luminescence sensor that has no flow dependence and does not require the probe to be vertically bobbed up and down in the water column during measurement.

Inundated surface area was recorded with a Trimble® Geoexplorer 6000® GPS unit. The perimeter only included ponded areas that had surface hydrological connectivity to the ponded area at the staff gauge. Peripheral ponding was observed and documented but was not mapped. Areas were calculated from the resultant shape files using ArcGIS (Esri, 2018). Depths of vernal pools were recorded from the installed staff gauges. Photographs of each vernal pool were taken at established photo points and at locations that allowed for recording water levels at the staff gauge.

Daily precipitation values were obtained from the National Weather Service Forecast Office (NWSFO) and Monterey Peninsula Regional Airport meteorological towers, approximately 5 miles southwest of Site 39 on former Fort Ord. The Monterey Peninsula Regional Airport tower replaced the NWSFO tower on April 1, 2020 and is located within 1 kilometer of the NWSFO tower. NWSFO determines normal rainfall based on a 30-year average that at the end of each decade is moved forward another 10 years. Normal for the NWSFO tower is defined as the mean precipitation from years 1991-2020.

### **3.2 Evaluation for Data Quality Objectives and Success Criteria**

Data quality objectives (DQOs) and performance standards outlined in the Wetland Plan were used to measure successful wetland function following MEC remediation activities. DQOs can be summarized as:

- DQO 1: depth – average of 25 cm through March for CTS and average of at least 10 cm through May for fairy shrimp
- DQO 2: inundation – consistent with baseline and similar to reference vernal pool trends
- DQO 3: vegetation – similar hydrophytic vegetation as reference control wetlands

- DQO 4: water quality – adequate for the presence of CTS and/or fairy shrimp
- DQO 5: wildlife – consistent with baseline and similar to reference control wetland trends

This report focuses on hydrological conditions and inundation area performance standard, which was assessed using DQO 1 and DQO 2. The performance standard was assessed by evaluating if the vernal pools held a sufficient average depth of water appropriate for CTS and fairy shrimp for the duration of the breeding season, and if inundation of the vernal pools was consistent with observed inundation trends during baseline years and at reference vernal pools, given the precipitation volume and frequency. DQO 1 was also used to assess wildlife usage performance standard. Suitable CTS habitat was defined as a vernal pool that retains an average depth of at least 25 cm from the first rain event through March (Burleson, 2006). Suitable fairy shrimp habitat was defined as a vernal pool that retains an average depth of 10 cm for 18 consecutive days through May. Wildlife usage performance standard was also evaluated for water quality, using DQO 4. Water quality measurements were compared to historical values as well as to values from other vernal pools because observed water quality parameters are variable due to the complex interactions between ambient air temperature, plant respiration rates, microbial community structure, and soil chemistry. Plant cover and species diversity performance standard was assessed using DQO 3, and wildlife usage was additionally assessed using DQO 5, both of which were analyzed in a separate report (Burleson, 2022).

In addition to DQOs outlined in the Wetland Plan, the PBO describes the following success criteria specifically for CTS and CCG (USFWS, 2017). Species reestablishment will be considered successful if, at the end of monitoring, each of the following is directly comparable to the conditions before the start of work:

1. Wetland function, as measured by the parameters of hydrologic conditions (inundation area and depth, pH, temperature, dissolved oxygen levels);
2. Wildlife usage, specifically CTS larval presence;
3. Plant cover and wetland plant species diversity and dominance; and
4. CCG abundance.

These four conditions were assessed in conjunction with the DQOs. Wetland function was assessed with DQO 1, DQO 2, and DQO 4, which are described in this report. Wildlife usage was assessed with DQO 5. Plant cover and wetland plant species diversity and dominance were assessed, as well as Contra Costa goldfield abundance were assessed with DQO 3.

Historic data for cumulative precipitation, physical characteristics, and water quality for all reference and post-remediation vernal pools were summarized by vernal pool. Inundated areas of vernal pools were mapped and compared to the inundations in previous years at remediated and reference vernal pools. A historic outline of inundation and water quality compared to the precipitation year is provided in Appendix B.

## 4 RESULTS

Hydrology surveys were conducted monthly from January through April when water was present. Measurable ponding was observed in only five vernal pools monitored in 2021 water year; ponds 3



North, 39, 42, 60, and 61 West. These vernal pools were inundated for a short period between February and March as a result of extremely low cumulative precipitation in 2021 water year (Figure 2-2).

Observed water quality measurements were similar to previous years for the five vernal pools that were inundated. Mean temperature was 14.7 °C in February, and 11.6 °C in March. Mean dissolved oxygen values was 4.8 milligrams per liter (mg/L) in February and 9.4 mg/L in March. The mean pH value was 6.5 in February and 6.9 in March. Mean turbidity value was 179 FNU in February and 16 FNU in March.

#### 4.1 Pond 5

Pond 5 is a reference vernal pool that was monitored as a control for comparison to the remediated vernal pools. Depth of Pond 5 was monitored three times during 2021 water year. Pond 5 remained dry throughout the water year although there was shallow peripheral ponding present. Water quality parameters were not measured (Table 4-1 and Figure 4-1).

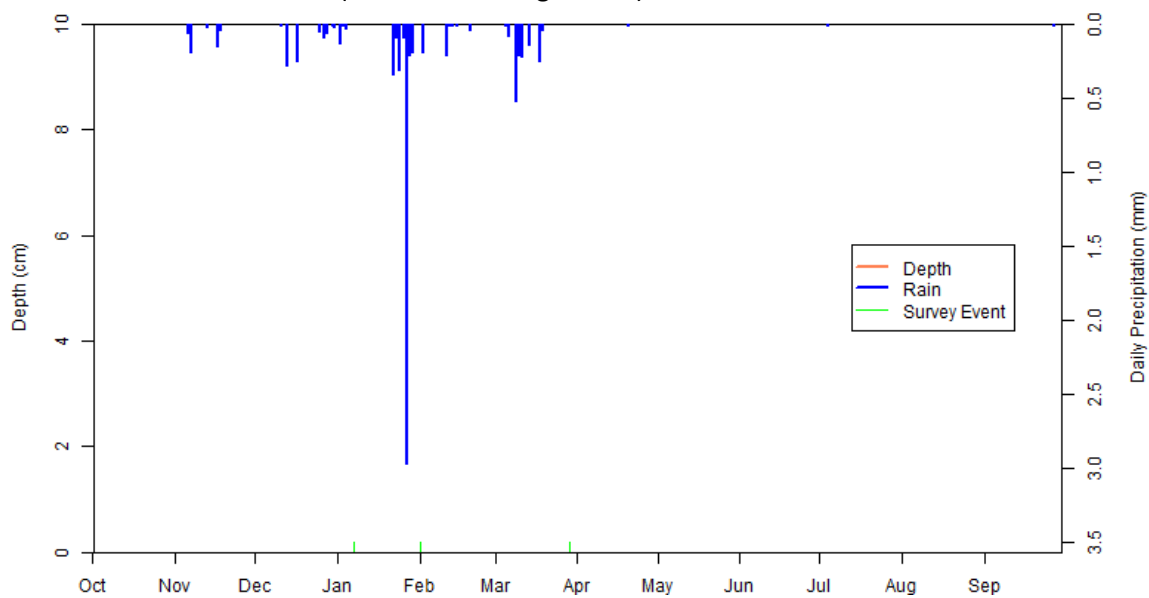


Figure 4-1. Pond 5 (Reference) Depth and Precipitation on Former Fort Ord, 2021

Table 4-1. Pond 5 (Reference) Hydrology Monitoring Results

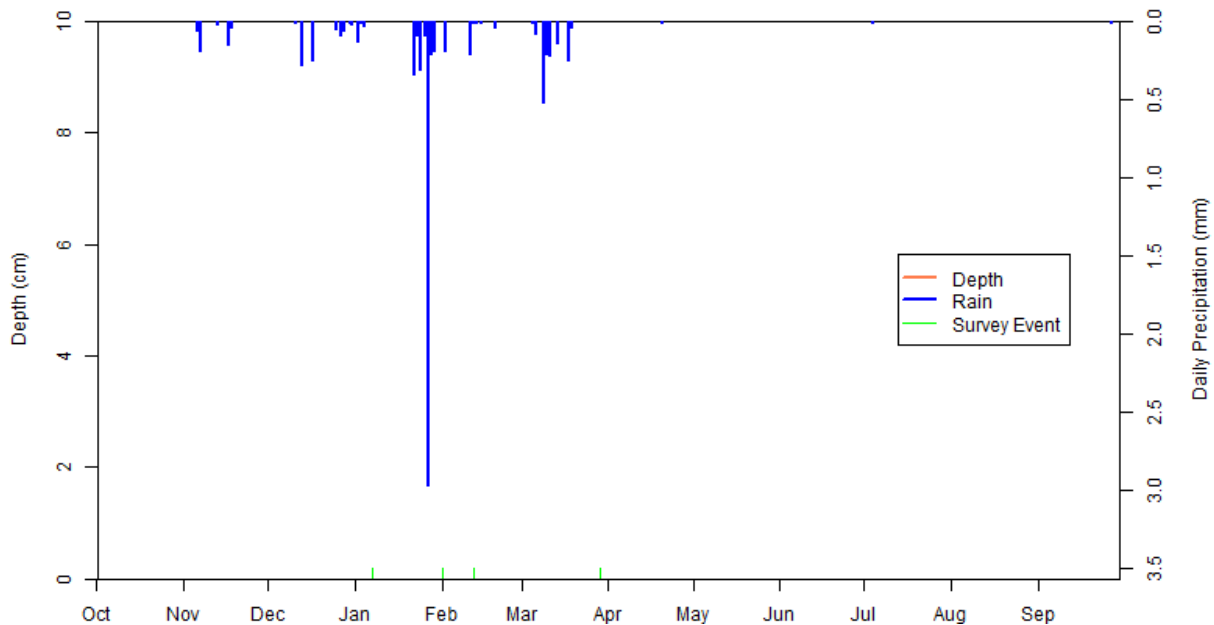
Pond 5							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-07	0	0					
2021-02-01 <sup>^</sup>	0	0					
2021-03-29 <sup>^</sup>	0	0					

NS = Not Surveyed

<sup>^</sup>Peripheral inundation present

## 4.2 Pond 101 East (East)

Pond 101 East (East) is a reference vernal pool that was monitored as a control for comparison to the remediated vernal pools. Depth of Pond 101 East (East) was monitored four times during 2021 water year. Pond 101 East (East) remained dry throughout the water year, thus the water quality parameters were not measured (Table 4-2 and Figure 4-2).



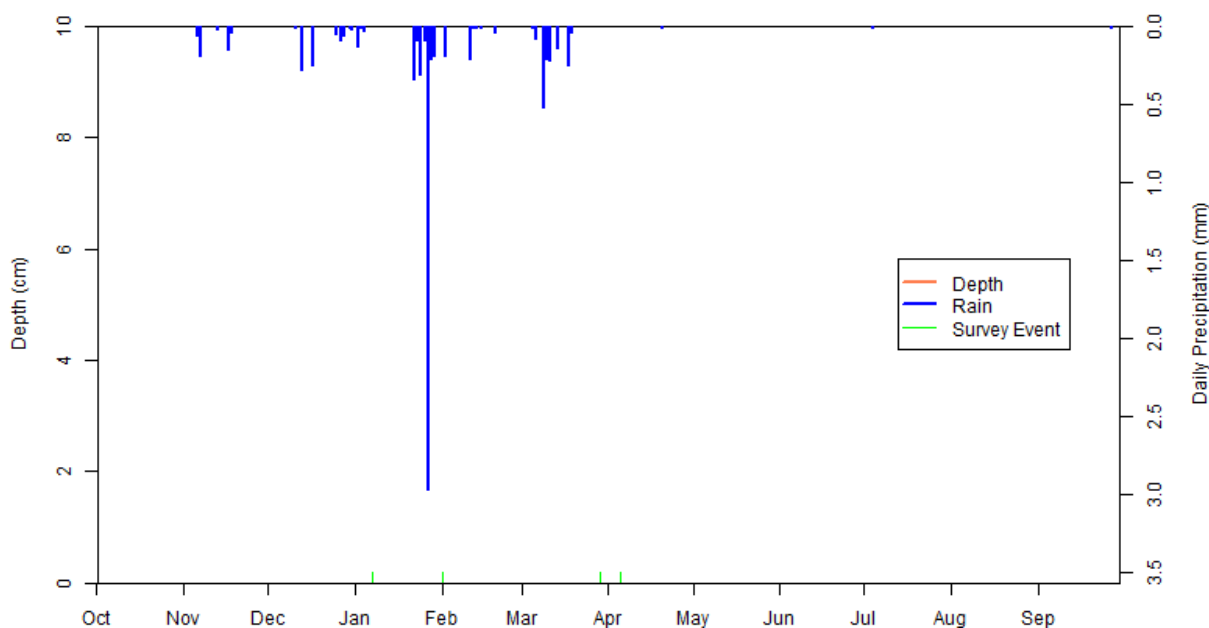
**Figure 4-2.** Pond 101 East (East) (Reference) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-2. Pond 101 East (East) (Reference) Hydrology Monitoring Results**

Pond 101EE							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-07	0	0					
2021-02-01	0	0					
2021-02-12	0	0					
2021-03-29	0	0					

### 4.3 Pond 997

Pond 997 is a reference vernal pool that was monitored as a control for comparison to the remediated vernal pools. Depth of Pond 997 was monitored four times during 2021 water year. Pond 997 remained dry throughout the water year, thus the water quality parameters were not measured (Table 4-3 and Figure 4-3).



**Figure 4-3.** Pond 997 (Reference) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-3. Pond 997 (Reference) Hydrology Monitoring Results**

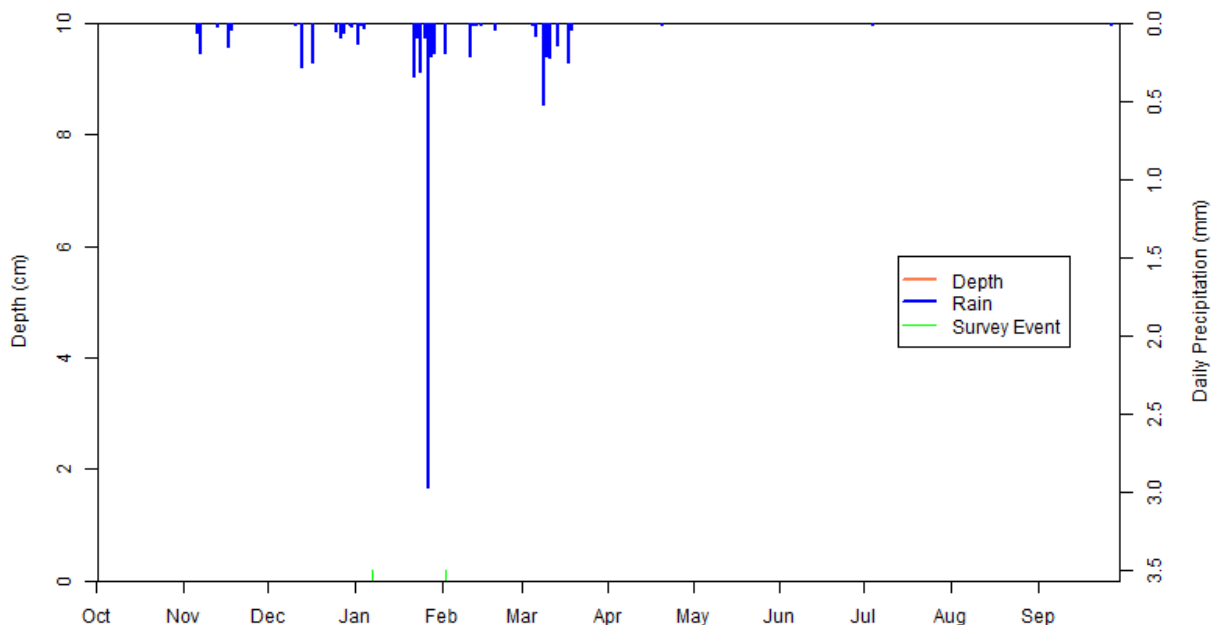
Pond 997							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-07	0	0					
2021-02-01	0	0					
2021-03-29	0	0					
2021-04-05	0	0					

NS = Not Surveyed



#### 4.4 Pond 75

Pond 75 was in baseline monitoring in 2021. Depth of Pond 75 was monitored two times during 2021 water year. Pond 75 remained dry throughout the water year, thus the water quality parameters were not measured (Table 4-4 and Figure 4-4).



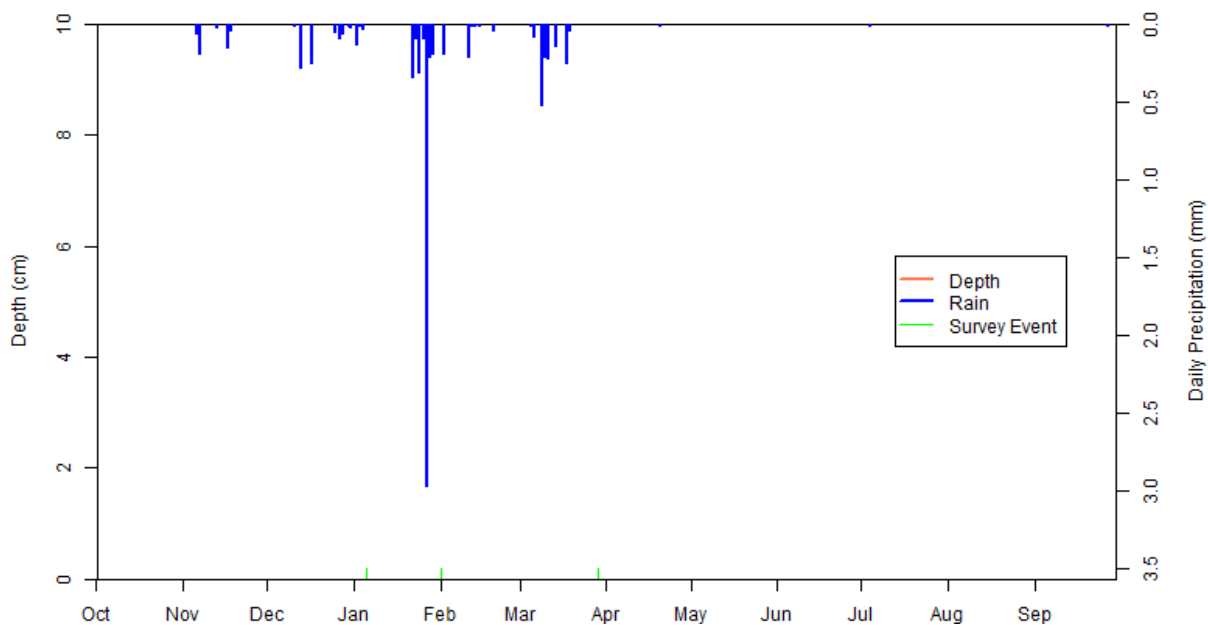
**Figure 4-4.** Pond 75 (Baseline) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-4. Pond 75 (Baseline) Hydrology Monitoring Results**

Pond 75							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-07	0	0					
2021-02-02	0	0					

#### 4.5 Pond 74

Pond 74, a post-mastication remediation vernal pool, was in year 3 of monitoring in 2021. Depth of Pond 74 was monitored three times during 2021 water year. Pond 74 remained dry throughout the water year, thus the water quality parameters were not measured (Table 4-5 and Figure 4-3).



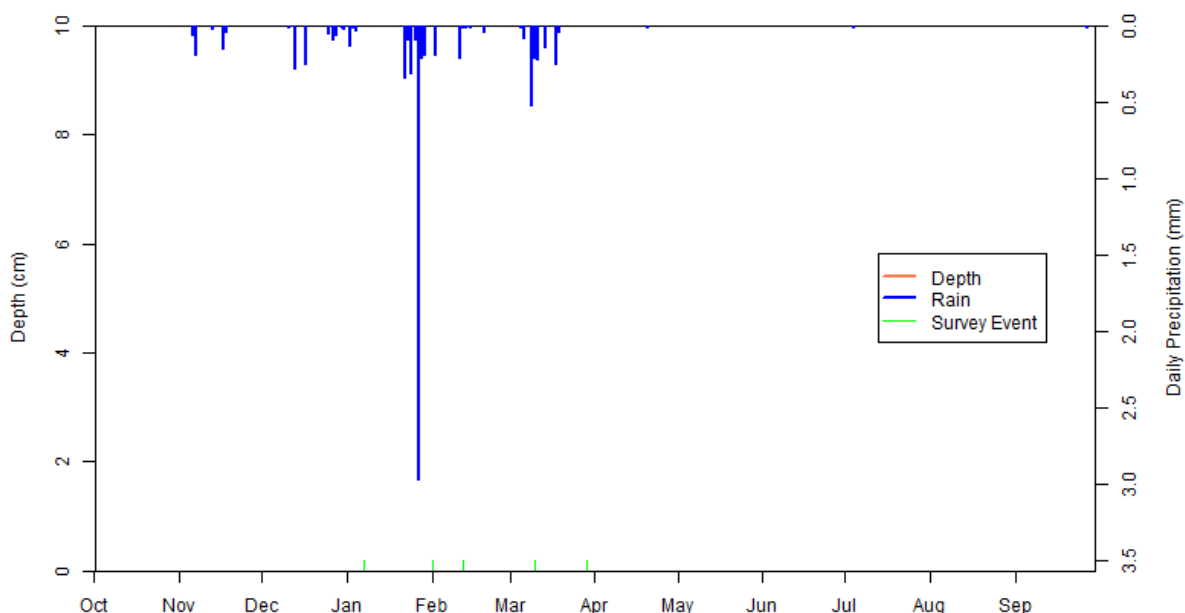
**Figure 4-5.** Pond 74 (Year 3 Post-Mastication) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-5. Pond 74 (Year 3 Post-Mastication) Hydrology Monitoring Results**

Pond 74							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-05	0	0					
2021-02-01	0	0					
2021-03-29	0	0					

#### 4.6 Pond 101 East (West)

Pond 101 East (West), a post-mastication remediation vernal pool, was in year 3 of monitoring in 2021. Depth of Pond 101 East (West) was monitored five times during 2021 water year. Pond 101 East (West) remained dry throughout the water year, thus the water quality parameters were not taken (Table 4-6 and Figure 4-6).



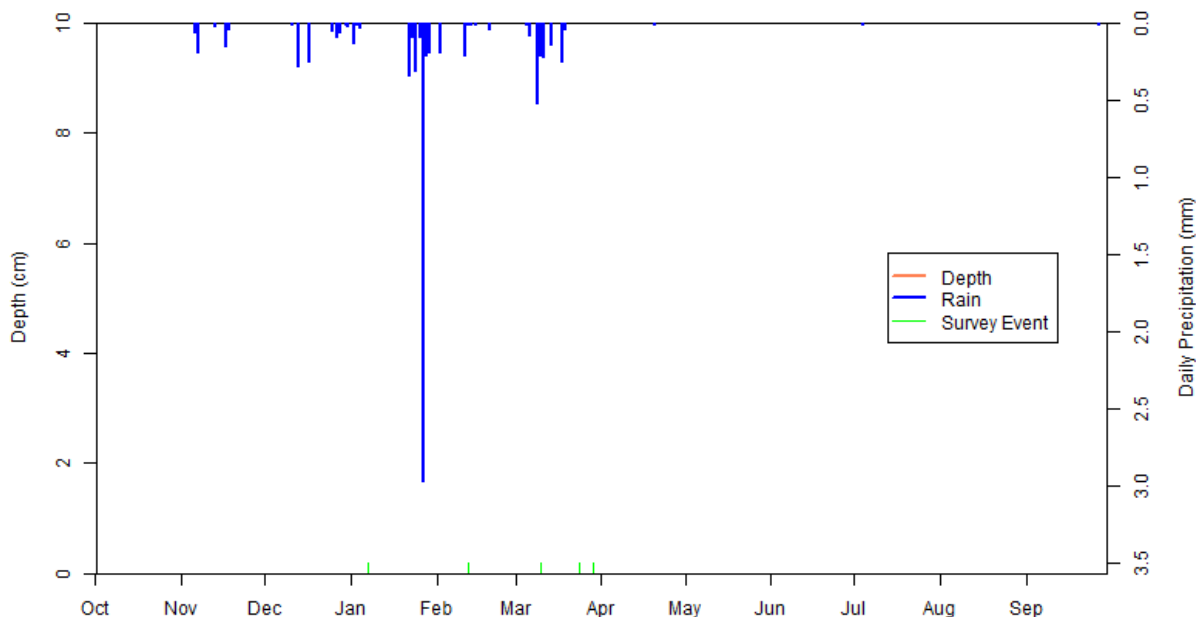
**Figure 4-6.** Pond 101 East (West) (Year 3 Post-Mastication) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-6. Pond 101 East (West) (Year 3 Post-Mastication) Hydrology Monitoring Results**

Pond 101EW							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-07	0	0					
2021-02-01	0	0					
2021-02-12	0	0					
2021-03-10	0	0					
2021-03-29	0	0					

#### 4.7 Pond 101 West

Pond 101 West, a post-mastication remediation vernal pool, was in year 3 of monitoring in 2021. Depth of Pond 101 West was monitored five times during 2021 water year. Pond 101 West remained dry throughout the water year, thus the water quality parameters were not measured (Table 4-7 and Figure 4-7).



**Figure 4-7.** Pond 101 West (Year 3 Post-Mastication) Depth and Precipitation on Former Fort Ord, 2021

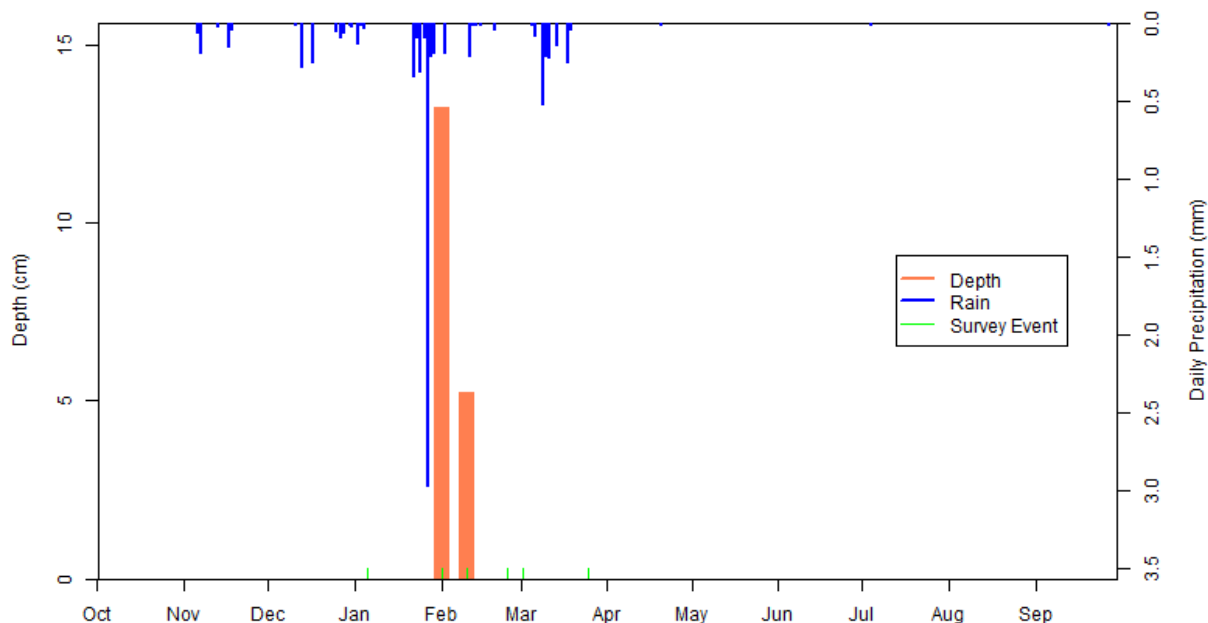
**Table 4-7. Pond 101 West (Year 3 Post-Mastication) Hydrology Monitoring Results**

Pond 101W							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-07	0	0					
2021-02-12	0	0					
2021-03-10	0	0					
2021-03-24	0	0					
2021-03-29	0	0					

NS = Not Surveyed

#### 4.8 Pond 3 North

Pond 3 North was in year 3 for post-subsurface munitions remediation in 2021. Depth of Pond 3 North was monitored six times and water quality parameters were measured once. Pond 3 North was inundated in early February surveys, but it dried by the end of the month (Table 4-8 and Figure 4-8).



**Figure 4-8.** Pond 3 North (Year 3 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-8. Pond 3 North (Year 3 Post-Subsurface Munitions Remediation)  
Hydrology Monitoring Results**

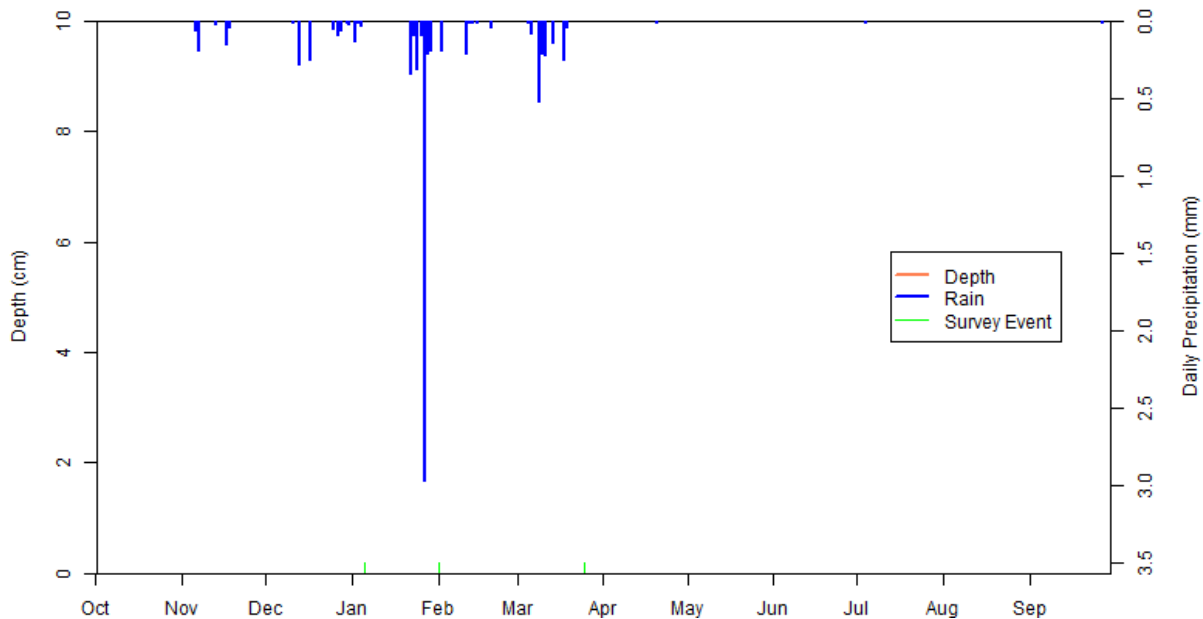
Pond 3N							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-05	0	0					
2021-02-01 <sup>^</sup>	0.0165	13	3.59	13.9	106.23	6.29	149.5
2021-02-10 <sup>^</sup>	NS	5	NS	NS	NS	NS	NS
2021-02-24	0	0					
2021-03-02	0	0					
2021-03-25	0	0					

NS = Not Surveyed

<sup>^</sup>Peripheral inundation present

#### 4.9 Pond 3 South

Pond 3 South was in year 3 for post-subsurface munitions remediation in 2021. Depth of Pond 3 South was monitored three times during 2021 water year. Pond 3 South remained dry throughout the water year, thus measurements of the water quality parameters were not taken (Table 4-9 and Figure 4-9).



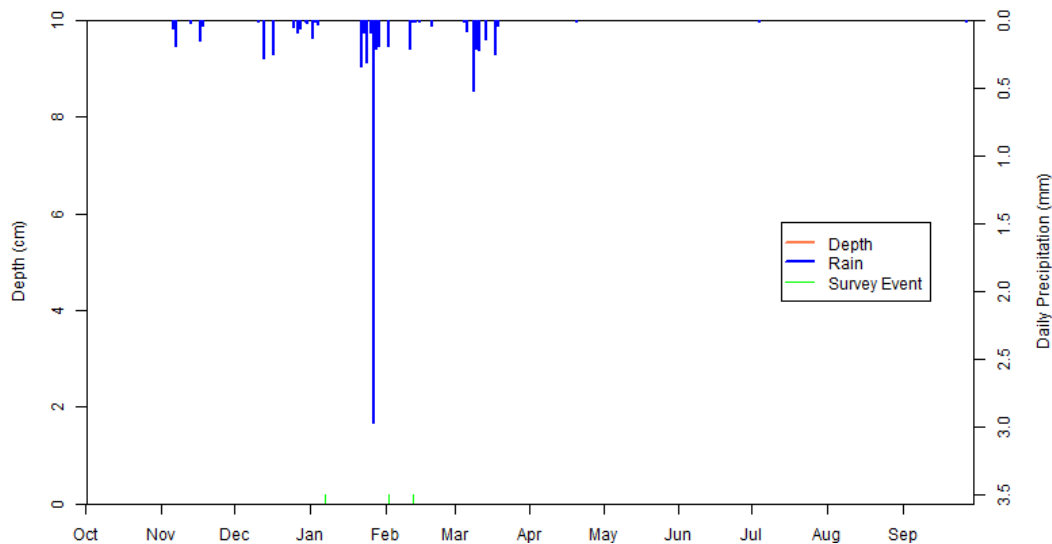
**Figure 4-9.** Pond 3 South (Year 3 Post-Subsurface Munitions Remediation) Depth and Precipitation Former Fort Ord, 2021

**Table 4-9. Pond 3 South (Year 3 Post-Subsurface Munitions Remediation)  
Hydrology Monitoring Results**

Pond 3S							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-05	0	0					
2021-02-01	0	0					
2021-03-25	0	0					
Not Surveyed							

#### 4.10 Pond 16

Pond 16 was in year 3 for post-subsurface munitions remediation in 2021. Depth of Pond 16 was monitored three times during 2021 water year. Pond 16 remained dry throughout the water year, thus the water quality parameters were not measured (Table 4-10 and Figure 4-10).



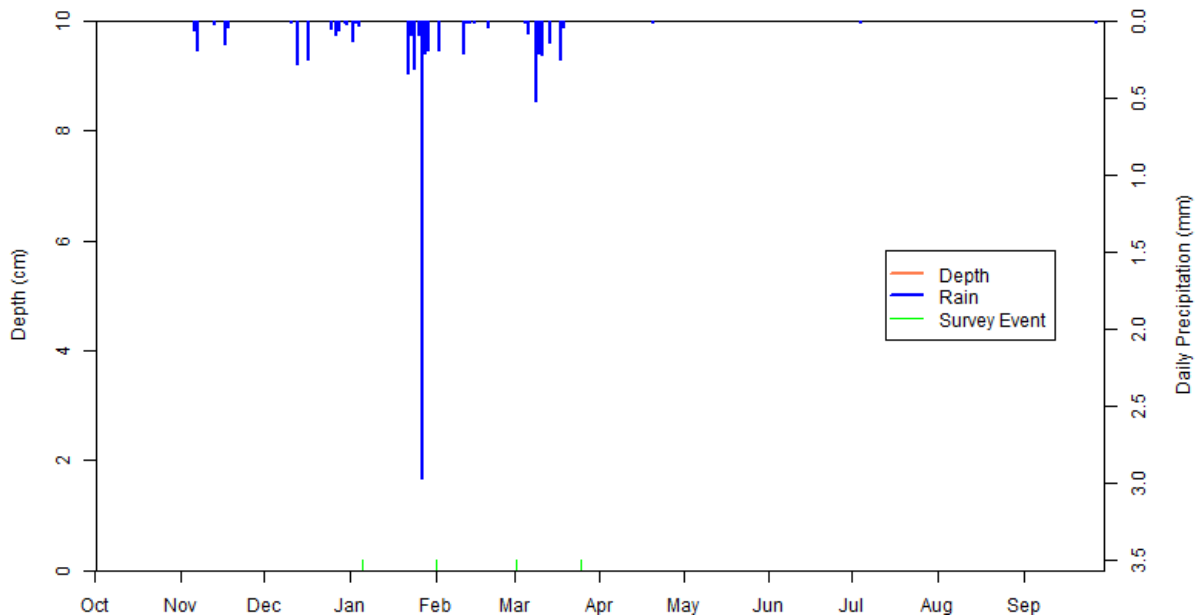
**Figure 4-10.** Pond 16 (Year 3 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-10. Pond 16 (Year 3 Post-Subsurface Munitions Remediation) Hydrology Monitoring Results**

Pond 16							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-07	0	0					
2021-02-02	0	0					
2021-02-12	0	0					

#### 4.11 Pond 35

Pond 35 was in year 3 of monitoring for post-subsurface munitions remediation in 2021. Depth of Pond 35 was monitored four times. Pond 35 remained dry throughout the water year, thus measurements of the water quality parameters were not taken (Table 4-11 and Figure 4-11).



**Figure 4-11.** Pond 35 (Year 3 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2021.

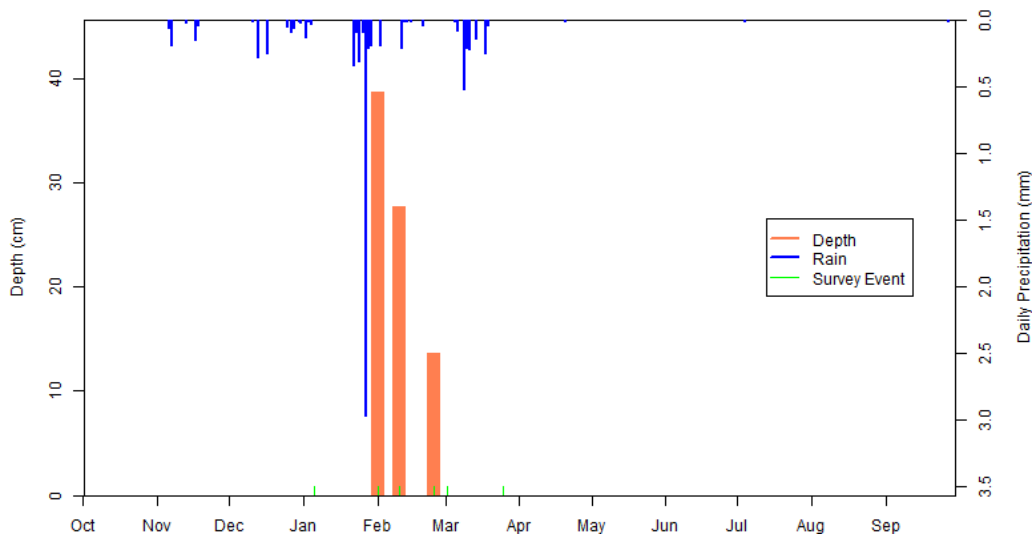
**Table 4-11. Pond 35 (Year 3 Post-Subsurface Munitions Remediation)  
Hydrology Monitoring Results**

Pond 35							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-05	0	0					
2021-02-01	0	0					
2021-03-02	0	0					
2021-03-25	0	0					
NS = Not Surveyed							



#### 4.12 Pond 39

Pond 39 was in year 3 of post-subsurface munitions remediation in 2021. Depth of Pond 39 was monitored six times and water quality parameters were measured once. Pond 39 was inundated throughout the month of February (Table 4-12 and Figure 4-12).



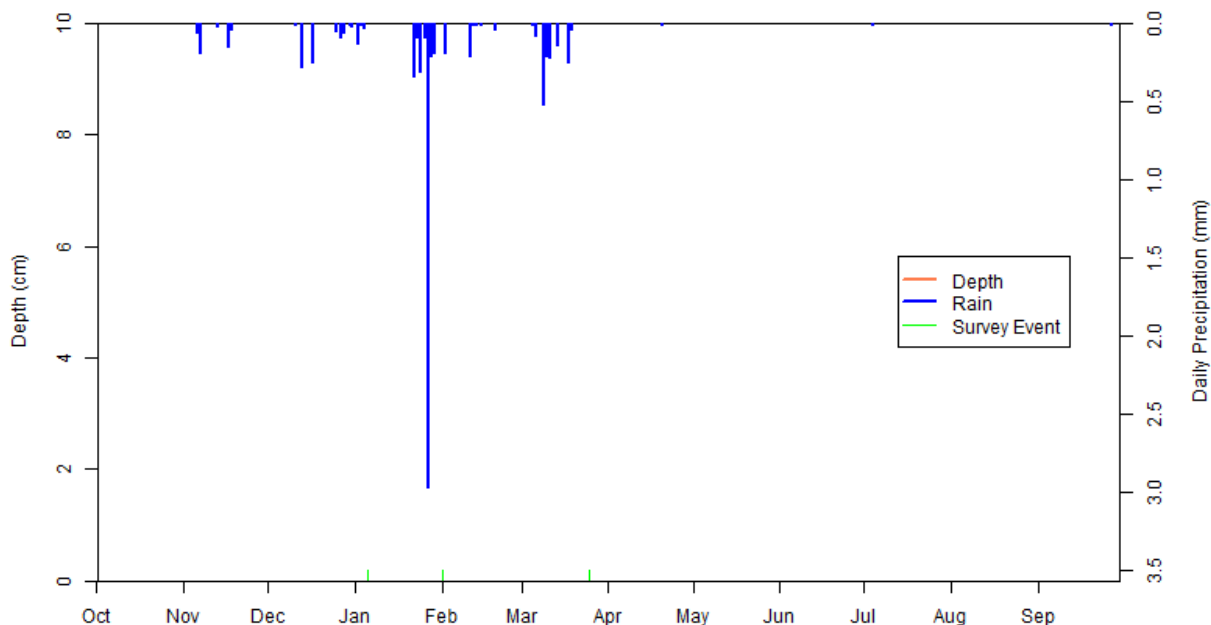
**Figure 4-12.** Pond 39 (Year 3 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-12. Pond 39 (Year 3 Post-Subsurface Munitions Remediation)  
Hydrology Monitoring Results**

Pond 39							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-05	0	0					
2021-02-01^	0.006	38	3.75	10.4	38.62	8	65.2
2021-02-10	NS	27	NS	NS	NS	NS	NS
2021-02-24	NS	13	NS	NS	NS	NS	NS
2021-03-02	0	0					
2021-03-25	0	0					
NS = Not Surveyed							
^Peripheral inundation present							

### 4.13 Pond 40 South

Pond 40 South was in year 3 of post-subsurface munitions remediation in 2021. Depth of Pond 40 South was monitored three times. Pond 40 South remained dry throughout the water year, thus measurements of the water quality parameters were not taken (Table 4-13 and Figure 4-13).



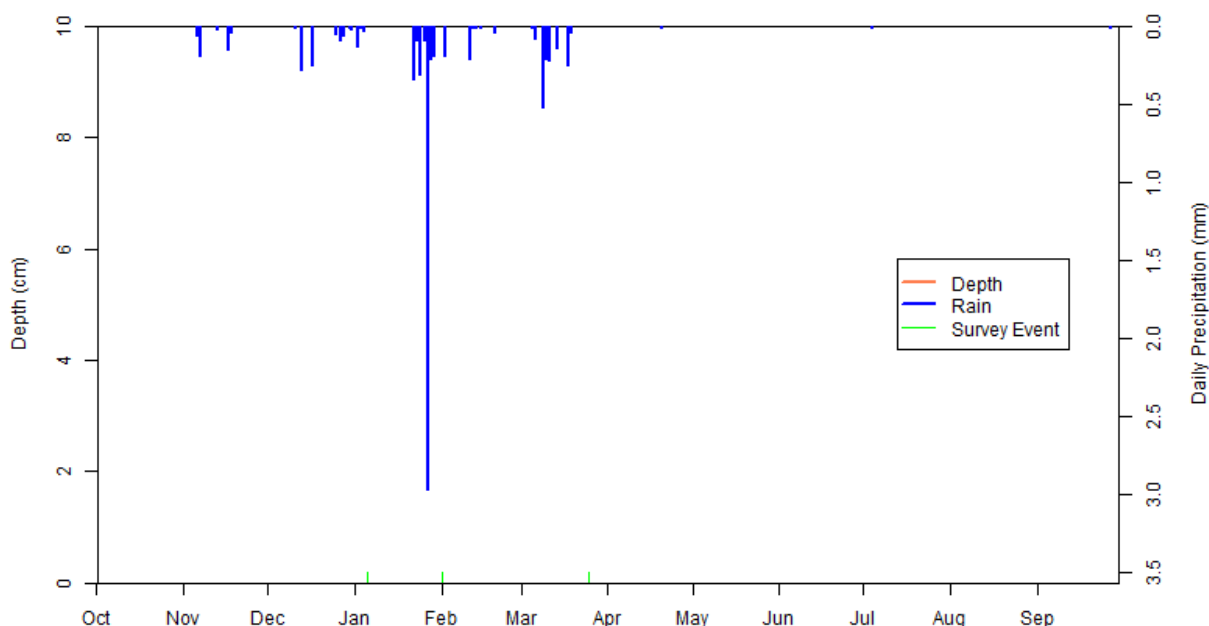
**Figure 4-13.** Pond 40 South (Year 3 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-13. Pond 40 South (Year 3 Post-Subsurface Munitions Remediation)  
Hydrology Monitoring Results**

Pond 40S							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-05	0	0					
2021-02-01	0	0					
2021-03-25	0	0					
NS = Not Surveyed							

#### 4.14 Pond 41

Pond 41, a post-subsurface munitions remediation vernal pool, was in year 3 of monitoring in 2021. Depth of Pond 41 was monitored three times during 2021 water year. Pond 41 remained dry throughout the water year, thus measurements of the water quality parameters were not taken (Table 4-14 and Figure 4-14).



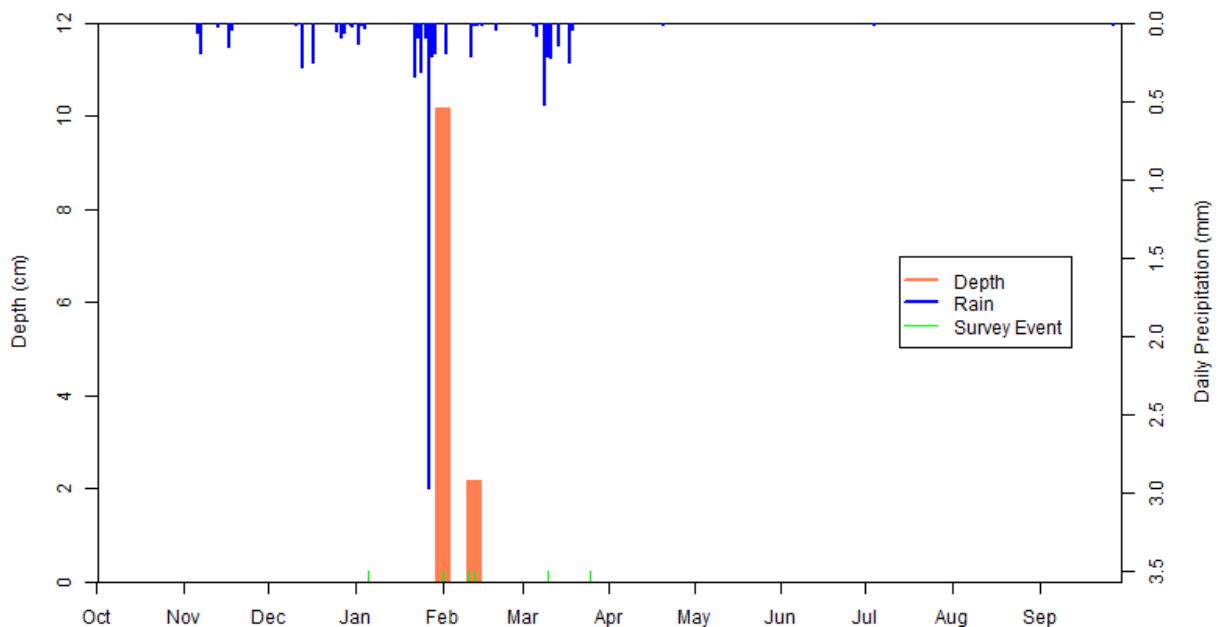
**Figure 4-14.** Pond 41 (Year 3 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-14. Pond 41 (Year 3 Post-Subsurface Munitions Remediation) Hydrology Monitoring Results**

Pond 41							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-05	0	0					
2021-02-01	0	0					
2021-03-25	0	0					

#### 4.15 Pond 42

Pond 42 was in year 3 for post-subsurface munitions remediation in 2021. Depth of Pond 42 was monitored six times and water quality parameters were measured once. Pond 42 was inundated beginning of February, which followed first significant precipitation event of the season. Pond 42 dried two times within the 2021 water year; first it dried out completely by February 10<sup>th</sup>, after which it became inundated the second time and it dried by March 10<sup>th</sup> (Table 4-15 and Figure 4-15).



**Figure 4-15.** Pond 42 (Year 3 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-15. Pond 42 (Year 3 Post-Subsurface Munitions Remediation) Hydrology Monitoring Results**

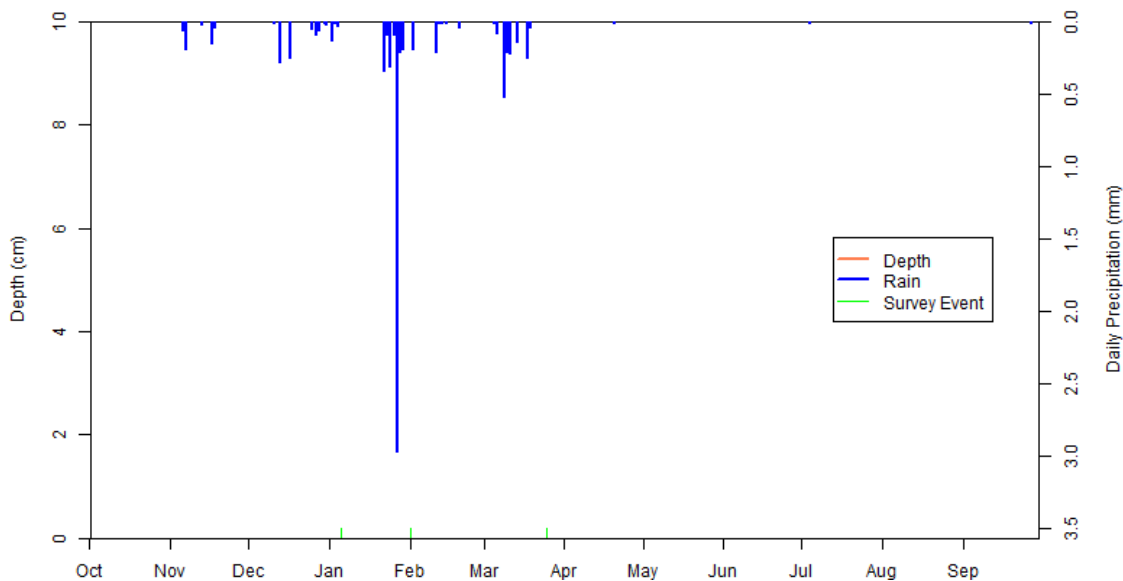
Pond 42							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-05	0	0					
2021-02-01 <sup>^</sup>	0.0082	10	5.56	18.9	449.52	6.84	135.4
2021-02-10	0	0					
2021-02-12	NS	2	NS	NS	NS	NS	NS
2021-03-10	0	0					
2021-03-25	0	0					

NS = Not Surveyed

<sup>^</sup>Peripheral inundation present

#### 4.16 Pond 43

Pond 43 was in year 3 of post-subsurface munitions remediation in 2021. Depth of Pond 43 was monitored three times. Pond 43 remained dry throughout the water year, thus measurements of the water quality parameters were not taken (Table 4-16 and Figure 4-16).



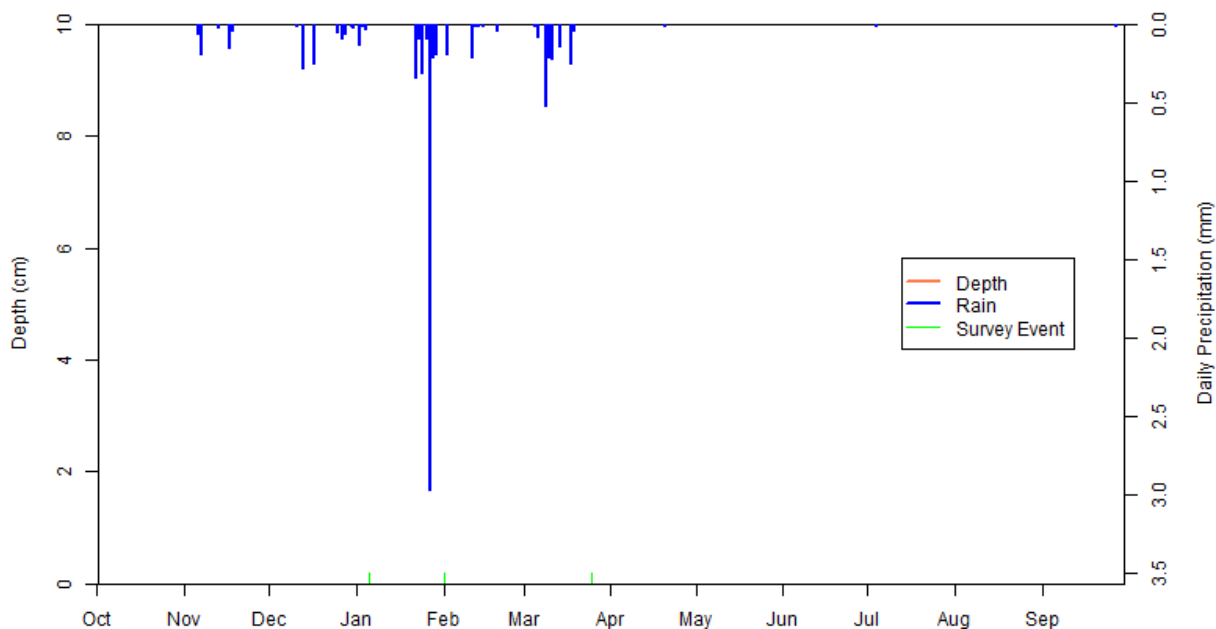
**Figure 4-16.** Pond 43 (Year 3 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-16. Pond 43 (Year 3 Post-Subsurface Munitions Remediation)**  
**Hydrology Monitoring Results**

Pond 43							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-05	0	0					
2021-02-01	0	0					
2021-03-25	0	0					

#### 4.17 Pond 44

Pond 44 was in year 3 of monitoring for post-subsurface munitions remediation in 2021. Depth of Pond 44 was monitored three times. Pond 44 remained dry throughout the water year, thus measurements of the water quality parameters were not taken (Table 4-17 and Figure 4-17).



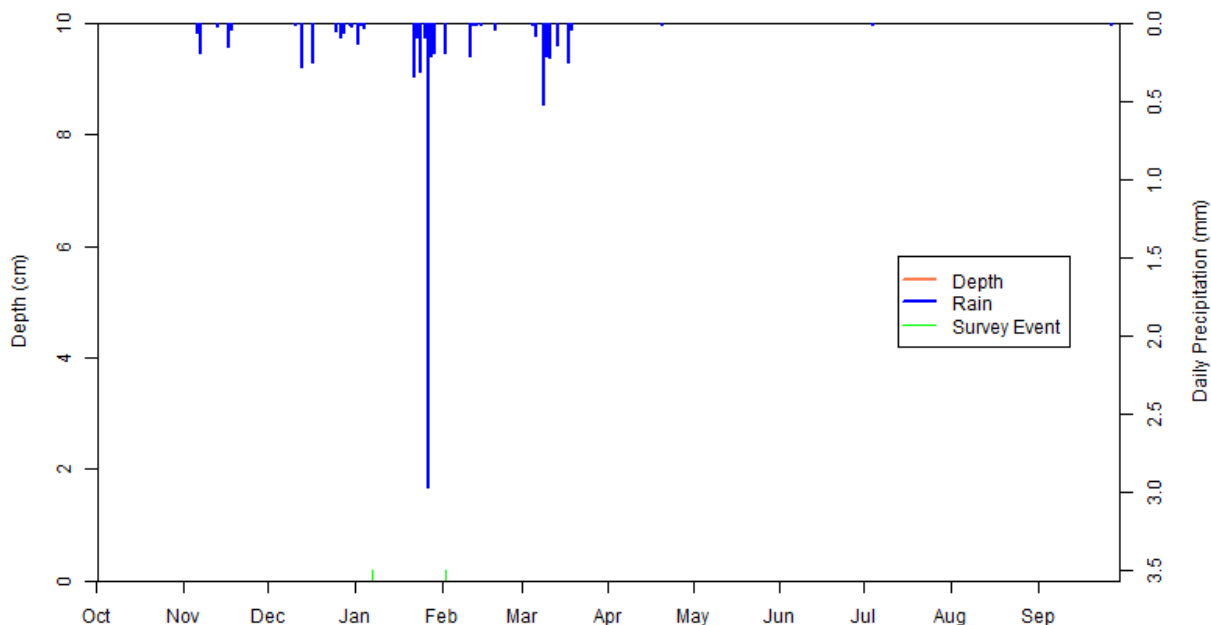
**Figure 4-17.** Pond 44 (Year 3 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-17. Pond 44 (Year 3 Post-Subsurface Munitions Remediation)  
Hydrology Monitoring Results**

Pond 44							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-05	0	0					
2021-02-01	0	0					
2021-03-25	0	0					

#### 4.18 Pond 54

Pond 54 was in year 3 of post-subsurface munitions remediation in 2021. Depth of Pond 54 was monitored two times. Pond 54 remained dry throughout the water year, thus measurements of the water quality parameters were not taken (Table 4-18 and Figure 4-18).



**Figure 4-18.** Pond 54 (Year 3 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2021

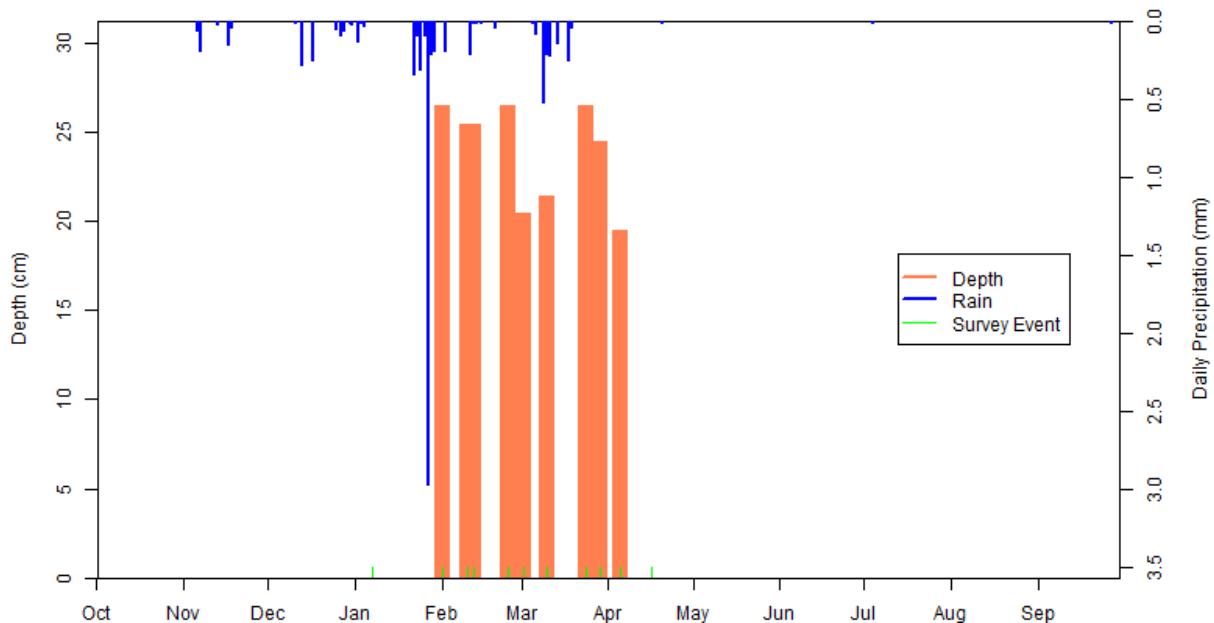
**Table 4-18. Pond 54 (Year 3 Post-Subsurface Munitions Remediation) Hydrology Monitoring Results**

Pond 54							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-07	0	0					
2021-02-02	0	0					

NS = Not Surveyed

#### 4.19 Pond 60

Pond 60 was in year 3 post-subsurface munitions remediation in 2021. Pond 60 was monitored eleven times and water quality parameters were measured three times. Pond 60 was inundated in early February, which followed first significant precipitation event of the season, and it dried by mid April (Table 4-19 and Figure 4-19).



**Figure 4-19.** Pond 60 (Year 3 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-19. Pond 60 (Year 3 Post-Subsurface Munitions Remediation) Hydrology Monitoring Results**

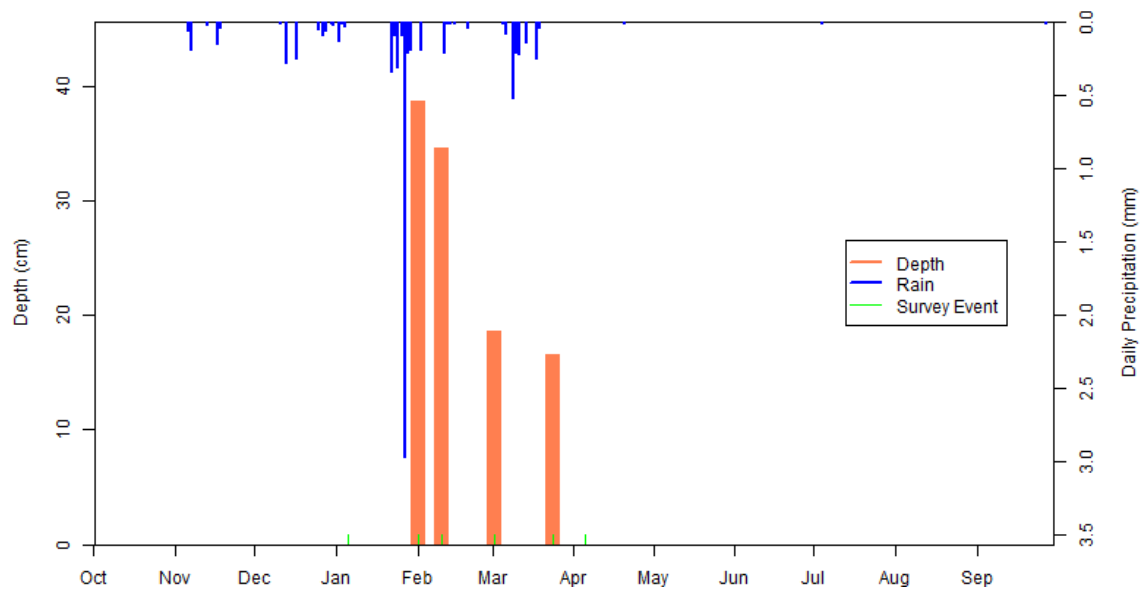
Pond 60							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-07	0	0					
2021-02-01	0.1411	26	0.43	15	283.97	6.14	1098
2021-02-10	NS	25	NS	NS	NS	NS	NS
2021-02-12	NS	25	NS	NS	NS	NS	NS
2021-02-24	NS	26	NS	NS	NS	NS	NS
2021-03-02	0.085	20	10.94	12.6	57.68	7.15	1306
2021-03-10	NS	21	NS	NS	NS	NS	NS
2021-03-24	0.1346	26	4.45	8.2	5.02	6.57	1513
2021-03-29	NS	24	NS	NS	NS	NS	NS
2021-04-05	NS	19	NS	NS	NS	NS	NS
2021-04-16	0	0					

NS = Not Surveyed



## 4.20 Pond 61

Pond 61 was in year 3 of monitoring for post-subsurface munitions remediation in 2021. Pond 61 consists of several depressions that fill with rain water at different rates. Per recommendations in the 2020 hydrology report (Chenega 2021) a staff gauge was installed in the western portion of Pond 61 and readings for the eastern and western portions were recorded separately. Pond 61 West was inundated from beginning of February to the end of March, while Pond 61 East was dry throughout the water year (Table 4-20 and Figure 4-20). Water quality parameters were measured three times at Pond 61 West.



**Figure 4-20.** Pond 61 West (Year 3 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-20. Pond 61 (Year 3 Post-Subsurface Munitions Remediation) Hydrology Monitoring Results**

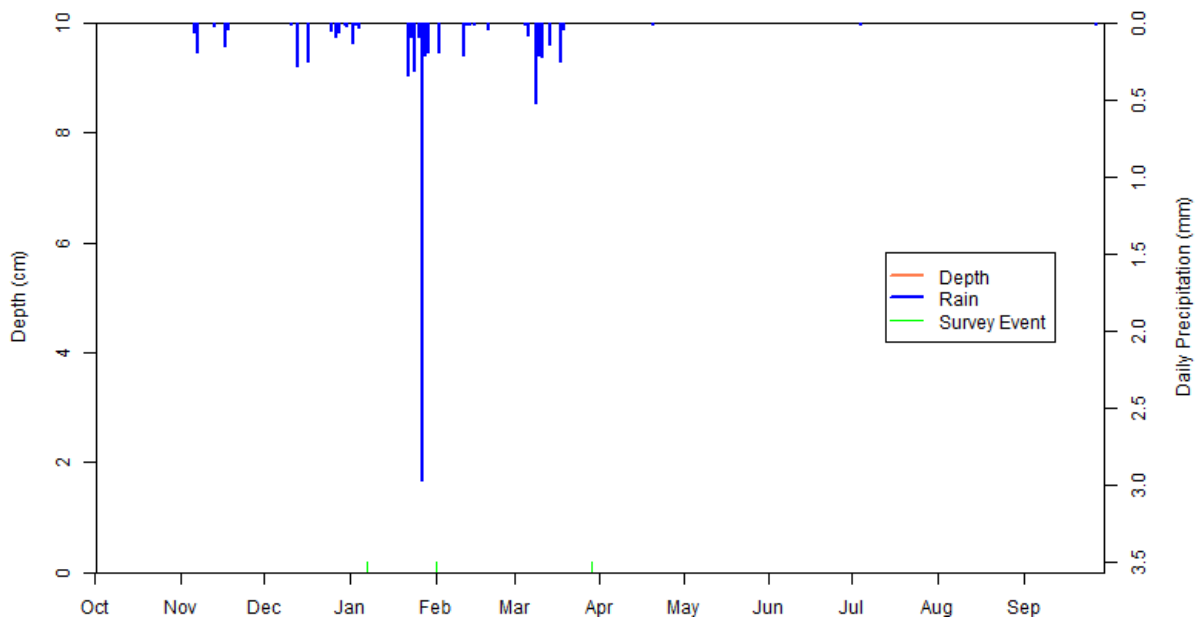
Pond 61W							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-05	0	0					
2021-02-01 <sup>^</sup>	0.0214	38	10.59	15.1	16.63	6.91	183.1
2021-02-10	NS	34	NS	NS	NS	NS	NS
2021-03-02	0.0048	18	11.96	14.8	1.3	7.07	250
2021-03-24	0.0045	16	10.14	10.7	0.07	6.95	289.6
2021-04-05	0	0					
Pond 61E							
2021-01-05	0	0					
2021-02-01	0	0					
2021-03-24	0	0					

NS = Not Surveyed

<sup>^</sup>Peripheral inundation present

#### 4.21 Pond 73

Pond 73 was in year 3 of monitoring for post-subsurface munitions remediation in 2021. Depth of Pond 73 was monitored three times. Pond 73 remained dry throughout the water year, thus measurements of the water quality parameters were not taken (Table 4-21 and Figure 4-21).



**Figure 4-21.** Pond 73 (Year 3 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2021

**Table 4-21. Pond 73 (Year 3 Post-Subsurface Munitions Remediation)  
Hydrology Monitoring Results**

Pond 73							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
2021-01-07	0	0					
2021-02-01	0	0					
2021-03-29	0	0					

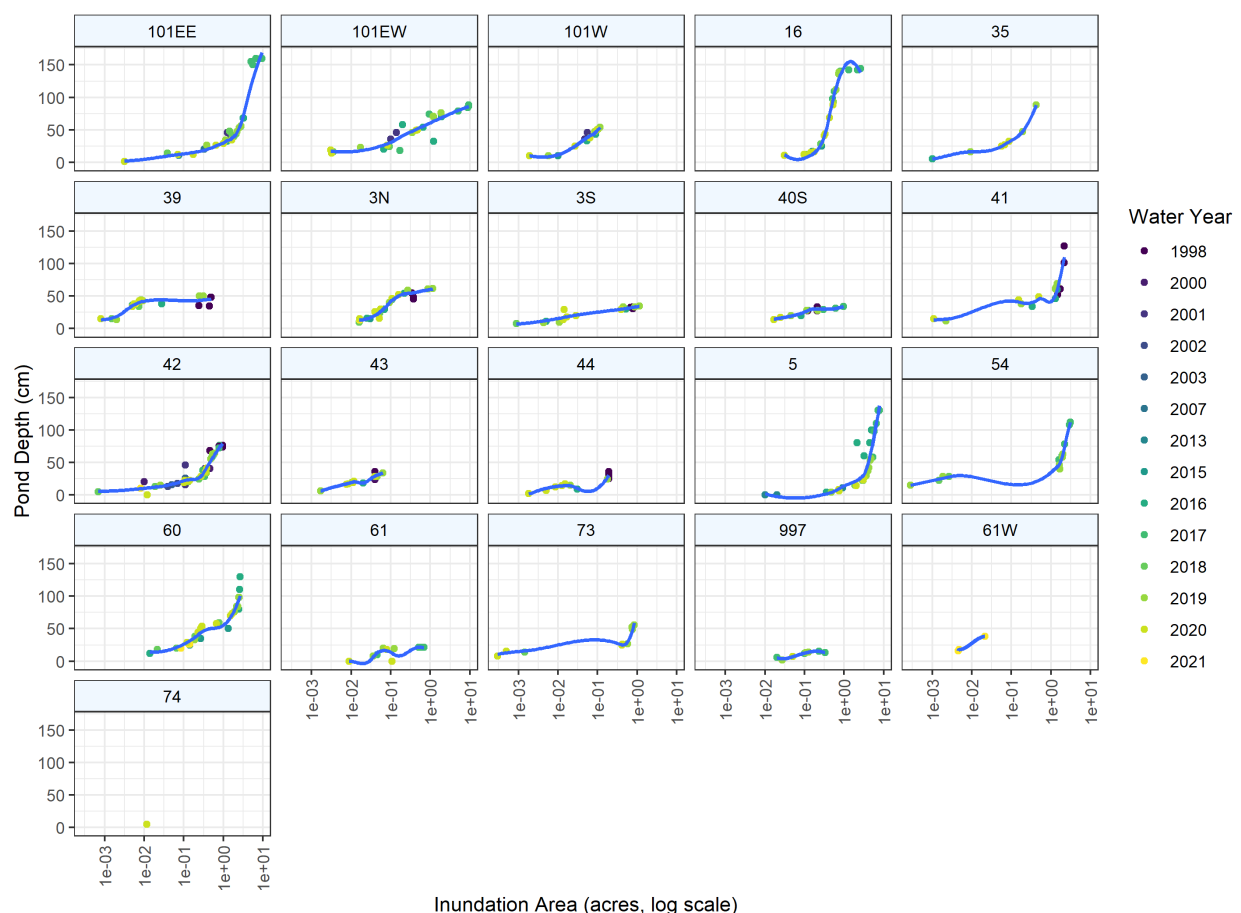
NS = Not Surveyed

## 5 DISCUSSION

Vernal pools were assessed for successful wetland function following MEC remediation activities using data quality objectives (DQOs) and performance standards outlined in the Wetland Plan (Burlison, 2006). This report addresses the hydrology DQOs that are summarized below:

- DQO 1: depth – average of 25 cm through March for CTS and at least 10 cm through May for fairy shrimp
- DQO 2: inundation – consistent with baseline and similar to reference vernal pool trends
- DQO 4: water quality – adequate for the presence of CTS and/or fairy shrimp

Depth of vernal pools and the area and the temporal length of inundation largely depend on the amount and frequency of precipitation, and the geomorphic features such as slope, extent of the vernal pool basin, size of its watershed, the underlying soil types and their geologic sources. The vernal pools on the former Fort Ord vary greatly based on the vernal pool basin size and shape. Figure 5-1 compares the historical depth vs inundation area across all vernal pools monitored in 2021 water year.

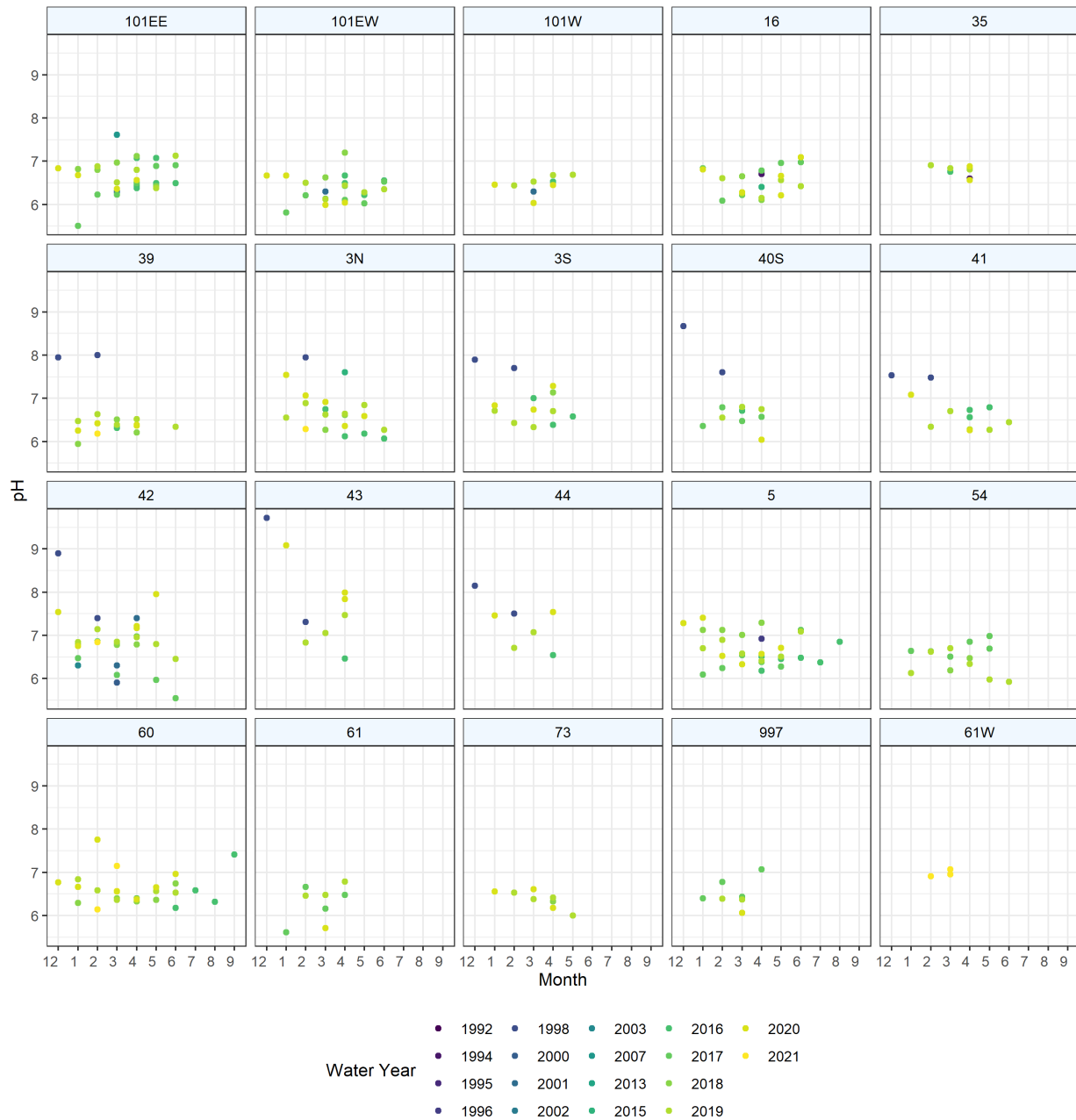


**Figure 5-1.** Plot of Historical Depth vs Inundation Area data going back to water year 1998 for all ponds surveyed in the 2021 water year except for pond 75, which was surveyed for the first time but was not inundated and has no depth data .

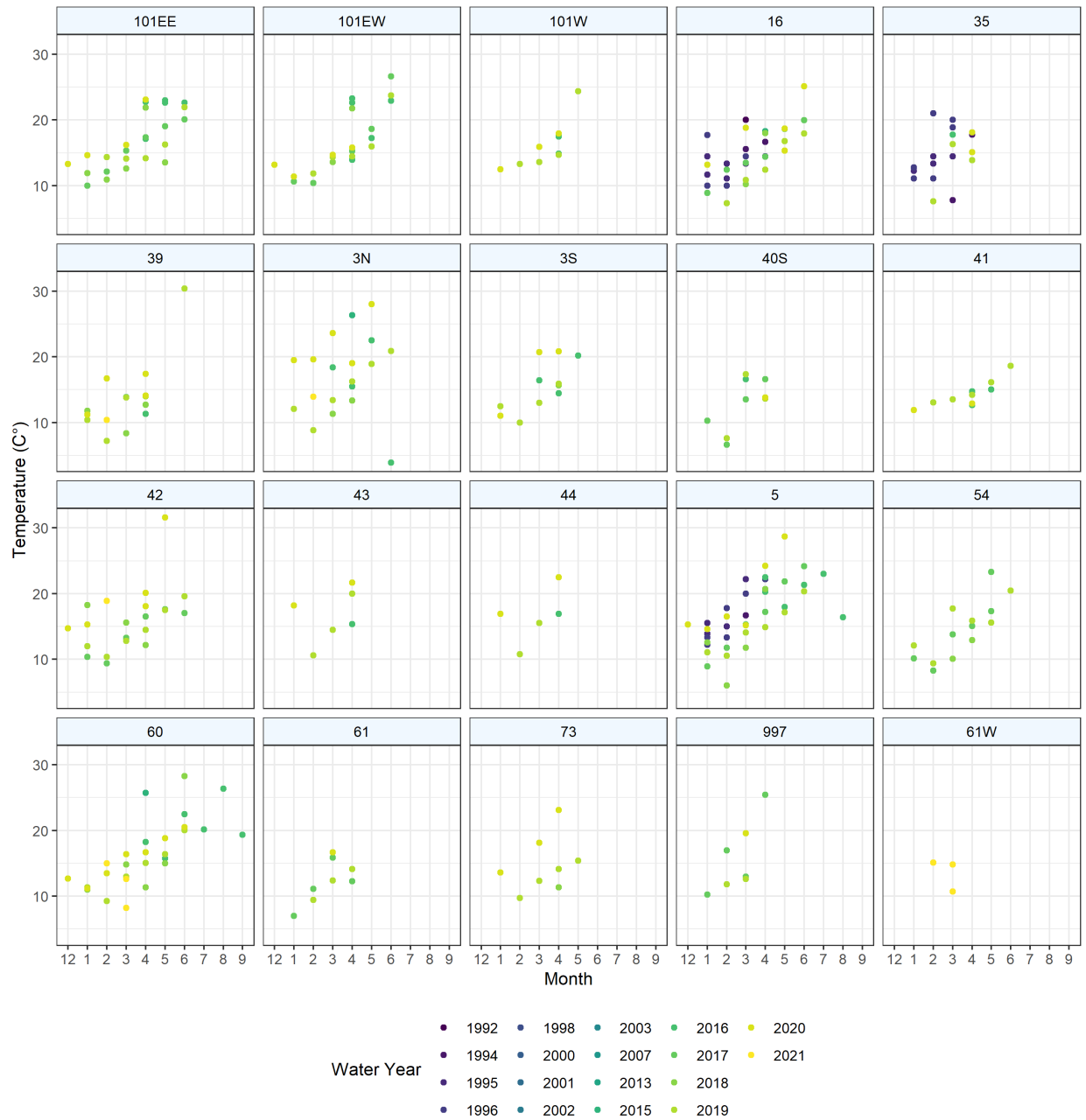
Following initial inundation, vernal pools with large and shallow basins tend to increase rapidly in inundation area with relatively small corresponding increases in depth. Once the inundation area in these vernal pools reaches the edge of the basin, there is a steep increase in depth with only modest increases in inundation area. Ponds 5 and 101 East (East) are good examples of large and shallow vernal pools (Figure 5-1). On the opposite end of the spectrum there are vernal pools that have small and steep basins. These vernal pools increase rapidly in depth following initial inundation as is demonstrated by Pond 3 North (Figure 5-1). Thus, assessments of wetland DQOs must be made in the context of combinations of basin extent (large vs small) and basin slope (shallow vs steep) as the main drivers of vernal pool hydroperiods in any given precipitation pattern. Discussions in the following sections address DQOs for each pond individually and makes comparisons to other vernal pools and water years within the context described above.

Water quality parameters for pH, temperature, dissolved oxygen, turbidity, and conductivity were measured approximately once a month in the inundated vernal pools that had sufficient depth of water. Water quality parameters can vary among vernal pools and within individual vernal pools between months and years, depending on amount and frequency of precipitation, length of inundation, depth, ambient temperature, amount of vegetation within the vernal pool, presence of wildlife, and general weather conditions. Typically, pH of vernal pools on former Fort Ord tends to be slightly acidic but can range to slightly alkaline (Figure 5-2). Water temperature tends to range from approximately 10° C in the winter months to approximately 30° C in late spring and early summer, as ambient temperature increases and vernal pools become shallower (Figure 5-3). Turbidity can be highly variable with amount and frequency of precipitation likely having a large effect (Figure 5-4). Dissolved oxygen generally varies from 10 mg/L to single digits, but values close to 25 mg/L have been recorded. Dissolved oxygen tends to decrease from the initial inundation of a vernal pool to when it dries out (Figure 5-5). Since water quality parameters can be variable, their assessment was conducted for each vernal pool by comparing them to their historic values, reference vernal pools, and other vernal pools with an objective of spotting any anomalous trends. Single measurements of water quality parameters that were out of range were noted, but occasional discrepancies are to be expected due to a variety of variables noted above. This was the first year water quality parameters were measured in Pond 61 West which are shown separately from Pond 61 (Figures 5-2 to 5-5) which historically has been surveyed in the eastern portion of the vernal pool.

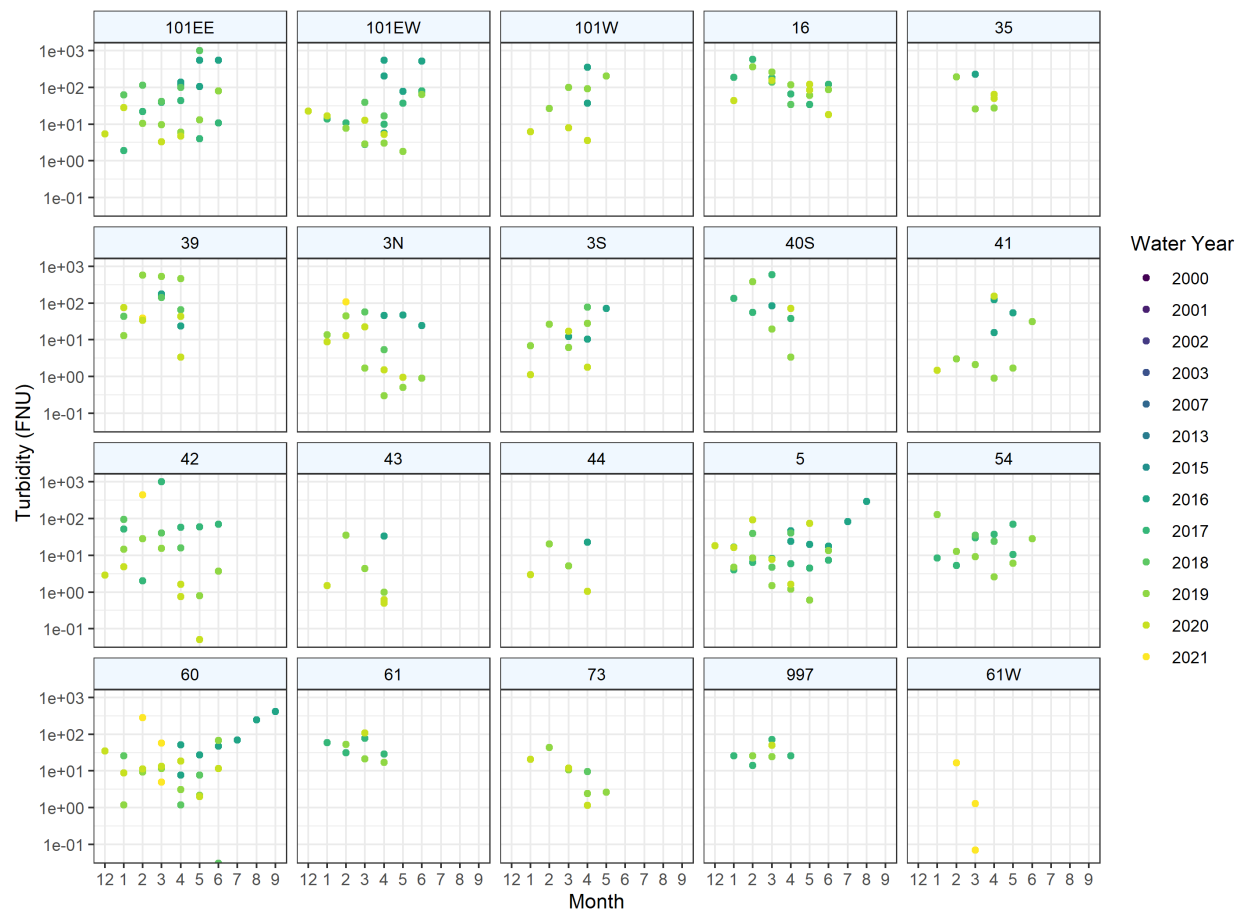
During 2021 water year, measured pH values were within historical range. Due to short inundation period for the vernal pools that held water, no trends in pH values have been spotted in 2021. Values of pH in Pond 61 West were slightly higher than in historical values of Pond 61, but not outside of expected range (Figure 5-2). Water temperature measurements were within historical ranges (Figure 5-3). Turbidity values were also within historical ranges. In ponds 60 and 61 West highest turbidity values were observed following the large precipitation event at the end of January, after which they subsided considerably (Figure 5-4). Dissolved oxygen was within historical ranges in all vernal pools (Figure 5-5).



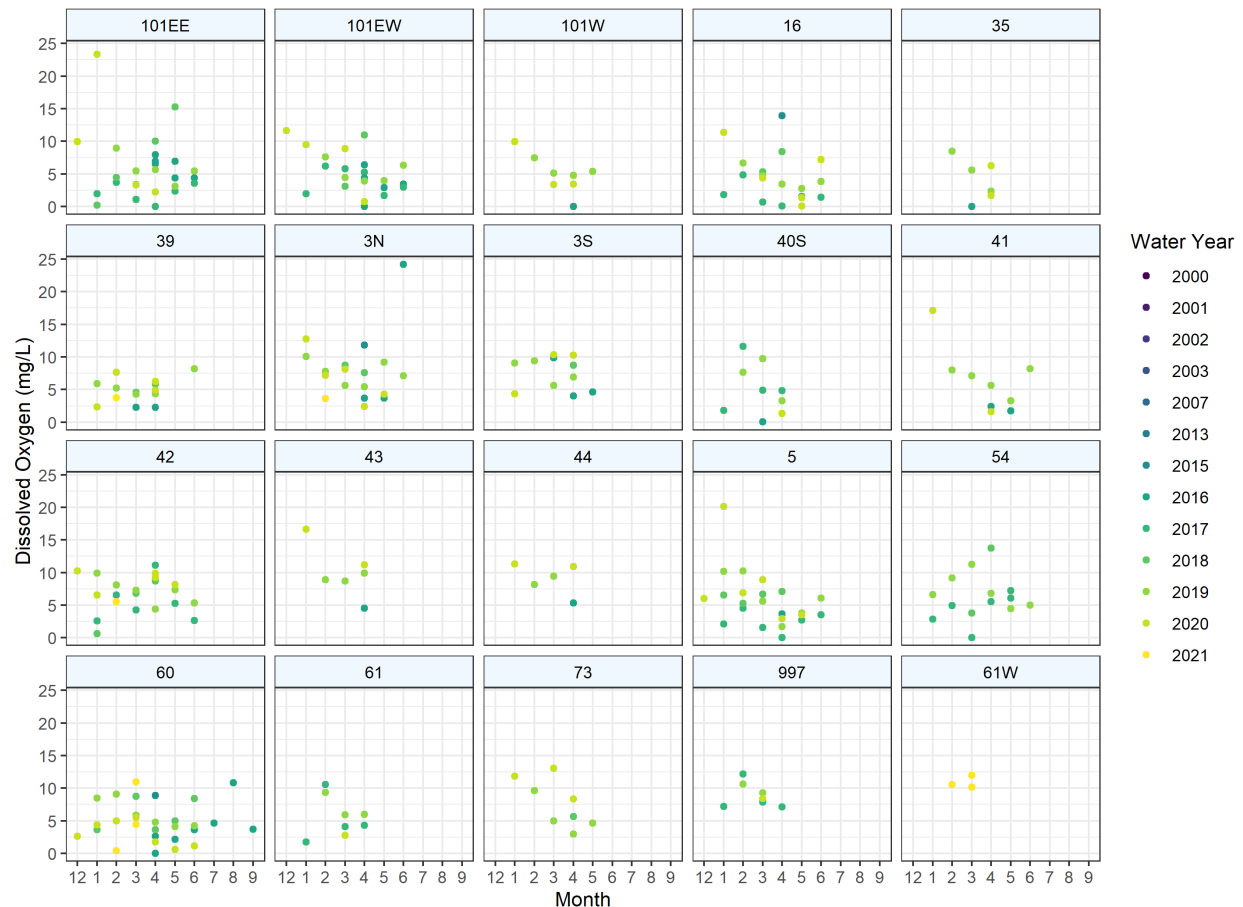
**Figure 5-2.** Plot of Historical pH Values going back to water year 1992 for all ponds surveyed in the 2021 water year. Water quality measurements were not taken at ponds 74 and 75 due to insufficient depth.



**Figure 5-3.** Plot of Historical Temperature Values going back to water year 1992 for all ponds surveyed in the 2021 water year. Water quality measurements were not taken at ponds 74 and 75 due to insufficient depth.



**Figure 5-4.** Plot of Historical Turbidity Values going back to water year 2000 for all ponds surveyed in the 2021 water year. Water quality measurements were not taken at ponds 74 and 75 due to insufficient depth.



**Figure 5-5.** Plot of Historical Dissolved Oxygen Values going back to water year 2000 for all ponds surveyed in the 2021 water year. Water quality measurements were not taken at ponds 74 and 75 due to insufficient depth.

### 5.1 Pond 5 – Reference

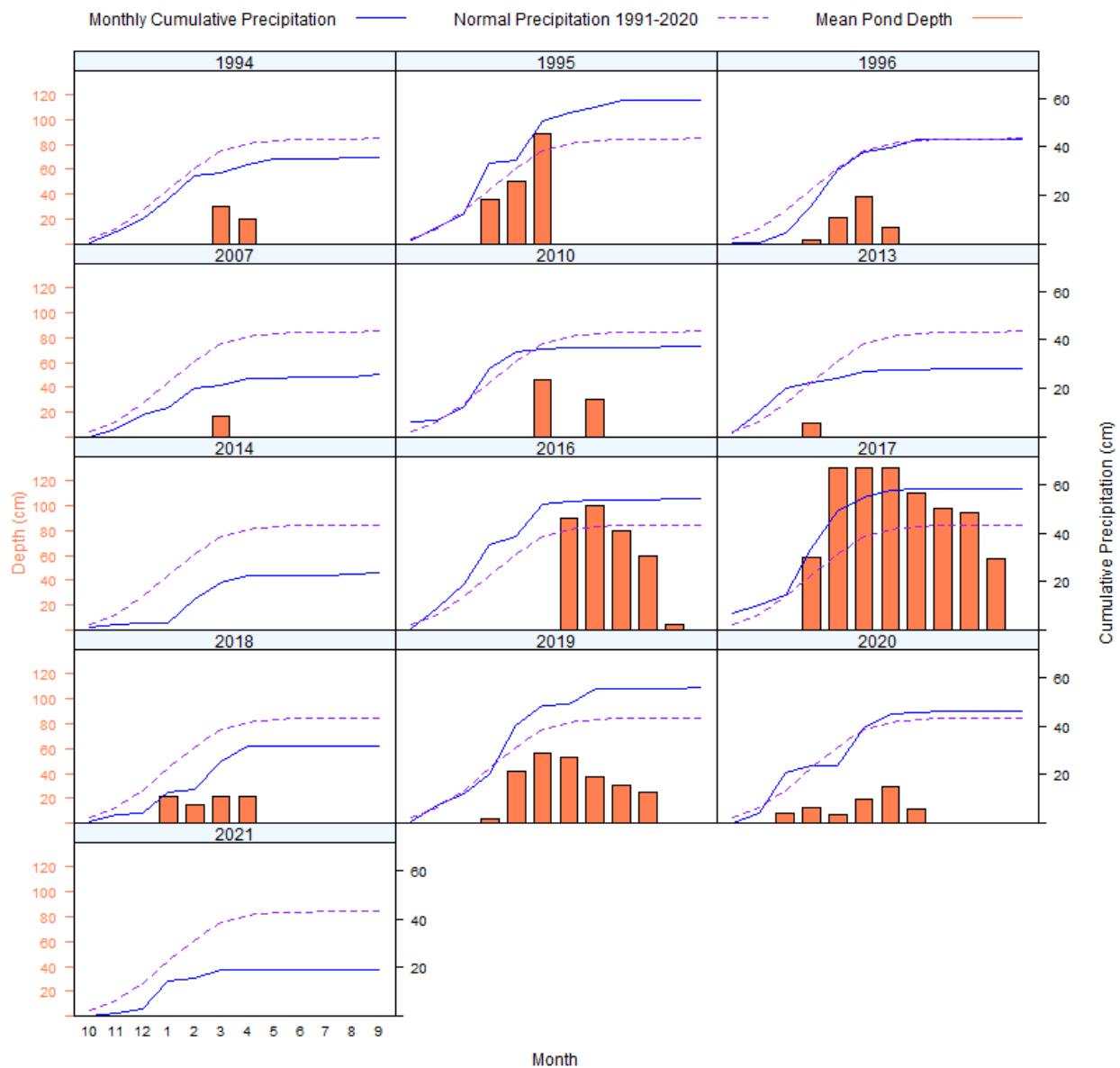
Pond 5 is situated within a large and shallow basin in the northeastern portion of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 5 have been monitored for thirteen years (Figure 5-6). Above normal water-years were 1995, 2016, 2017, and 2019. Close to normal water years were 1996 and 2020. All other monitoring was conducted either in a below normal water year, drought year, or consecutive drought year.

Historically, Pond 5 remained completely dry in a consecutive drought year (2014), and it reached a maximum depth of 130 cm and a maximum inundation of 7.8 acres in a consecutive above normal water year (2017; Figure 5-6). Pond 5 remained dry in 2021 water year, although peripheral inundation was present in February and March (Table 4-1). Inundation extent, depth, and water quality measurements were not taken. Historical values are presented in Figures 5-6 through 5-9.

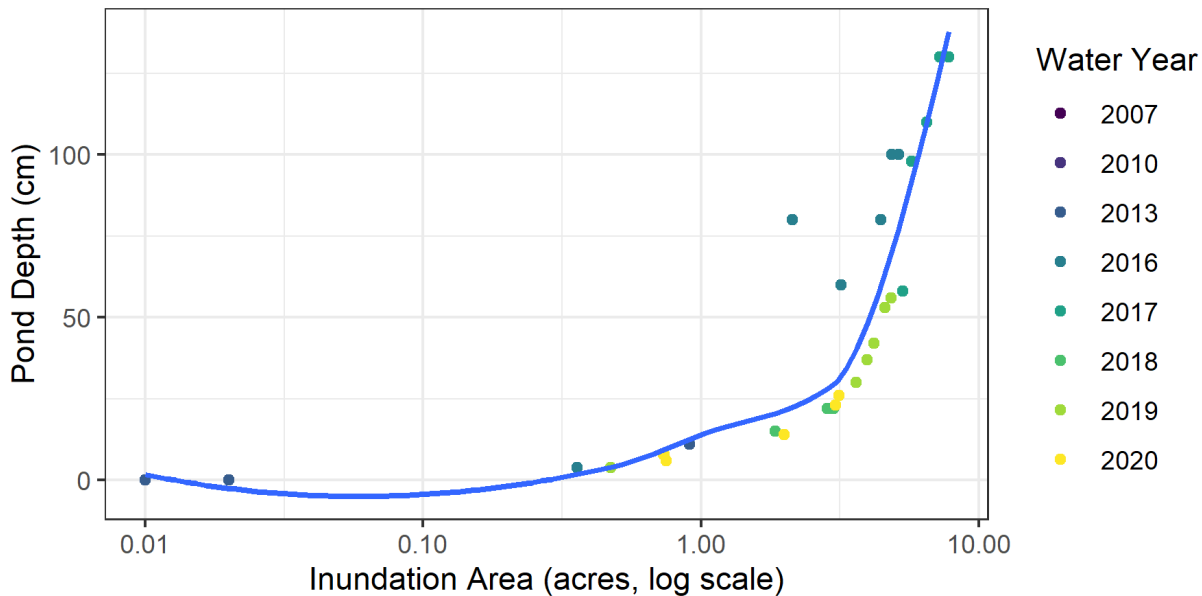
It is important to note that during the thirteen years of monitoring of Pond 5 the cumulative precipitation in 2021 was the lowest. There was only one other instance of Pond 5 remaining dry throughout the water year; 2014, which was a consecutive drought year. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding.



This suggests that there simply was not enough precipitation in 2021 water year to completely saturate the sandy loam layer and/or the underlying clay layer. Even though the 2020 water year was slightly above normal, the unusual frequency of precipitation that year caused Pond 5 to reach lower depths than in 1996, a normal year with more consistent precipitation. This may have caused the underlying clay layer to contain less water content going into 2021 water year, and thus requiring more precipitation to saturate it.



**Figure 5-6.** Pond 5 (Reference) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)



**Figure 5-7.** Pond 5 (Reference) Plot of Depth vs Inundation Area since 2007 Water Year

#### 5.1.1 Data Quality Objective 1

Pond 5 did not meet the required average depths of 25 cm from the first rain event through March for CTS, nor the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 5 did not sustain sufficient depth for CTS (0 cm through March), nor for fairy shrimp (0 cm through May).

#### 5.1.2 Data Quality Objective 2

Pond 5 remained dry in 2021 water year which was not unexpected given the well below normal precipitation (Figure 5-6).

#### 5.1.3 Performance Standard: Hydrological Conditions and Inundation Area

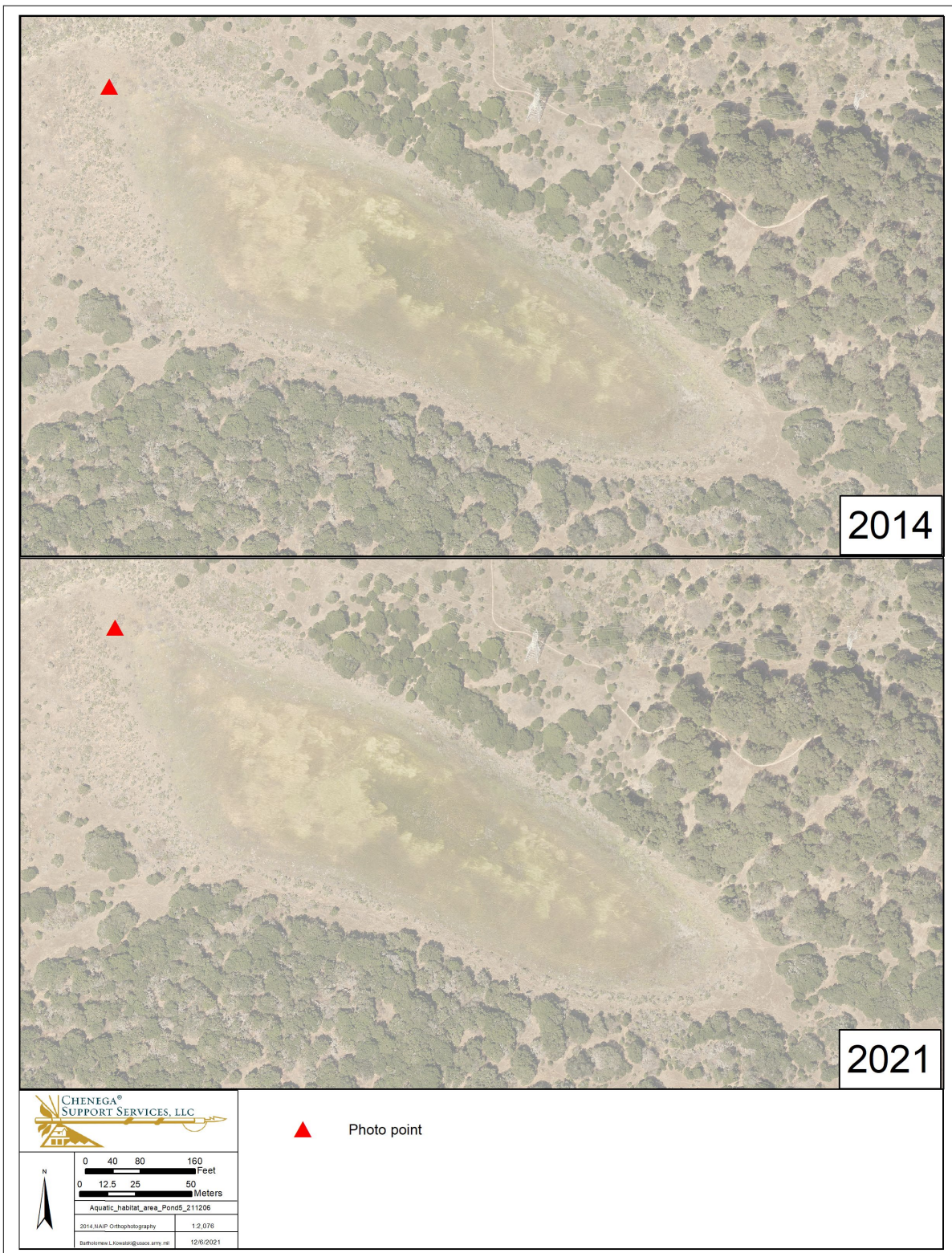
Pond 5 did not sustain suitable habitat for CTS nor for fairy shrimp in 2021 because it remained dry. Pond 5 is a reference vernal pool and was not required to meet the performance standards. Instead, the vernal pool was used as a control for comparison to the remediated vernal pools.

#### 5.1.4 Data Quality Objective 4

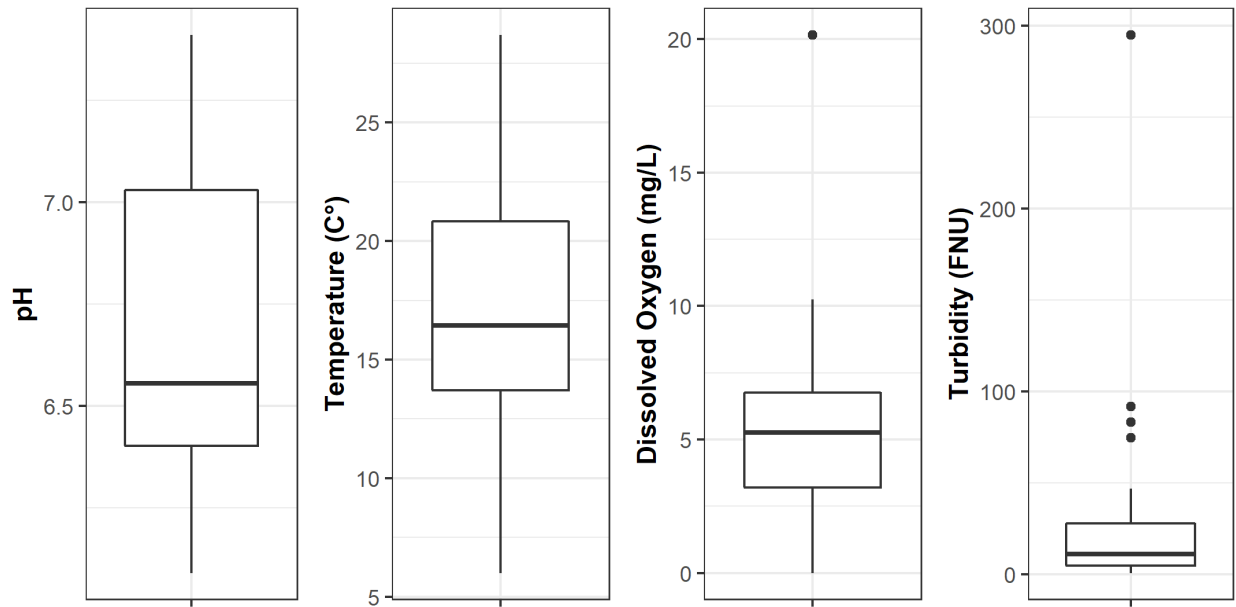
Water quality parameters were not taken at Pond 5 because it remained dry in 2021.

#### 5.1.5 Performance Standard: Wildlife Usage

Water quality cannot be assessed for suitability for wildlife use. Pond 5 is a reference vernal pool and was not required to meet the performance standards. Instead, the vernal pool was used as a control for comparison to the remediated vernal pools.



**Figure 5-8.** Pond 5 (Reference) inundations. It remained dry at the staff gauge in 2014 and 2021 (both years had well below normal precipitation), but peripheral inundation was present in 2021.



**Figure 5-9.** Pond 5 (Reference) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

#### 5.1.6 Conclusion

With the exception of DQO 4, Pond 5 metrics were suitable for comparison to the remediated vernal pools (Table 5-1).

**Table 5-1.** Success at Pond 5 (Reference) Based on Performance Standards and Applicable Data Quality Objectives

Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Suitable for Comparison
	DQO 2	Suitable for Comparison
Wildlife Usage	DQO 1	Suitable for Comparison
	DQO 4	Cannot assess

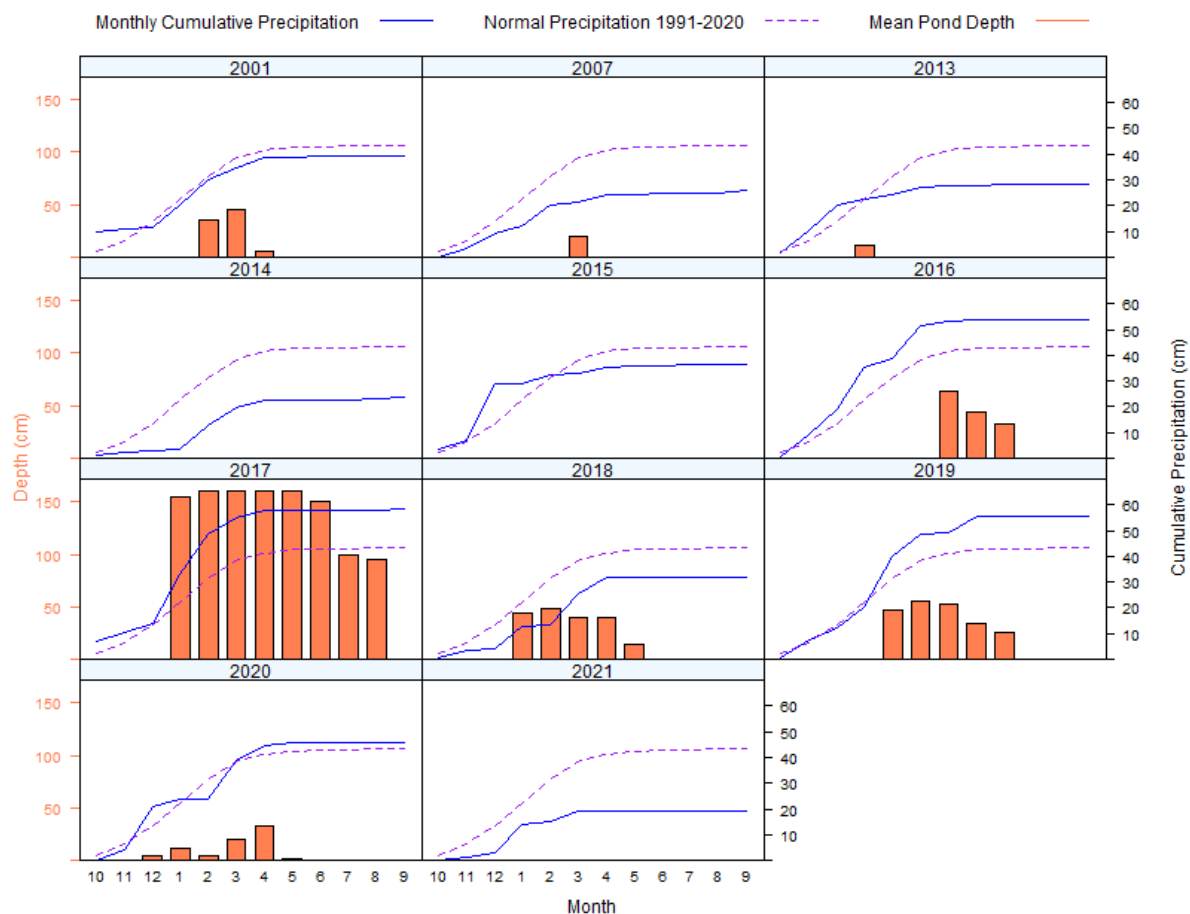
## 5.2 Pond 101 East (East) – Reference

Pond 101 East (East) is situated within a large and shallow basin in the northern tip of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 101 East (East) have been monitored for eleven years (Figure 5-10). Above normal water years were 2016, 2017, and 2019. Close to normal water years were 2001 and 2020. All other monitoring was conducted either in a below normal water year, drought year, or a consecutive drought year. In extreme above normal water years Pond 101 East (East) can become hydrologically connected to Pond 101 East (West), and even to Pond 101 West which occurred during an El Niño water year in 1998.

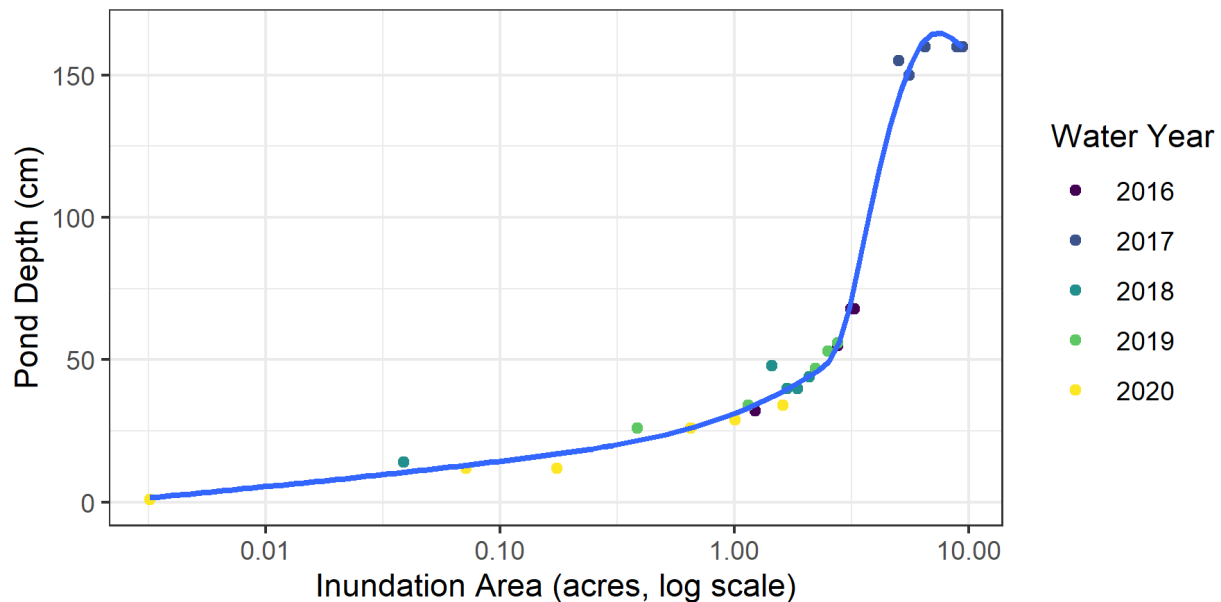


Historically, Pond 101 East (East) remained completely dry in a consecutive drought year (2014, 2015), and it reached a maximum depth of 160 cm and a maximum inundation of 9.38 acres in a consecutive above normal water year (2017, when it became hydrologically connected to Pond 101 East (West), Figure 5-10). Pond 101 East (East) remained dry in 2021 water year and thus inundation extent, depth, and water quality measurements were not taken. Historical values are presented in Figures 5-10 to 5-13.

It is important to note that during the eleven years of monitoring of Pond 101 East (East) the cumulative precipitation in 2021 was the lowest (Figure 5-10). There were only two other instances of Pond 101 East (East) remaining dry throughout the water year; 2014 and 2015 which were both consecutive drought years. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. This suggests that there simply was not enough precipitation in 2021 water year to completely saturate the sandy loam layer and/or the underlying clay layer. Even though the 2020 water year was slightly above normal, the unusual frequency of precipitation that year caused Pond 101 East (East) to reach lower depths than in years with less but more consistent precipitation (2001, 2018). This may have caused the underlying clay layer to contain less water content going into 2021 water year, and thus requiring more precipitation to saturate it.



**Figure 5-10.** Pond 101 East (East) (Reference) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)



**Figure 5-11.** Pond 101 East (East) Plot of Depth vs Area since 2016 Water Year

#### 5.2.1 Data Quality Objective 1

Pond 101 East (East) did not meet the required average depths of 25 cm from the first rain event through March for CTS, nor the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 101 East (East) did not sustain sufficient depth for CTS (0 cm through March), nor for fairy shrimp (0 cm through May).

#### 5.2.2 Data Quality Objective 2

Pond 101 East (East) remained dry in 2021 water year which was not unexpected given the well below normal precipitation (Figure 5-10).

#### 5.2.3 Performance Standard: Hydrological Conditions and Inundation Area

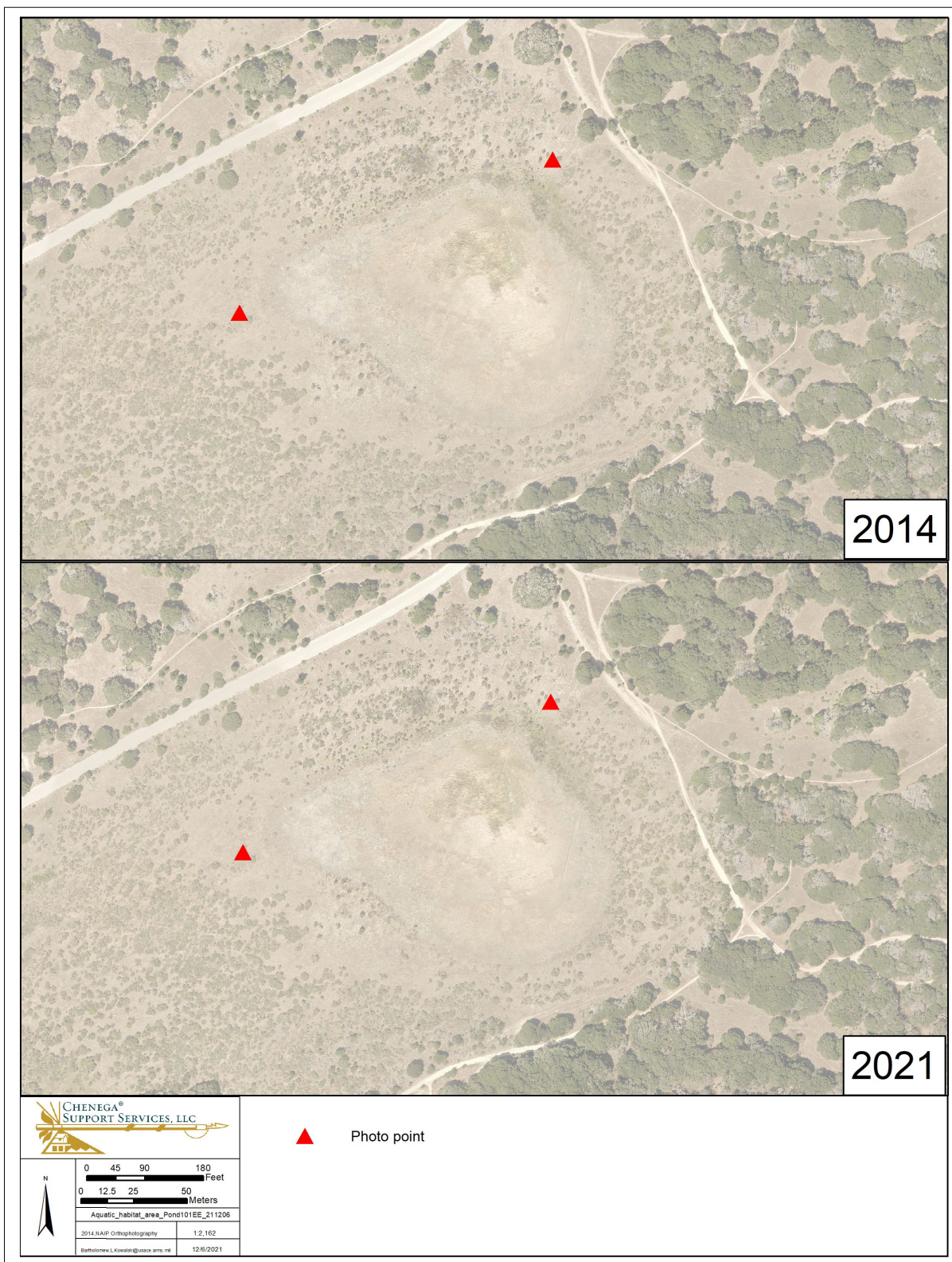
Pond 101 East (East) did not sustain suitable habitat for CTS nor for fairy shrimp in 2021 because it remained dry. Pond 101 East (East) is a reference vernal pool and was not required to meet the performance standards. Instead, the vernal pool was used as a control for comparison to the remediated vernal pools.

#### 5.2.4 Data Quality Objective 4

Water quality parameters were not taken at 101 Pond East (East) because it remained dry in 2021.

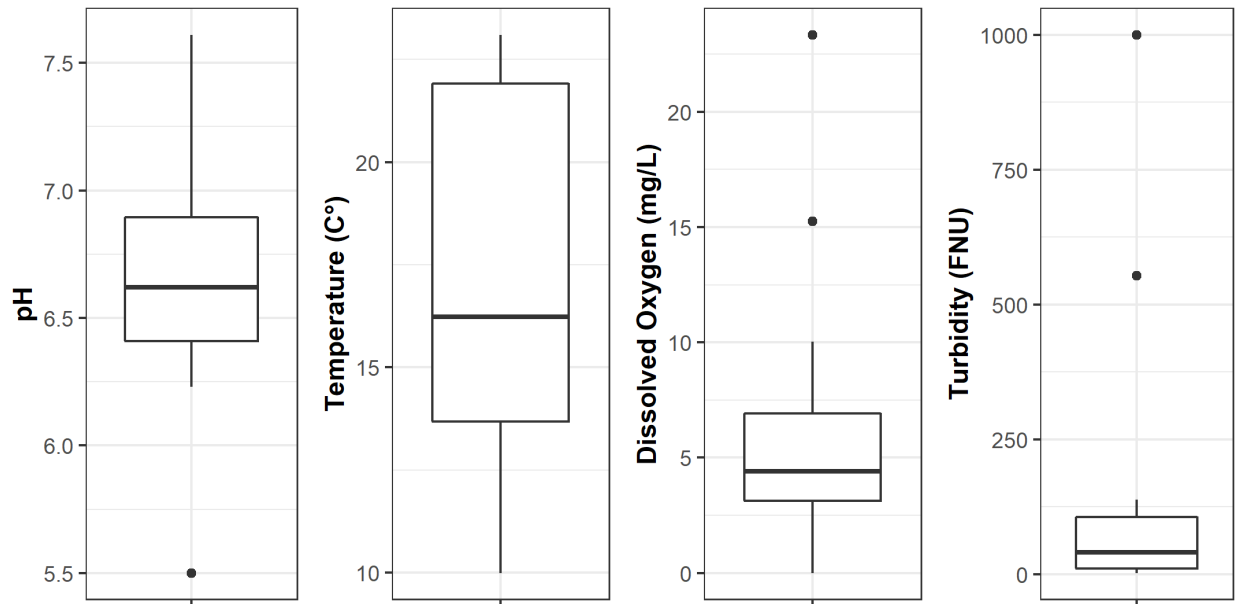
#### 5.2.5 Performance Standard: Wildlife Usage

Water quality cannot be assessed for suitability for wildlife use. Pond 101 East (East) is a reference vernal pool and was not required to meet the performance standards. Instead, the vernal pool was used as a control for comparison to the remediated vernal pools.



**Figure 5-12.** Pond 101 East (East) (Reference) inundations. It remained dry in 2014 and 2021 (both years had well below normal precipitation)





**Figure 5-13.** Pond 101 East (East) (Reference) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

### 5.2.6 Conclusion

With the exception of DQO 4, Pond 101 East (East) metrics were suitable for comparison to the remediated vernal pools (Table 5-2).

**Table 5-2. Success at Pond 101 East (East) (Reference) Based on Performance Standards and Applicable Data Quality Objectives**

Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Suitable for Comparison
	DQO 2	Suitable for Comparison
Wildlife Usage	DQO 1	Suitable for Comparison
	DQO 4	Cannot assess

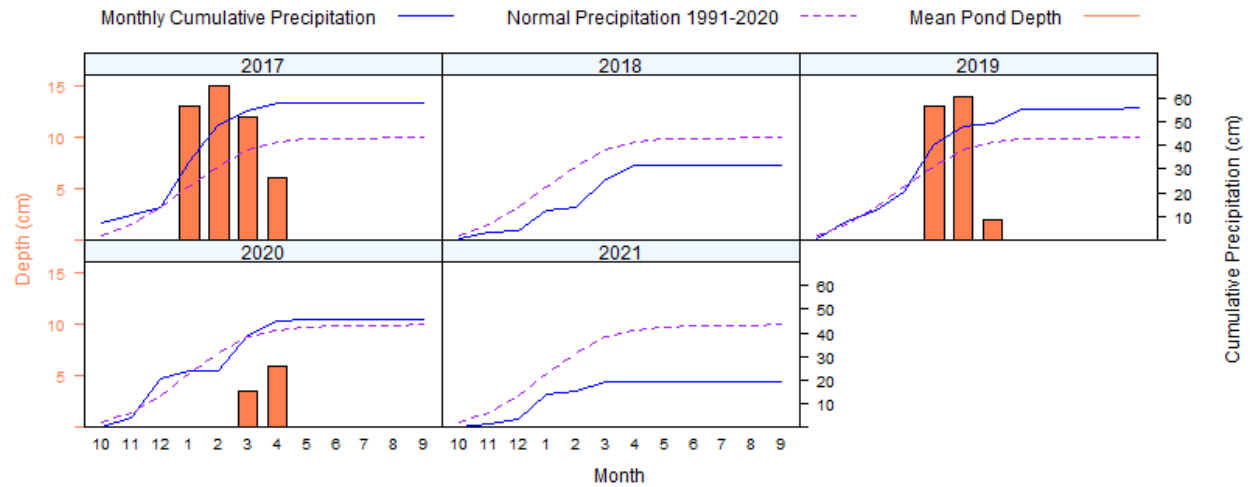
## 5.3 Pond 997 – Reference

Pond 997 is situated within a small and shallow basin in the northern part of the Fort Ord National Monument (Figure 2-4). Although approximately 13% of vegetation within the Pond 997 watershed was masticated in 2017, pond 997 was monitored for five years as a reference vernal pool (Figure 5-14). The 2017 and 2019 water-years were above-normal, 2020 was close-to-normal, whereas 2018 and 2021 water years were below normal.

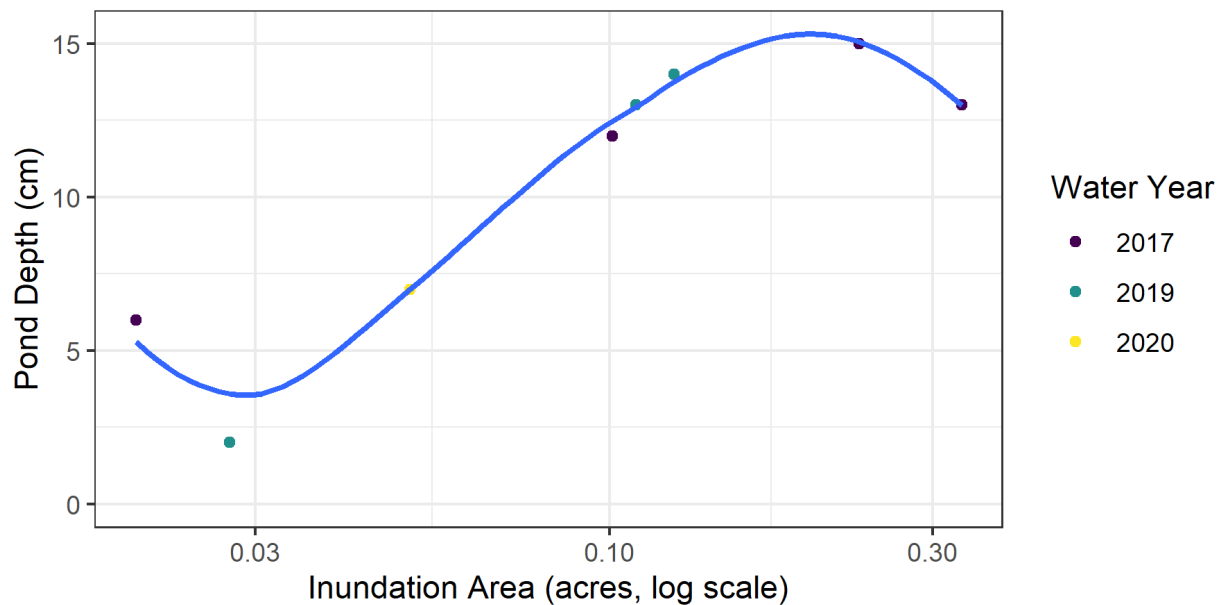
Historically, during the five years of monitoring, Pond 997 remained completely dry in a below normal water year (2018), and it reached a maximum depth of 15 cm and a maximum inundation of 0.33 acres in an above normal water year (2017; Figure 5-14). Pond 997 remained dry in 2021 water year (Table 4-3 and Figure 4-3) and thus inundation extent, depth, and water quality measurements were not taken.



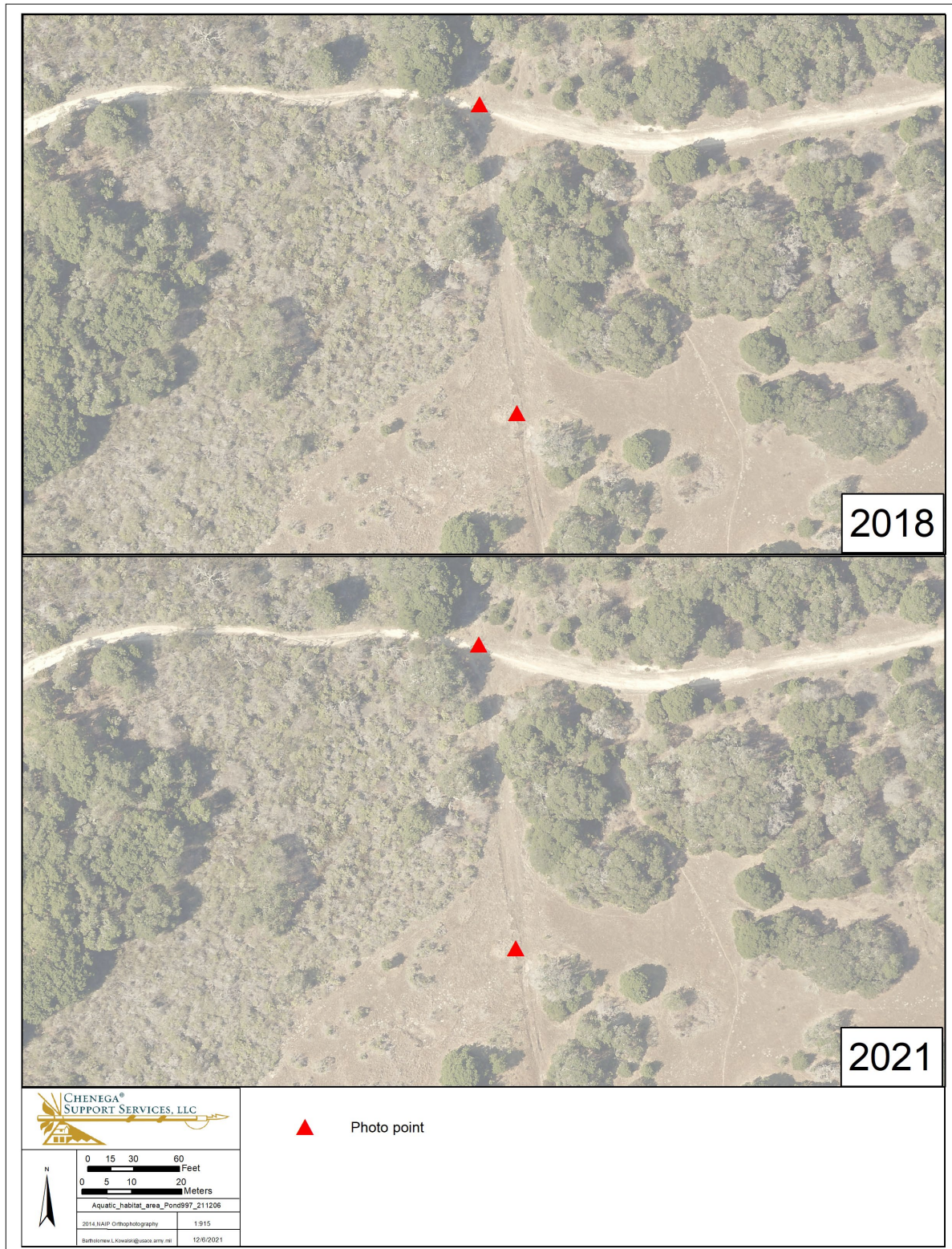
Historical values are presented in Figures 5-14 to 5-17.



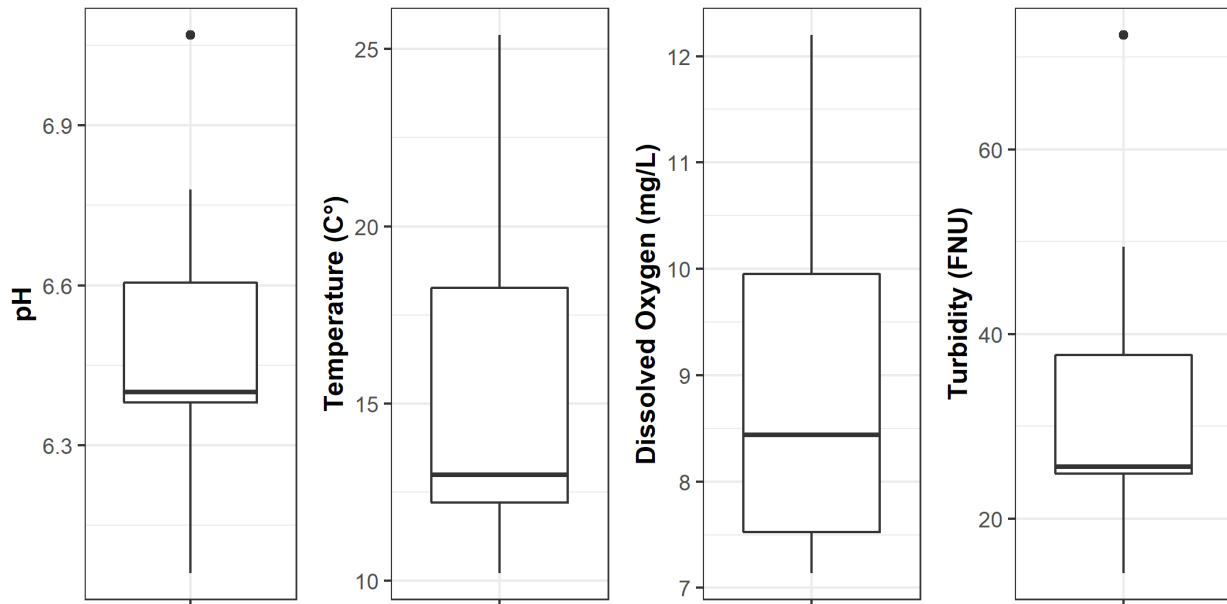
**Figure 5-14.** Pond 997 (Reference) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)



**Figure 5-15.** Pond 997 (Reference) Plot of Depth vs Area since 2017 Water Year



**Figure 5-16.** Pond 997 (Reference) inundations. It remained dry in 2018 and 2021 (both years had below normal precipitation)



**Figure 5-17.** Pond 997 (Reference) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

#### 5.3.1 Data Quality Objective 1

Pond 997 did not meet the required average depths of 25 cm from the first rain event through March for CTS nor the 10 cm for 18 consecutive days through May for fairy shrimp. Pond 997 did not sustain sufficient depth for either CTS (0 cm through March) nor fairy shrimp (0 cm through May).

#### 5.3.2 Data Quality Objective 2

Pond 997 remained dry in 2021 water year which was not unexpected given the well below normal precipitation (Figure 5-16).

#### 5.3.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 997 did not sustain suitable habitat for CTS nor fairy shrimp in 2021 because it remained dry. Pond 997 is a reference vernal pool and was not required to meet the performance standard. Instead, the vernal pool was used as a control for comparison to the remediated vernal pools.

#### 5.3.4 Data Quality Objective 4

Water quality parameters were not taken at Pond 997 because it remained dry in 2021.

#### 5.3.5 Performance Standard: Wildlife Usage

Water quality cannot be assessed for suitability for wildlife use. Pond 997 is a reference vernal pool and was not required to meet the performance standards. Instead, the vernal pool was used as a control for comparison to the remediated vernal pools.



### 5.3.6 Conclusion

With the exception of DQO 4, Pond 997 metrics were suitable for comparison to the remediated vernal pools (Table 5-3).

**Table 5-3. Success at Pond 997 (Reference) Based on Performance Standards and Applicable Data Quality Objectives**

Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Suitable for Comparison
	DQO 2	Suitable for Comparison
Wildlife Usage	DQO 1	Suitable for Comparison
	DQO 4	Cannot assess

## 5.4 Pond 75 – Baseline

Pond 75 is situated within a small and very shallow basin within a narrow valley in the southern part of the Fort Ord National Monument within the Impact Area (Figure 2-4). The valley slopes gently from south to north and thus it precludes Pond 75 from ever reaching deep inundations. Pond 75 was surveyed for the first time in 2021. Since Pond 75 was monitored for Baseline, data were collected in 2021 and will be compared to data from future surveys. Due to its small size and shallow profile, the most similar reference vernal pool is Pond 997. Pond 75 remained dry in 2021 water year and thus inundation extent, depth, and water quality measurements were not taken.

### 5.4.1 Data Quality Objective 1

Pond 75 did not meet the required average depths of 25 cm from the first rain event through March for CTS nor the 10 cm for 18 consecutive days through May for fairy shrimp. Pond 75 did not sustain sufficient depth for either CTS (0 cm through March) nor fairy shrimp (0 cm through May).

### 5.4.2 Data Quality Objective 2

Pond 75 was monitored for the first time in 2021 for baseline. Just like the reference vernal pools Pond 75 stayed dry in 2021 water year which reflected the well below normal precipitation.

### 5.4.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 75 did not sustain suitable habitat for CTS nor fairy shrimp in 2021 because it remained dry. Pond 75 is in a baseline year and was not required to meet the performance standard. Instead, data collected will be used to assess impact after MEC cleanup operations take place in the future years.

### 5.4.4 Data Quality Objective 4

Water quality parameters of Pond 75 were not taken because it remained dry in 2021.

### 5.4.5 Performance Standard: Wildlife Usage

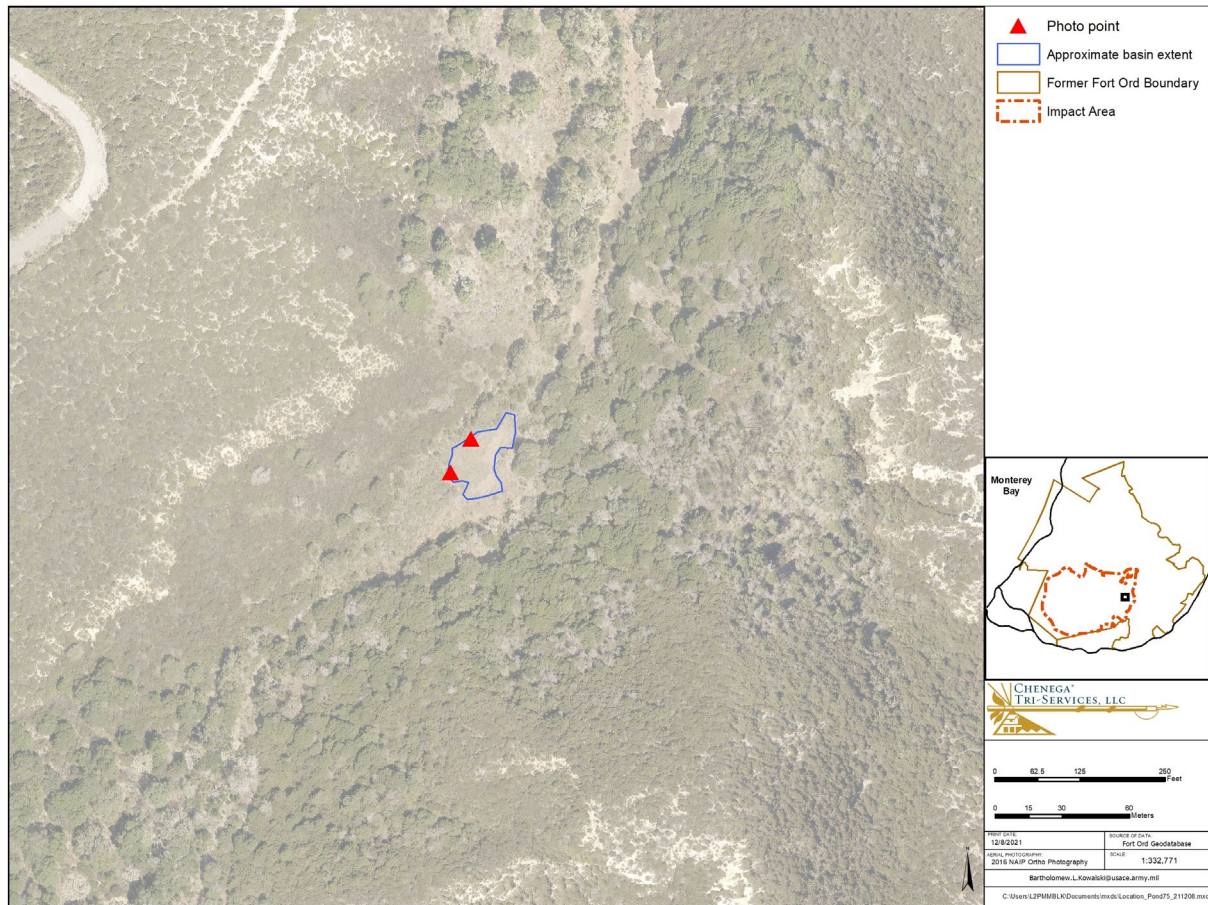
Water quality cannot be assessed for suitability for wildlife use. Pond 75 was a baseline vernal pool in 2021 and was not required to meet the performance standard. Instead, data collected will be used to assess impact after MEC cleanup operations take place in the future years.

### 5.4.6 Conclusion

Pond 75 was not compared to DQOs in 2021 because it was in baseline condition. With the exception of DQO 4, Pond 75 is suitable for comparison to future monitoring events (Table 5-4).

**Table 5-4. Success at Pond 75 (Baseline) Based on Performance Standards and Applicable Data Quality Objectives**

Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Suitable for Comparison
	DQO 2	Suitable for Comparison
Wildlife Usage	DQO 1	Suitable for Comparison
	DQO 4	Cannot assess

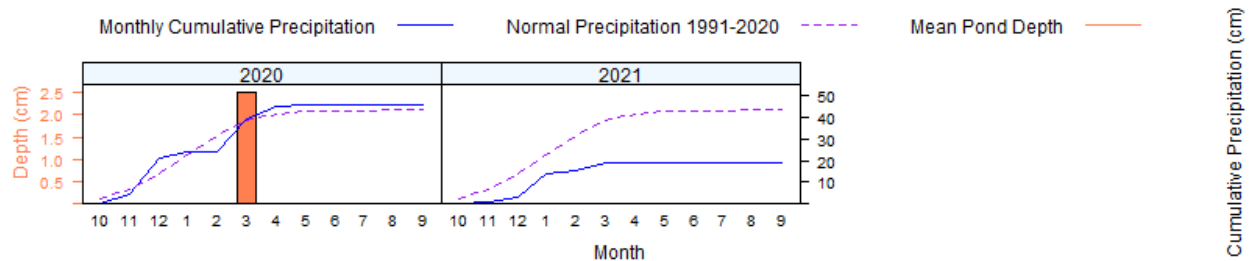


**Figure 5-18.** Pond 75 (Baseline) Inundation for 2021 (below normal precipitation). Pond 75 stayed dry during 2021 water year.

### 5.5 Pond 74 – Year 3 Post-mastication

Pond 74 is situated within a small and shallow basin in the northern part of the Fort Ord National Monument (Figure 2-4). Due to its small size, Pond 74 wasn't discovered until vegetation in BLM Area B Unit B-2A was masticated in 2019, and thus no baseline data exists. While majority of the unit was masticated in 2017, the basin of Pond 74 and its drainage area are small enough that 2017 mastication and munitions cleanup activities likely had no noticeable effect on Pond 74 hydrology. No subsurface remediation occurred within the basin of Pond 74. Pond 74 inundation area was recorded in 2019 and 2020, but depth was not measured in 2019 and was estimated in 2020, as there was no staff gauge. Given the limited data on Pond 74, comparison of hydrologic conditions and assessment of DQOs can

only be made to 2019 post mastication inundation area, and to reference vernal pools. Due to its small size and shallow profile, the most similar reference vernal pool is Pond 997. Pond 74 remained dry in 2021 water year and thus inundation extent, depth, and water quality measurements were not taken.



**Figure 5-19.** Pond 74 (Year 3 Post-mastication) Historic Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDL NOAA, 2021)

#### 5.5.1 Data Quality Objective 1

Pond 74 did not meet the required average depths of 25 cm from the first rain event through March for CTS, nor the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 74 did not sustain sufficient depth for CTS (0 cm through March), nor for fairy shrimp (0 cm through May).

#### 5.5.2 Data Quality Objective 2

Just like the reference vernal pools Pond 74 remained dry in 2021 water year which reflected the well below normal precipitation pattern. There is no baseline data for Pond 74.

#### 5.5.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 74, a post-mastication vernal pool, was not on track to meet this performance standard for Year 3 in 2021. Pond 74 did not meet DQO 1 indicating that it did not sustain suitable habitat for CTS and fairy shrimp in 2021. Pond 74 remained dry in 2021 water year just as reference Pond 997, and DQO 2 was met.

#### 5.5.4 Data Quality Objective 4

Water quality parameters were not taken at Pond 74 because it remained dry in 2021.

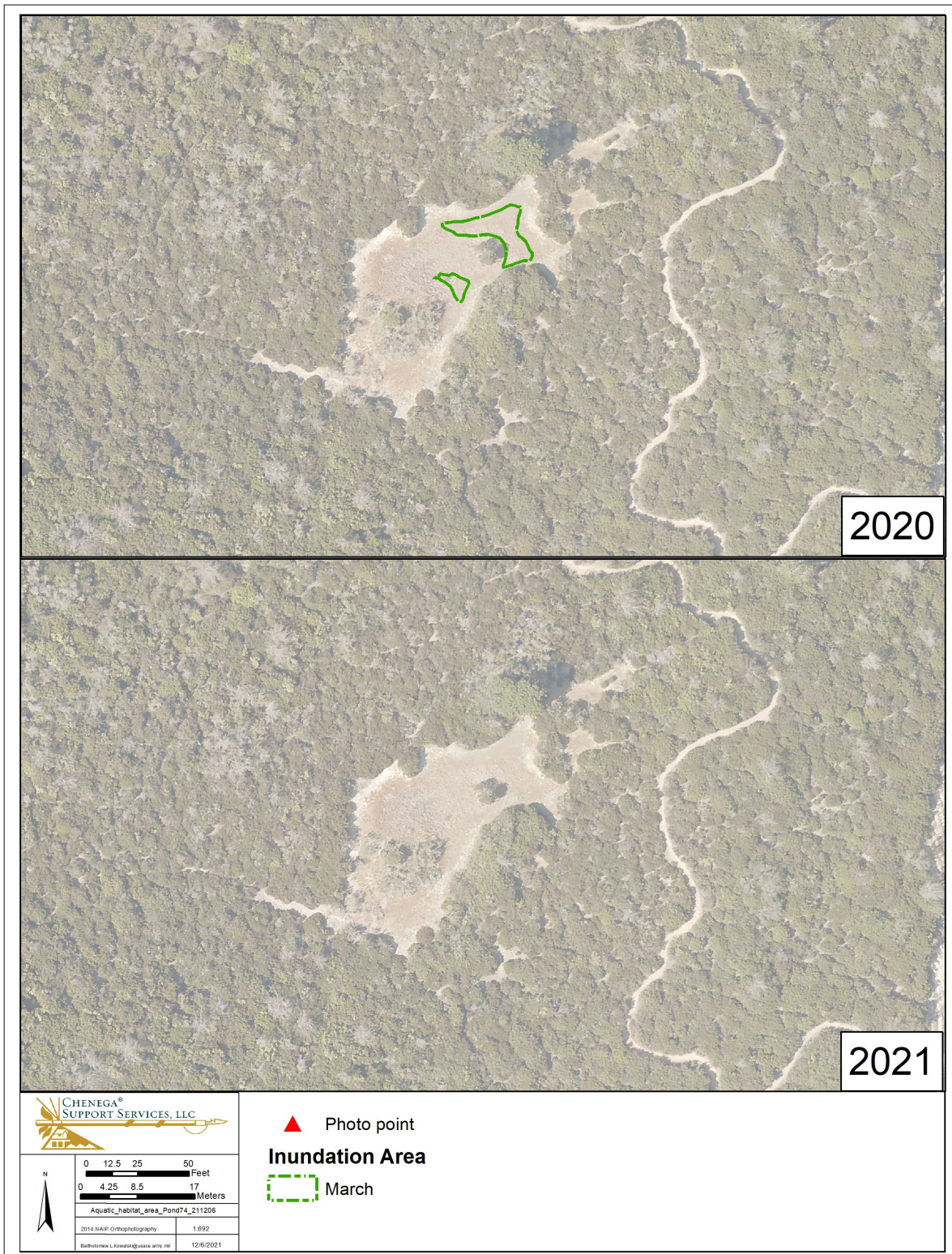
#### 5.5.5 Performance Standard: Wildlife Usage

Pond 74 was not on track to meet the performance standard for year 3 in 2021 because it remained dry. Pond 74 was not on track for DQO 1. DQO 4 cannot be accessed for 2021 water year.

#### 5.5.6 Conclusion

Pond 74, a post-mastication vernal pool, was in Year 3 of monitoring in 2021, which was the last year of required monitoring. DQO 1 was not met and DQO 4 could not be assessed at the vernal pool because it remained dry due to well below normal precipitation, but DQO 2 was met (Table 5-5). While there is no baseline data for Pond 74, its small extent and shallow slope can be expected to result in short hydro





**Figure 5-20.** Pond 74 (Year 3 Post-Mastication) Inundations for 2020 (close to normal precipitation) and 2021 (well below normal precipitation). Pond 74 stayed dry in 2021 water year.

period. Pond 74 was only briefly inundated in 2020 water year, which had cumulative close to normal precipitation, and was inundated for only two and a half months in 2019, an above normal water year (Burlison, 2020). Mastication activities within the watershed of Pond 74 occurred outside of the vernal pool basin, and where not likely the cause of its short inundation period.

The wildlife usage performance standard cannot be assessed for DQO 4 because water quality measurements could not be taken during the follow up monitoring due to insufficient (2020) and non-existent (2021) water level. Additional monitoring could help assess whether the vernal pool can provide sufficient inundation and water quality suitable for wildlife, but it could only provide confirmation that performance standards were not affected by mastication if CTS and/or fairy shrimp were detected. In case of their non-detection, no assessment could be made whether mastication activities had a negative effect on presence and abundance of these species because it's unknown if they were present prior to mastication. In the case of detection of either or both species additional monitoring could only re-affirm they were not impacted but it could not confirm the negative impacts due to mastication. Since neither of these scenarios would warrant mitigation measures, additional monitoring would be of limited utility and is not recommended.

**Table 5-5. Success at Pond 74 (Year 3 Post-Mastication) Based on Performance Standards and Applicable Data Quality Objectives**

Performance Standard	Applicable DQO	2019	2020	2021
Hydrological Conditions & Inundation Area	DQO 1	NS	Not on track	Not on track
	DQO 2	On track*	On track*	On track*
Wildlife Usage	DQO 1	NS	Not on track	Not on track
	DQO 4	NS	Cannot assess	Cannot assess

NS = Not Surveyed

\*No baseline for comparison, only compared to reference vernal pools

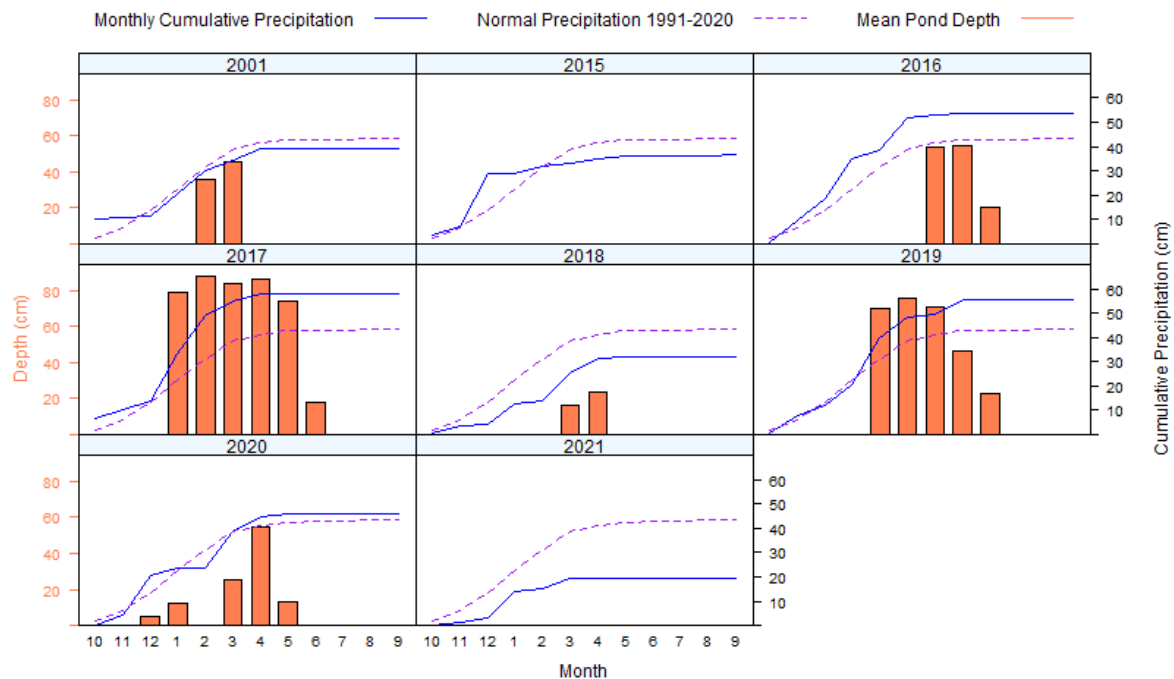
## 5.6 Pond 101 East (West) – Year 3

Pond 101 East (West) is situated within a large and shallow basin in the northern tip of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 101 East (West) were monitored for eight years (Figure 5-21). Above normal water years were 2016, 2017, and 2019. Close to normal water years were 2001 and 2020. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015). In extreme above normal water years Pond 101 East (West) can become hydrologically connected to Pond 101 East (East), and even to Pond 101 West which occurred during an El Niño water year in 1998. By size, Pond 101 East (West) is most similar to reference Pond 101 East (East) (Figure 5-1).

Pond 101 East (West) was monitored in 2021 as a Year 3 post-mastication vernal pool. Vegetation within its basin was partially masticated in 2018 in preparation for conducting a prescribed burn. Historically, Pond 101 East (West) remained completely dry in a consecutive drought year (2015), and it reached a maximum depth of 88 cm and a maximum inundation of 9.38 acres in a consecutive above normal water year (2017, when it became hydrologically connected to Pond 101 East (East); Figure 5-21). Pond 101 East (West) remained dry in 2021 water year (Figure 5-21) and thus inundation extent, depth, and water quality measurements were not taken. Historical values are presented in Figures 5-21 to 5-24.



During the eight years of monitoring of Pond 101 East (West) the cumulative precipitation in 2021 was the lowest (Figure 5-21). There was only one other instance of Pond 101 East (West) remaining dry throughout the water year; 2015, which was a consecutive drought year. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. This suggests that there simply was not enough precipitation in 2021 water year to completely saturate the sandy loam layer and/or the underlying clay layer.



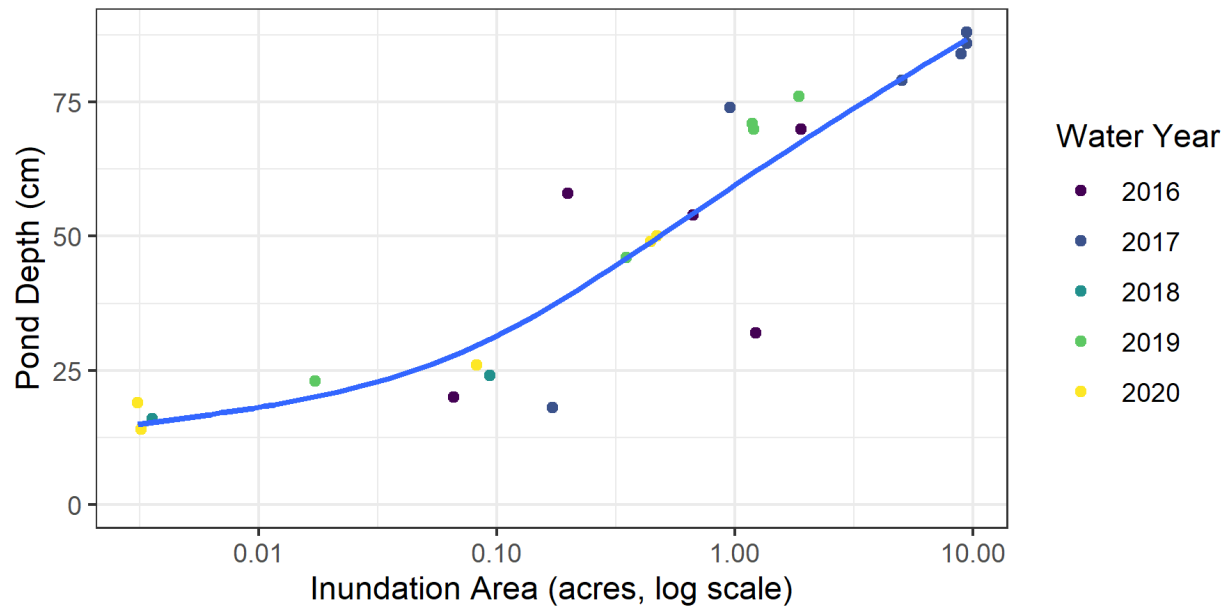
**Figure 5-21.** 101 East (West) (Year 3 Post-Mastication) Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)

#### 5.6.1 Data Quality Objective 1

Pond 101 East (West) did not meet the required average depths of 25 cm from the first rain event through March for CTS, nor the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 101 East (West) did not sustain sufficient depth for CTS (0 cm through March), nor for for fairy shrimp (0 cm through May).

#### 5.6.2 Data Quality Objective 2

Just like the reference vernal pools, Pond 101 East (West) remained dry in 2021 water year which was not unexpected given the well below normal precipitation (Figure 5-21).



**Figure 5-22.** Pond 101 East (West) (Year 3 Post-Mastication) Plot of Depth vs Area since 2016 Water Year.

#### 5.6.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 101 East (West), a post-mastication vernal pool, was not on track to meet the performance standard for Year 3 in 2021. Pond 101 East (West) did not meet DQO 1 indicating that it did not sustain suitable habitat for CTS and fairy shrimp in 2021. Pond 101 East (West) remained dry in 2021 water year just as reference Pond 101 East (East) and DQO 2 was met.

#### 5.6.4 Data Quality Objective 4

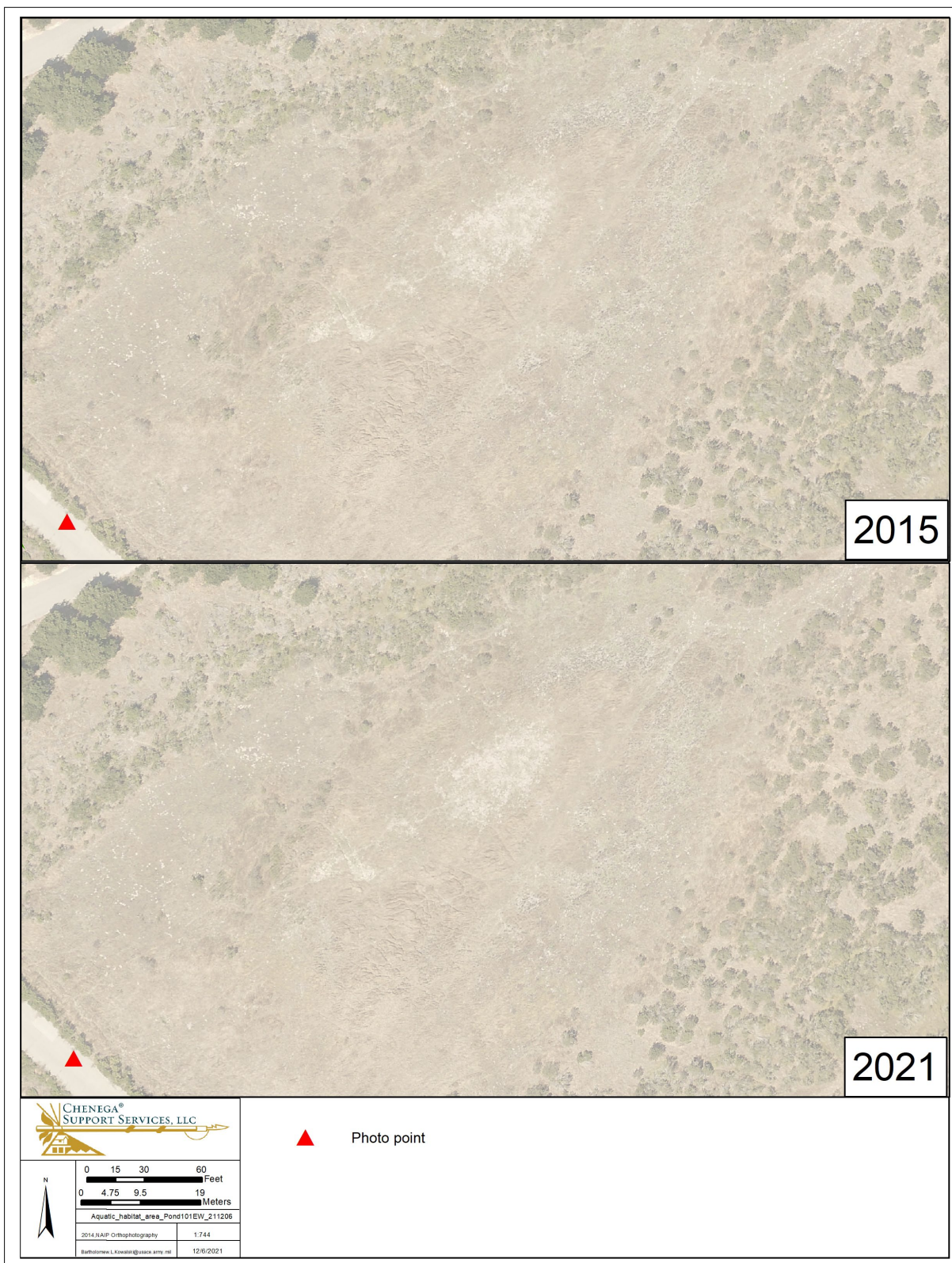
Water quality parameters were not taken at Pond 101 East (West) because it remained dry in 2021.

#### 5.6.5 Performance Standard: Wildlife Usage

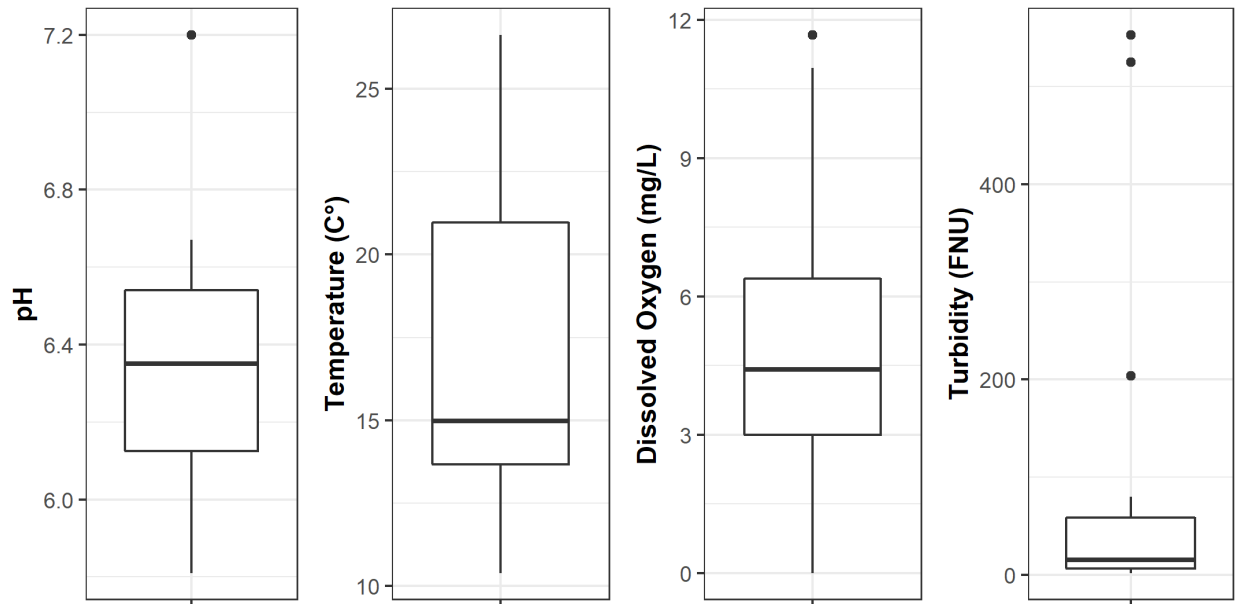
Pond 101 East (West) was not on track to meet the performance standard for year 3 in 2021 because it remained dry. Pond 101 East (West) was not on track for DQO 1. DQO 4 cannot be accessed for 2021 water year.

#### 5.6.6 Conclusion

Pond 101 East (West), a post-mastication vernal pool, was in Year 3 of monitoring in 2021. DQO 1 was not met and DQO 4 could not be assessed at the vernal pool because it remained dry, but DQO 2 was met (Table 5-6). This was the final year of required monitoring for Pond 101 East (West). In 2019, and above normal water year, Pond 101 East (West) met all performance standards, and in 2020, a close to normal water year, it partially met performance standards due to unusual precipitation frequency which caused it to dry out and become inundated three times within the water year (Chenega, 2021). In 2021, a well below normal water year, the cumulative precipitation was not enough to inundate Pond 101 East (West) but based on data from 2019 and 2020, and comparisons to reference vernal pools, it does not appear that mastication activities negatively affected hydrology or water quality of the vernal pool. Additional monitoring at Pond 101 East (West) is not recommended.



**Figure 5-23.** Pond 101 East (West) (Year 3 Post-Mastication) inundations. It remained dry in 2015 and 2021 (both years had below normal precipitation)



**Figure 5-24.** Pond 101 East (West) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

**Table 5-6. Success at Pond 101 East (West) (Year 3 Post-Mastication) Based on Performance Standards and Applicable Data Quality Objectives**

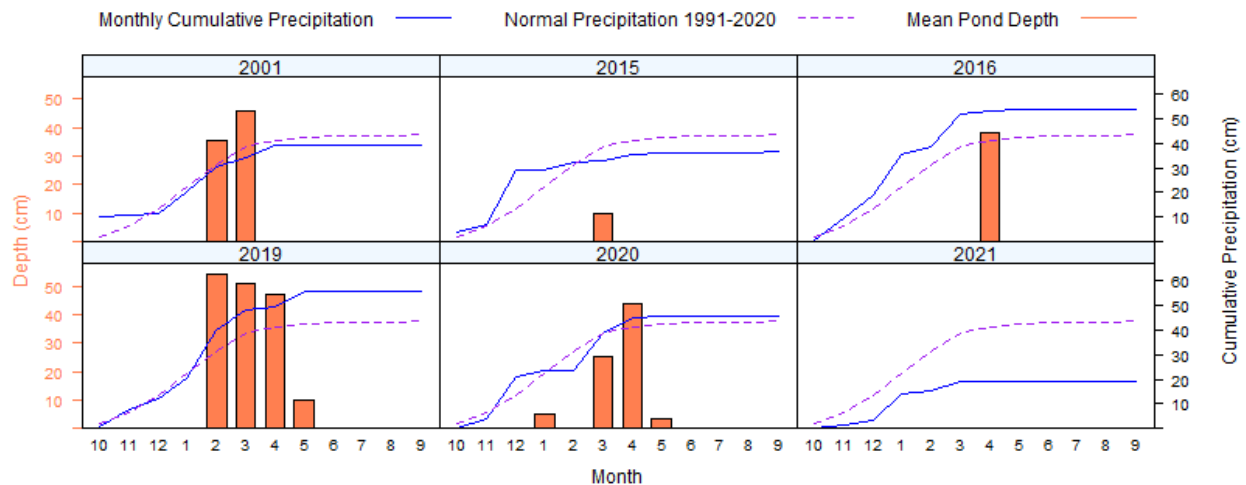
Performance Standard	Applicable DQO	2019	2020	2021
Hydrological Conditions & Inundation Area	DQO 1	On track	Partially on track	Not on track
	DQO 2	On track	On track	On track
Wildlife Usage	DQO 1	On track	Partially on track	Not on track
	DQO 4	On track	On track	Cannot assess

## 5.7 Pond 101 West – Year 3

Pond 101 West is situated within a small basin with a medium steep profile in the northern tip of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 101 West have been monitored for six years (Figure 5-26). Above normal water years were 2016, and 2019. Close to normal water years were 2001 and 2020. Year 2015 was a consecutive drought year, and 2021 was a well below normal water year. In extreme above normal water years Pond 101 West can become hydrologically connected to Pond 101 East (West) which occurred during an El Niño water year in 1998. By size, Pond 101 West is most similar to reference Pond 997, although it has a steeper profile (Figure 5-1).

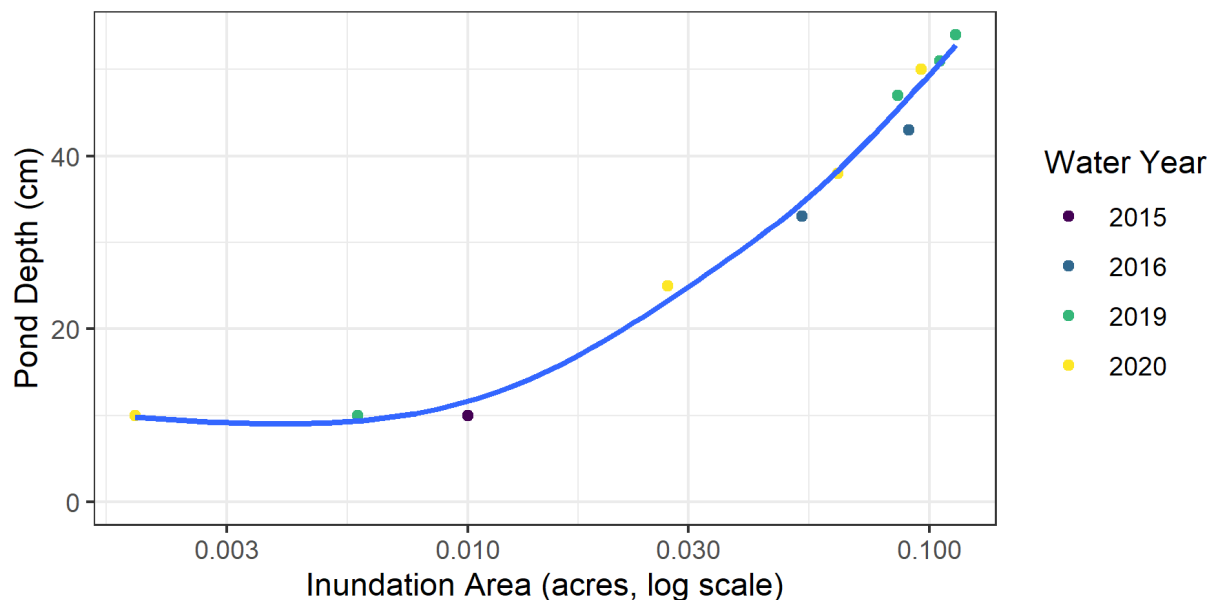
Pond 101 West was monitored in 2021 as a Year 3 Post-mastication vernal pool. Vegetation within its basin was partially masticated in 2018 in preparation for conducting a prescribed burn. Historically, Pond 101 West reached a depth of 10 cm and an inundation area of 0.01 ac in a consecutive drought year (2015), and it reached a maximum depth of 54 cm and a maximum inundation of 0.11 acres in an above normal water year (2019, and 5-24). Pond 101 West remained dry in 2021 water year (Figure

5-25) and thus inundation extent, depth, and water quality measurements were not taken. Historical values are presented in Figures 5-25 to 5-28.



**Figure 5-25.** Pond 101 West (Year 3 Post-Mastication) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)

During the six years of monitoring of Pond 101 West the cumulative precipitation in 2021 was the lowest (Figure 5-25). This was the first instance of Pond 101 West remaining dry throughout the water year. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. This suggests that there simply was not enough precipitation in 2021 water year to completely saturate the sandy loam layer and/or the underlying clay layer.



**Figure 5-26.** Pond 101 West (Year 3 Post-Mastication) Plot of Depth vs Area since 2015 Water Year.



### 5.7.1 Data Quality Objective 1

Pond 101 West did not meet the required average depths of 25 cm from the first rain event through March for CTS, nor the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 101 West did not sustain sufficient depth for CTS (0 cm through March), nor for fairy shrimp (0 cm through May).

### 5.7.2 Data Quality Objective 2

Just like the reference vernal pools Pond 101 West remained dry in 2021 water year which was not unexpected given the well below normal precipitation.

### 5.7.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 101 West, a post-mastication vernal pool, was not on track to meet the performance standard for Year 3 in 2021. Pond 101 West did not meet DQO 1 indicating that it did not sustain suitable habitat for CTS and fairy shrimp in 2021. Pond 101 West remained dry in 2021 water year just as reference Pond 997 and DQO 2 was met.

### 5.7.4 Data Quality Objective 4

Water quality parameters were not taken at Pond 101 West because it remained dry in 2021.

### 5.7.5 Performance Standard: Wildlife Usage

Pond 101 West was not on track to meet the performance standard for year 3 in 2021 because it remained dry. Pond 101 West was not on track for DQO 1. DQO 4 cannot be accessed for 2021 water year.

### 5.7.6 Conclusion

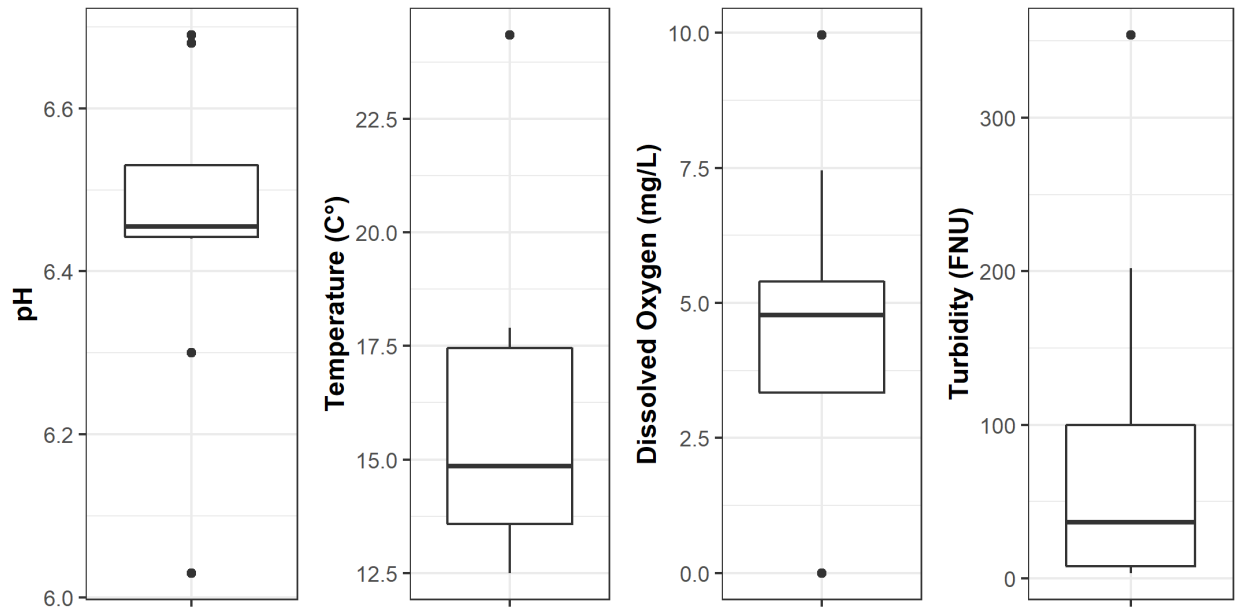
Pond 101 West, a post-mastication vernal pool, was in Year 3 of monitoring in 2021. DQO 1 was not met and DQO 4 could not be assessed at the vernal pool because it remained dry, but DQO 2 was met (Table 5-7). This was the final year of required monitoring for Pond 101 West. In 2019, and above normal water year, Pond 101 West met all performance standards, and in 2020, a close to normal water year, it partially met performance standards due to unusual precipitation frequency which caused it to dry out and become inundated two times within the water year (Chenega, 2021). In 2021, a well below normal water year, the cumulative precipitation was not enough to inundate Pond 101 West but based on data from 2019 and 2020, and comparisons to reference vernal pools, it does not appear that mastication activities negatively affected hydrology or water quality of the vernal pool. Additional monitoring at Pond 101 West is not recommended.

**Table 5-7. Success at Pond 101 West (Year 3 Post-Mastication) Based on Performance Standards and Applicable Data Quality Objectives**

Performance Standard	Applicable DQO	2019	2020	2021
Hydrological Conditions & Inundation Area	DQO 1	On track	Partially on track	Not on track
	DQO 2	On track	On track	On track
Wildlife Usage	DQO 1	On track	Partially on track	Not on track
	DQO 4	On track	On track	Cannot assess



**Figure 5-27.** Pond 101 West (Year 3 Post-Mastication) Inundations for 2015 and 2021 (both years had below normal precipitation)



**Figure 5-28.** Pond 101 West (Year 3 Post-Mastication) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

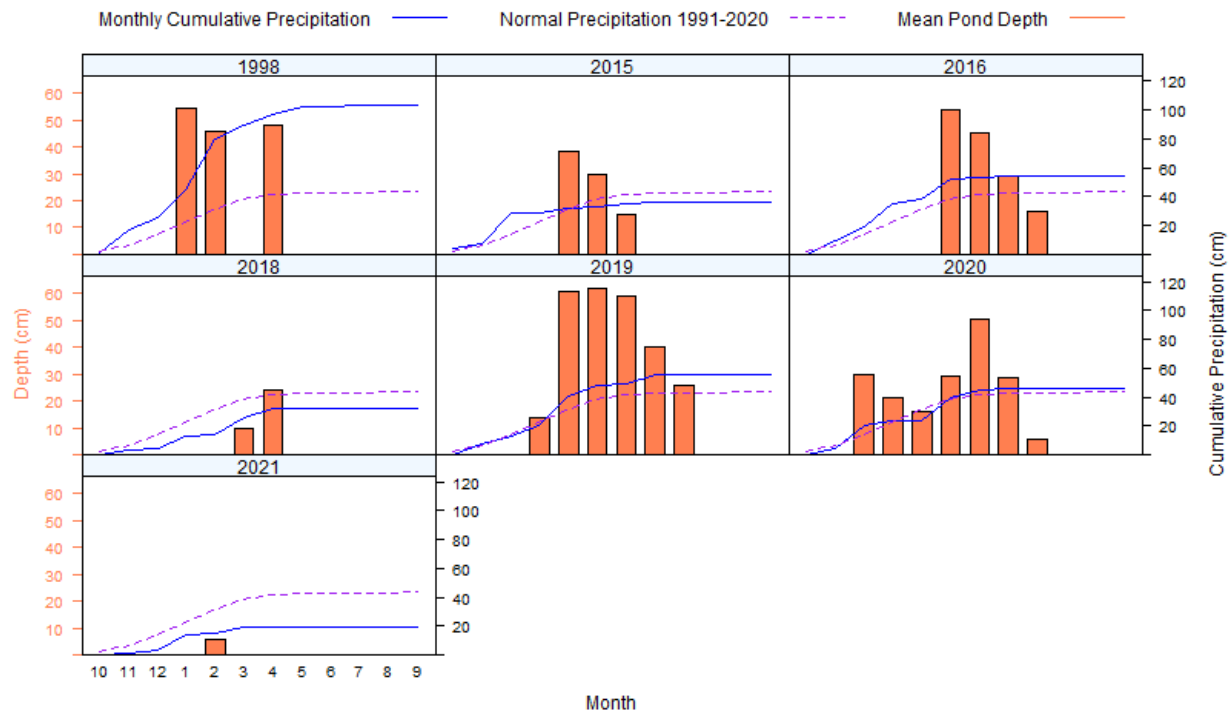
## 5.8 Pond 3 North – Year 3

Pond 3 North is situated within a medium size basin in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 3 North have been monitored for seven years (Figure 5-29). Above normal water years were 1998, 2016, and 2019. Year 2020 was a close to normal water year. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015). In extremely above normal water years Pond 3 North can become hydrologically connected to Pond 3 South, which last time occurred in 2019. By size, Pond 3 North is between reference Ponds 101 East (East) and 997.

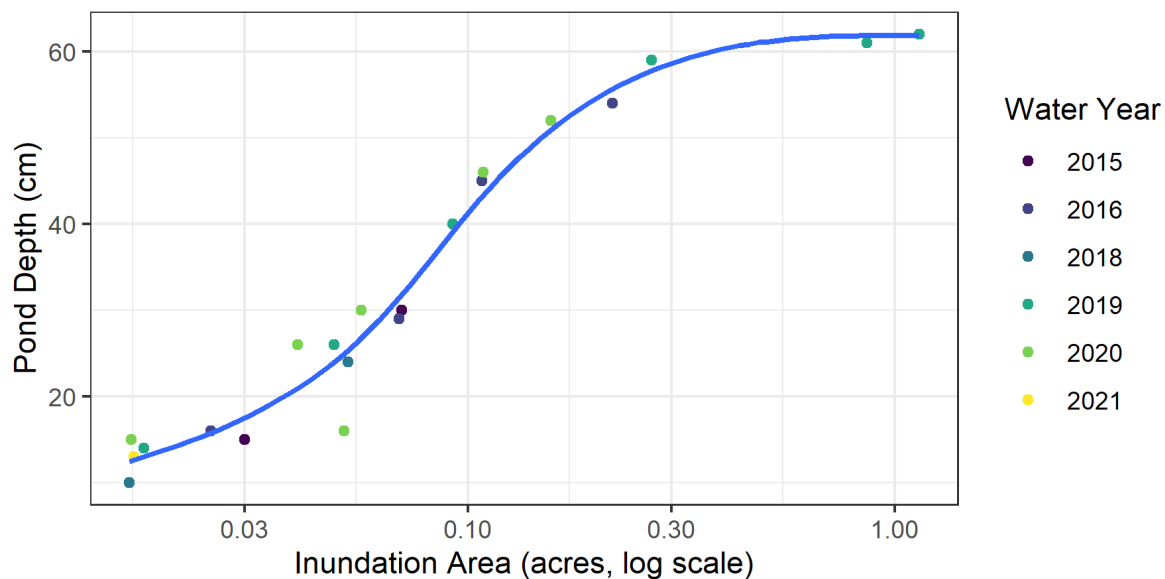
Pond 3 North was monitored in 2021 as a Year 3 Post-Subsurface Munitions Remediation vernal pool. Vegetation in Pond 3 North and within its watershed was burned in October 2017 as part of the prescribed burn of BLM Area B Unit B. Subsurface anomaly investigations occurred in the basin of Pond 3 North in 2018. Historically, Pond 3 North reached a depth of 24 cm and an inundation area of 0.05 ac in a below normal water year (2018), and it reached a maximum depth of 62 cm and a maximum inundation of 1.14 acres in an above normal water year (2019, when it became hydrologically connected to Pond 3 South). The 2021 maximum depth of Pond 3 North was 13 cm and maximum measured inundation was 0.017 acres (Table 4-8). The depth and inundation values were among the lowest on record for Pond 3 North (Figure 5-30).

Pond 3 North was briefly inundated in February and its hydroperiod in 2021 mostly resembled that of 2018 water year (Figure 5-29). Maximum inundation area was smaller in 2021 than in 2018, which was a below normal water year (Figure 5-31).



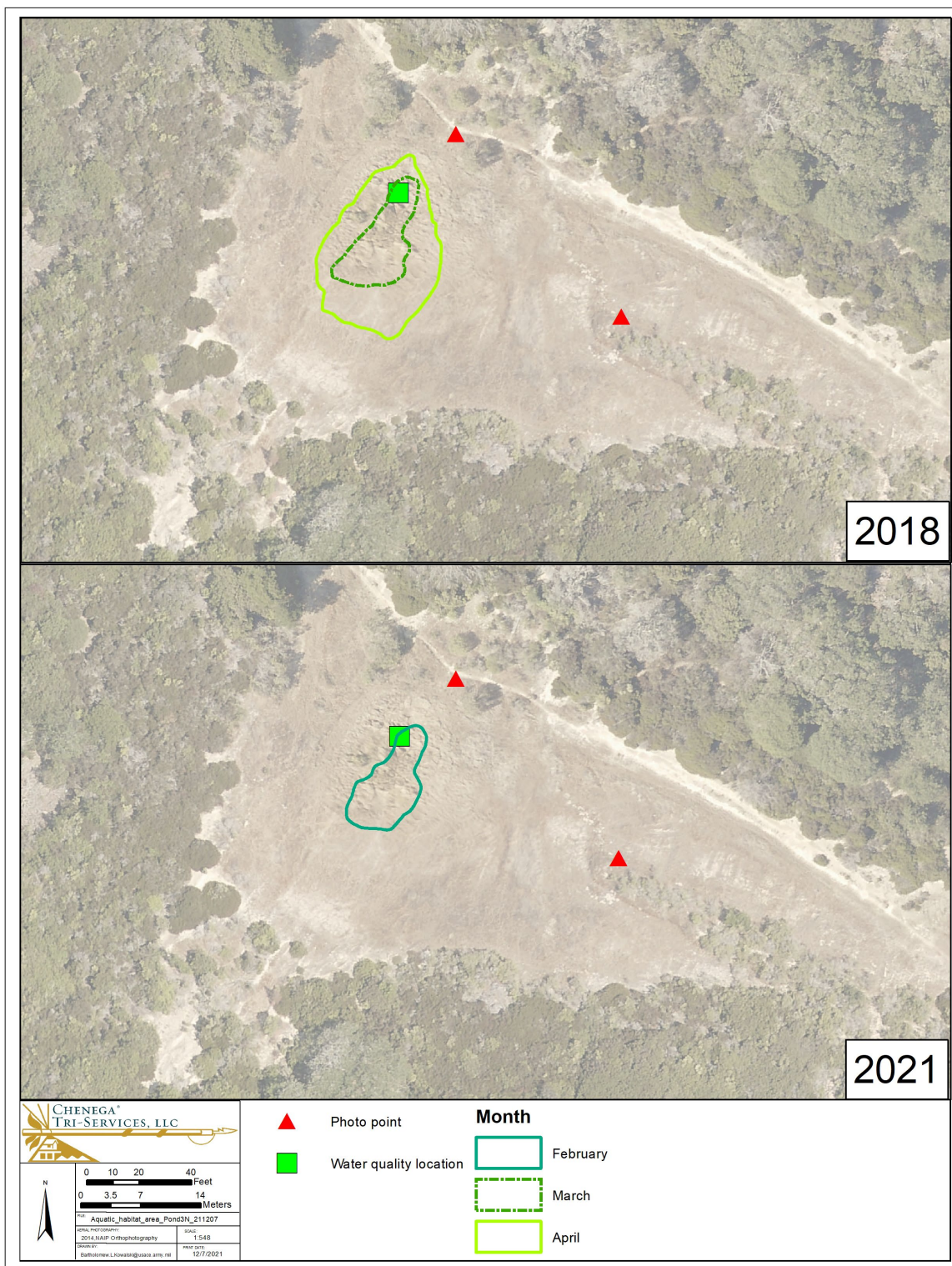


**Figure 5-29.** Pond 3 North (Year 3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)

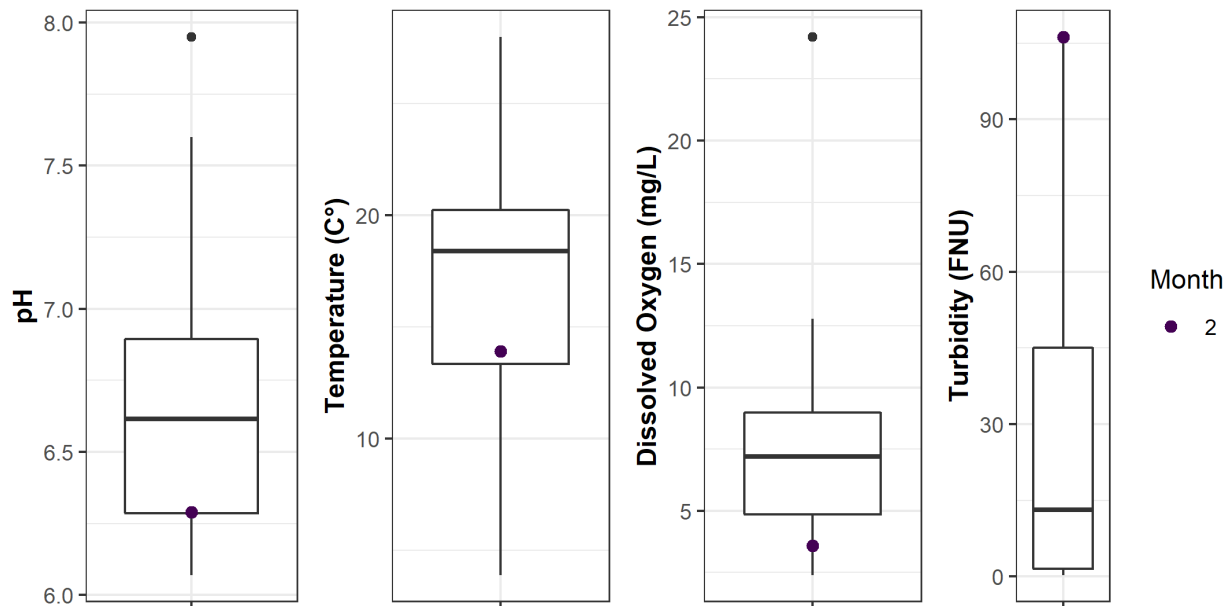


**Figure 5-30.** Pond 3 North (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2015.

Water quality parameters of Pond 3 North were within the historical ranges with the exception of turbidity, which was the highest on record but still in accord with turbidity values observed at other vernal pools (Figure 5-32 and Figure 5-4).



**Figure 5-31.** Pond 3 North (Year 3 Post-Subsurface Munitions Remediation) Inundations for 2018 and 2021 (both below normal precipitation water years).



**Figure 5-32.** Pond 3 North (Year 3 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The colored dots represent observed values in 2021 water year. The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

#### 5.8.1 Data Quality Objective 1

Pond 3 North did not stay inundated long enough to meet the required average depths of 25 cm from the first rain event through March for CTS nor the 10 cm for 18 consecutive days through May for fairy shrimp.

#### 5.8.2 Data Quality Objective 2

Unlike the reference vernal pools which remained dry, Pond 3 North was briefly inundated in the first two weeks of February. Maximum inundation area in 2021 was smaller than in baseline year 2015, a consecutive drought year, or 2018, a below normal water year (Figure 5-30).

#### 5.8.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 3 North, a post-subsurface munitions remediation vernal pool, was not on track to meet the performance standard for Year 3 in 2021. Pond 3 North did not meet DQO 1 indicating that it did not sustain suitable habitat for CTS and fairy shrimp in 2021. Pond 3 North was briefly inundated and by comparison to reference vernal pools DQO 2 was met. The vernal pool will continue to be monitored in the future to evaluate its progress toward meeting the performance standard.

#### 5.8.4 Data Quality Objective 4

Water quality parameters of Pond 3 North were within the historical ranges and values observed at other vernal pools (Figure 5-32 and Figures 5-2 through 5-5).

### 5.8.5 Performance Standard: Wildlife Usage

Pond 3 North was not on track to meet this performance standard as it did not sustain sufficient depth and inundation for CTS and fairy shrimp. Water quality measurements were adequate for wildlife.

### 5.8.6 Conclusion

Pond 3 North, a post-subsurface munitions remediation vernal pool, was in year 3 of monitoring in 2021. The vernal pool was not on track to meet the performance standards (Table 5-8). Pond 3 North will continue to be monitored in the future.

**Table 5-8. Success at Pond 3 North (Year 3 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

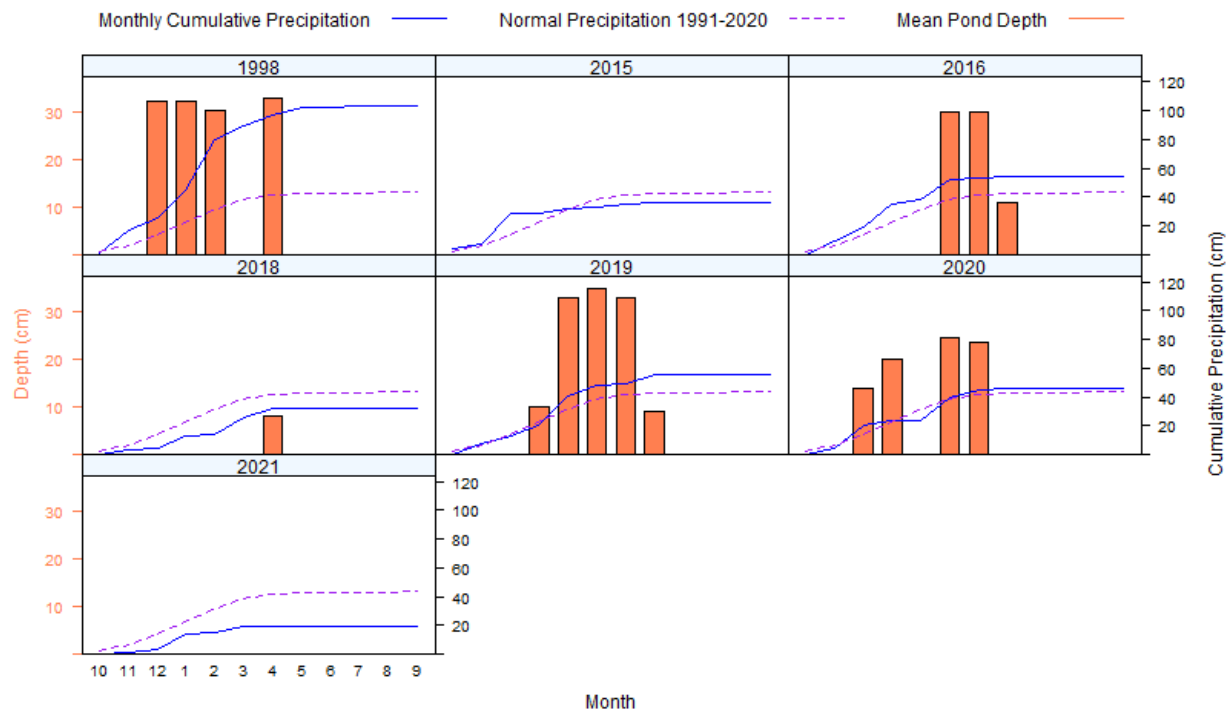
Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Not on track
	DQO 2	On track
Wildlife Usage	DQO 1	Not on track
	DQO 4	On track

## 5.9 Pond 3 South – Year 3

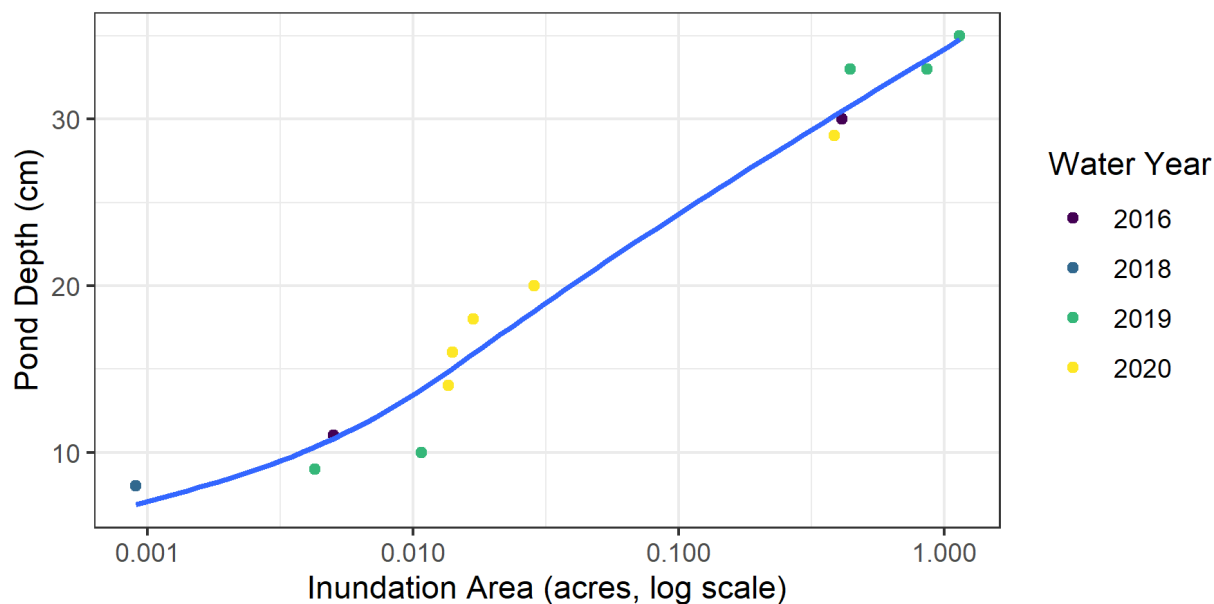
Pond 3 South is situated within a medium size basin in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 3 South have been monitored for seven years (Figure 5-33). Above normal water years were 1998, 2016, and 2019. Year 2020 was a close to normal water year. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015). In extremely above normal water years Pond 3 South can become hydrologically connected to Pond 3 North, which last time occurred in 2019. By size, Pond 3 South is between reference Ponds 101 East (East) and 997.

Pond 3 South was monitored in 2021 as a Year 3 Post-Subsurface Munitions Remediation vernal pool. Vegetation within Pond 3 South basin and its watershed was burned in October 2017 as part of the prescribed burn of BLM Area B Unit B. Subsurface anomaly investigations occurred in the basin of Pond 3 South in 2018. Historically, Pond 3 South remained dry in a consecutive drought year (2015), and it reached a maximum depth of 35 cm and a maximum inundation of 1.14 acres in an above normal water year (2019, when it became hydrologically connected to Pond 3 North). Pond 3 South remained dry in 2021 water year (Figure 5-33) and thus inundation extent, depth, and water quality measurements were not taken. Historical values are presented in Figures 5-33 to 5-36.

During the seven years of monitoring of Pond 3 South the cumulative precipitation in 2021 was the lowest (Figure 5-33). There was only one other instance of Pond 3 South remaining dry throughout the water year; 2015, which was a consecutive drought year. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. Considering that all of the reference vernal pools remained dry in 2021 it suggests that there simply was not enough precipitation in 2021 water year to completely saturate the sandy loam layer and/or the underlying clay layer.



**Figure 5-33.** Pond 3 South (Year 3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)



**Figure 5-34.** Pond 3 South (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2016.

#### 5.9.1 Data Quality Objective 1

Pond 3 South did not meet the required average depths of 25 cm from the first rain event through March for CTS, nor the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 3



South did not sustain sufficient depth for CTS (0 cm through March), nor for fairy shrimp (0 cm through May).

#### 5.9.2 Data Quality Objective 2

Just like the reference vernal pools Pond 101 East (East) and 997, Pond 3 South remained dry in 2021 water year which was not unexpected given the well below normal precipitation (Figure 5-33).

#### 5.9.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 3 South, a post-subsurface munitions remediation vernal pool, was not on track to meet the performance standard for Year 3 in 2021. Pond 3 South did not meet DQO 1 indicating that it did not sustain suitable habitat for CTS and fairy shrimp in 2021. Pond 3 South remained dry in 2021 water year just as reference Pond 101 East (East) and Pond 997, thus DQO 2 was met.

#### 5.9.4 Data Quality Objective 4

Water quality parameters could not be assessed at of Pond 3 South because it remained dry in 2021.

#### 5.9.5 Performance Standard: Wildlife Usage

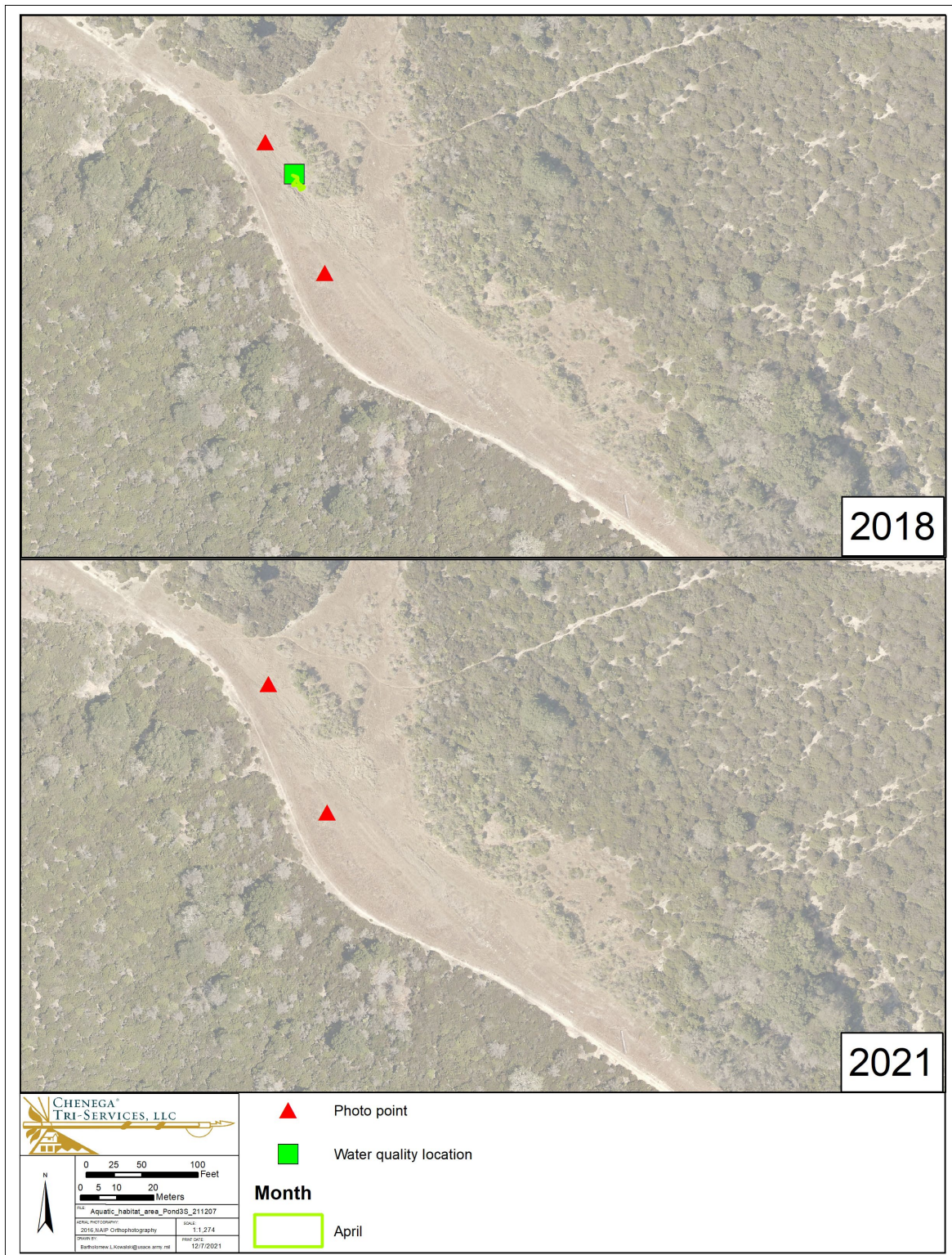
Pond 3 South was not on track to meet the performance standard for year 3 in 2021 because it remained dry. Pond 101 East (West) was not on track for DQO 1. DQO 4 cannot be accessed for 2021 water year.

#### 5.9.6 Conclusion

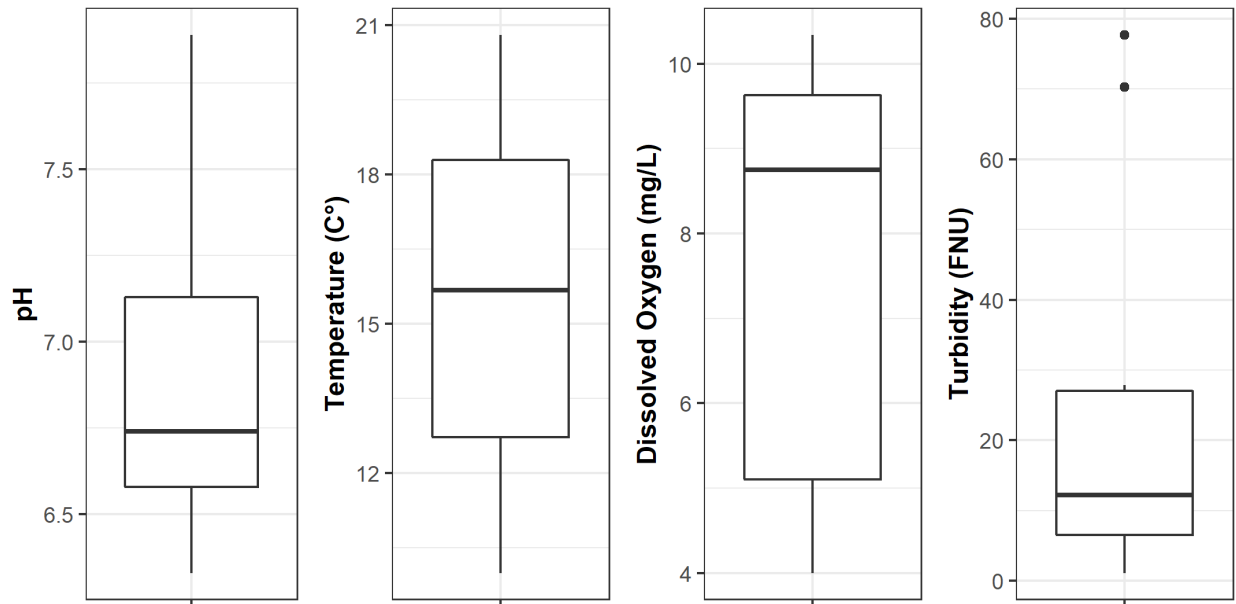
Pond 3 South, a post-subsurface munitions remediation vernal pool, was in year 3 of monitoring in 2021. The vernal pool was not on track to meet the performance standards (Table 5-9). Pond 3 South will continue to be monitored in the future.

**Table 5-9. Success at Pond 3 South (Year 3 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Not on track
	DQO 2	On track
Wildlife Usage	DQO 1	Not on track
	DQO 4	Cannot assess



**Figure 5-35.** Pond 3 South (Year 3 Post-Subsurface Munitions Remediation) Inundations for 2018 and 2021 (both water years had below normal precipitation).



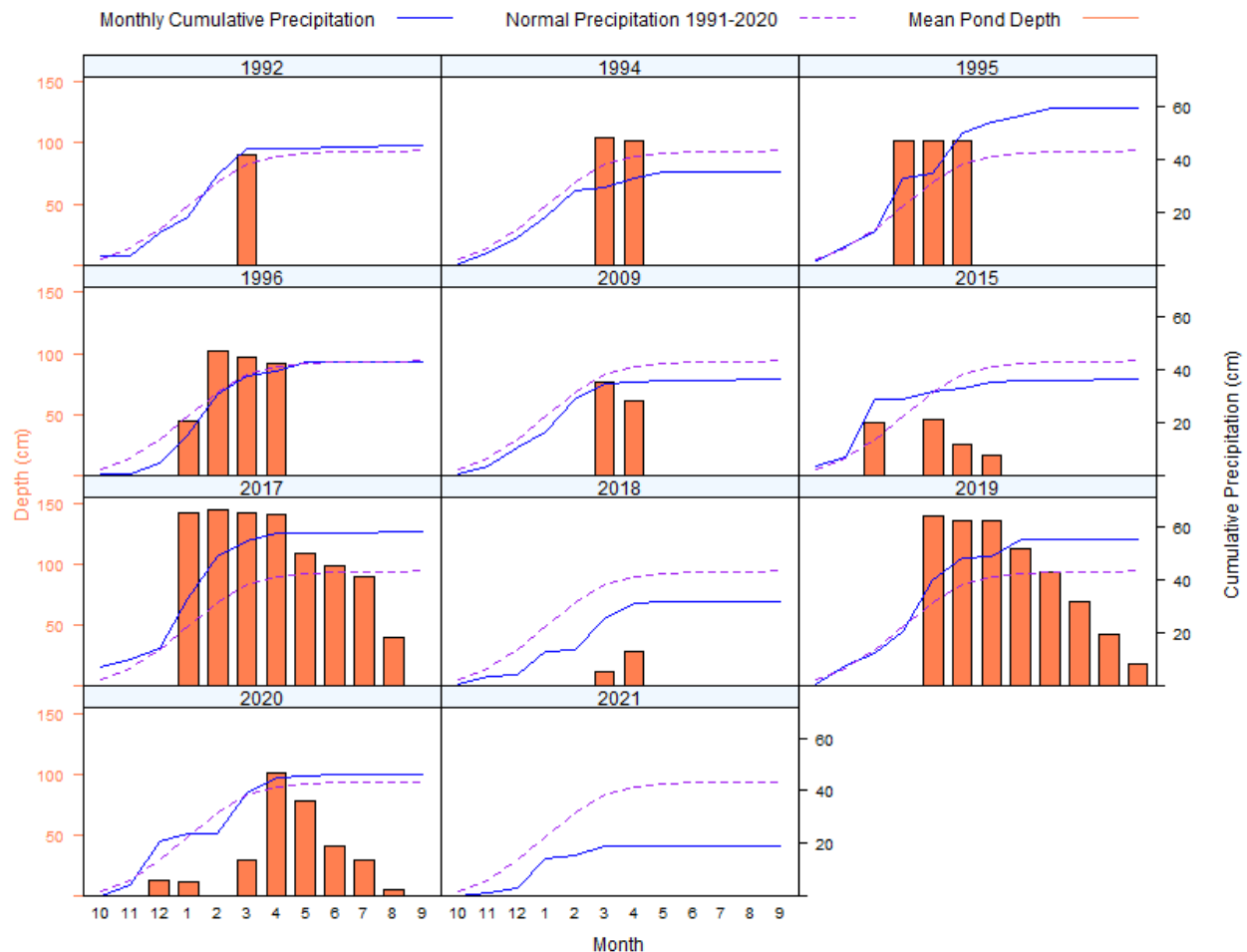
**Figure 5-36.** Pond 3 South (Year 3 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

### 5.10 Pond 16 – Year 3

Pond 16 is situated within a medium size basin with a steep profile in the southern part of the Fort Ord National Monument within the Impact Area (Figure 2-4). Depth and inundation of Pond 16 have been monitored for eleven years (Figure 5-37). Above normal water years were 1995, 2017, and 2019. Years 1992, 1996 and 2020 were close to normal water years, and all other years were below normal (1994, 2009, 2018, 2021) or consecutive drought years (2015). In above normal water years water can spill out of primary basin of Pond 16 and significantly expand its inundated area to the north which last time occurred in 2017. By size, Pond 16 is most similar to reference Pond 101 East (East), although it has a much steeper profile (Figure 5-1).

Pond 16 was monitored in 2021 as a Year 3 Post-Subsurface Munitions Remediation vernal pool. Vegetation within Pond 16 and immediately around it was masticated in the summer of 2016 in preparation for a prescribed burn in Unit 31. Less than 50 percent of the Pond 16 watershed was masticated, and limited vegetation mastication occurred within the inundation area. Subsurface anomaly investigations occurred in 2018. Historically, Pond 16 reached a depth of 28 cm and an inundation area of 0.26 ac in a below normal water year (2018), and it reached a maximum depth of 144 cm and a maximum inundation of 2.57 acres in an above normal water year (2017, Figure 5-38). Pond 16 remained dry in 2021 water year (Figure 5-37) and thus inundation extent, depth, and water quality measurements were not taken. Historical values are presented in Figures 5-37 to 5-40.





**Figure 5-37.** Pond 16 (Year 3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)

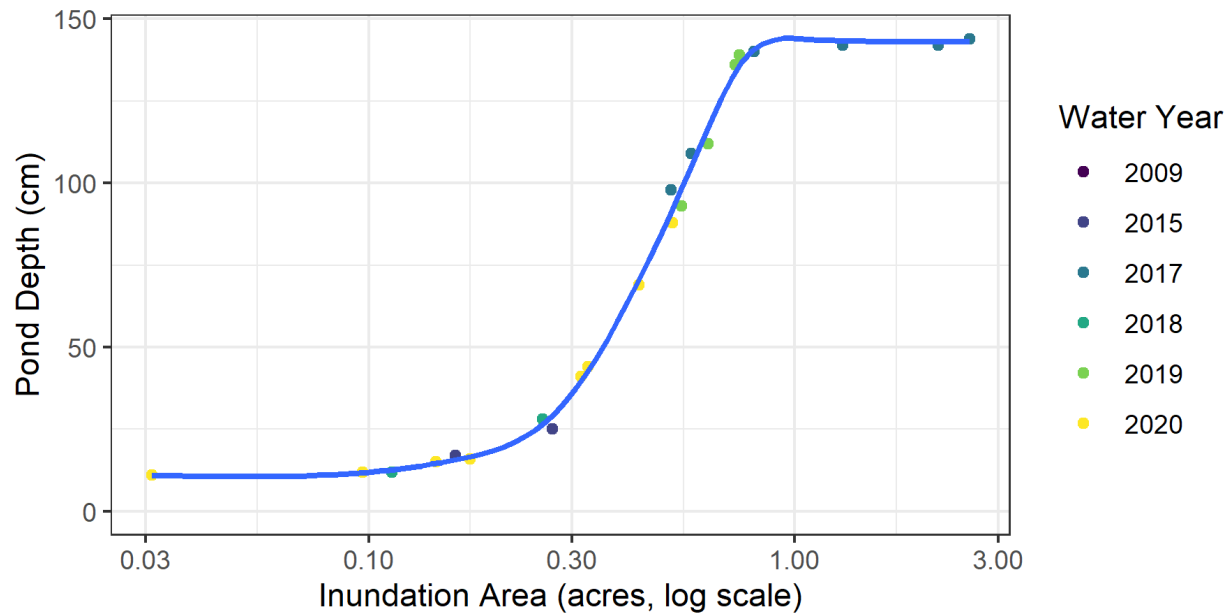
During the eleven years of monitoring of Pond 16 the cumulative precipitation in 2021 was the lowest and was the only instance of the vernal pool remaining dry throughout the water year (Figure 5-37). Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. Considering that all of the reference vernal pools remained dry in 2021 it suggests that there simply was not enough precipitation in 2021 water year to completely saturate the sandy loam layer and/or the underlying clay layer.

#### 5.10.1 Data Quality Objective 1

Pond 16 did not meet the required average depths of 25 cm from the first rain event through March for CTS, nor the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 16 did not sustain sufficient depth for CTS (0 cm through March), nor for fairy shrimp (0 cm through May).

#### 5.10.2 Data Quality Objective 2

Just like the reference vernal pools Pond 16 remained dry in 2021 water year which was not unexpected given the well below normal precipitation (Figure 5-37).



**Figure 5-38.** Pond 16 (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area since 2009 Water Year

#### 5.10.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 16, a post-subsurface munitions remediation vernal pool, was not on track to meet the performance standard for Year 3 in 2021 water year. Pond 16 did not meet DQO 1 indicating that it did not sustain suitable habitat for CTS and fairy shrimp in 2021. Pond 16 remained dry in 2021 water year just as reference Pond 101 East (East) and DQO 2 was met.

#### 5.10.4 Data Quality Objective 4

Water quality parameters could not be assessed at of Pond 3 South because it remained dry in 2021.

#### 5.10.5 Performance Standard: Wildlife Usage

Pond 16 was not on track to meet the performance standard for year 3 in 2021 because it remained dry. Pond 16 was not on track for DQO 1. DQO 4 cannot be accessed for 2021 water year.

#### 5.10.6 Conclusion

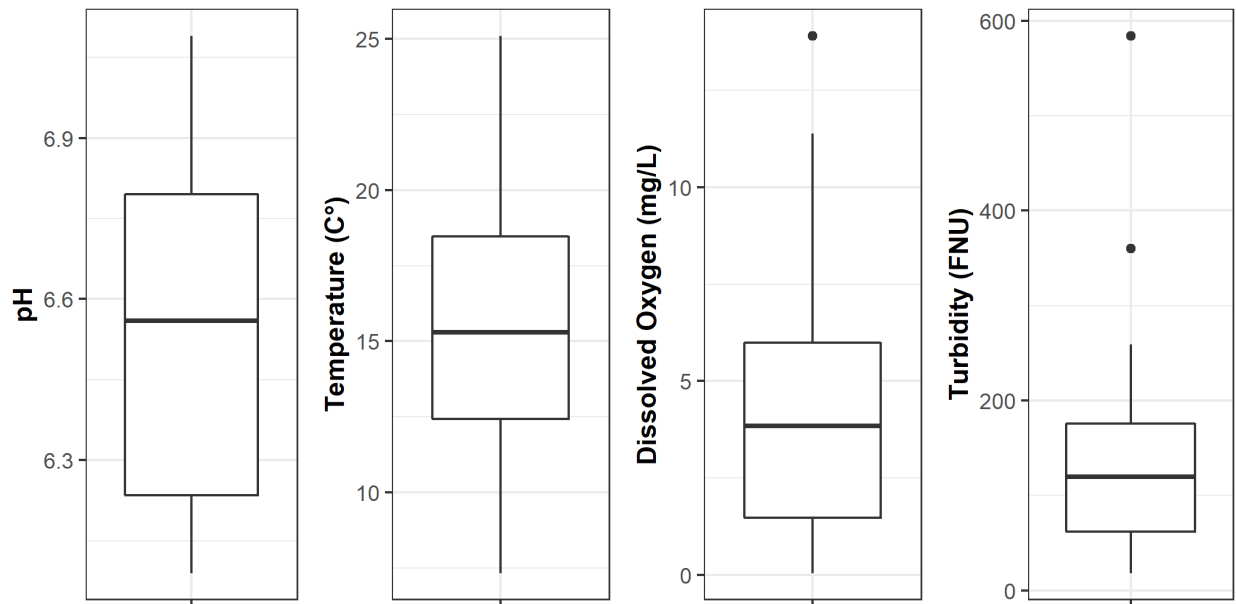
Pond 16, a post-subsurface munitions remediation vernal pool, was in year 3 of monitoring in 2021. The vernal pool was not on track to meet the performance standards (Table 5-10). Pond 16 will continue to be monitored in the future.

**Table 5-10. Success at Pond 16 (Year 3 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Not on track
	DQO 2	On track
Wildlife Usage	DQO 1	Not on track
	DQO 4	Cannot assess



**Figure 5-39.** Pond 16 (Year 3 Post-Subsurface Munitions Remediation) Inundations for 2018 and 2021 (both years had below normal precipitation).



**Figure 5-40.** Pond 16 (Year 3 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

### 5.11 Pond 35 – Year 3

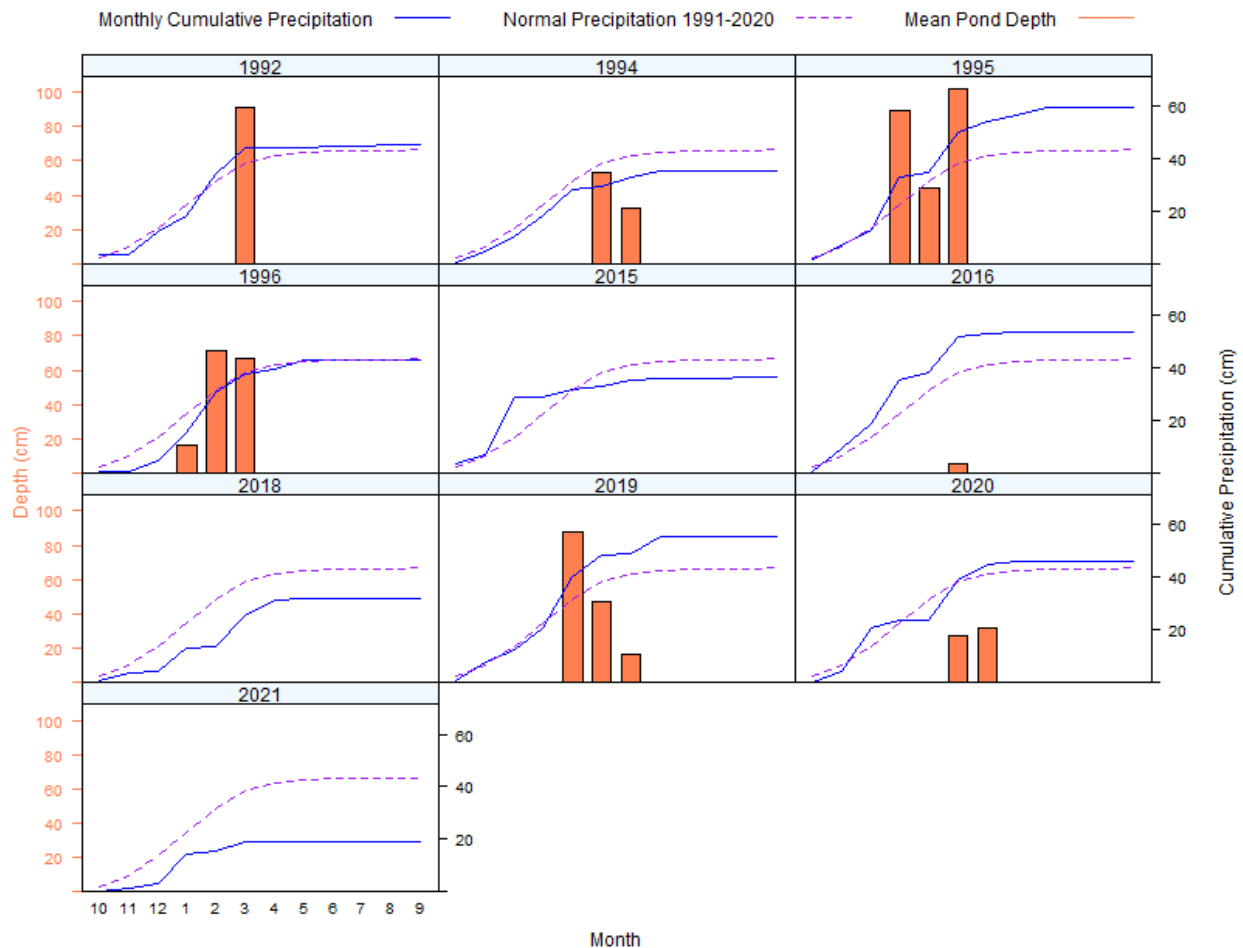
Pond 35 is situated within a small basin with a moderately steep profile in the northern part of the Fort Ord National Monument (Figure 2-4). Pond 35 was monitored for ten years (Figure 5-41). Above normal water years were 1995, 2016, and 2019. Years 1992, 1996, and 2020 were close to normal water years. All other years were below normal (1994, 2018, 2021) or consecutive drought years (2015). By size, Pond 35 is most similar to reference Pond 101 East (East) (Figure 5-1).

Pond 35 was monitored in 2021 as a Year 3 Post-Subsurface Munitions Remediation vernal pool. Vegetation within the Pond 35 watershed was masticated in summer of 2017 in preparation for a prescribed burn of BLM Area B Subunit B. Vegetation within and immediately around Pond 35 was not burned, although parts of the Pond 35 watershed were burned in October 2017. Subsurface anomaly investigations occurred in Pond 35 basin in 2018. Historically, Pond 35 remained completely dry in a consecutive drought year (2015) and in a below normal water year (2018), and it reached a maximum depth of 102 cm and a maximum inundation of 0.92 acres in an above normal water year (1995; Figure 5-41). Pond 35 remained dry in 2021 water year (Figure 5-41) and thus inundation extent, depth, and water quality measurements were not taken. Historical values are presented in Figures 5-41 to 5-44.

During the ten years of monitoring of Pond 35 the cumulative precipitation in 2021 was the lowest (Figure 5-41). Pond 35 remained dry in 2015, 2018, and in 2021, all below normal water years (2015 was a consecutive drought year) suggesting that normal or above normal precipitation is necessary for it to become inundated. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. Considering that all of the reference vernal



pools remained dry in 2021 it suggests that there simply was not enough precipitation in 2021 water year to completely saturate the sandy loam layer and/or the underlying clay layer.



**Figure 5-41.** Pond 35 (Year 3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)

#### 5.11.1 Data Quality Objective 1

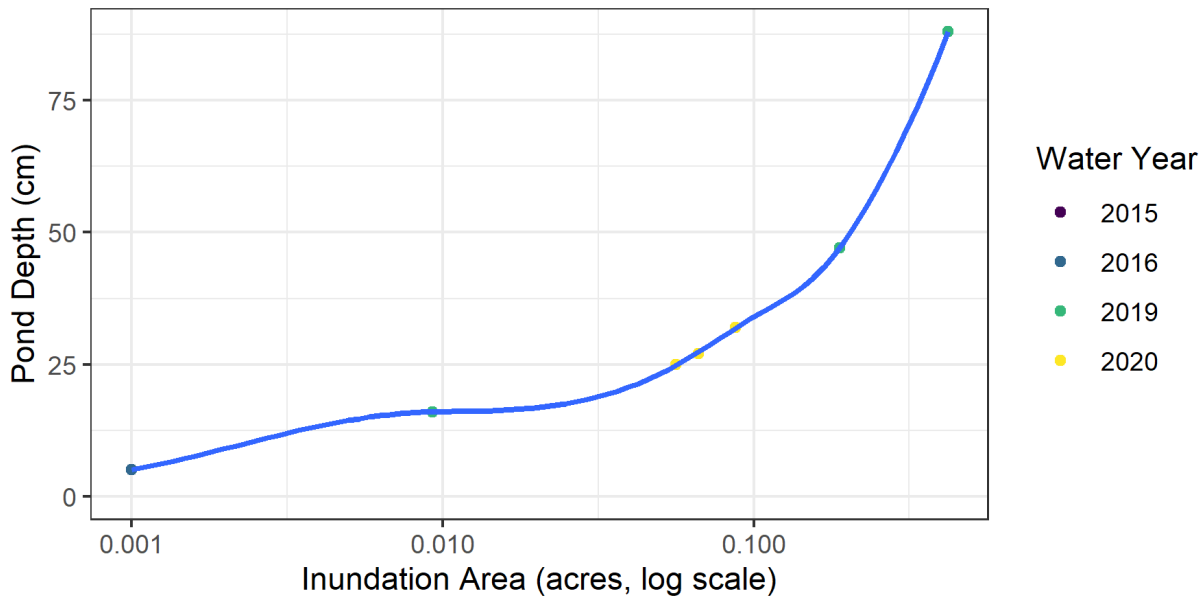
Pond 35 did not meet the required average depth of 25 cm from the first rain event through March for CTS, nor the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 35 did not sustain sufficient depth for CTS (0 cm through March), nor for fairy shrimp (0 cm through May).

#### 5.11.2 Data Quality Objective 2

Just like the reference vernal pools, Pond 35 remained dry in 2021 water year which was not unexpected given the well below normal precipitation (Figure 5-41).

#### 5.11.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 35, a post-subsurface munitions remediation, vernal pool, was not on track to meet the performance standard for Year 3 in 2021. Pond 35 did not meet DQO 1 indicating that it did not sustain suitable habitat for CTS and fairy shrimp in 2021. Pond 35 remained dry in 2021 water year just as reference Pond 101 East (East) and DQO 2 was met.



**Figure 5-42.** Pond 35 (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area since 2015 Water Year.

#### 5.11.4 Data Quality Objective 4

Water quality parameters could not be assessed at of Pond 35 because it remained dry in 2021.

#### 5.11.5 Performance Standard: Wildlife Usage

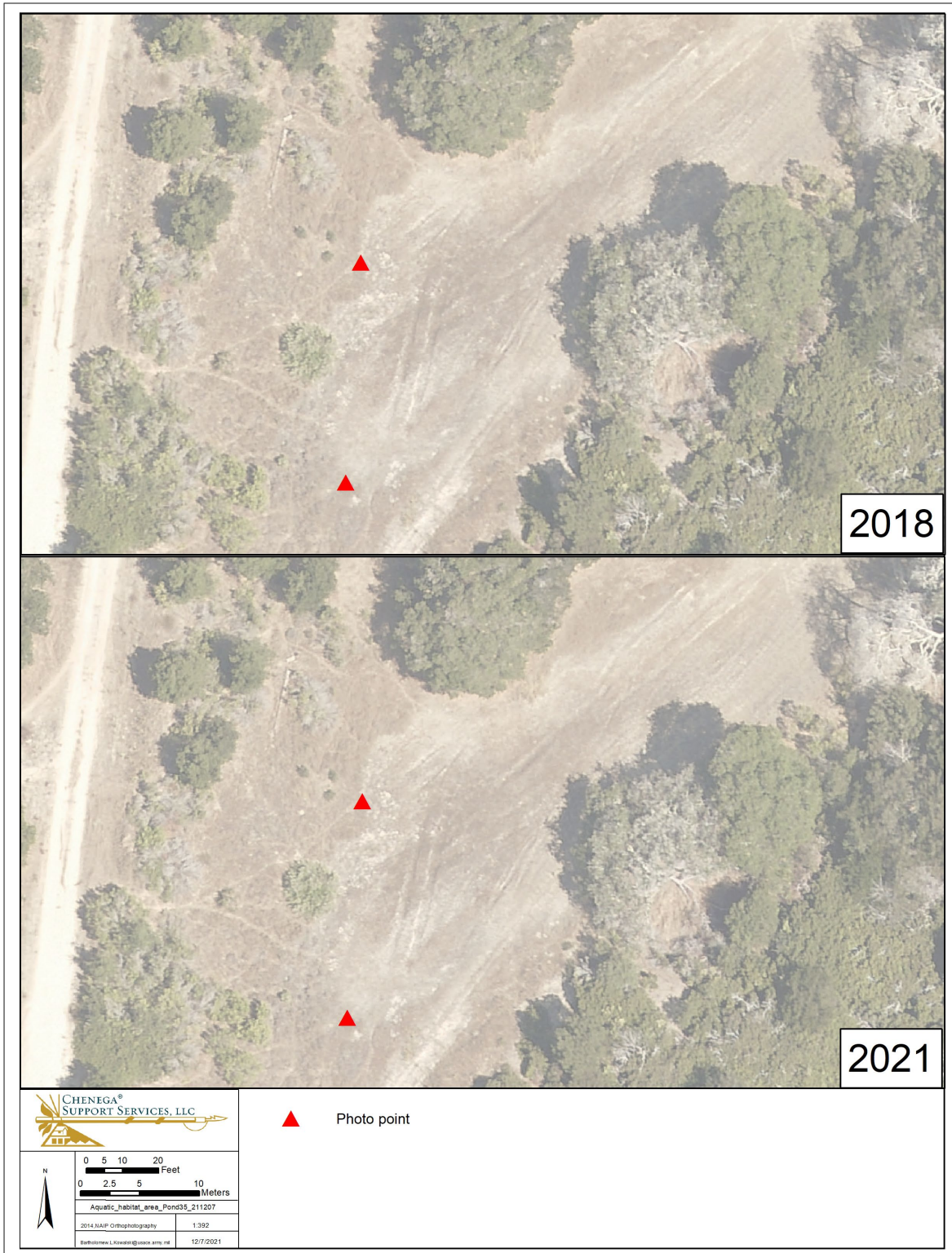
Pond 35 was not on track to meet the performance standard for year 3 in 2021 because it remained dry. Pond 35 was not on track for DQO 1. DQO 4 cannot be accessed for 2021 water year.

#### 5.11.6 Conclusion

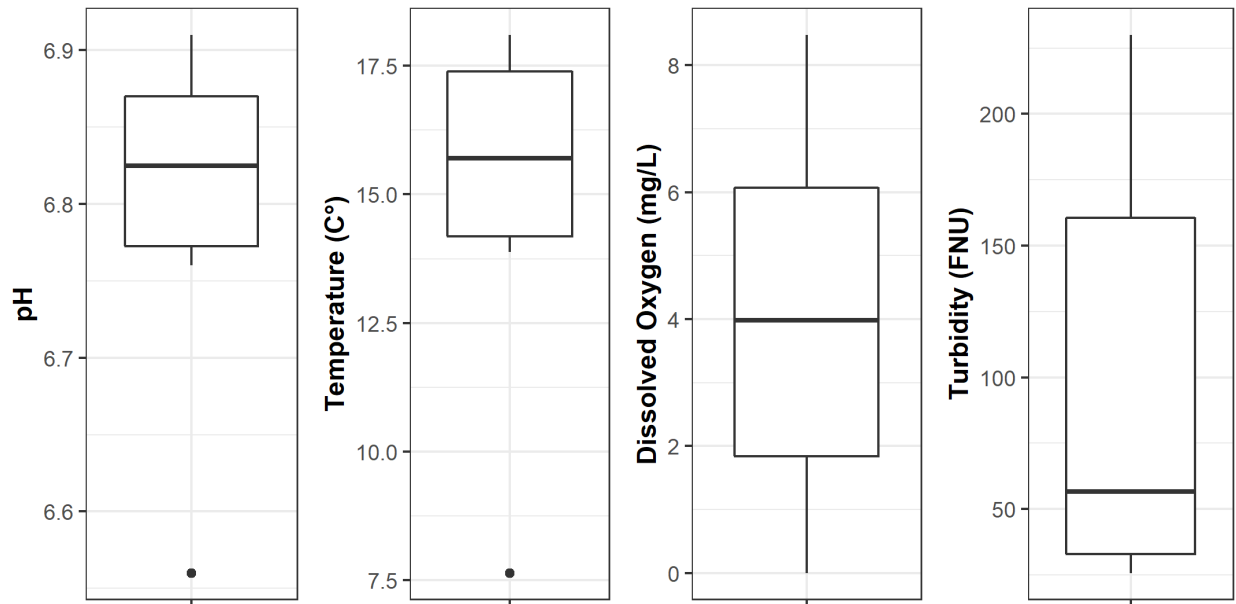
Pond 35, a post-subsurface munitions remediation vernal pool, was in year 3 of monitoring in 2021. The vernal pool was not on track to meet the performance standards (Table 5-11). Pond 35 will continue to be monitored in the future.

**Table 5-11. Success at Pond 35 (Year 3 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Not on track
	DQO 2	On track
Wildlife Usage	DQO 1	Not on track
	DQO 4	Cannot assess



**Figure 5-43.** Pond 35 (Year 3 Post-Subsurface Munitions Remediation) Inundations for 2018 and 2021 (both below normal water years).



**Figure 5-44.** Pond 35 (Year 3 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

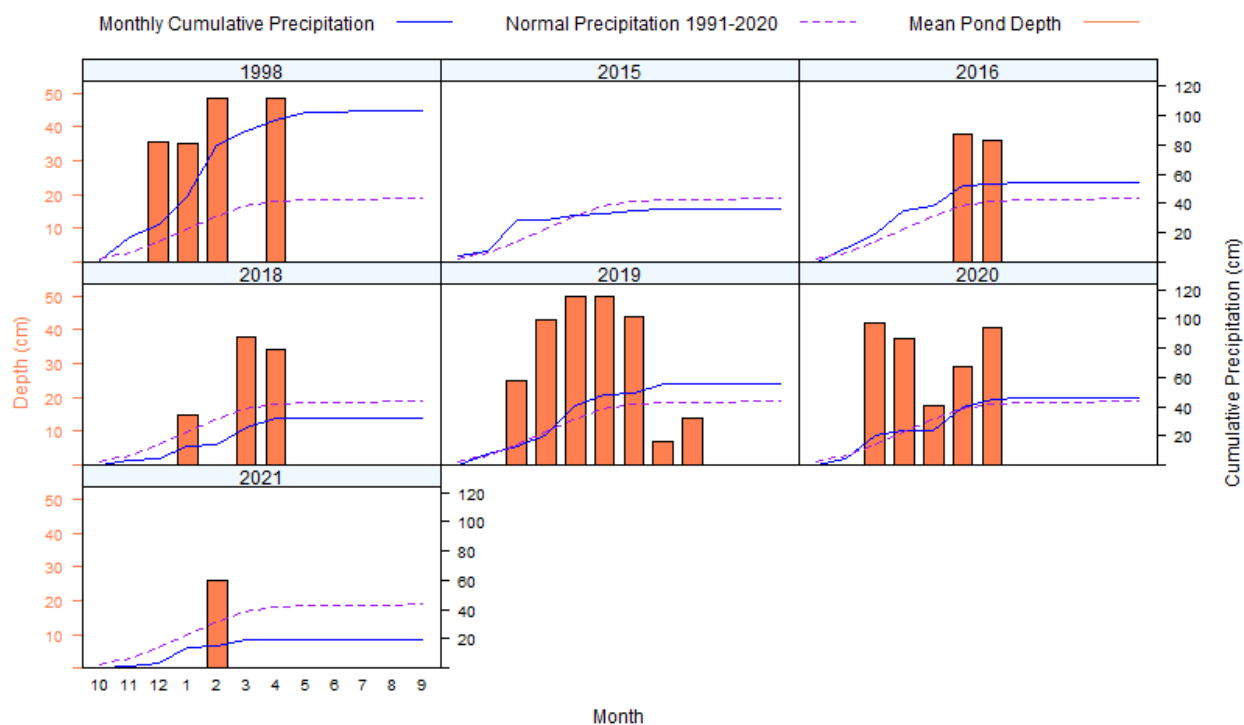
### 5.12 Pond 39 – Year 3

Pond 39 is situated within a very small basin with a steep profile, surrounded by topographically varied small inundations that in an above normal water year can become inundated and hydrologically connected. Pond 39 is located in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 39 have been monitored for seven years (Figure 5-45). Above normal water years were 1998, 2016, and 2019. Year 2020 was a close to normal water year. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015). By size, Pond 39 is most similar to reference Pond 997, although it has a much steeper profile and in years with above normal precipitation it can reach much greater area.

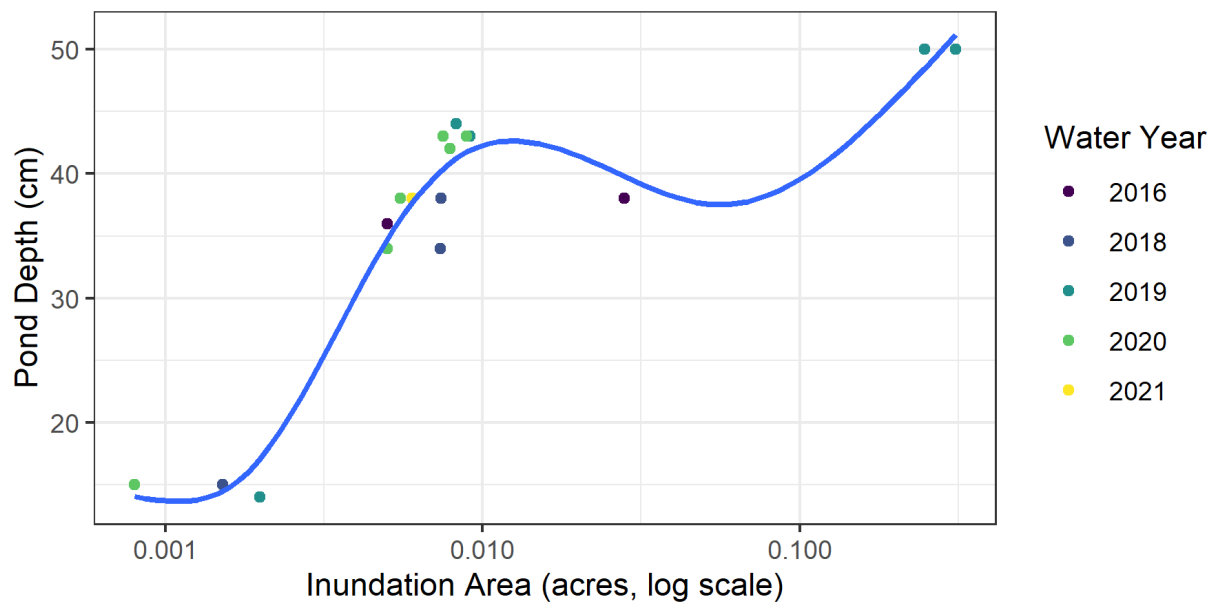
Pond 39 was monitored in 2021 as a Year 3 post-subsurface munitions remediation vernal pool. Pond 39 was monitored for baseline conditions in 2015 and 2016. Vegetation in Pond 39 and within its watershed was burned in October 2017 as part of the prescribed burn of BLM Area B Subunit B. Subsurface anomaly investigations occurred within the Pond 39 basin in 2018. Historically, Pond 39 remained dry in a consecutive drought year (2015), and it reached a maximum depth of 50 cm and a maximum inundation of 0.31 acres in 2019, an above normal water year. The 2021 maximum depth of Pond 39 was 38 cm and maximum inundation for was 0.006 acres (Table 4-12). The depth and inundation values were within range of previously recorded values (Figure 5-46).

Pond 39 was inundated throughout the month of February, and its hydroperiod in 2021 did not resemble that of any reference vernal pools or its own hydroperiod in previous years. Pond 39 stayed dry in 2015, which was a consecutive drought year (Figure 5-45). Maximum inundation area was smaller in 2021 than in 2018, which was a below normal water year (Figure 5-47).

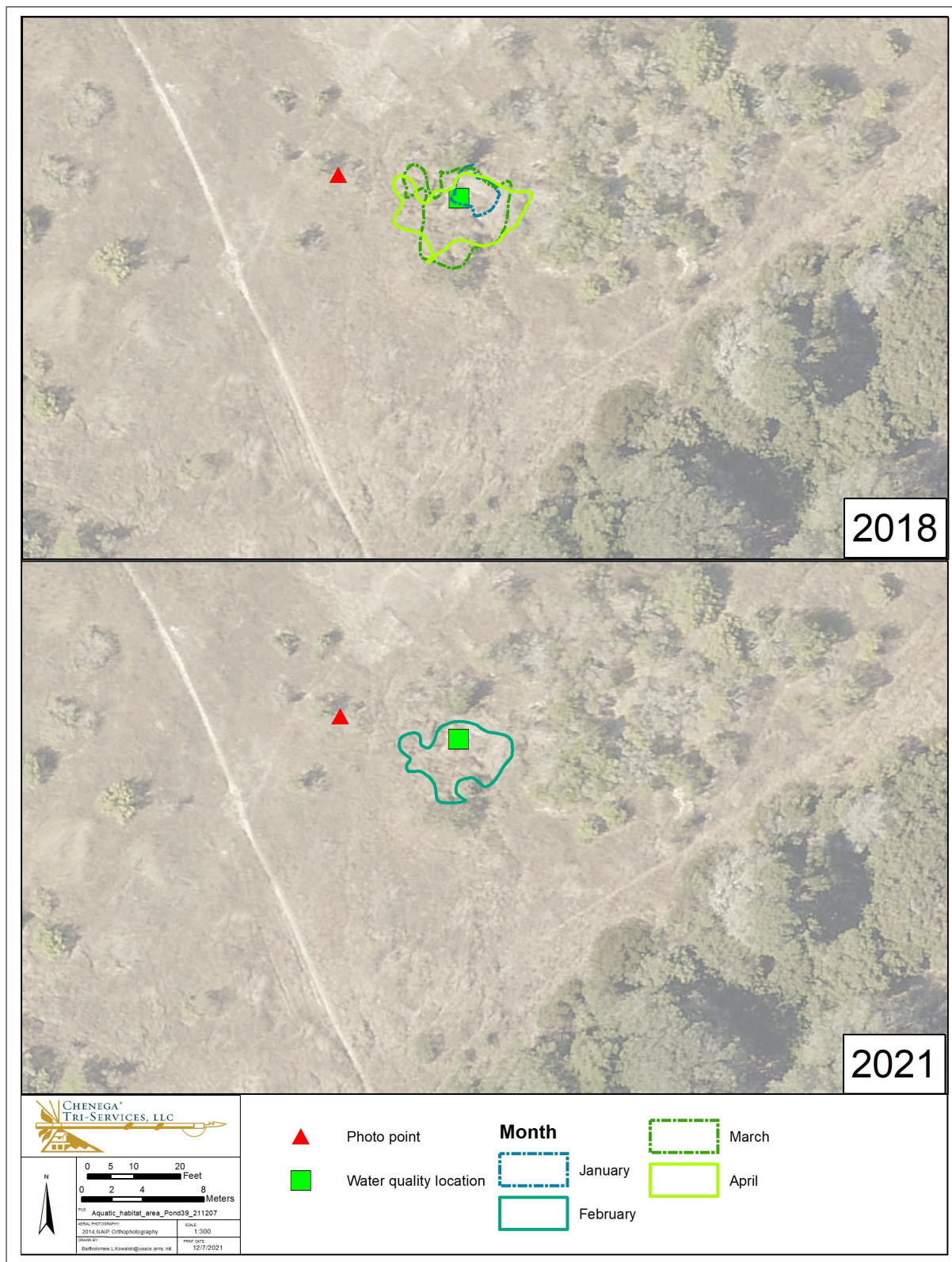




**Figure 5-45.** Pond 39 (Year 3 Post-Burn, Year 3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)

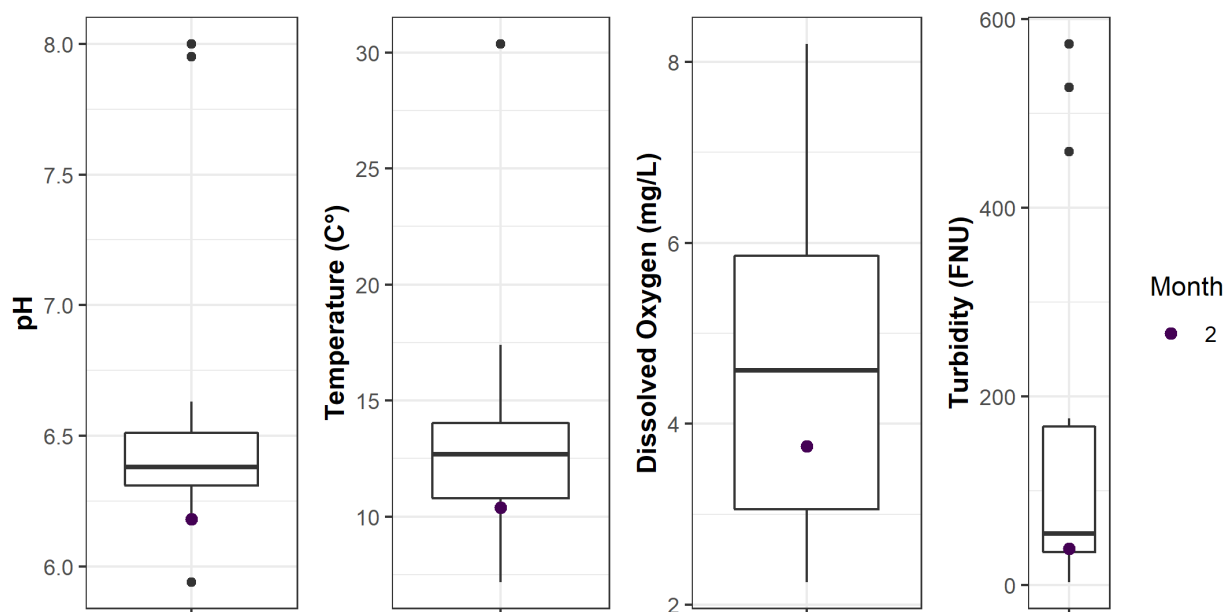


**Figure 5-46.** Pond 39 (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2015.



**Figure 5-47.** Pond 39 (Year 3 Post-Subsurface Munitions Remediation) Inundations for 2018 and 2021 (both below normal water years).

Water quality parameters of Pond 39 were within the historical ranges and similar to other vernal pools (Figure 5-48 and Figures 5-2 to 5-5).



**Figure 5-48.** Pond 39 (Year 3 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The colored dots represent observed values in 2021 water year. The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

#### 5.12.1 Data Quality Objective 1

Pond 39 did not stay inundated long enough to meet the required average depths of 25 cm from the first rain event through March for CTS nor the 10 cm for 18 consecutive days through May for fairy shrimp.

#### 5.12.2 Data Quality Objective 2

Unlike the reference vernal pools which remained dry, Pond 39 was inundated throughout the month of February. Maximum inundation area in 2021 was smaller than in 2018, a below normal water year (Figure 5-47).

#### 5.12.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 39, a post-subsurface munitions remediation vernal pool, was not on track to meet the performance standard for Year 3 in 2021. Pond 39 did not meet DQO 1 indicating that it did not sustain suitable habitat for CTS or fairy shrimp in 2021. Pond 39 was briefly inundated in 2021 and by comparison to reference vernal pools DQO 2 was met. The vernal pool will continue to be monitored in the future to evaluate its progress toward meeting the performance standard.

#### 5.12.4 Data Quality Objective 4

Water quality parameters of Pond 39 were within the historical ranges (Figure 5-48).

#### 5.12.5 Performance Standard: Wildlife Usage

Pond 39 was not on track to meet this performance standard as it did not sustain sufficient depth and inundation for CTS or fairy shrimp. Water quality measurements were adequate for wildlife.

#### 5.12.6 Conclusion

Pond 39, a post-subsurface munitions remediation vernal pool, was in year 3 of monitoring in 2021. The vernal pool was not on track to meet the performance standards (Table 5-12). Pond 39 will continue to be monitored in the future.

**Table 5-12. Success at Pond 39 (Year 3 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

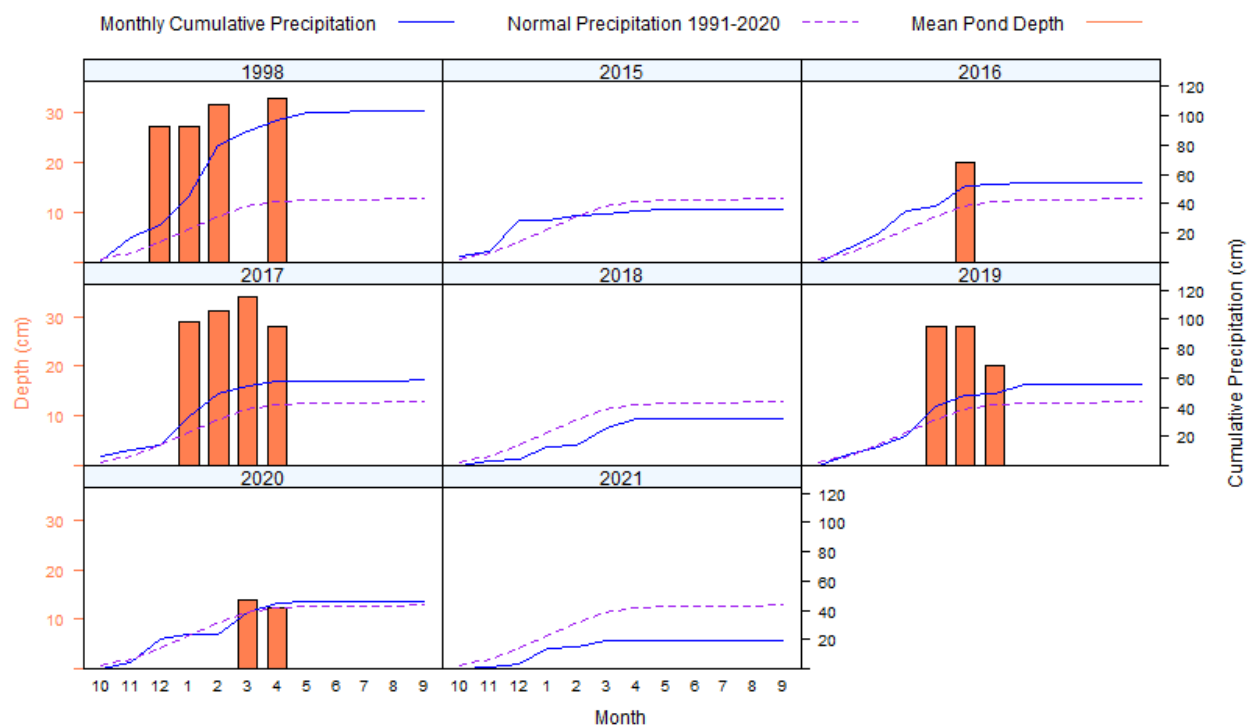
Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Not on track
	DQO 2	On track
Wildlife Usage	DQO 1	Not on track
	DQO 4	On track

### 5.13 Pond 40 South – Year 3

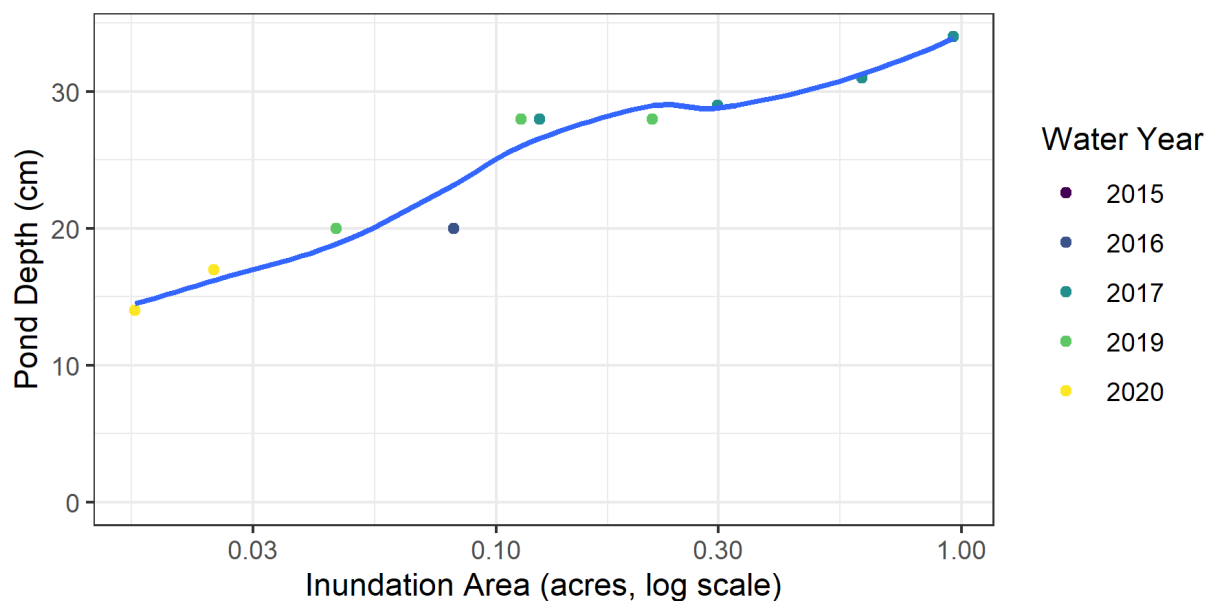
Pond 40 South is situated within a small and shallow basin, surrounded by topographically varied small depressions that in an above normal water year can become inundated and hydrologically connected. Pond 40 South is located in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 40 South have been monitored for eight years (Figure 5-49). Above normal water years were 1998, 2016, 2017, and 2019. Year 2020 was a close to normal water year. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015). By size, Pond 40 South is most similar to reference Pond 997.

Pond 40 South was monitored in 2021 as a Year 3 post-subsurface munitions remediation vernal pool. Pond 40 South was monitored for baseline conditions in 2015, 2016, and 2017. Vegetation within Pond 40 South basin and within its watershed was burned in October 2017 as part of the prescribed burn of BLM Area B Subunit B. Subsurface anomaly investigations occurred in 2018 within the Pond 40 South basin. Historically, Pond 40 South remained dry in a below normal water year (2018), and it reached a maximum depth of 34 cm and a maximum inundation of 0.96 acres in an above normal water year (2017). Pond 40 South remained dry in 2021 water year (Figure 5-49) and thus inundation extent, depth, and water quality measurements were not taken. Historical values are presented in Figures 5-49 to 5-52.

During the eight years of monitoring of Pond 40 South the cumulative precipitation in 2021 was the lowest. Pond 40 South remained dry in 2015, 2018, and in 2021, all below normal water years (2015 was a consecutive drought year) suggesting that normal or above normal precipitation is necessary for it to become inundated. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. Considering that all of the reference vernal pools remained dry in 2021 it suggests that there simply was not enough precipitation in 2021 water year to completely saturate the sandy loam layer and/or the underlying clay layer.

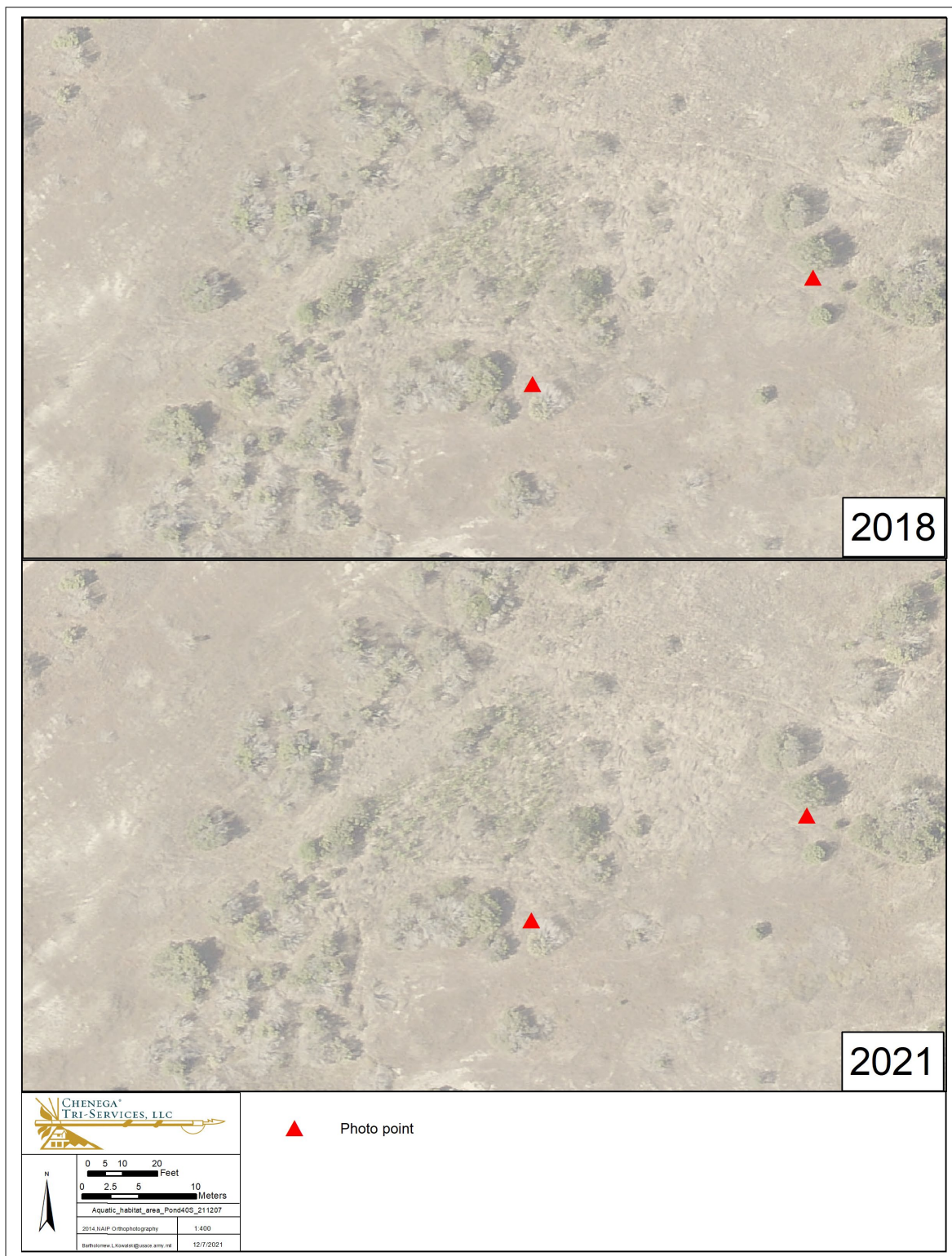


**Figure 5-49.** Pond 40 South (Year 3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)

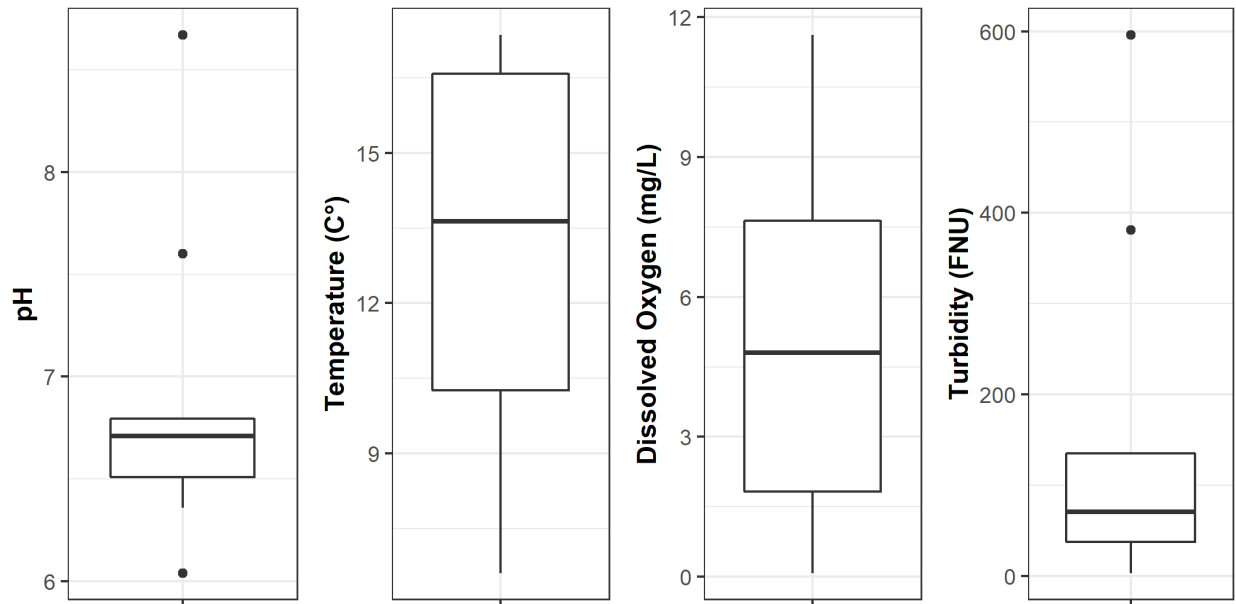


**Figure 5-50.** Pond 40 South (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2015.





**Figure 5-51.** Pond 40 South (Year 3 Post-Subsurface Munitions Remediation) Inundations for 2018 and 2021 (both below normal water years).



**Figure 5-52.** Pond 40 South (Year 3 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

#### 5.13.1 Data Quality Objective 1

Pond 40 South did not meet the required average depths of 25 cm from the first rain event through March for CTS, nor the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 40 South did not sustain sufficient depth for CTS (0 cm through March) nor for fairy shrimp (0 cm from March through April).

#### 5.13.2 Data Quality Objective 2

Just like the reference vernal pools, Pond 40 South remained dry in 2021 water year which was not unexpected given the well below normal precipitation (Figure 5-49).

#### 5.13.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 40 South, a post-subsurface munitions remediation, vernal pool, was not on track to meet the performance standard for Year 3 in 2021. Pond 40 South did not meet DQO 1 indicating that it did not sustain suitable habitat for CTS and fairy shrimp in 2021. Pond 40 South remained dry in 2021 water year just as reference Pond 997 and DQO 2 was met.

#### 5.13.4 Data Quality Objective 4

Water quality parameters could not be assessed at of Pond 40 South because it remained dry in 2021.

#### 5.13.5 Performance Standard: Wildlife Usage

Pond 40 South was not on track to meet the performance standard for year 3 in 2021 because it remained dry. Pond 40 South was not on track for DQO 1. DQO 4 cannot be accessed for 2021 water year.

### 5.13.6 Conclusion

Pond 40 South, a post-subsurface munitions remediation vernal pool, was in year 3 of monitoring in 2021. The vernal pool was not on track to meet the performance standards (Table 5-13). Pond 40 South will continue to be monitored in the future.

**Table 5-13. Success at Pond 40 South (Year 3 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Not on track
	DQO 2	On track
Wildlife Usage	DQO 1	Not on track
	DQO 4	Cannot assess

## 5.14 Pond 41 – Year 3

Pond 41 is situated within a medium size shallow basin in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 41 have been monitored for six years (Figure 5-53). Above normal water years were 2016, 2019, and 1998 which was an El Niño year. Water year 2020 was close to normal, 2015 was a consecutive drought year, and 2021 was a well below normal water year. By size, Pond 41 is most similar to reference Pond 101 East (East).

Pond 41 was monitored in 2021 as a Year 3 post-subsurface munitions remediation vernal pool. In 2018 intrusive anomaly investigations occurred at Pond 41. Historically, Pond 41 remained dry in a consecutive drought year (2015), and it reached a maximum depth of 127 cm and a maximum inundation of 2.13 acres in an extremely above normal El Niño year (1998, Figure 5-54). Pond 41 remained dry in 2021 water year (Figure 5-53) and thus inundation extent, depth, and water quality measurements were not taken. Historical values are presented in Figures 5-53 to 5-56.

During the six years of monitoring of Pond 41 the cumulative precipitation in 2021 was the lowest (Figure 5-53). Pond 41 remained dry in 2015 and in 2021, both below normal water years (2015 was a consecutive drought year) suggesting that normal or above normal precipitation is necessary for it to become inundated. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. Considering that all of the reference vernal pools remained dry in 2021 it suggests that there simply was not enough precipitation in 2021 water year to completely saturate the sandy loam layer and/or the underlying clay layer.

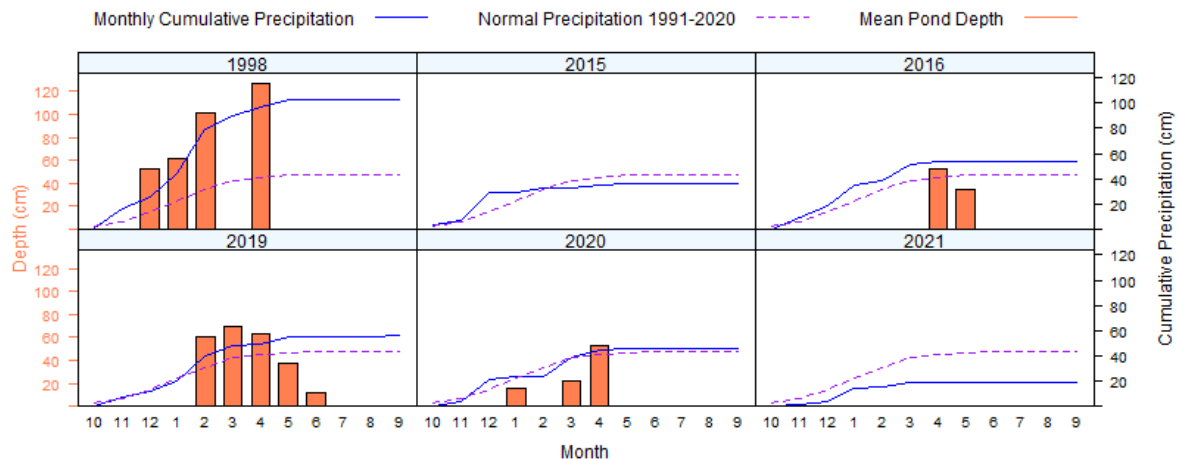
### 5.14.1 Data Quality Objective 1

Pond 41 did not meet the required average depths of 25 cm from the first rain event through March for CTS, nor the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 41 did not sustain sufficient depth for CTS (0 cm through March), nor for fairy shrimp (0 cm through May).

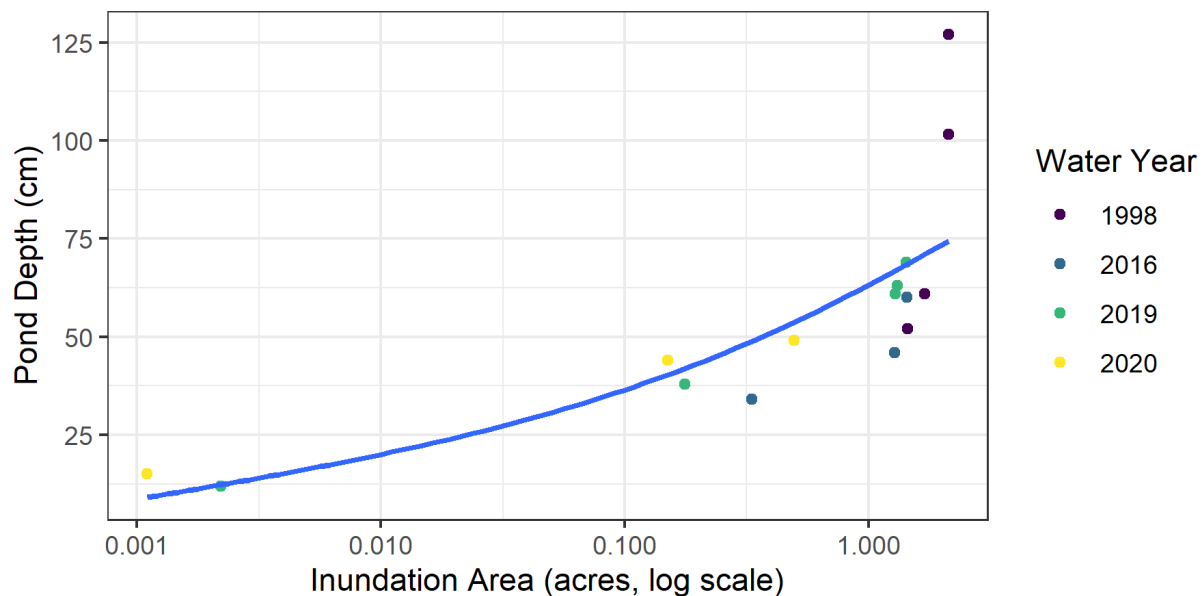
### 5.14.2 Data Quality Objective 2

Just like the reference vernal pools, Pond 41 remained dry in 2021 water year which was not unexpected given the well below normal precipitation (Figure 5-53).





**Figure 5-53.** Pond 41 (Year 3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)



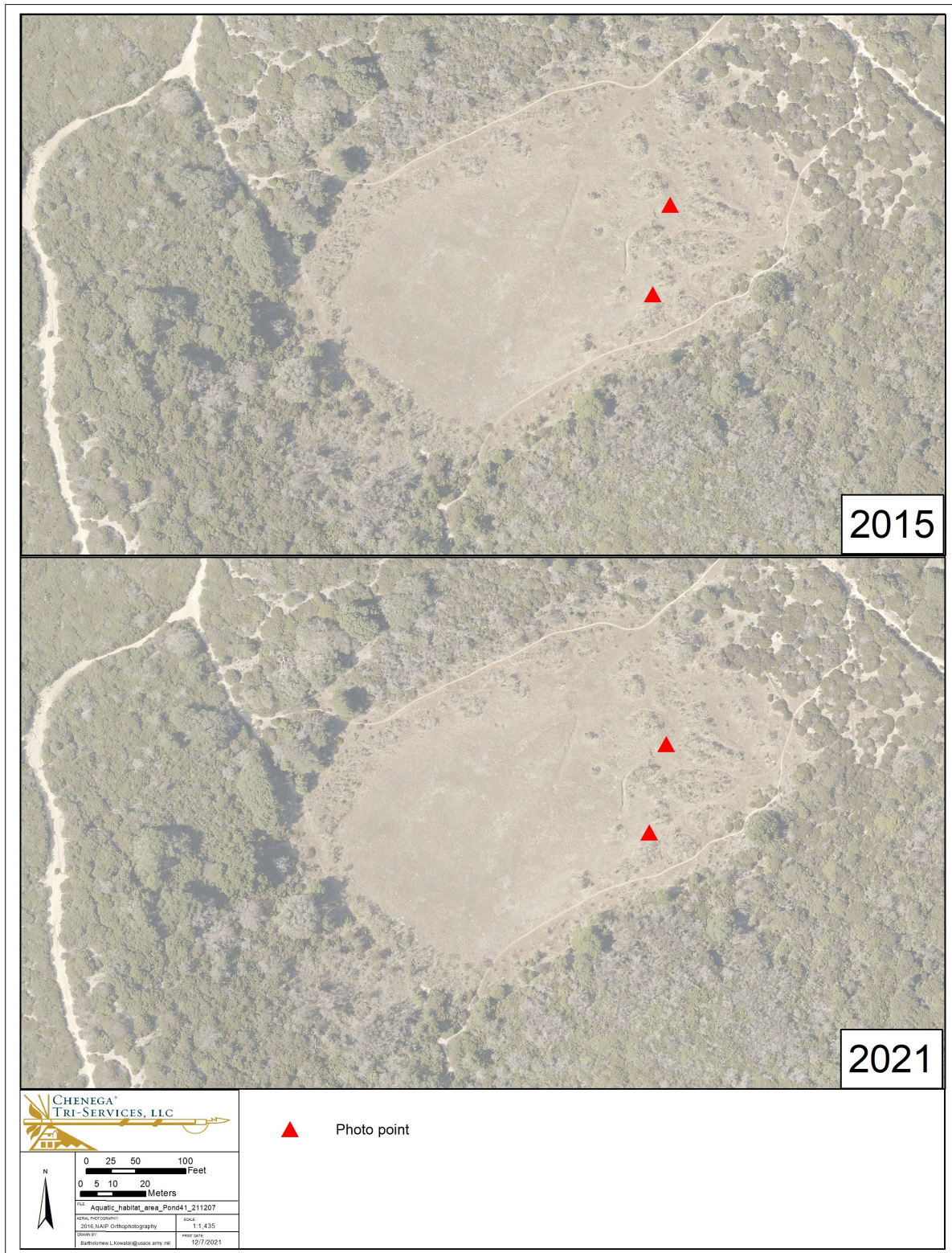
**Figure 5-54.** Pond 41 (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 1998.

#### 5.14.3 Performance Standard: Hydrological Conditions and Inundation Area

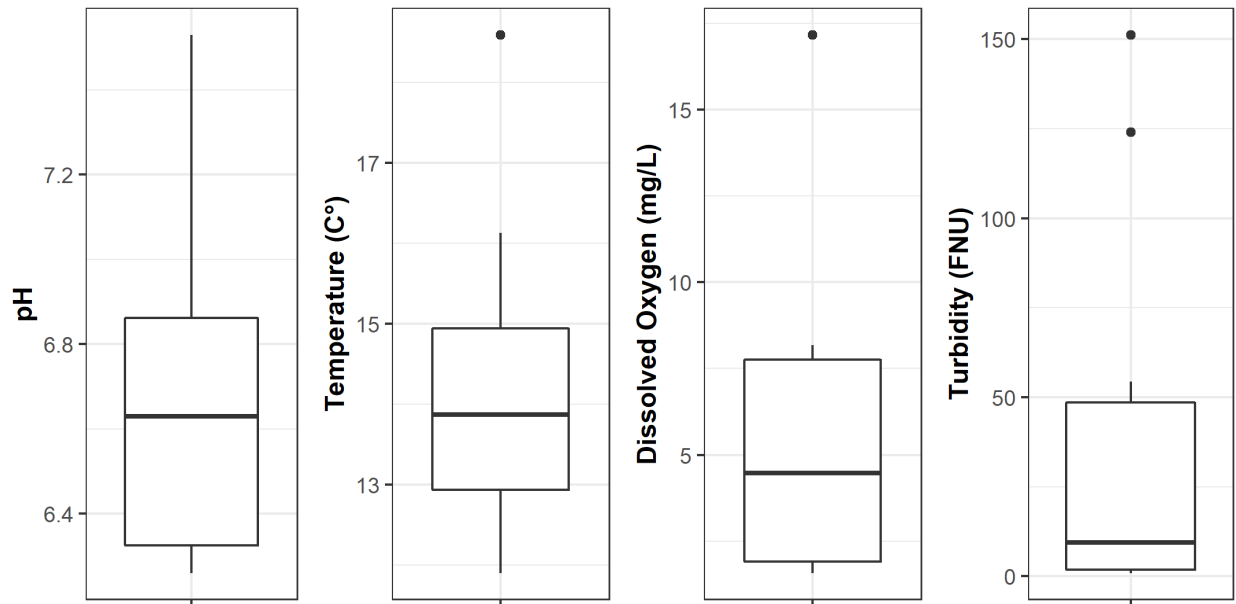
Pond 41, a post-subsurface munitions remediation vernal pool, was not on track to meet the performance standard for Year 3 in 2021. Pond 41 did not meet DQO 1 indicating that it did not sustain suitable habitat for CTS and fairy shrimp in 2021. Pond 41 remained dry in 2021 water year just as reference Pond 101 East (East) and DQO 2 was met.

#### 5.14.4 Data Quality Objective 4

Water quality parameters could not be assessed at Pond 41 because it remained dry in 2021.



**Figure 5-55.** Pond 41 (Year 3 Post-Subsurface Munitions Remediation) Inundations for 2015 (consecutive drought year) and 2021 (below normal water year).



**Figure 5-56.** Pond 41 (Year 3 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

#### 5.14.5 Performance Standard: Wildlife Usage

Pond 41 was not on track to meet the performance standard for year 3 in 2021 because it remained dry. Pond 41 was not on track for DQO 1. DQO 4 cannot be accessed for 2021 water year.

#### 5.14.6 Conclusion

Pond 41, a post-subsurface munitions remediation vernal pool, was in year 3 of monitoring in 2021. The vernal pool was not on track to meet the performance standards (Table 5-14). Pond 41 will continue to be monitored in the future.

**Table 5-14. Success at Pond 41 (Year 3 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

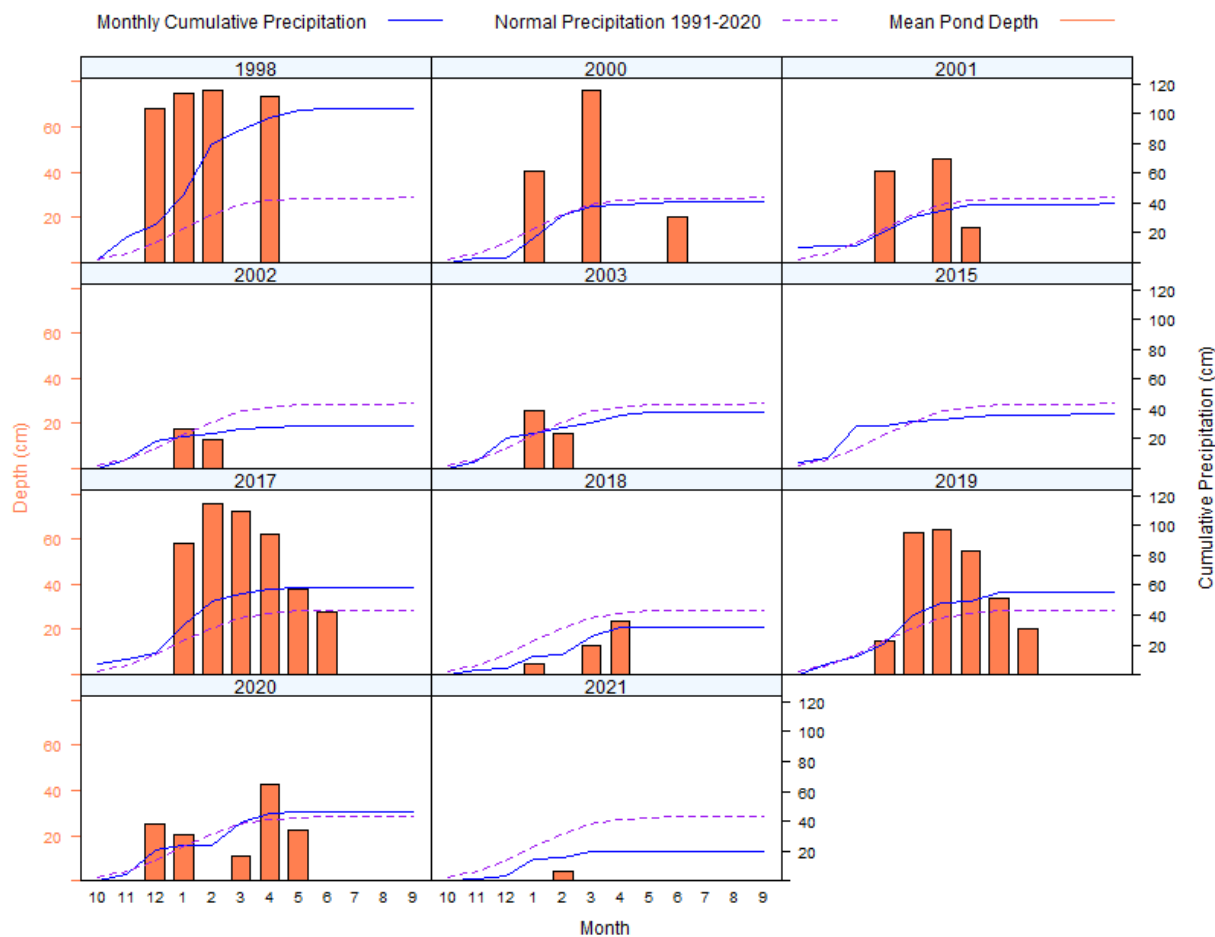
Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Not on track
	DQO 2	On track
Wildlife Usage	DQO 1	Not on track
	DQO 4	Cannot assess

### 5.15 Pond 42 – Year 3

Pond 42 is situated within a small shallow basin in the northern part of Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 42 have been monitored for eleven years (Figure 5-57). Above normal water years were 1998, 2017, and 2019. Years 2000, 2001, 2003, and 2020 were close to normal water year. All other monitoring was conducted in below normal water years (2002, 2018, 2021),



or in a consecutive drought year (2015). By size, Pond 42 is most similar to reference Pond 997, but it has a steeper profile (Figure 5-1).

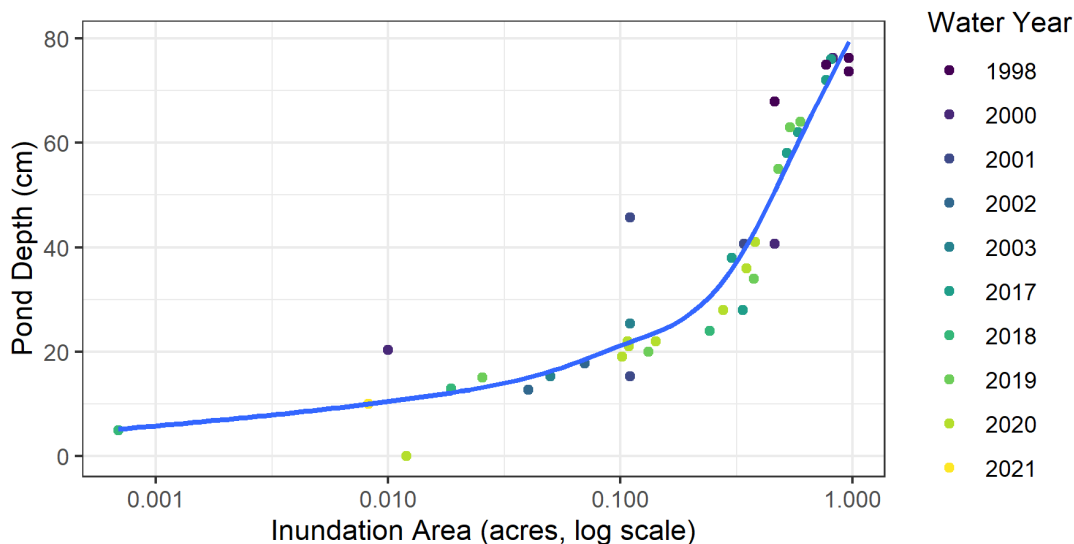


**Figure 5-57.** Pond 42 (3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)

Pond 42 was monitored in 2021 as a Year 3 post-subsurface munitions remediation vernal pool. Vegetation in Pond 42 and within its watershed was masticated in the summer of 2017 and burned in October 2017 as part of the prescribed burn of BLM Area B Subunit B. Subsurface anomaly investigations occurred within Pond 42 basin in 2018. Pond 42 was first monitored for baseline in 1998. Following MEC remediation activities, Pond 42 was monitored annually from 2000 to 2003 (HLA, 2001; Harding, 2002; MACTEC, 2003). Additional baseline surveys occurred in 2015 and 2017. Historically, Pond 42 remained dry in a consecutive drought year (2015), and it reached a maximum depth of 76 cm and a maximum inundation of 0.81 acres in an above normal water year (2017, Figure 5-58). The 2021 maximum depth of Pond 42 was 10 cm and maximum inundation was 0.008 acres (Table 4-15). The depth and inundation values were within range of previously recorded values (Figure 5-58).

Pond 42 dried out two times during the 2021 water year; first following initial inundation in February, and second time by mid March (Table 4-15 and Figure 4-15). This pattern was similar to the ones observed in 2018 and 2020 (Figure 5-57). Maximum inundation area of Pond 42 was much smaller than

in 2018, which was also a below normal water year (Figure 5-59). Hydroperiod of Pond 42 was not similar to any of the reference vernal pools since they all stayed dry in 2021 water year.



**Figure 5-58.** Pond 42 (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Data since 1998 Water Year .

Water quality parameters of Pond 42 were generally within the historical ranges with the exception of turbidity value, which at 449.52 FNU was the second highest on record at Pond 42 (Figure 5-60). However, when compared to historical measurements of other vernal pools this value is not outside of the observed range (Figure 5-4).

#### 5.15.1 Data Quality Objective 1

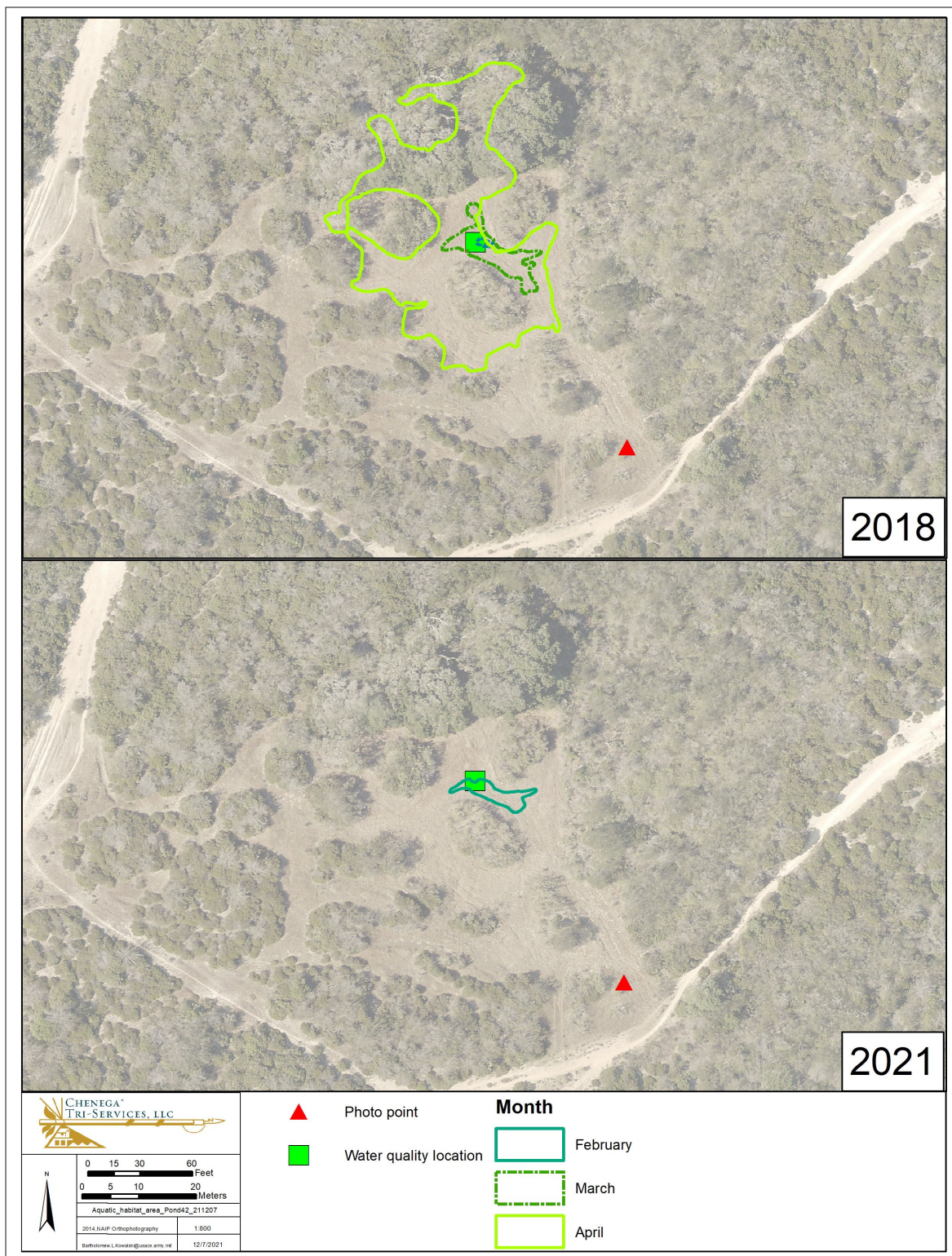
Pond 42 did not stay inundated long enough to meet the required average depths of 25 cm from the first rain event through March for CTS nor the 10 cm for 18 consecutive days through May for fairy shrimp.

#### 5.15.2 Data Quality Objective 2

Unlike all of the reference vernal pools which remained dry in 2021, Pond 42 was intermittently inundated from February through March and was completely dry by March 10, 2021. Pond 42 depth and inundation metrics reflected the well below normal precipitation pattern of 2021 and were within the historical range (Figure 5-58). Maximum inundated area was much smaller than in 2018, a below normal water year (Figure 5-59).

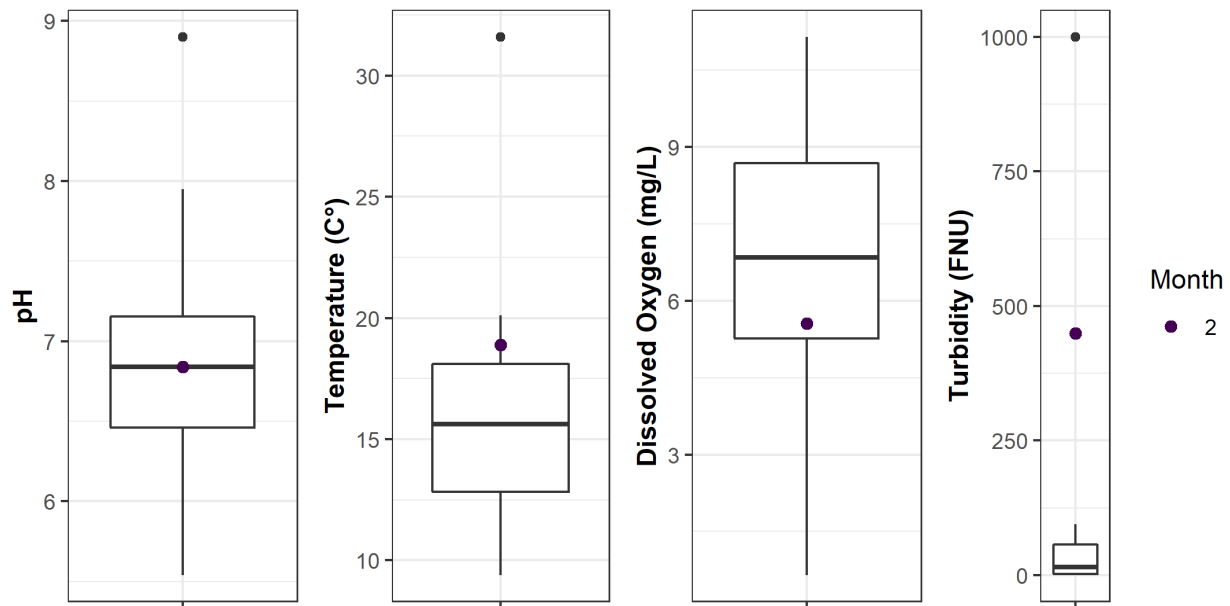
#### 5.15.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 42, a post-subsurface munitions remediation vernal pool, was not on track to meet the performance standard for Year 3 in 2021. Pond 42 did not meet DQO 1 indicating that it did not sustain suitable habitat for CTS or fairy shrimp in 2021. Pond 42 was briefly inundated in 2021 and by comparison to reference vernal pools DQO 2 was met. The vernal pool will continue to be monitored in the future to evaluate its progress toward meeting the performance standard.



**Figure 5-59.** Pond 42 (Year 3 Post-Subsurface Munitions Remediation) Inundations for 2018 and 2021 (both below normal precipitation years).





**Figure 5-60.** Pond 42 (Year 3 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The colored dots represent observed values in 2021 water year. The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

#### 5.15.4 Data Quality Objective 4

Water quality parameters of Pond 42 were generally within the historical ranges (Figures 5-4 and 5-60).

#### 5.15.5 Performance Standard: Wildlife Usage

Pond 42 was not on track to meet this performance standard as it did not sustain sufficient depth and inundation for CTS or fairy shrimp. Water quality measurements were adequate for wildlife.

#### 5.15.6 Conclusion

Pond 42, a post-subsurface munitions remediation vernal pool, was in year 3 of monitoring in 2021. The vernal pool was not on track to meet performance standards (Table 5-15). Pond 42 will continue to be monitored in the future.

**Table 5-15. Success at Pond 42 (Year 3 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

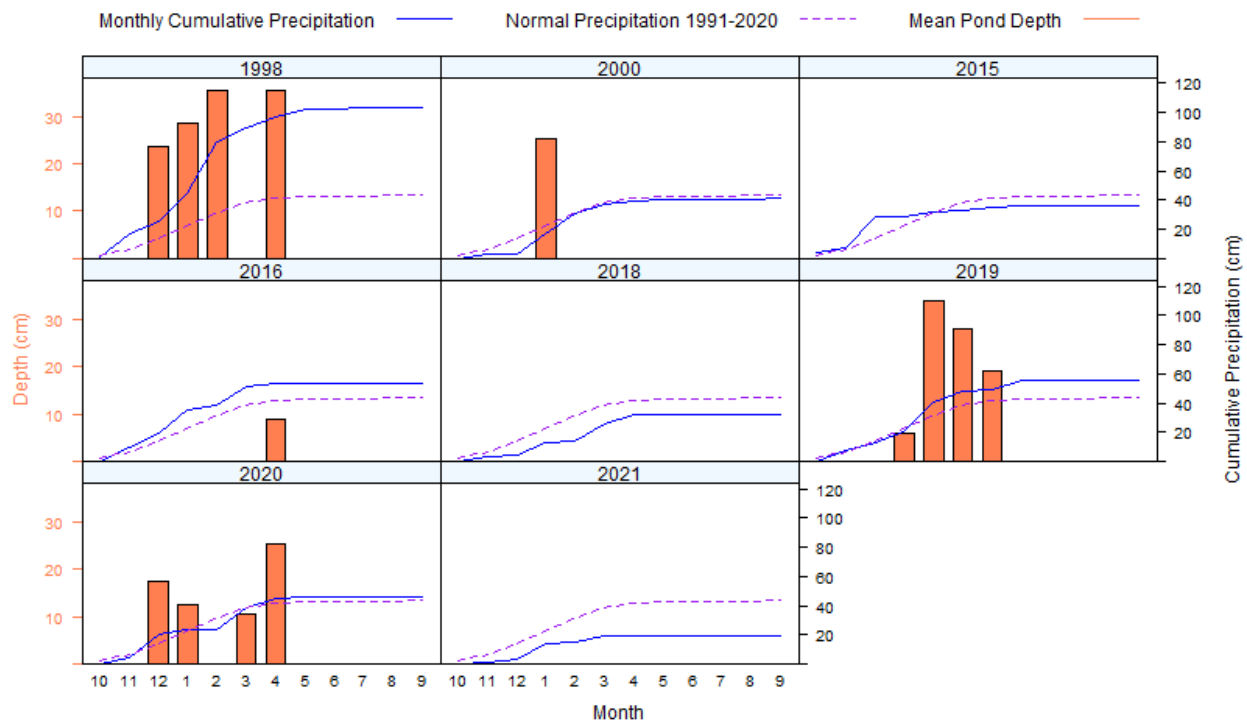
Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Not on track
	DQO 2	On track
Wildlife Usage	DQO 1	Not on track
	DQO 4	On track

### 5.16 Pond 43 – Year 3

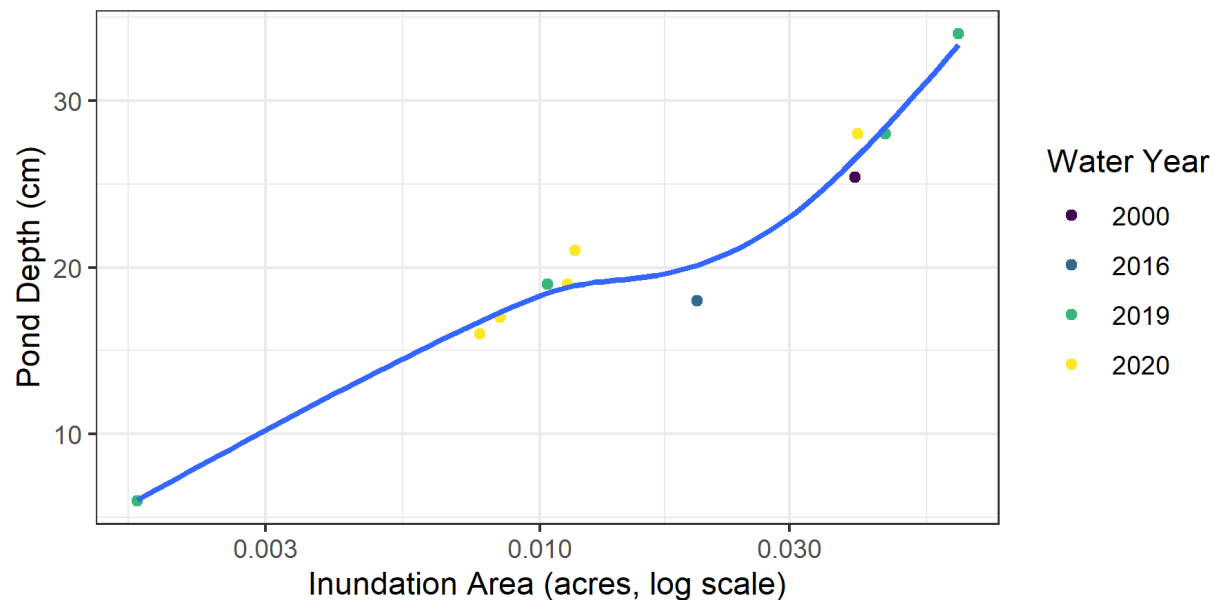
Pond 43 is situated within a small and shallow basin in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 43 have been monitored for eight years (Figure 5-61). Above normal water years were 1998, 2016, and 2019. Years 2000 and 2020 were close to normal water years. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015). By size, Pond 43 is most similar to reference Pond 997.

Pond 43 was monitored in 2021 as a Year 3 post-subsurface munitions remediation vernal pool. Vegetation in Pond 43 and within its watershed was burned in October 2017 as part of the prescribed burn of BLM Area B Subunit B. Subsurface anomaly investigations occurred within Pond 43 basin in 2018. Historically, Pond 43 remained dry in 2015, a consecutive drought year, and in 2018, a below normal water year. In 2019, an above normal water year, it reached a maximum depth of 34 cm and a maximum inundation of 0.06 acres. Pond 43 remained dry in 2021 water year (Figure 5-61) and thus inundation extent, depth, and water quality measurements were not taken. Historical values are presented in Figures 5-61 to 5-64.

During the eight years of monitoring of Pond 43 the cumulative precipitation in 2021 was the lowest. Pond 43 remained dry in 2015, 2018, and in 2021, all below normal water years (2015 was a consecutive drought year) suggesting that normal or above normal precipitation is necessary for it to hold water. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. This suggests that there simply was not enough precipitation in 2021 water year to completely saturate the sandy loam layer and/or the underlying clay layer.



**Figure 5-61.** Pond 43 (Year 3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)



**Figure 5-62.** Pond 43 (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2000.

#### 5.16.1 Data Quality Objective 1

Pond 43 did not meet the required average depths of 25 cm from the first rain event through March for CTS, nor the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 43 did not sustain sufficient depth for CTS (0 cm through March), nor for fairy shrimp (0 cm through May).

#### 5.16.2 Data Quality Objective 2

Just like the reference vernal pools, Pond 43 remained dry in 2021 water year which was not unexpected given the well below normal precipitation (Figure 5-61).

#### 5.16.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 43, a post-subsurface munitions remediation vernal pool, was not on track to meet the performance standard for Year 3 in 2021. Pond 43 did not meet DQO 1 indicating that it did not sustain suitable habitat for CTS and fairy shrimp in 2021. Pond 43 remained dry in 2021 water year just as reference Pond 997 and DQO 2 was met.

#### 5.16.4 Data Quality Objective 4

Water quality parameters could not be assessed at of Pond 43 because it remained dry in 2021.

#### 5.16.5 Performance Standard: Wildlife Usage

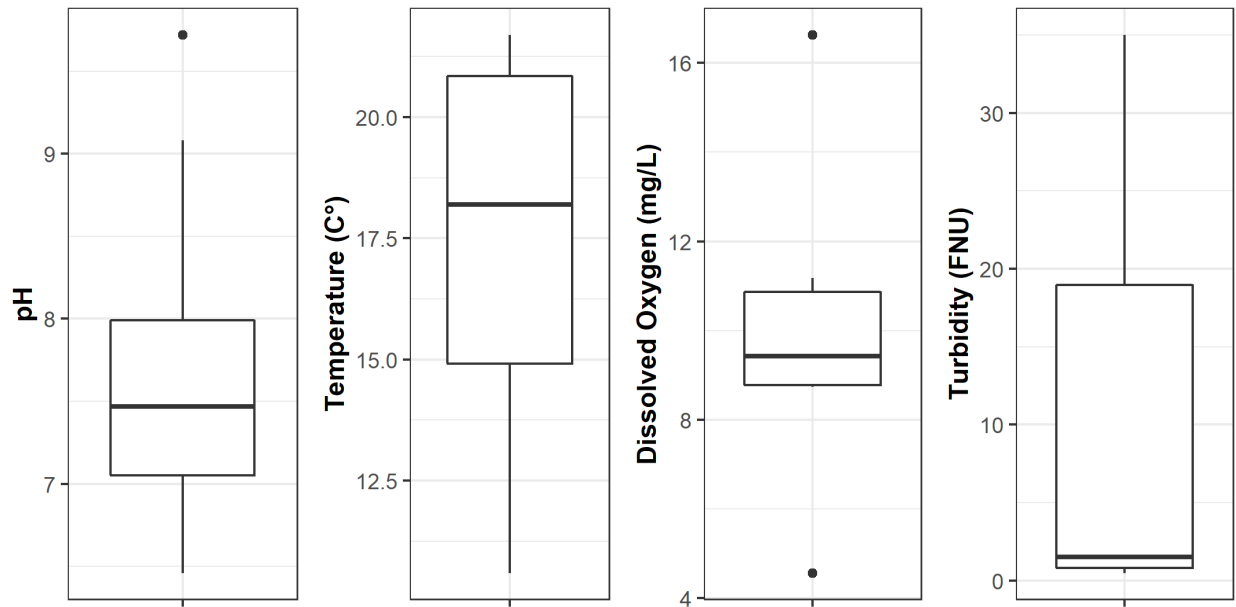
Pond 43 was not on track to meet the performance standard for year 3 in 2021 because it remained dry. Pond 43 was not on track for DQO 1. DQO 4 cannot be accessed for 2021 water year.

#### 5.16.6 Conclusion

Pond 43, a post-subsurface munitions remediation vernal pool, was in year 3 of monitoring in 2021. The vernal pool was not on track to meet the performance standards (Table 5-16). Pond 43 will continue to be monitored in the future.



**Figure 5-63.** Pond 43 (Year 3 Post-Subsurface Munitions Remediation) Inundations for 2018 and 2021 (both below normal precipitation years).



**Figure 5-64.** Pond 43 (Year 3 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

**Table 5-16. Success at Pond 43 (Year 3 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

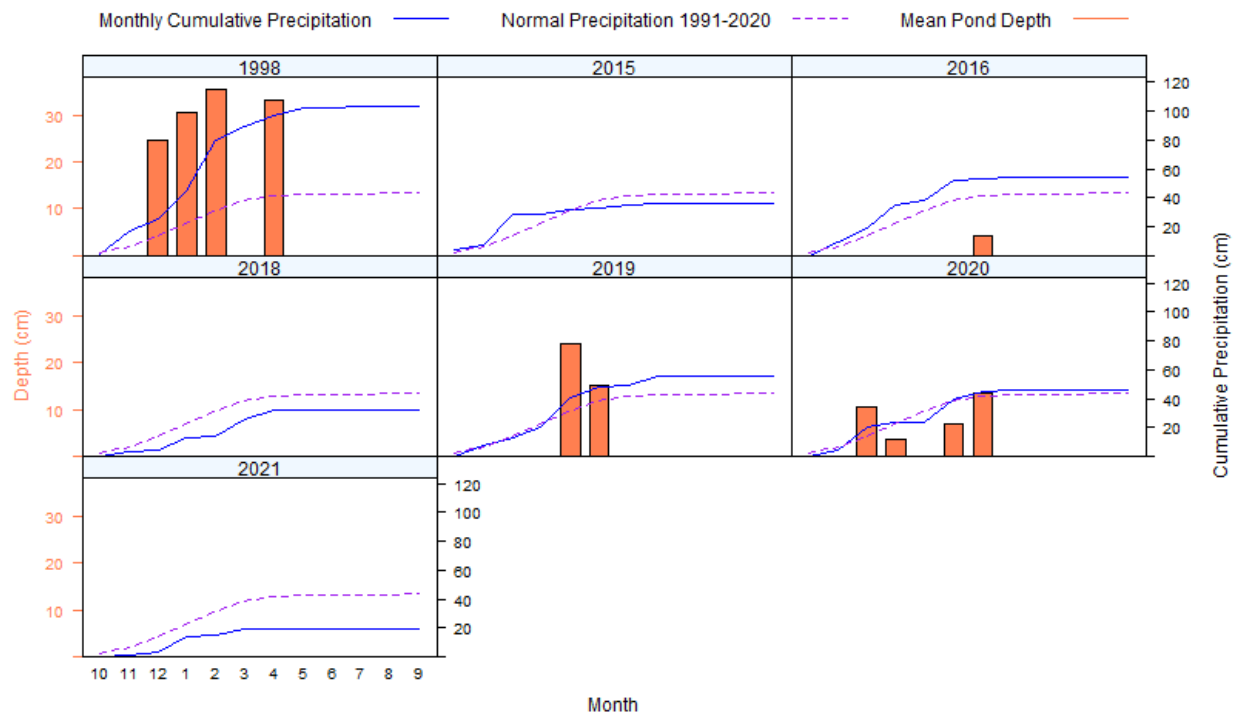
Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Not on track
	DQO 2	On track
Wildlife Usage	DQO 1	Not on track
	DQO 4	Cannot assess

### 5.17 Pond 44 – Year 3

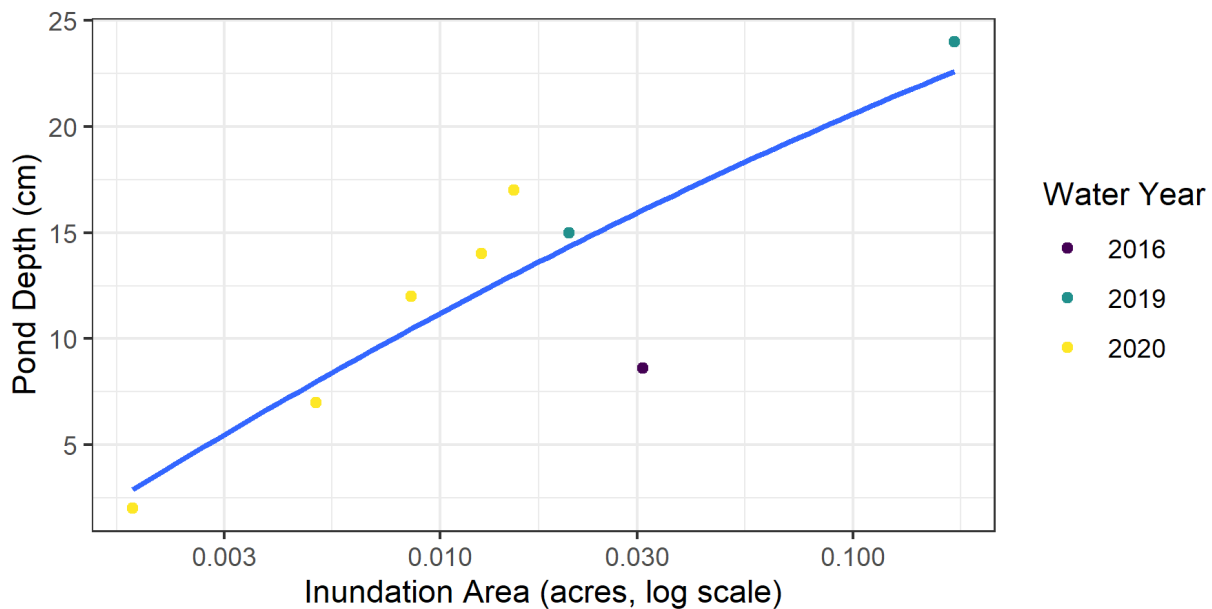
Pond 44 is situated within a small and shallow basin. Pond 44 is located in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 44 have been monitored for seven years (Figure 5-65). Above normal water years were 1998, 2016, and 2019. Year 2020 was a close to normal water year. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015). By size, Pond 44 is most similar to reference Pond 997.

Pond 44 was monitored in 2021 as a Year 3 post-subsurface munitions remediation vernal pool. Pond 44 was monitored for baseline conditions in 1998, 2015, and 2016. Vegetation in Pond 44 and within its watershed was masticated in 2017 during preparations for a prescribed burn of BLM Area B Subunit B. Subsurface anomaly investigations occurred within the Pond 44 basin in 2018. Historically, Pond 44 remained dry in a consecutive drought year (2015), and it reached a maximum depth of 36 cm and a maximum inundation of 0.19 acres in 1998, an extreme above normal water year. Pond 44 remained dry

in 2021 water year (Figure 5-65) and thus inundation extent, depth, and water quality measurements were not taken. Historical values are presented in Figures 5-65 to 5-68.



**Figure 5-65.** Pond 44 (Year 3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)



**Figure 5-66.** Pond 44 (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Data since 2016 Water Year.



During the seven years of monitoring of Pond 44 the cumulative precipitation in 2021 was the lowest (Figure 5-65). Pond 44 remained dry in 2015, 2018, and in 2021, all below normal water years (2015 was a consecutive drought year) suggesting that normal or above normal precipitation is necessary for it to hold water. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. This suggests that there simply was not enough precipitation in 2021 water year to completely saturate the sandy loam layer and/or the underlying clay layer.

#### 5.17.1 Data Quality Objective 1

Pond 44 did not meet the required average depths of 25 cm from the first rain event through March for CTS, nor the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 44 did not sustain sufficient depth for CTS (0 cm through March) or fairy shrimp (0 cm through April).

#### 5.17.2 Data Quality Objective 2

Just like the reference vernal pools, Pond 44 remained dry in 2021 water year which was not unexpected given the well below normal precipitation (Figure 5-65).

#### 5.17.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 44, a post-subsurface munitions remediation, vernal pool, was not on track to meet the performance standard for Year 3 in 2021. Pond 44 did not meet DQO 1 indicating that it did not sustain suitable habitat for CTS and fairy shrimp in 2021. Pond 44 remained dry in 2021 water year just as reference Pond 997 and DQO 2 was met.

#### 5.17.4 Data Quality Objective 4

Water quality parameters could not be assessed at of Pond 44 because it remained dry in 2021.

#### 5.17.5 Performance Standard: Wildlife Usage

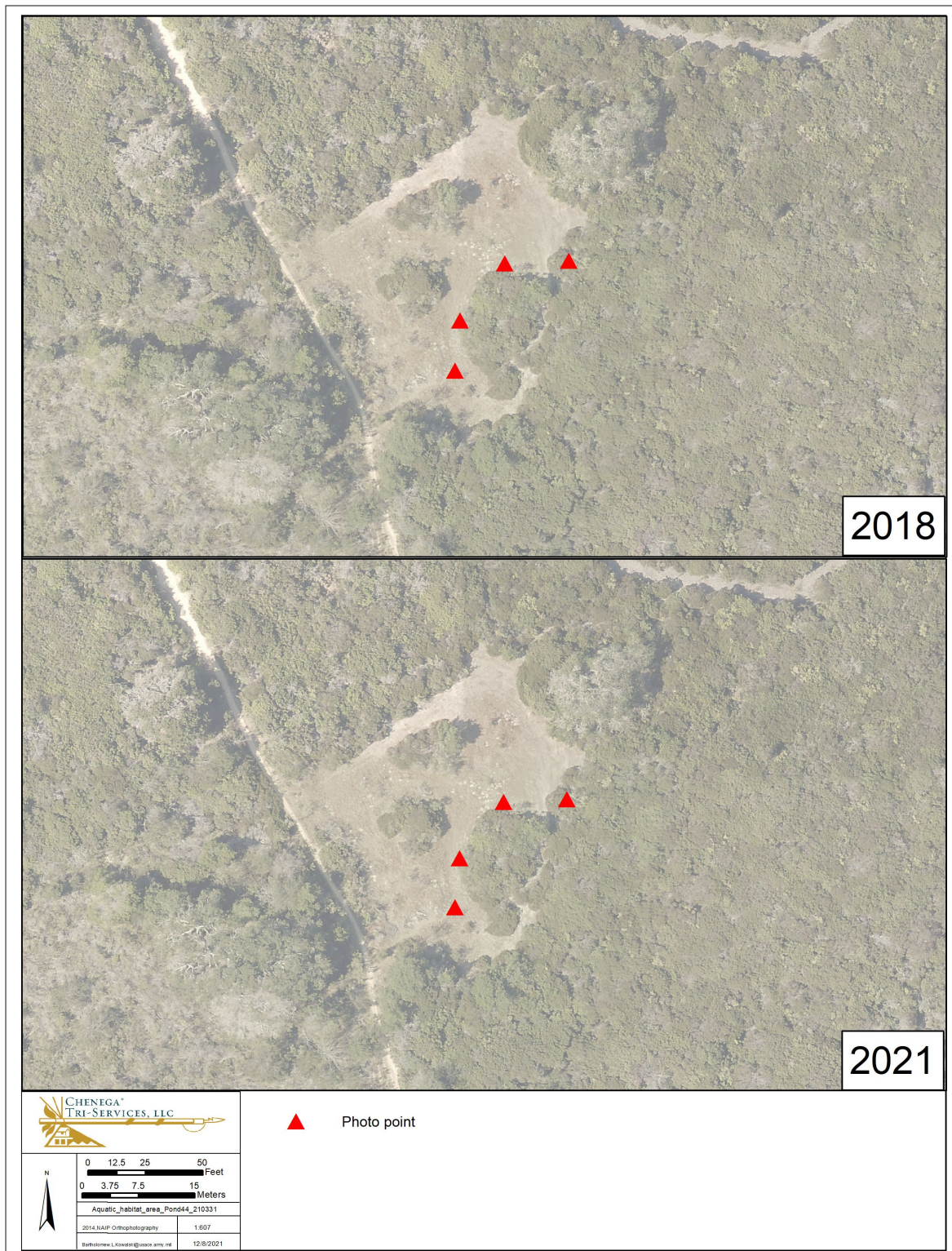
Pond 44 was not on track to meet the performance standard for year 3 in 2021 because it remained dry. Pond 44 was not on track for DQO 1. DQO 4 cannot be accessed for 2021 water year.

#### 5.17.6 Conclusion

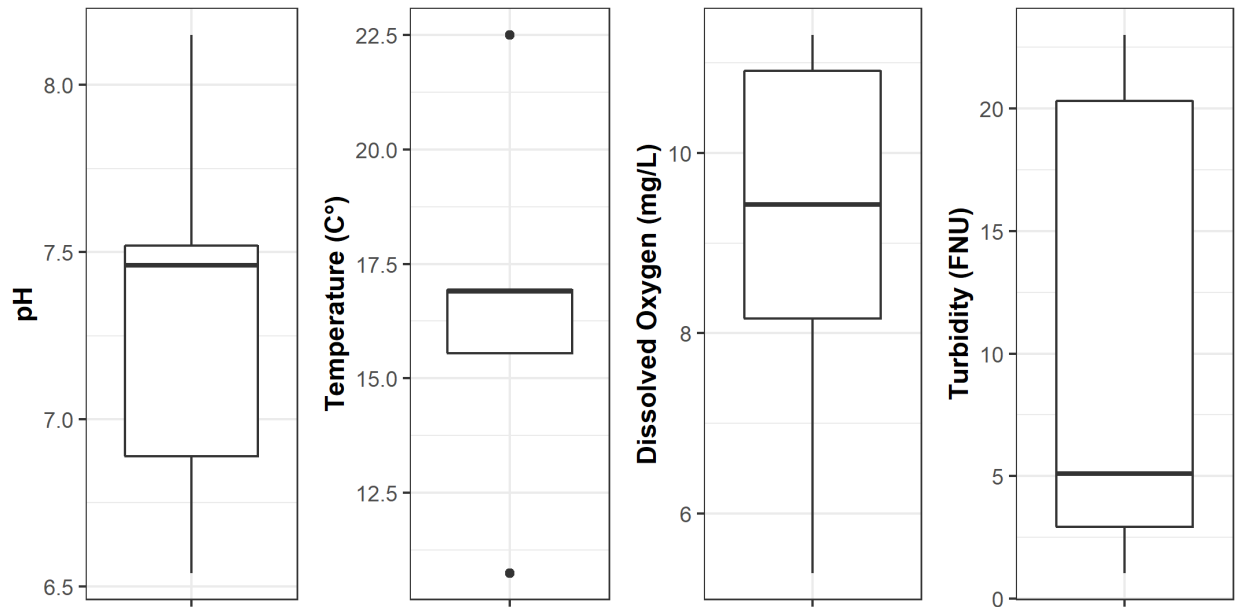
Pond 44, a post-mastication and post-subsurface munitions remediation vernal pool, was in year 3 of monitoring in 2021. Pond 44 was not on track to meet performance standards (Table 5-17). Pond 44 will continue to be monitored in the future.

**Table 5-17. Success at Pond 44 (Year 3 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Not on track
	DQO 2	On track
Wildlife Usage	DQO 1	Not on track
	DQO 4	Cannot assess



**Figure 5-67.** Pond 44 (Year 3 Post-Subsurface Munitions Remediation) Inundations for 2018 and 2021 (both years had below normal precipitation).



**Figure 5-68.** Pond 44 (Year 3 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

### 5.18 Pond 54 – Year 3

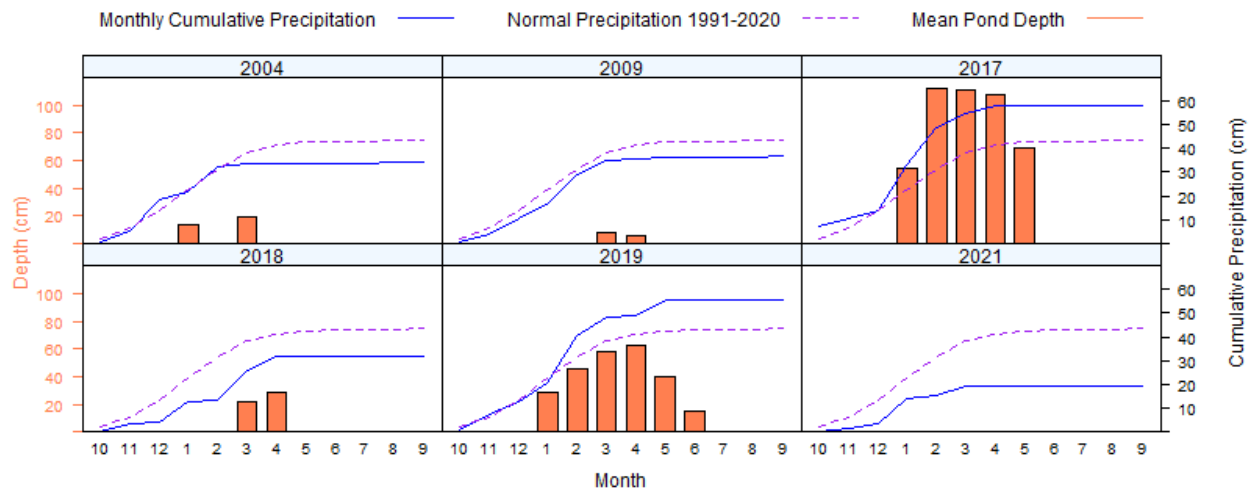
Pond 54 is situated within a medium size basin in the southern part of the Fort Ord National Monument within the Impact Area (Figure 2-4). The surrounding slopes are much steeper than most vernal pools monitored in 2021 water year. Depth and inundation of Pond 54 have been monitored for six years (Figure 5-69). Year 2015 was a consecutive drought year, 2019 was an above normal water year, and years 2004, 2009, 2018 and 2021 were below normal water years. By size, Pond 54 is most similar to reference Pond 101 East (East) (Figure 5-1).

Pond 54 was monitored in 2021 as a year 3 post-subsurface munitions remediation vernal pool. Pond 54 was monitored for baseline conditions in 2015. Vegetation within Pond 54 watershed was masticated in the summer of 2015 in support of MEC remediation in Unit 23. Risk reduction activities in Unit 23 resulted in subsurface munitions remediation in Pond 54 in 2018. Historically, Pond 54 reached a depth of 28 cm and 0.003 ac in 2018, a below normal year, and it reached a maximum depth of 112 cm and a maximum inundation of 3.10 acres in 2017, an above normal water year (Figure 5-70). Pond 54 remained dry in 2021 water year (Figure 5-69) and thus inundation extent, depth, and water quality measurements were not taken. Historical values are presented in Figures 5-69 to 5-72.

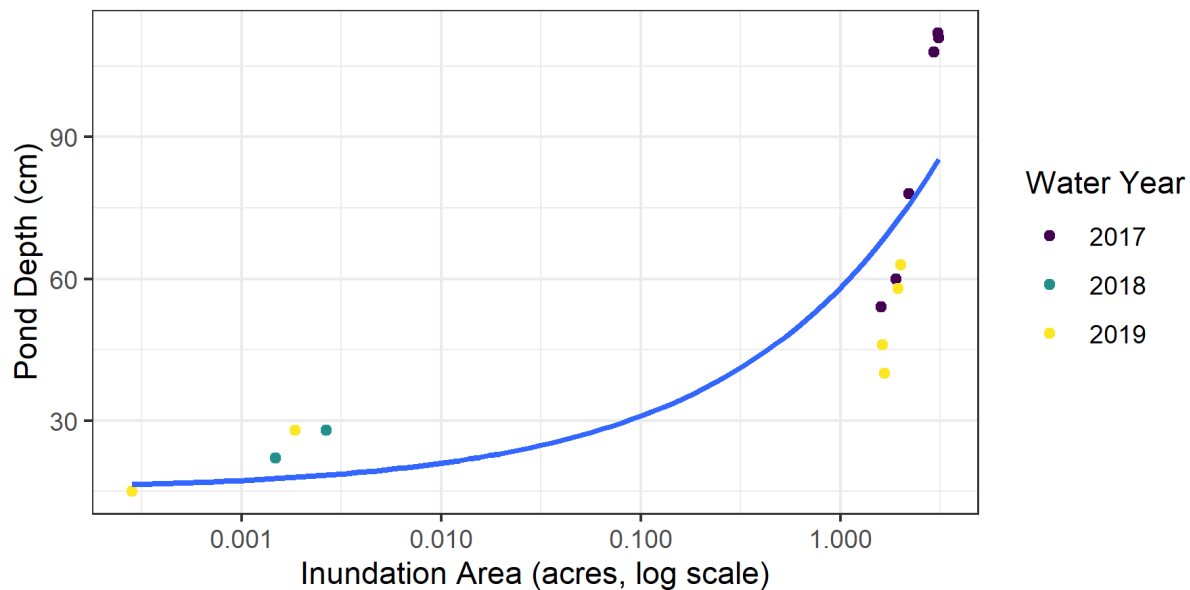
During the five years of monitoring of Pond 54 the cumulative precipitation in 2021 was the lowest (Figure 5-69). This was the only year when Pond 54 remained dry. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. Since neither of the reference vernal pools held water in 2021, it suggests that there simply was not enough



precipitation in 2021 water year to completely saturate the sandy loam layer and/or the underlying clay layer for Pond 54 and the reference vernal pools to become inundated.



**Figure 5-69.** Pond 54 (Year 3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)



**Figure 5-70.** Pond 54 (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2017.

#### 5.18.1 Data Quality Objective 1

Pond 54 did not meet the required average depths of 25 cm from the first rain event through March for CTS, nor the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 54 did not sustain sufficient depth for CTS (0 cm through March), or fairy shrimp (0 cm through May).

#### 5.18.2 Data Quality Objective 2

Just like the reference vernal pools, Pond 54 remained dry in 2021 water year which was not unexpected given the well below normal precipitation (Figure 5-69).

### 5.18.3 Performance Standard: Hydrological Conditions and Inundation Area

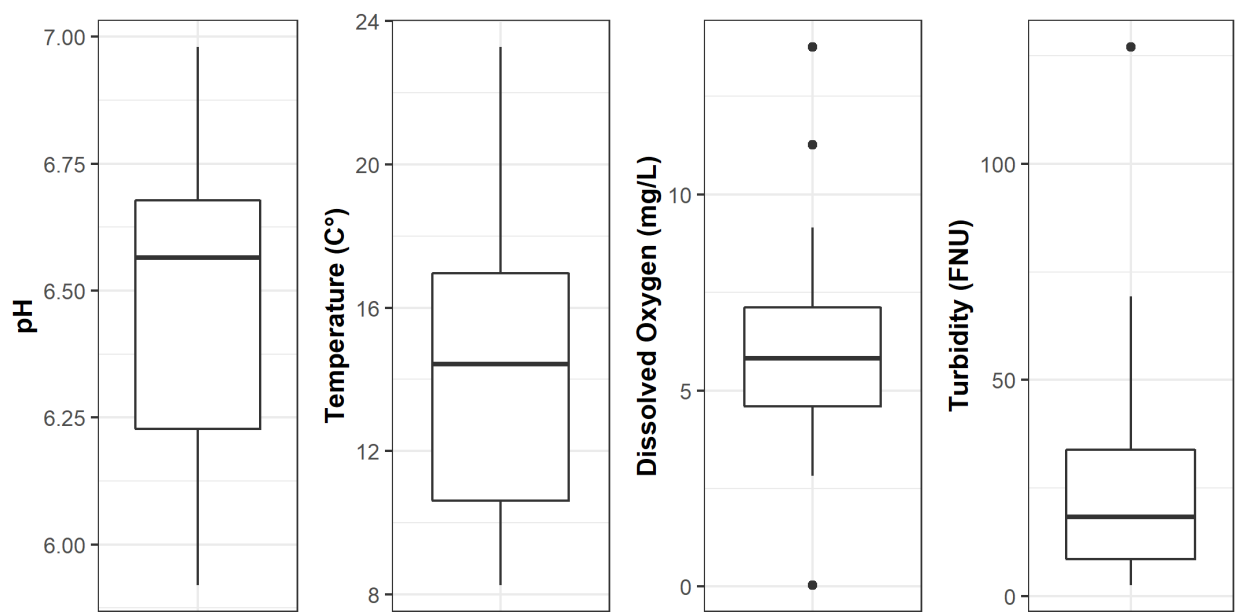
Pond 54, a post-subsurface munitions remediation, vernal pool, was not on track to meet the performance standard for Year 3 in 2021. Pond 54 did not meet DQO 1 indicating that it did not sustain suitable habitat for CTS or fairy shrimp in 2021. Pond 54 remained dry in 2021 water year just as reference Pond 101 East (East) and DQO 2 was met.

### 5.18.4 Data Quality Objective 4

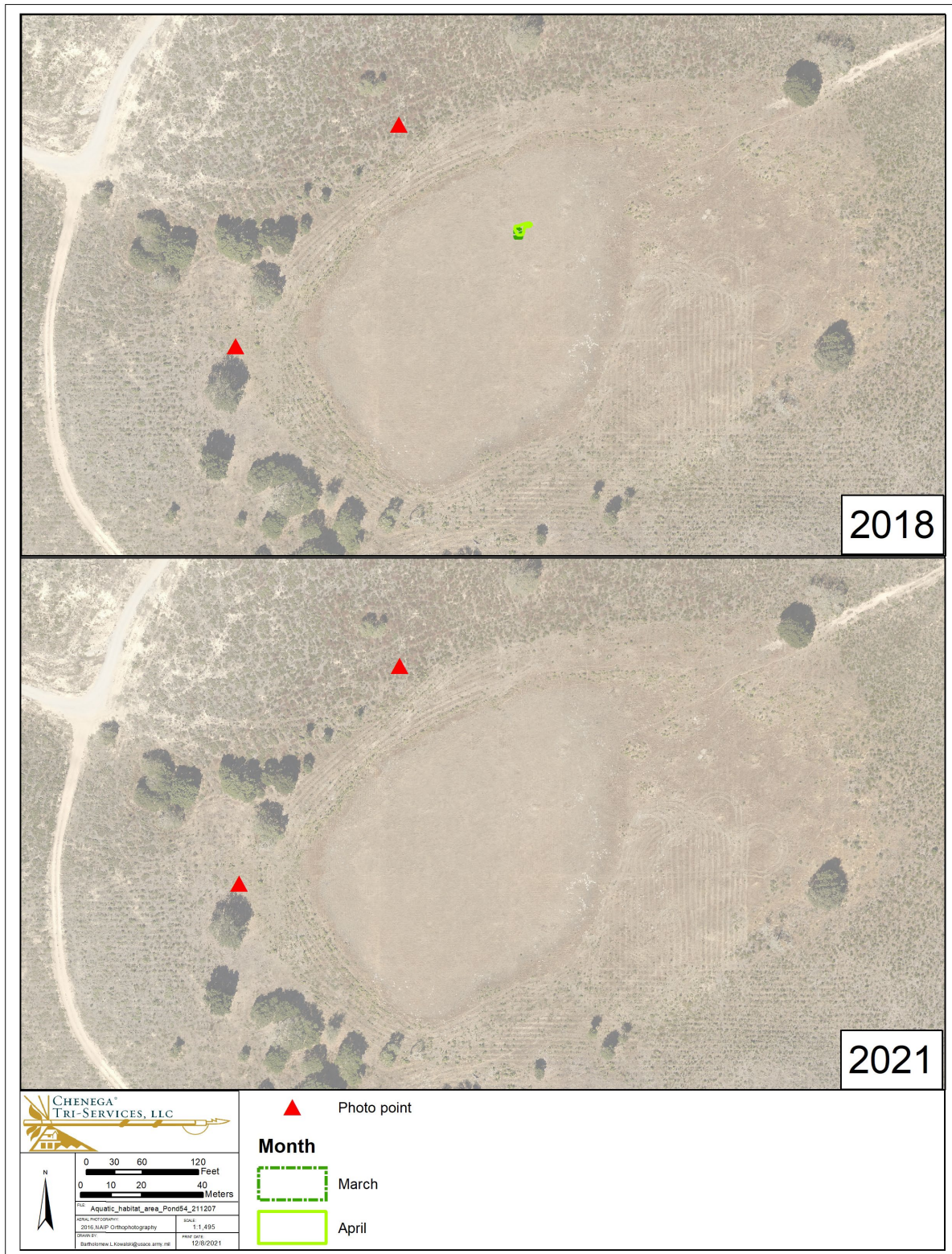
Water quality parameters could not be assessed at Pond 54 because it remained dry in 2021.

### 5.18.5 Performance Standard: Wildlife Usage

Pond 54 was not on track to meet the performance standard for year 3 in 2021 because it remained dry. Pond 54 was not on track for DQO 1. DQO 4 cannot be accessed for 2021 water year.



**Figure 5-71.** Pond 54 (Year 3 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.



**Figure 5-72.** Pond 54 (Year 3 Post-Subsurface Munitions Remediation) Inundations for 2018 and 2021 (both below normal water years).



### 5.18.6 Conclusion

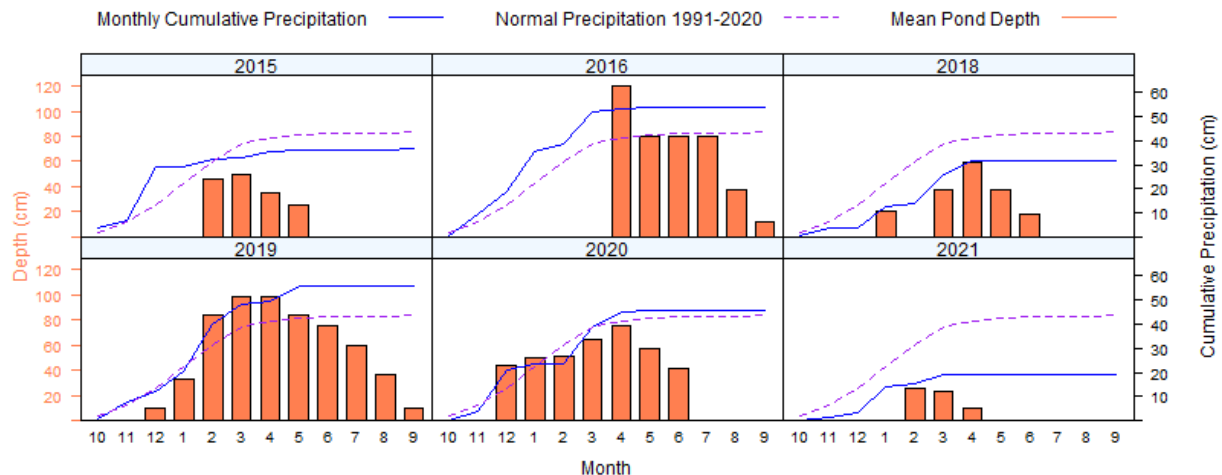
Pond 54, a post-subsurface munitions remediation vernal pool, was in year 3 of monitoring in 2021. Pond 54 was not on track to meet performance standards (Table 5-18). Pond 54 will continue to be monitored in the future.

**Table 5-18. Success at Pond 54 (Year 3 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Not on track
	DQO 2	On track
Wildlife Usage	DQO 1	Not on track
	DQO 4	Cannot assess

### 5.19 Pond 60 – Year 3

Pond 60 is situated within a medium sized basin with a moderate profile in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 60 have been monitored for six years (Figure 5-73). Above normal water years were 2016 and 2019. Water year 2020 was close to normal. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015). By size, Pond 60 is most similar to reference Pond 101 East (East), but it has a slightly steeper profile (Figure 5-1).



**Figure 5-73.** Pond 60 (Year 3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)

Pond 60 was monitored in 2021 as a Year 3 post-subsurface munitions remediation vernal pool. Pond 60 was monitored for baseline conditions in 2015 and 2016. Vegetation within the watershed of Pond 60 was masticated in 2017 to support MEC remediation activities and prepare areas for a prescribed burn. Subsurface anomaly investigations occurred in Pond 60 basin in 2018. Historically, Pond 60 reached an estimated depth of 50 cm and 1.31 ac in 2015, a consecutive drought year, and it reached a maximum

depth of 130 cm and a maximum inundation of 2.65 acres in 2016, an above normal water year (Figure 5-74). The 2021 maximum depth of Pond 60 reached 26 cm and maximum measured inundation was 0.14 acres (Table 4-19). The depth and inundation values were within range of previously recorded values (Figure 5-74).

Pond 60 was inundated from February through April and it was completely dry by mid April (Table 4-19 and Figure 4-19). The inundation pattern of Pond 60 was unlike any of the reference vernal pools, since they all stayed dry in 2021 water year. Maximum inundation area was smaller in 2021 than in 2018, which was a below normal water year (Figure 5-76).

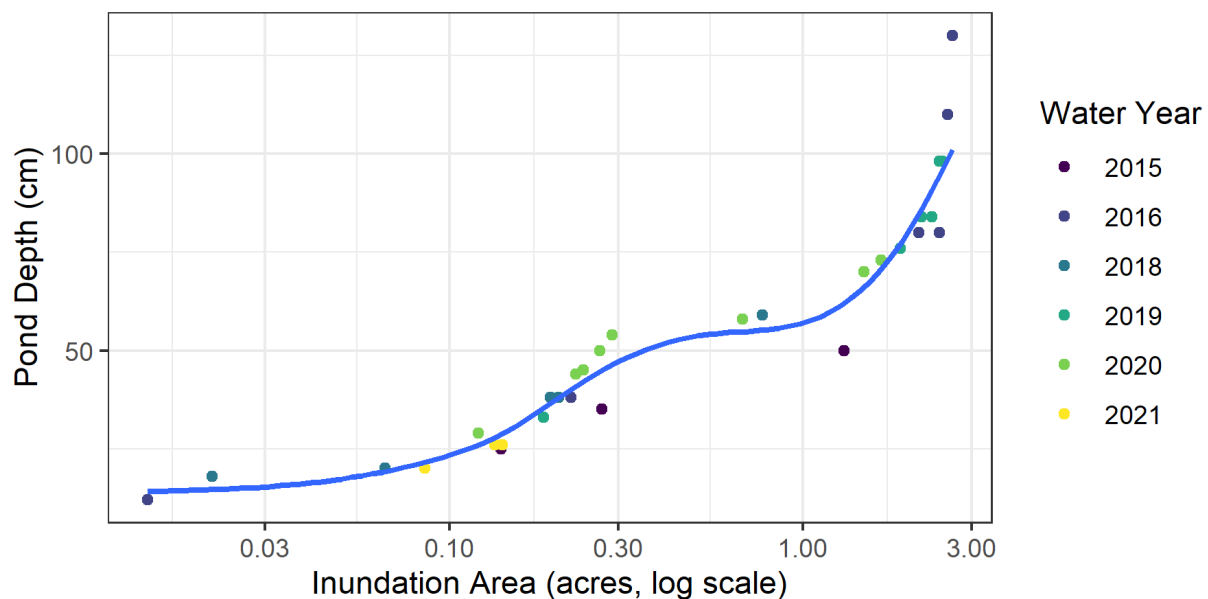
Water quality parameters of Pond 60 were generally within the historical ranges. March dissolved oxygen value of DO = 10.94 mg/L was highest on record at Pond 60 but it was not out of range observed at other vernal pools (Figure 5-75 and Figure 5-5).

#### 5.19.1 Data Quality Objective 1

Pond 60 did not meet the required average depths of 25 cm from the first rain event through March for CTS, but it did meet the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 60 did not sustain sufficient depth for CTS (21 cm through March), but it did provide sufficient depth for fairy shrimp (19 cm through April).

#### 5.19.2 Data Quality Objective 2

Unlike the reference vernal pools which remained dry, Pond 60 was inundated from February through April. Maximum inundation area in 2021 was smaller than in 2018, a below normal water year (Figure 5-76).



**Figure 5-74.** Pond 60 (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Data since 2015 Water Year.

### 5.19.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 60, a post-subsurface munitions remediation vernal pool, was partially on track to meet this performance standard for year 3 in 2021. Pond 60 partially met DQO 1 indicating that it provided suitable habitat for fairy shrimp but not CTS. Pond 60 was inundated in 2021 and by comparison to reference vernal pools DQO 2 was met. The vernal pool will continue to be monitored in the future to evaluate its progress toward meeting the performance standard.

### 5.19.4 Data Quality Objective 4

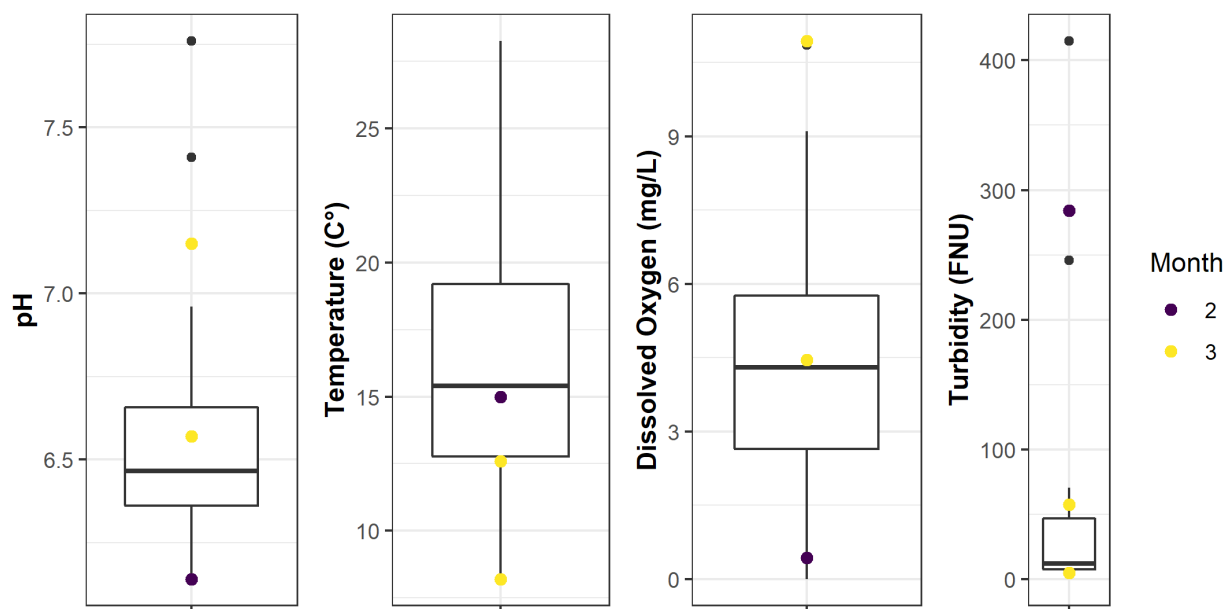
Water quality parameters of Pond 60 were generally within the historical ranges with the exception of dissolved oxygen value in March, although it was still within ranges observed at other vernal pools (Figure 5-75 and Figure 5-2).

### 5.19.5 Performance Standard: Wildlife Usage

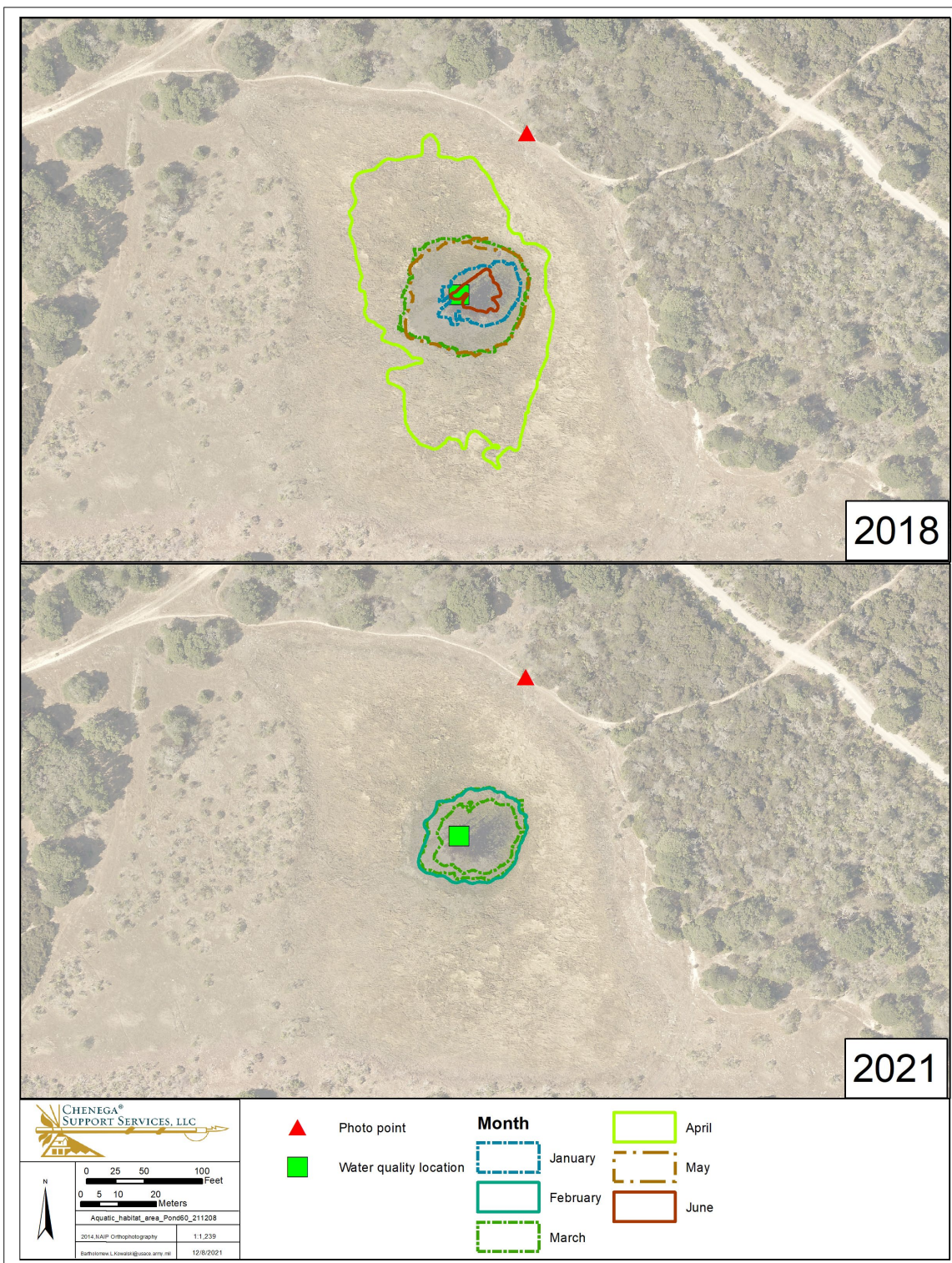
This performance standard was partially on track in 2021 at Pond 60 due to insufficient inundation depth and duration for CTS, but sufficient for fairy shrimp. Water quality measurements were adequate for wildlife.

### 5.19.6 Conclusion

Pond 60, a post-subsurface munitions remediation vernal pool, was in year 3 of monitoring in 2021. The vernal pool was partially on track to meet the performance standards (Table 5-19). Pond 60 will continue to be monitored in the future.



**Figure 5-75.** Pond 60 (Year 3 Post-Subsurface Munitions Remediation) historical and 2021 water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The colored dots represent observed values in 2021 water year. The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.



**Figure 5-76.** Pond 60 (Year 3 Post-Subsurface Munitions Remediation) Inundations for 2018 and 2021 (both below normal precipitation).



**Table 5-19. Success at Pond 60 (Year 3 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Partially on track
	DQO 2	On track
Wildlife Usage	DQO 1	Partially on track
	DQO 4	On track

## 5.20 Pond 61 – Year 3

Pond 61 is situated within a medium sized basin in the northern part of the Fort Ord National Monument. It is characterized by mima mounds and topographically varied small depressions that in an above normal water year can become inundated and hydrologically connected. In close to normal and below normal water years Pond 61 consist of several separate depressions, with two largest ones in the west and in the east portion of the basin. The western depression requires less precipitation to become inundated, however, the first water gauge was installed in the eastern depression. As a result, while some gauge readings in the eastern depression had zero values, the western depression may have been holding water and in those instances it was recorded as “peripheral inundation present” (Appendix B). Per recommendations in the 2020 hydrology report (Chenega, 2021) a staff gauge was installed in the western portion of Pond 61 and readings for the eastern and western portions were recorded separately in 2021. Pond 61 was monitored for five years (Figure 5-77). Above normal water years were 2017, and 2019. Year 2020 was a close to normal water year, while 2018 and 2021 were below normal water years.

Pond 61 was monitored for baseline conditions in 2017. Although limited subsurface remediation occurred at this vernal pool in 1999, the Army did not conduct monitoring prior to 2017 and it is assumed that 2017 represents baseline conditions. Less than 50 percent of Pond 61 watershed was masticated in the summer of 2017 to support MEC remediation in BLM Area B Subunits B-3 East and B2-A. Intrusive anomaly investigations occurred within Pond 61 basin in 2018. Historically, Pond 61 East remained completely dry in a below normal water year (2018), and it reached a maximum depth of 21 cm and a maximum inundation of 0.70 acres in 2017 when it was hydrologically connected to Pond 61 West (Figure 5-79). Pond 61 East remained dry in 2021. Pond 61 West held water in all monitoring years. The 2021 maximum depth of Pond 61 West was 38 cm and maximum inundation area was 0.02 acres (Table 4-20). This was the first year when depth values were recorded at Pond 61 West (Figure 5-78).

Pond 61 West was inundated from February through March and was dry on April 5 (Table 4-20 and Figure 4-20). Pond 61 East remained dry, just like reference vernal pools.

Water quality parameters of Pond 61 West were generally similar to the historical ranges of Pond 61 East, but had slightly higher dissolved oxygen values, and lower turbidity values (Figure 5-81 and Figures 5-4 to 5-5).

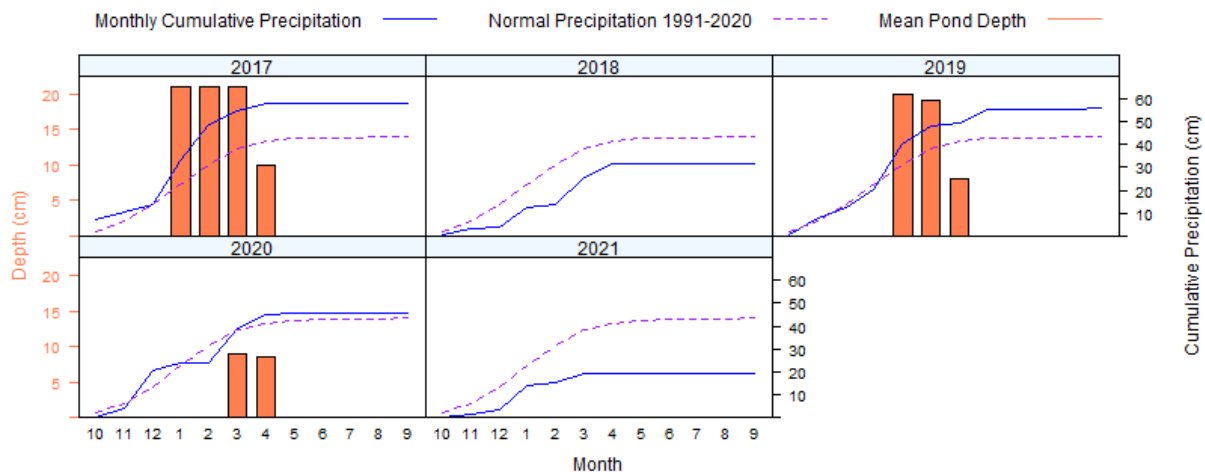
### 5.20.1 Data Quality Objective 1

Neither Pond 61 West nor Pond 61 East met the required average depths of 25 cm from the first rain event through March for CTS, but Pond 61 West met the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 61 West did not sustain sufficient depth for CTS (21 cm through March), but it did provide sufficient depth for fairy shrimp (18 cm through April). Pond 61 East stayed dry in 2021 water year, hence it did not sustain sufficient depth for neither CTS or fairy shrimp.

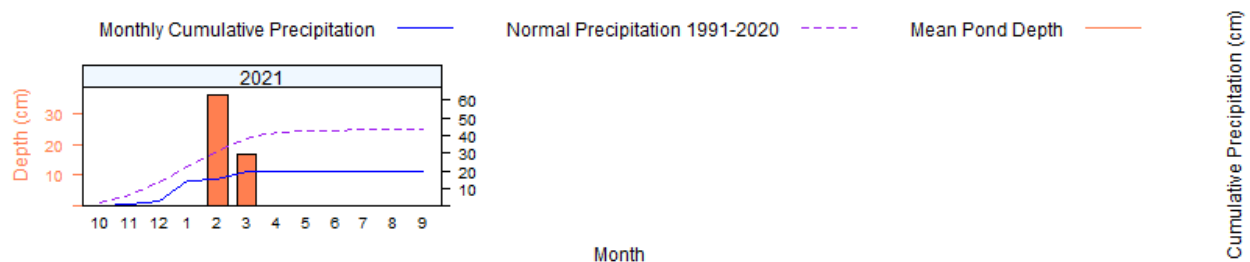


### 5.20.2 Data Quality Objective 2

Pond 61 West was inundated from February through March and it was dry on April 5, while Pond 61 East stayed dry in 2021 water year just like reference vernal pools (Table 4-20). Pond 61 East was also dry in 2018, a below normal water year. Pond 61 West held water in 2018, but the inundation extent was not recorded (Figures 5-79 and 5-80).



**Figure 5-77.** Pond 61 East (Year 3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)



**Figure 5-78.** Pond 61 West (Year 3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)

### 5.20.3 Performance Standard: Hydrological Conditions and Inundation Area

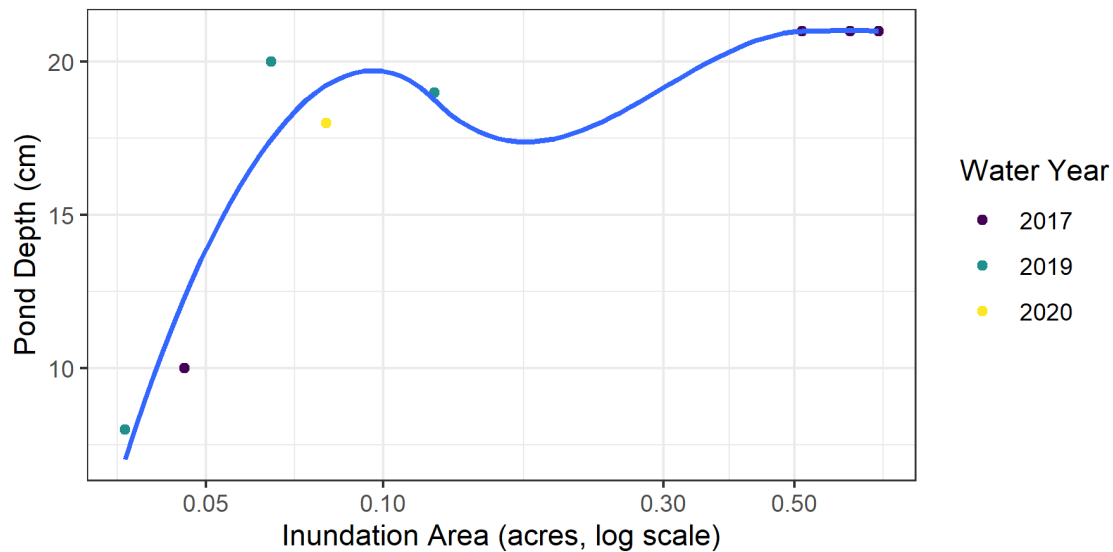
Pond 61 (encompassing both west and east depressions), a post-subsurface munitions remediation vernal pool, was partially on track to meet the performance standard for year 3 in 2021. Pond 61 did not meet DQO 1 for CTS, but there was adequate depth for fairy shrimp in the western depression. Pond 61 West held water in February and March, while Pond 61 East and the reference ponds stayed dry, thus DQO 2 was met. The vernal pool will continue to be monitored in future years to evaluate its progress to meet the performance standard.

### 5.20.4 Data Quality Objective 4

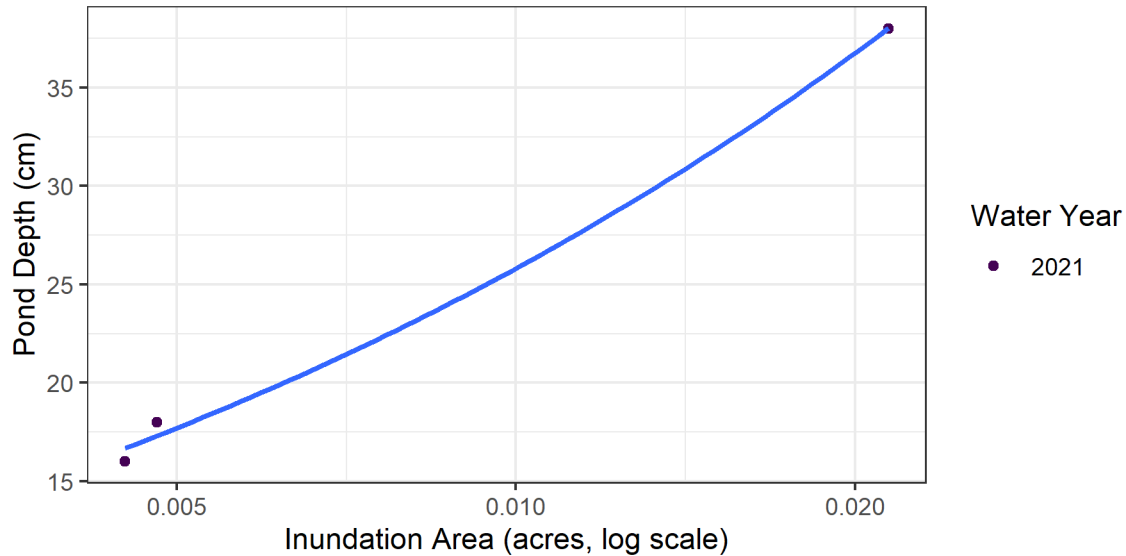
Water quality parameters of Pond 61 West were generally within the historical ranges (Figure 5-81).

### 5.20.5 Performance Standard: Wildlife Usage

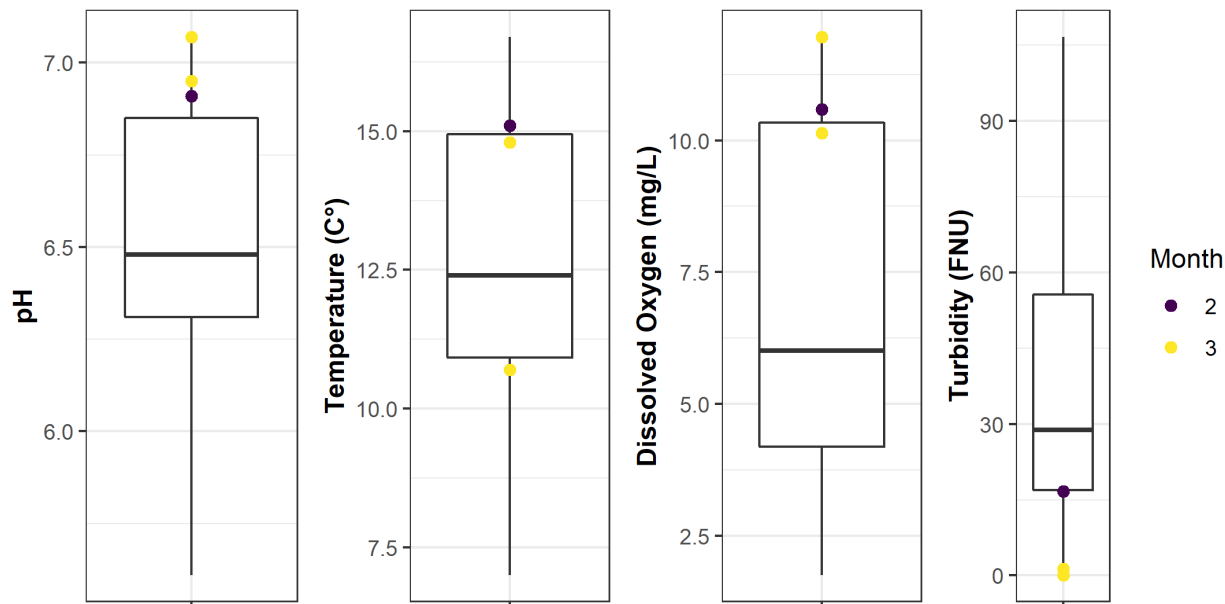
This performance standard was partially on track in 2021 at Pond 61 due to insufficient inundation depth and duration for CTS, but sufficient for fairy shrimp. Water quality measurements were adequate for wildlife.



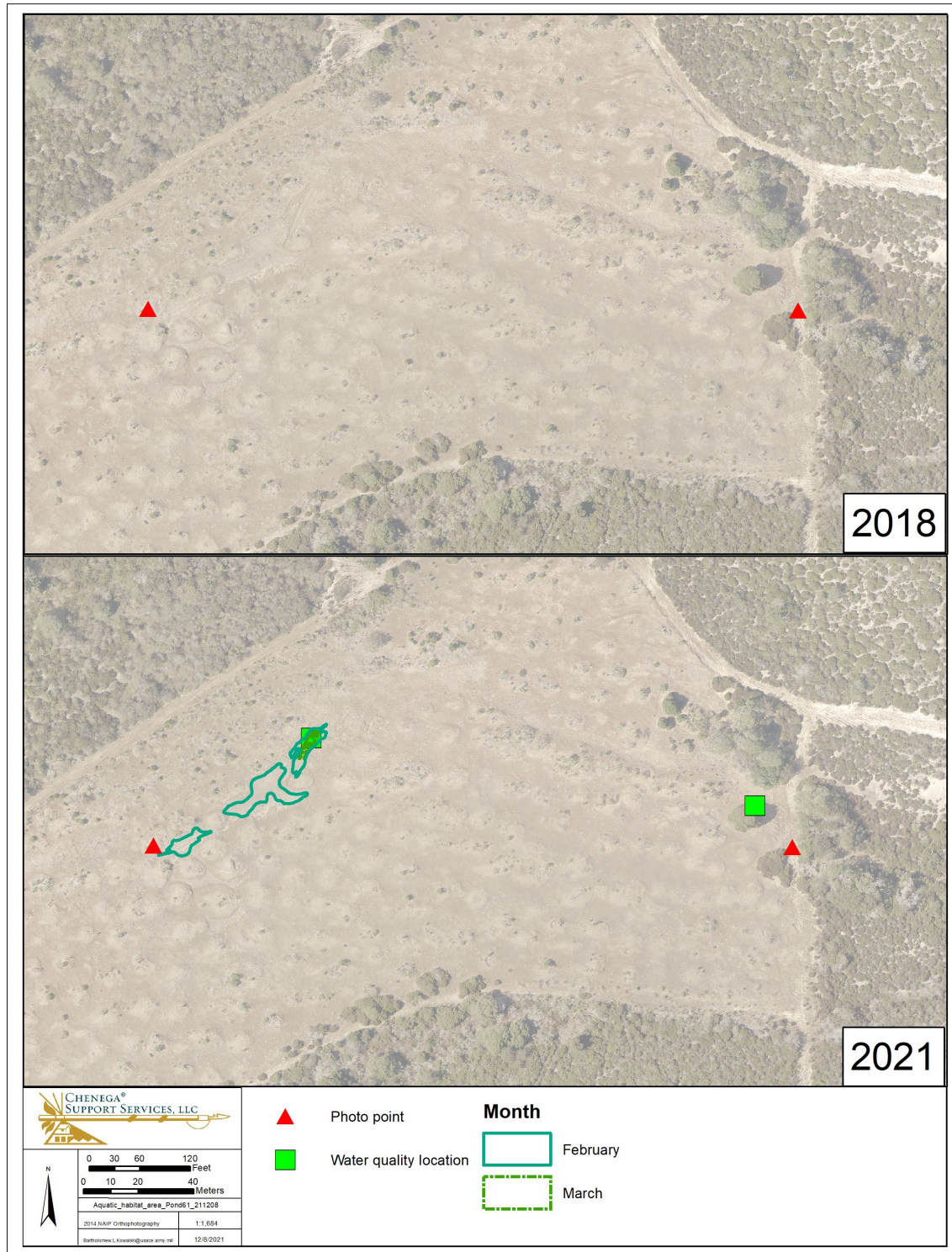
**Figure 5-79.** Pond 61 East (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area since 2007 Water Year.



**Figure 5-80.** Pond 61 West (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area since 2007 Water Year.



**Figure 5-81.** Pond 61 (Year 3 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The colored dots represent observed values in 2021 water year at Pond 61 West. The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics. Historical values were measured at Pond 61 East, while 2021 values were measured at Pond 61 West.



**Figure 5-82.** Ponds 61 East and 61 West (Year 3 Post-Subsurface Munitions Remediation) Inundations for 2018 and 2021 (both below normal precipitation water years). Inundation of Pond 61 West was not recorded in 2018.

### 5.20.6 Conclusion

Pond 61, a post-subsurface munitions remediation vernal pool, was in year 3 monitoring in 2021. The vernal pool was partially on track to meet the performance standards (Table 5-20). Pond 61 will continue to be monitored in the future.

**Table 5-20. Success at Pond 61 (Year 3 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Partially on track
	DQO 2	On track
Wildlife Usage	DQO 1	Partially on track
	DQO 4	On track

### 5.21 Pond 73 – Year 3

Pond 73 is situated within a medium sized and shallow basin in the northern part of the Fort Ord National Monument. Depth and inundation of Pond 73 have been monitored for four years (Figure 5-83). Baseline inundation was recorded in 2017 but depth and water quality parameters were not measured that year. Years 2017 and 2019 were above normal water years, 2020 was close to normal water year, and 2018 and 2021 were below normal water years. By size, Pond 73 can be compared to reference Ponds 101 East (East) and 997 (Figure 5-1).

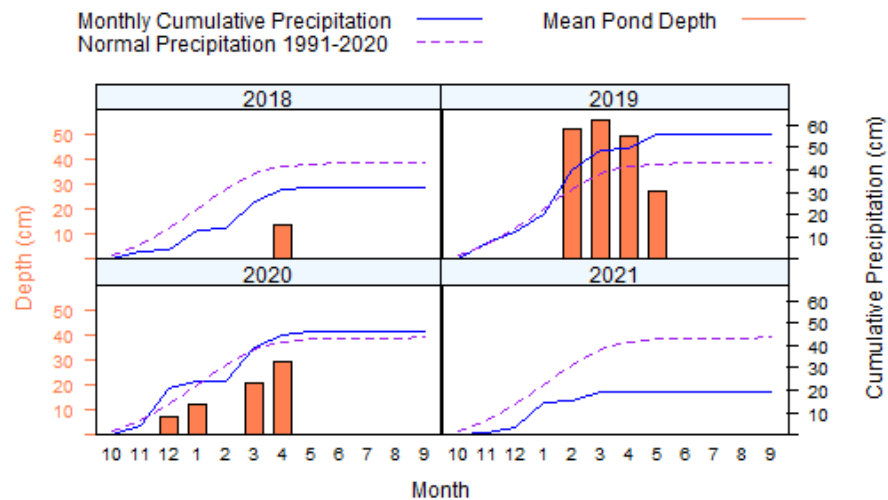
Pond 73 was monitored in 2021 as a Year 3 post-subsurface munitions remediation vernal pool. Vegetation within the Pond 73 watershed was masticated in the summer of 2017 to support MEC remediation in BLM Area B Subunit B-3 East. Subsurface anomaly investigations occurred in Pond 73 basin in 2018. Historically, Pond 73 reached a depth of 14 cm and an inundation area of 0.001 ac in 2018, a below normal year, and it reached a maximum depth of 56 cm and a maximum inundation of 0.85 acres in 2019, an above normal water year (Figure 5-84). Pond 73 remained dry in 2021 water year (Figure 5-83) and thus inundation extent, depth, and water quality measurements were not taken. Historical values are presented in Figure 5-83 to Figure 5-86.

During the four years of monitoring of Pond 73 the cumulative precipitation in 2021 was the lowest (Figure 5-83). This was the only year when Pond 73 remained dry. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. Since neither of the reference vernal pools held water in 2021, it suggests that there simply was not enough precipitation in 2021 water year to completely saturate the sandy loam layer and/or the underlying clay layer for Pond 73 and the reference vernal pools to become inundated.

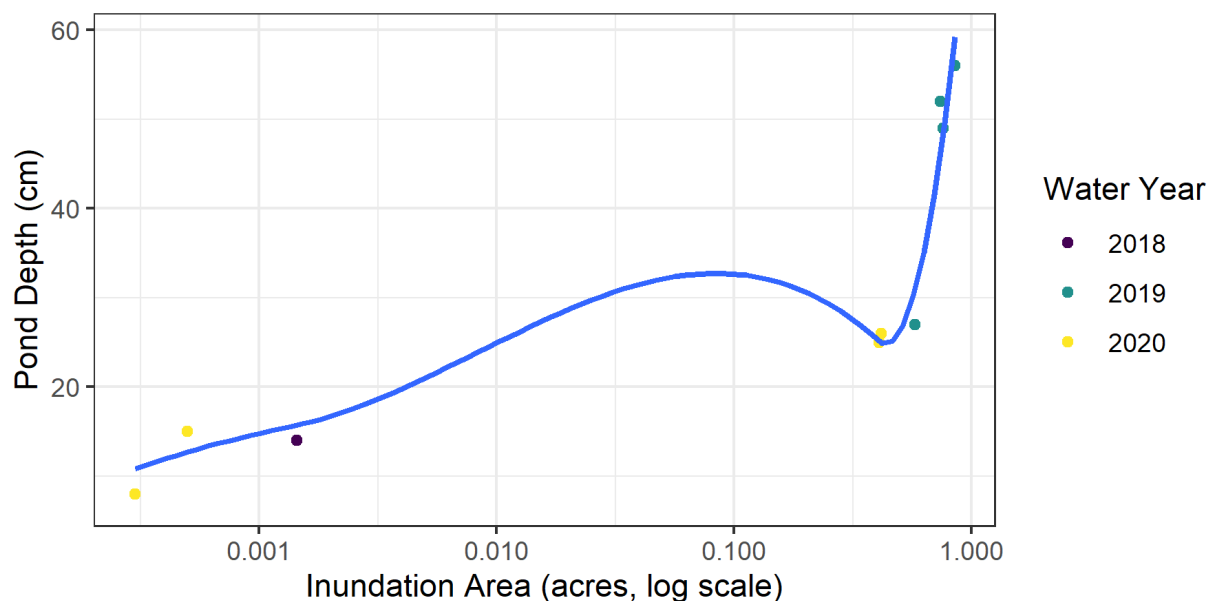
#### 5.21.1 Data Quality Objective 1

Pond 73 did not meet the required average depths of 25 cm from the first rain event through March for CTS, nor the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 73 did not sustain sufficient depth for CTS (0 cm through March), or fairy shrimp (0 cm through May).





**Figure 5-83.** Pond 73 (Year 3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2021; NCDC NOAA, 2021)



**Figure 5-84.** Pond 73 (Year 3 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2018.

#### 5.21.2 Data Quality Objective 2

Just like the reference vernal pools, Pond 73 remained dry in 2021 water year which was not unexpected given the well below normal precipitation (Figure 5-83).

#### 5.21.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 73, a post-subsurface munitions remediation, vernal pool, was not on track to meet the performance standard for Year 3 in 2021. Pond 73 did not meet DQO 1 indicating that it did not sustain

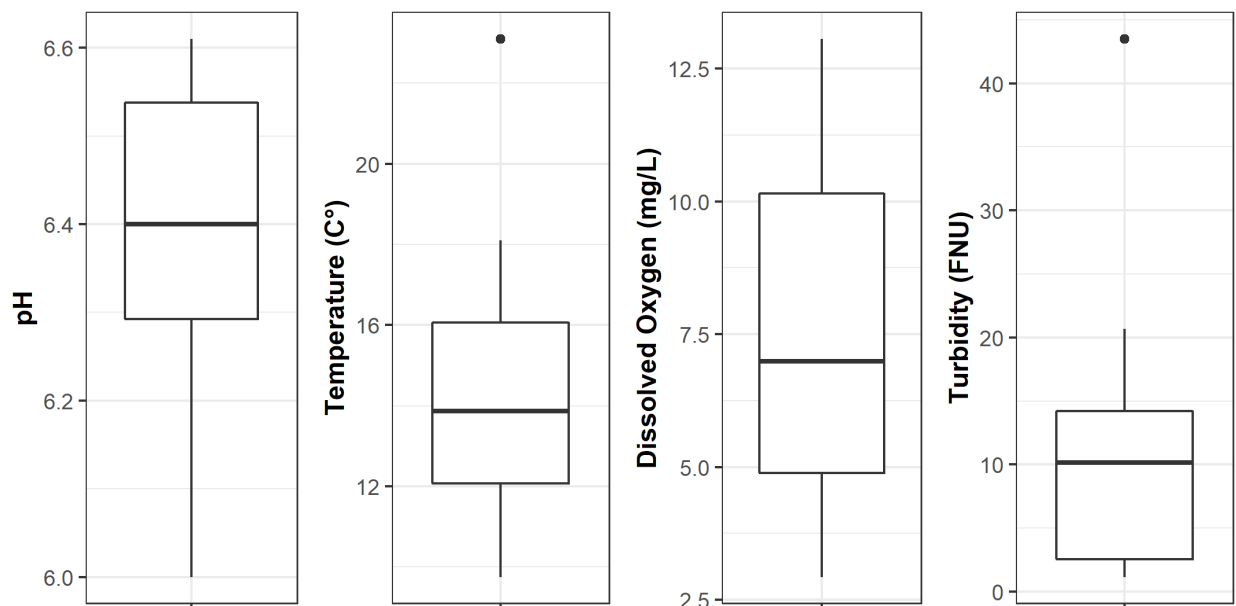
suitable habitat for CTS or fairy shrimp in 2021. Pond 73 remained dry in 2021 water year just as reference vernal pools and DQO 2 was met.

#### 5.21.4 Data Quality Objective 4

Water quality parameters could not be assessed at of Pond 73 because it remained dry in 2021.

#### 5.21.5 Performance Standard: Wildlife Usage

Pond 73 was not on track to meet the performance standard for year 3 in 2021 because it remained dry. Pond 73 was not on track for DQO 1. DQO 4 cannot be accessed for 2021 water year.



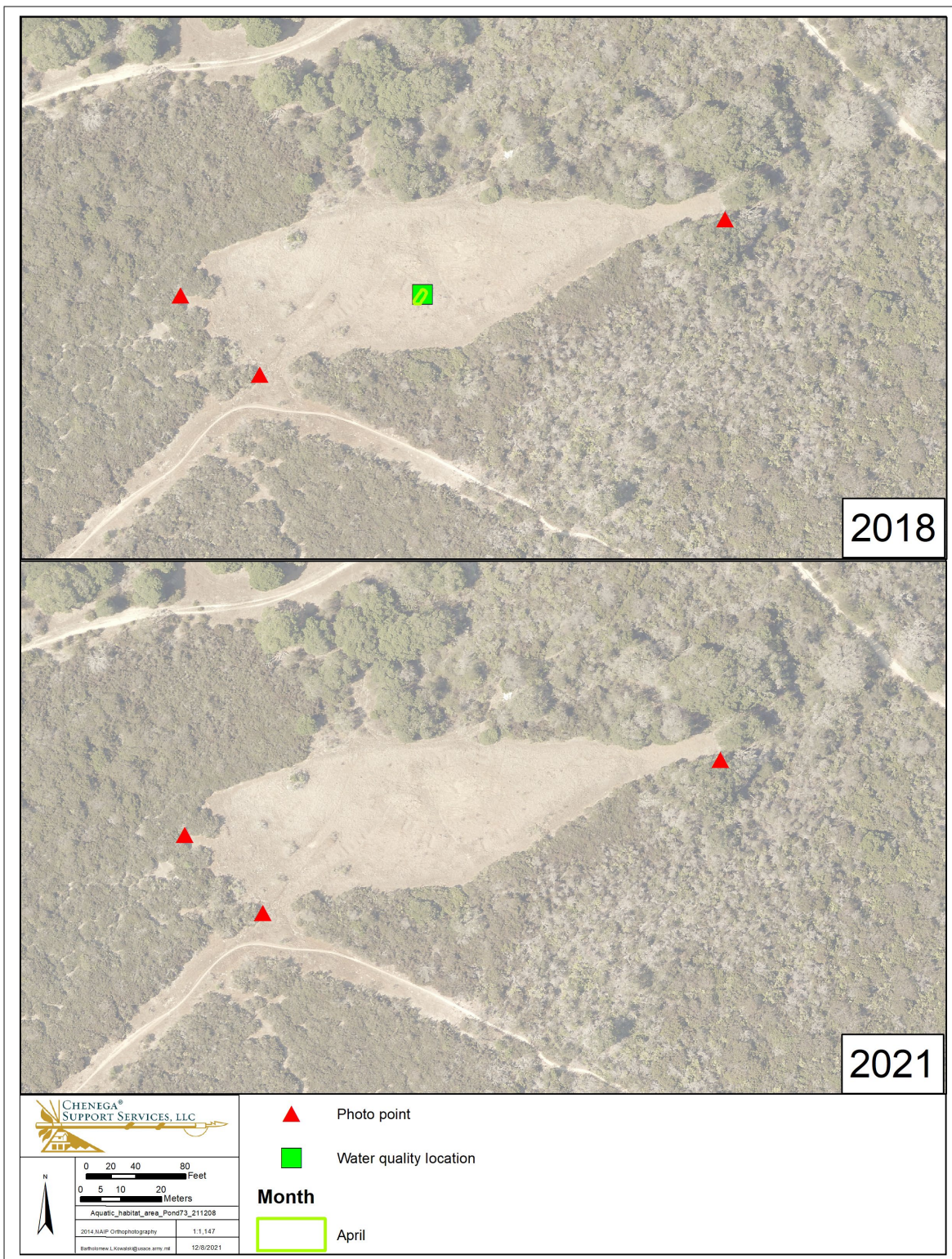
**Figure 5-85.** Pond 73 (Year 3 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Small black dots represent values outside of those statistics.

#### 5.21.6 Conclusion

Pond 73, a post-subsurface munitions remediation vernal pool, was in year 3 of monitoring in 2021. Pond 73 was not on track to meet the performance standards (Table 5-21). Pond 73 will continue to be monitored in the future.

**Table 5-21. Success at Pond 73 (Year 3 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Not on track
	DQO 2	On track
Wildlife Usage	DQO 1	Not on track
	DQO 4	Cannot assess



**Figure 5-86.** Pond 73 (Year 3 Post-Subsurface Munitions Remediation) Inundations for 2018 and 2021 (both years had below normal precipitation).



## 6 CONCLUSION

With only one major rain event at the end of January, and below normal precipitation in the remaining months, the cumulative precipitation in 2021 water year was approximately 44% of normal (Figure 2-2). This was not enough for most of the 21 monitored vernal pools on former Fort Ord to become inundated, including all three reference vernal pools. The exception were Ponds 3 North, 39, 42, 60 and 61 which were inundated for a short period in February and March. Unsurprisingly, none of the monitored vernal pools met the DQO 1 for CTS as none of them had the minimum required depth of 25 cm from the first rain event through March. DQO 1 was met for fairy shrimp at Ponds 60 and 61, and those were the only ponds that partially met the wildlife usage performance standard in 2021. Since all of the reference vernal pools stayed dry in 2021 water year, DQO 2 was met for all remediated vernal pools monitored. Water quality metrics were within the expected ranges at the five vernal pools that held water (Table 6-1).

Ponds 74, 101 East (West), and 101 West were in their last year of required monitoring following mastication, which occurred within their watersheds in 2018. While none of these vernal pools met the performance standards in 2021, Ponds 101 East (West) and 101 West met all of them in 2019 (Burleson, 2020) and partially met all of them in 2020 (Chenega, 2021). Inundation patterns at these vernal pools were similar to those observed at reference vernal pools in all three years. Based on the collected data it does not appear that 2018 mastication activities within the watersheds of these vernal pools affected their ability to hold water and reach sufficient depths for CTS and fairy shrimp, and they did not affect the water quality required to support wildlife. Thus, further monitoring at Ponds 101 East (West) and 101 West is not recommended. Pond 74 did not meet all of the performance standards in any of the last three years, with a caveat that depth and water quality were not measured in 2019. As described in section 5.5.6, Pond 74 was discovered during mastication of Unit B-2A and baseline data were not collected. Considering the record low precipitation in 2021 and the unusual precipitation frequency in 2020 (Chenega, 2021), the lack of inundation in 2021 and the brief inundation period and shallow depth in 2020 are likely a function of small size and shallow profile, similar to reference Pond 997. It is unlikely that failure to meet the success criteria at Pond 74 was caused by mastication of vegetation within its watershed. Additional monitoring at Pond 74 could not confirm potential negative effects due to mastication because of lack of baseline data, hence continued monitoring is not recommended.

Remaining remediated vernal pools monitored in 2021 were either monitored for baseline year (Pond 75) or for the third year of post-subsurface munitions remediation and will continue to be monitored in the future according to specified requirements in PBO and the wetland plan.

**Table 6-1. 2021 Remediated Vernal Pools and Performance Standards Status**

Vernal Pool	Monitoring Status	Hydrology		Wildlife	
		DQO 1 (depth)	DQO 2 (inundation)	DQO 1 (depth)	DQO 4 (water quality)
Pond 74*	Year 3 Post-Mastication	Not met	Met	Not met	Can't assess
Pond 101 East (West)	Year 3 Post-Mastication	Met	Met	Met	Met
Pond 101 West	Year 3 Post-Mastication	Met	Met	Met	Met
Pond 3 North	Year 3 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	On track
Pond 3 South	Year 3 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	Can't assess

Vernal Pool	Monitoring Status	Hydrology		Wildlife	
		DQO 1 (depth)	DQO 2 (inundation)	DQO 1 (depth)	DQO 4 (water quality)
Pond 16	Year 3 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	Can't assess
Pond 35	Year 3 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	Can't assess
Pond 39	Year 3 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	On track
Pond 40 South	Year 3 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	Can't assess
Pond 41	Year 3 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	Can't assess
Pond 42	Year 3 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	On track
Pond 43	Year 3 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	Can't assess
Pond 44	Year 3 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	Can't assess
Pond 54	Year 3 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	Can't assess
Pond 60	Year 3 Post-Subsurface Munitions Remediation	Partial	On track	Partial	On track
Pond 61	Year 3 Post-Subsurface Munitions Remediation	Partial	On track	Partial	On track
Pond 73*	Year 3 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	Can't assess

\*Only evaluated against reference vernal pools and/or previous years, no baseline data.



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## **APPENDIX A**

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### **Water Quality Results and Inundation Area for Vernal Pools by Month**

January								
Pond	Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
74	2021-01-05	0	0					
3N	2021-01-05	0	0					
3S	2021-01-05	0	0					
35	2021-01-05	0	0					
39	2021-01-05	0	0					
40S	2021-01-05	0	0					
41	2021-01-05	0	0					
42	2021-01-05	0	0					
43	2021-01-05	0	0					
44	2021-01-05	0	0					
61E	2021-01-05	0	0					
61W	2021-01-05	0	0					
5	2021-01-07	0	0					
101EE	2021-01-07	0	0					
997	2021-01-07	0	0					
75	2021-01-07	0	0					
101EW	2021-01-07	0	0					

January								
Pond	Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
101W	2021-01-07	0	0					
16	2021-01-07	0	0					
54	2021-01-07	0	0					
60	2021-01-07	0	0					
73	2021-01-07	0	0					

NS = Not Surveyed



February								
Pond	Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
5^	2021-02-01	0.0000	0					
101EE	2021-02-01	0.0000	0					
997	2021-02-01	0.0000	0					
74	2021-02-01	0.0000	0					
101EW	2021-02-01	0.0000	0					
3N^	2021-02-01	0.0165	13	3.59	14	106	6.3	150
3S	2021-02-01	0.0000	0					
35	2021-02-01	0.0000	0					
39^	2021-02-01	0.0060	38	3.75	10	39	6.2	65
40S	2021-02-01	0.0000	0					
41	2021-02-01	0.0000	0					
42^	2021-02-01	0.0082	10	5.56	19	450	6.8	135
43	2021-02-01	0.0000	0					
44	2021-02-01	0.0000	0					
60	2021-02-01	0.1411	26	0.43	15	284	6.1	1,098
61E	2021-02-01	0.0000	0					
61W^	2021-02-01	0.0214	38	10.59	15	17	6.9	183
73	2021-02-01	0.0000	0					

February								
Pond	Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
75	2021-02-02	0.0000	0					
16	2021-02-02	0.0000	0					
54	2021-02-02	0.0000	0					
3N^	2021-02-10	NS	5	NS	NS	NS	NS	NS
39	2021-02-10	NS	27	NS	NS	NS	NS	NS
42	2021-02-10	0.0000	0					
60	2021-02-10	NS	25	NS	NS	NS	NS	NS
61W	2021-02-10	NS	34	NS	NS	NS	NS	NS
101EE	2021-02-12	0.0000	0					
101EW	2021-02-12	0.0000	0					
101W	2021-02-12	0.0000	0					
16	2021-02-12	0.0000	0					
42	2021-02-12	NS	2	NS	NS	NS	NS	NS
60	2021-02-12	NS	25	NS	NS	NS	NS	NS
3N	2021-02-24	0.0000	0					
39	2021-02-24	NS	13	NS	NS	NS	NS	NS
44	2021-02-24	NS	22	NS	NS	NS	NS	NS
60	2021-02-24	NS	26	NS	NS	NS	NS	NS

NS = Not Surveyed

^Peripheral inundation present

March								
Pond	Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
3N	2021-03-02	0.0000	0					
35	2021-03-02	0.0000	0					
39	2021-03-02	0.0000	0					
60	2021-03-02	0.0850	20	10.9	12.6	57.68	7.2	1,306
61W	2021-03-02	0.0048	18	12.0	14.8	1.30	7.1	250
101EW	2021-03-10	0.0000	0					
101W	2021-03-10	0.0000	0					
42	2021-03-10	0.0000	0					
60	2021-03-10	NS	21	NS	NS	NS	NS	NS
101W	2021-03-24	0.0000	0					
60	2021-03-24	0.1346	26	4.4	8.2	5.02	6.6	1,513
61E	2021-03-24	0.0000	0					
61W	2021-03-24	0.0045	16	10.1	10.7	0.07	7.0	290
3N	2021-03-25	0.0000	0					
3S	2021-03-25	0.0000	0					
35	2021-03-25	0.0000	0					
39	2021-03-25	0.0000	0					
40S	2021-03-25	0.0000	0					

March								
Pond	Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
41	2021-03-25	0.0000	0					
42	2021-03-25	0.0000	0					
43	2021-03-25	0.0000	0					
44	2021-03-25	0.0000	0					
5^	2021-03-29	0.0000	0					
101EE	2021-03-29	0.0000	0					
997	2021-03-29	0.0000	0					
74	2021-03-29	0.0000	0					
101EW	2021-03-29	0.0000	0					
101W	2021-03-29	0.0000	0					
60	2021-03-29	NS	24	NS	NS	NS	NS	NS
73	2021-03-29	0.0000	0					

NS = Not Surveyed

^Peripheral inundation present

April								
Pond	Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
997	2021-04-05	0	0					
60	2021-04-05	NS	19	NS	NS	NS	NS	NS
61W	2021-04-05	0	0					
60	2021-04-16	0	0					

NS = Not Surveyed



## **APPENDIX B**

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### **Historical Hydrology Monitoring Results for Reference and Remediated Vernal Pools**

**Table B-1. Pond 5 (Reference) Historical Hydrology Results on Former Fort Ord 1994-2021**

Water Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1994	3/29/1994	-	17.00	-	-	31	2.75
	4/13/1994	-	20.00	-	-	20	-
1995	1/11/1995	-	16.00	-	-	28	0.17
	1/26/1995	-	14.00	-	-	43	0.52
	2/10/1995	-	15.00	-	-	51	0.50
	2/24/1995	-	13.00	-	-	51	0.52
	3/10/1995	-	-	-	-	76	1.72
	3/24/1995	-	22.00	-	-	>100	6.89
1996	1/3/1996	-	-	-	-	0	-
	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	-	-	-	-	0	-
2007	12/1/2006	-	-	-	-	0	-
	1/23/2007	-	-	-	-	0	-
	3/6/2007	7.20	-	-	5.1 (NTU)	17	1.58
2010	3/11/2010	-	-	-	-	46	-
	5/25/2010	-	-	-	-	30	-
2013	11/26/2012	-	-	-	-	0	-
	12/19/2012	-	-	-	-	0§	0.01
	1/22/2013	-	-	-	-	11	0.91
	2/25/2013	-	-	-	-	0	0.00
	3/15/2013	-	-	-	-	0	0.00
	4/12/2013	-	-	-	-	0	0.00
	5/10/2013	-	-	-	-	0	0.00
2014	12/11/2013	-	-	-	-	0	0.00
	2/18/2014	-	-	-	-	0	0.00
	3/17/2014	-	-	-	-	0	0.00
	4/7/2014	-	-	-	-	0	0.00
	5/6/2014	-	-	-	-	0	0.00
	6/3/2014	-	-	-	-	0	0.00

**Table B-1. Pond 5 (Reference) Historical Hydrology Results on Former Fort Ord 1994-2021**

Water Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2016	4/5/2016	6.41	25.06	6.91	63.4	no gauge, ~100	5.33
	4/19/2016	6.51	20.27	5.73	23.8	no gauge, ~100	5.14
	5/9/2016	6.45	17.99	7.3	19.6	no gauge, ~100	4.86
	6/8/2016	6.48	21.32	0.34	17.7	no gauge, ~80	4.44
	7/7/2016	6.37	23.01	6.65	83.2	no gauge, ~60	3.19
	8/10/2016	6.85	16.37	0.97	295.0	4	0.36
	9/12/2016	-	-	-	-	0	0.00
2017	1/25/2017	6.09	8.94	2.13	4.0	58	5.32
	2/27/2017	6.24	11.77	4.52	6.4	gauge submerged, ~130	7.78
	3/23/2017	6.54	15.30	1.55	8.3	gauge submerged, ~130	7.30
	4/20/2017	6.38	17.22	0.00	5.9	gauge submerged, ~130	7.24
	5/25/2017	6.28	21.85	2.73	4.5	110	6.49
	6/20/2017	7.12	24.16	3.54	7.4	98	5.74
	7/28/2017	-	-	-	-	94	-
	8/16/2017	-	-	-	-	57	-
	9/6/2017	-	-	-	-	45	-
2018	11/20/2017	-	-	-	-	18	-
	1/15/2018	7.12	12.56	6.54	16.6	22	2.95
	2/23/2018	7.12	6.00	5.27	39.2	15	1.85
	3/21/2018	7.01	11.76	6.65	4.7	22	3.01
	4/18/2018	7.29	20.68	7.09	40.6	22	2.85
	5/22/2018	-	-	-	-	0	0.00 <sup>‡</sup>
	1/14/2019	6.70	11.09	10.16	4.7	4	0.47 <sup>‡</sup>
2019	2/13/2019	6.89	10.55	10.24	8.4	42	4.21 <sup>‡</sup>
	3/7/2019	6.58	14.10	5.58	1.5	56	4.83 <sup>‡</sup>
	4/4/2019	6.41	14.87	1.71	1.2	53	4.59

**Table B-1. Pond 5 (Reference) Historical Hydrology Results on Former Fort Ord 1994-2021**

Water Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
	5/9/2019	6.51	17.15	3.80	0.6	37	3.96
	6/6/2019	7.09	20.32	6.07	13.6	30	3.62
	7/9/2019	-	-	-	-	25 <sup>§</sup>	-
	8/13/2019	-	-	-	-	0	0.00
2020	12/4/2019	-	-	-	-	9	-
	12/20/2019 <sup>#</sup>	7.28	15.3	6.01	18.37	8	0.7359
	1/8/2020	-	-	-	-	11	-
	1/30/2020	7.41	14.6	20.16	16.54	14	1.9979
	2/21/2020	-	-	-	-	8	-
	2/27/2020	6.52	16.5	6.87	91.61	6	0.751
	3/17/2020 <sup>*</sup>	-	-	-	-	15	-
	3/27/2020	6.33	15.2	8.89	7.82	23	3.0472
	4/15/2020 <sup>*</sup>	-	-	-	-	33	-
	4/28/2020	6.57	24.2	2.9	1.63	26	3.1494
	5/18/2020 <sup>*</sup>	-	-	-	-	15	-
	5/26/2020	6.71	28.7	3.51	74.48	8	0.7328
	6/10/2020 <sup>*</sup>	-	-	-	-	0	0
	1/7/2021	-	-	-	-	0	0
2021	2/1/2021 <sup>‡</sup>	-	-	-	-	0	0
	3/29/2021 <sup>‡</sup>	-	-	-	-	0	0

‡Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

§Depth is an estimate. Decreased visibility due to emergent vegetation.

\*taken during Burleson surveys

#Probe not fully submerged

Pond 5 was monitored thirteen years between 1994 and 2021 water years. Pond 5 is a reference vernal pool and no remediation has occurred. The Historical data and precipitation are summarized below:

- 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 20-31 cm, mean 26
  - temperature 17°-20° C, mean 18.5° C
- 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 102 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 28->100 cm, mean 58 cm
  - temperature range 13°-22° C, mean 16° C
- 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 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 5-38 cm, mean 20 cm
  - No water quality data collected
- 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 17 cm
  - One water quality sample 7.20 pH, 5.1 FNU turbidity
- 2010 (Shaw, 2011)
  - DD&A conducted wildlife surveys in March and May. Only depth records were taken but data was not reported.
  - Below normal rain year
  - Yearly cumulative precipitation 14.6 inches
  - Maximum recorded depth was 46 cm
- 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 11 cm, only one depth recorded
  - No water quality data collected
- 2014 (Tetra Tech, 2015)
  - In a 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

- 2016 (Burleson, 2017)
  - 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 5.33 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 0.36-5.33 acres, mean 3.89 acres
  - Depth range 4-100 cm, mean 74 cm
  - pH range 6.37-6.85, mean 6.51
  - temperature range 16.4°-25.1° C, mean 20.7° C
  - dissolved oxygen range 0.34-7.30 mg/L, mean 4.65 mg/L
  - turbidity range 17.7-295.0 FNU, mean 83.8 FNU
- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 5 was inundated from the first recorded monitoring in January through September (Pond 5 did not 0 by last recorded monitoring in September). The maximum inundation area was 7.78 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord, with a few high readings in the middle of the season. Dissolved oxygen had a small range, with moderate levels. Turbidity was low on average.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected January - September, nine monitoring events
  - Inundated January through September (pond did not 0 at last reading in September)
  - Inundation range 5.32-7.78 acres, mean 6.65 acres
  - Depth range 45-~130 cm, mean 95 cm
  - pH range 6.09-7.12, mean 6.44
  - temperature range 8.9°-24.2° C, mean 16.5° C
  - dissolved oxygen range 0.00-4.52 mg/L, mean 2.41 mg/L
  - turbidity range 4.0-8.3 FNU, mean 6.1 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 5 was inundated from the first recorded monitoring in January through April. The maximum inundation area was 3.01 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity was low on average.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected November - May, six monitoring events
  - Inundated November through April
  - Inundation range 1.85-3.01 acres, mean 2.66 acres
  - Depth range 15-22 cm, mean 20 cm
  - pH range 7.01-7.29, mean 7.14



- temperature range 6.00°-20.68° C, mean 12.75° C
  - dissolved oxygen range 5.27-7.09 mg/L, mean 6.39mg/L
  - turbidity range 4.7-40.6 FNU, mean 25.3 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 5 was inundated from the first recorded monitoring in January through July. The maximum inundation area was 4.83 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity was low on average.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - August, eight monitoring events
  - Inundated January through July
  - Inundation range 0.47-4.83 acres, mean 3.61 acres
  - Depth range 4-56 cm, mean 35 cm
  - pH range 6.41-7.09, mean 6.70
  - temperature range 10.55°-20.32° C, mean 14.68° C
  - dissolved oxygen range 1.71-10.24 mg/L, mean 6.26 mg/L
  - turbidity range 0.6-13.6 FNU, mean 5.0 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 5 was inundated from the first recorded monitoring in December through May. The maximum inundation area was 3.15 acres. Water quality was generally within historical ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen in January was highest on record, but otherwise within historical range. Turbidity values were somewhat elevated in February and May, but not outside of historical range.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - June, 13 monitoring events
  - Inundated December through May
  - Inundation range 0-3.15 acres, mean 1.49 acres
  - Depth range 0-33 cm, mean 13.6 cm
  - pH range 6.33-7.41, mean 6.80
  - temperature range 14.6°-28.7° C, mean 19.08° C
  - dissolved oxygen range 2.9-20.16 mg/L, mean 8.06 mg/L
  - turbidity range 1.63-91.61 FNU, mean 35.08 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 5 did not fill
  - Data collected Jan-March, three monitoring events

**Table B-2. Pond 101 East (East) (Reference) Historical Hydrology Results on  
Former Fort Ord 2001-2021**

Water Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2001	Feb	-	-	-	-	36 <sub>y</sub>	1.47
	Mar	6.30	-	-	-	>46 <sub>y</sub>	1.26
	Apr	6.81	-	-	-	>5 <sub>y</sub>	0.36
	May	-	-	-	-	-	0.24
2007	Dec	-	-	-	-	0	0.00
	Jan	-	-	-	-	0	0.00
	Mar	7.61	-	-	6.1 (NTU)	20	0.32
	Apr	-	-	-	-	0	0.00
	May	-	-	-	-	0	0.00
	June	-	-	-	-	0	0.00
2013	11/26/2012	-	-	-	-	0 <sub>\$</sub>	0.00
	12/19/2012	-	-	-	-	0 <sub>\$</sub>	0.00
	1/22/2013	-	-	-	-	11 <sub>\$</sub>	0.08
	2/25/2013	-	-	-	-	0 <sub>\$</sub>	0.00
	3/15/2013	-	-	-	-	0 <sub>\$</sub>	0.00
	4/12/2013	-	-	-	-	0 <sub>\$</sub>	0.00
	5/10/2013	-	-	-	-	0 <sub>\$</sub>	0.00
2014	12/11/2014	-	-	-	-	0 <sub>\$</sub>	0.00
	2/18/2014	-	-	-	-	0 <sub>\$</sub>	0.00
	3/17/2014	-	-	-	-	0 <sub>\$</sub>	0.00
	4/7/2014	-	-	-	-	0 <sub>\$</sub>	0.00
	5/6/2014	-	-	-	-	0 <sub>\$</sub>	0.00
	6/3/2014	-	-	-	-	0 <sub>\$</sub>	0.00
2015	3/18/2015	-	-	-	-	0	0.00
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2016	4/5/2016	6.44	17.1	7.93	138.0	68	3.24
	4/19/2016	6.38	22.7	6.50	112.0	68	3.13
	5/9/2016	7.07	23.0	6.92	106.0	55	2.77
	6/8/2016	6.49	23.0	4.36	53.0	32	1.23
	7/7/2016	-	-	-	-	0	0.00
2017	1/24/2017	5.50	10.0	1.95	1.9	~155, gauge submerged	Connected to 101 East (West), total 5.02
	2/27/2017	6.23	12.2	3.68	21.8	~160, gauge submerged	Connected to 101 East (West), total 9.37
	3/20/2017	6.23	15.3	1.07	39.2	~160, gauge submerged	Connected to 101 East (West), total 8.89

**Table B-2. Pond 101 East (East) (Reference) Historical Hydrology Results on  
Former Fort Ord 2001-2021**

Water Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
	4/20/2017	6.49	17.3	0.00	43.2	~160, gauge submerged	Connected to 101 East (West), total 9.38
	5/25/2017	6.89	19.0	2.38	4.0	~160, gauge submerged	6.52
	6/21/2017	6.91	20.1	3.58	10.7	~150, gauge submerged	5.57
	7/28/2017	-	-	-	-	100	-
	8/16/2017	-	-	-	-	95	-
	9/6/2017	-	-	-	-	77	-
2018	11/20/2017	-	-	-	-	44	-
	1/19/2018	6.82	11.92	0.21	63.0	44	2.09
	2/16/2018	6.80	10.94	4.45	114.0	-	1.44
	3/21/2018	6.97	12.62	3.35	40.8	40	1.86
	4/17/2018	7.12	21.88	10.03	99.4	40	1.67
	5/22/2018	6.42	13.55	15.25	1000.0	14	0.04
	6/19/2018	-	-	-	-	0	0.00
2019	1/14/2019	-	-	-	-	0	0.00
	2/14/2019	6.88	14.36	8.94	10.4	47	2.21 <sup>‡</sup>
	3/7/2019	6.51	14.08	5.48	9.7	56	2.76 <sup>‡</sup>
	4/4/2019	6.80	14.15	5.63	6.1	53	2.51 <sup>‡</sup>
	5/9/2019	6.38	16.26	3.09	13.0	34	1.14
	6/6/2019	7.13	21.92	5.48	79.8	26	0.38
	7/9/2019	-	-	-	-	0	0.00
2020	12/04/2019	-	-	-	-	13	-
	12/13/2019	-	-	-	-	0	0
	12/20/2019	-	-	-	-	0	0
	12/23/2019	-	-	-	-	0	0
	12/31/2019	6.84	13.3	9.98	5.46	12	0.0715
	1/06/2020	-	-	-	-	11	-
	1/30/2020 <sup>#</sup>	6.68	14.6	23.33	28.16	12	0.1752
	2/19/2020	-	-	-	-	8	-
	2/27/2020	-	-	-	-	1	0.0032
	3/11/2020	-	-	-	-	0	0
	3/20/2020 <sup>^</sup>	-	-	-	-	26	0.6504
	3/30/2020	6.36	16.2	3.28	3.31	34	1.6103
	4/17/2020 <sup>*</sup>	-	-	-	-	37	-
	4/28/2020	6.56	23.1	2.24	4.72	29	1.0074

**Table B-2. Pond 101 East (East) (Reference) Historical Hydrology Results on  
Former Fort Ord 2001-2021**

Water Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
	5/19/2020*	-	-	-	-	4	-
	5/26/2020	-	-	-	-	0	0
2021	1/7/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	2/12/2021	-	-	-	-	0	0
	3/29/2021	-	-	-	-	0	0

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

§No staff gauge. Cannot access ponds to measure depth due to potential for subsurface unexploded ordnance and other hazards. Depths are estimations

#Probe not fully submerged

\*taken during Burleson surveys

^Peripheral inundation present

Pond 101 East (East) was monitored eleven years between 2001 and 2021 water years. Pond 101 East (East) is a reference vernal pool and no remediation has occurred. The Historical data and precipitation are summarized below:

- 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 January-May, five monitoring events
  - 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
- 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
- 2013 (Tetra Tech, 2014)
  - In a 0 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, 0.08 acres
  - Depth 11 cm in January
  - No water quality data collected
- 2014 (Tetra Tech, 2015)
  - In a 0 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
  - 0 in all monitoring events
  - No water quality data collected
- 2015 (Burleson, 2016)
  - In a 0 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
  - 0 in all monitoring events
  - No water quality data collected
- 2016 (Burleson, 2017)
  - 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 1.23-3.24 acres, mean 2.59 acres
  - Depth range 32-68 cm, mean 56 cm
  - pH range 6.38-7.07, mean 6.60
  - temperature range 17.1°-23.0° C, mean 21.4° C
  - dissolved oxygen range 4.36-7.93 mg/L, mean 6.43 mg/L
  - turbidity range 106-553 FNU, mean 227 FNU
- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 101 East (East) was inundated from the first recorded monitoring in January through September (Pond 101EE did not 0 at last recorded monitoring in September). The maximum inundation area was 9.374 acres (101EE was connected to 101EW). Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a large range, with moderate levels.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected January - September, nine monitoring events
  - Inundated January through September (pond did not 0 by last recorded monitoring in September)
  - Inundation range 5.02-9.40 acres, mean 7.46 acres (pond was connected to 101 East (West) for range and mean values)

- Depth range 77~160 cm, mean 135 cm
  - pH range 5.5-6.91, mean 6.38
  - temperature range 10.0°-20.1° C, mean 15.7° C
  - dissolved oxygen range 0.0-3.68 mg/L, mean 2.11 mg/L
  - turbidity range 1.9-43.2 FNU, mean 20.13 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 101 East (East) was inundated from the first recorded monitoring in January through May. The maximum inundation area was 2.09 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a large range. Turbidity had a large range, with an out-of-range reading in May.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected November - June, seven monitoring events
  - Inundated January through May
  - Inundation range 0.04-2.09 acres, mean 1.42 acres
  - Depth range 14-48 cm, mean 38 cm
  - pH range 6.42-7.12, mean 6.83
  - temperature range 10.94°-21.88° C, mean 14.18° C
  - dissolved oxygen range 0.21-15.25 mg/L, mean 6.66 mg/L
  - turbidity range 40.8-1000 FNU, mean 263.44 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 101 East (East) was inundated from the second recorded monitoring in February through June. The maximum inundation area was 2.76 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range with moderate levels. Turbidity had a large range with moderate levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - July, seven monitoring events
  - Inundated February through June
  - Inundation range 0.38-2.76 acres, mean 1.80 acres
  - Depth range 26-56 cm, mean 43 cm
  - pH range 6.38-7.13, mean 6.74
  - temperature range 14.08°-21.92° C, mean 16.15° C
  - dissolved oxygen range 3.09-8.94 mg/L, mean 5.72 mg/L
  - turbidity range 6.1-79.8 FNU, mean 23.8 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 101 East (East) was inundated intermittently from the first recorded monitoring in December through May. The maximum inundation area was 1.61 acres. Water quality was generally within historical ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen in January was highest on record, but otherwise within the historical range. Turbidity values were within the historical range.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 15 monitoring events
  - Inundated intermittently from December through May, dried out three times
  - Inundation range 0-1.61 acres, mean 0.32 acres
  - Depth range 0-37 cm, mean 11.69 cm
  - pH range 6.33-6.87, mean 6.61



- temperature range 13.3°-23.1° C, mean 16.8° C
  - dissolved oxygen range 2.24-23.33 mg/L, mean 9.707 mg/L
  - turbidity range 3.31-28.16 FNU, mean 10.11 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 101 East (East) did not fill
  - Data collected Jan-March, four monitoring events

**Table B-3. Pond 997 (Reference) Historical Hydrology Results on Former Fort Ord 2017-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2017	1/25/2017	6.40	10.22	7.17	25.6	13	0.33
	2/27/2017	6.78	16.94	12.20	14.1	15	0.23
	3/23/2017	6.43	12.99	7.88	72.4	12	0.10
	4/19/2017	7.07	25.42	7.14 <sup>†</sup>	25.5 <sup>†</sup>	6	0.02
	5/24/2017	-	-	-	-	0	0.00
2018	1/19/2018	-	-	-	-	0	0.00
	2/23/2018	-	-	-	-	0	0.00
	3/20/2018	-	-	-	-	0	0.00
	4/18/2018	-	-	-	-	0	0.00
2019	1/14/2019	-	-	-	-	0	0.00
	2/13/2019	6.39 <sup>†</sup>	11.79 <sup>†</sup>	10.62 <sup>†</sup>	26.0 <sup>†</sup>	13	0.11 <sup>‡</sup>
	3/5/2019	6.37 <sup>†</sup>	12.61 <sup>†</sup>	9.28 <sup>†</sup>	24.2 <sup>†</sup>	14	0.12 <sup>‡</sup>
	4/9/2019	-	-	-	-	2	0.03
	5/9/2019	-	-	-	-	0	0.00
2020	12/04/19 <sup>^</sup>	-	-	-	-	0	0
	12/20/19	-	-	-	-	0	0
	12/23/19	-	-	-	-	0	0
	01/06/20	-	-	-	-	0	0
	01/30/20	-	-	-	-	0	0
	03/20/20	-	-	-	-	0	0
	03/27/20 <sup>^#</sup>	6.06	19.6	8.44	49.45	7	0.0507
	04/17/20 <sup>*</sup>	-	-	-	-	6	-
	04/28/20	-	-	-	-	0	0
	1/7/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	3/29/2021	-	-	-	-	0	0
2021	4/05/2021	-	-	-	-	0	0

<sup>†</sup>Water quality probe was horizontal for measurements.

<sup>‡</sup>Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

<sup>#</sup>Probe not fully submerged

<sup>\*</sup>taken during Burleson surveys

<sup>^</sup>Peripheral inundation present

Pond 997 was monitored five years between 2017 and 2020 water years. Pond 997 is a reference vernal pool and no remediation has occurred. The Historical data and precipitation are summarized below:

- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 997 was inundated from the first recorded monitoring in January through April. The maximum inundation area was 0.33 acres. Water quality was within normal ranges. Slightly acidic

pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a large range, with moderate levels.

- Yearly cumulative precipitation 22.92 inches
- Data collected January - May, five monitoring events
- Inundated January through April
- Inundation range 0.02-0.33 acres, mean 0.17 acres
- Depth range 6-15 cm, mean 12 cm
- pH range 6.40-7.07, mean 6.67
- temperature range 10.2°-25.4° C, mean 16.4° C
- dissolved oxygen range 7.14-12.20 mg/L, mean 8.60 mg/L
- turbidity range 14.1-72.4 FNU, mean 34.4 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 997 did not hold water.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - April, four monitoring events
  - 0 in all monitoring events
  - No water quality data collected
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 997 was inundated from the second recorded monitoring in February through April. The maximum inundation area was 0.12 acres. Water quality was within normal ranges. Water quality data were collected in February and March. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a small range, with moderate levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January through May, five monitoring events
  - Inundated February through April
  - Inundation range 0.03-0.12 acres, mean 0.09 acres
  - Depth range 2-14 cm, mean 10 cm
  - pH range 6.37-6.39, mean 6.38
  - temperature range 11.79°-12.61° C, mean 12.20° C
  - dissolved oxygen range 9.28-10.62 mg/L, mean 9.95 mg/L
  - turbidity range 24.2-26.0 FNU, mean 25.1 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 997 was inundated from late March through mid-April. The maximum inundation area was 0.05 acres. Water quality was measured only once but it was within Historical ranges. Slightly acidic pH value was observed.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - April, nine monitoring events
  - Inundated from late March through mid-April
  - Inundation range 0-05 acres, mean 0.05 acres
  - Depth range 0-7 cm, mean 1.44 cm
  - pH value of 6.06
  - temperature value of 19.6
  - dissolved oxygen value of 8.44
  - turbidity value of 49.45
- 2021

- In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 997 did not fill
- Data collected Jan-April, four monitoring events

**Table B-4. Pond 75 (Baseline) Historical Hydrology Results on Former Fort Ord 2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2021	1/7/2021	-	-	-	-	0	0
	2021-02-02	-	-	-	-	0	0

Pond 75 was monitored for the first time in 2021 water year. Monitoring events and related activities are summarized below:

- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 75 did not fill
  - Data collected Jan-Feb, two monitoring events

**Table B-4. Pond 74 (Year 3 Post-Mastication) Historical Hydrology Results on Former Fort Ord 2019-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2019	2/12/2019	-	-	-	-	-	0.081
	2/28/2019	-	-	-	-	-	0.089
	3/11/2019	-	-	-	-	-	0.091
	3/18/2019	-	-	-	-	-	0.077
	3/26/2019	-	-	-	-	-	0.093
	4/3/2019	-	-	-	-	-	0.076
	4/8/2019	-	-	-	-	-	0.071
	4/29/2019	-	-	-	-	-	0.007
2020	1/30/2020	-	-	-	-	0	0
	3/20/2020	-	-	-	-	0	0
	3/30/2020	-	-	-	-	5	0.012
	4/29/2020	-	-	-	-	0	0
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	3/29/2021	-	-	-	-	0	0

Pond 74 was monitored three years between 2019 and 2021 water years. Pond 74 is a Year 3 Post-Mastication vernal pool. Pond 74 wasn't discovered until remaining vegetation in BLM Area B Unit B-2A was masticated in 2019, and thus no baseline data exists. Depth was not measured in 2019 and was estimated in 2021, and water quality was not measured. Monitoring events and related activities are summarized below:

- 2017
  - Mastication of Unit B-2A, vegetation around Pond 74
- 2019 (Burlison, 2020)
  - Mastication of the remaining vegetation around Pond 74, initial discovery of the pond
  - In an above normal water-year, Pond 74 was inundated from mid-February through April. The maximum inundation area was 0.09 acres. Water quality was not measured
  - Yearly cumulative precipitation 21.97 inches
  - Data collected from February through April, eight monitoring events
  - Inundated February through April
  - Inundation range 0.012-0.093 acres, mean 0.073 acres
  - Depth was not measured
  - No water quality data collected
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 997 was inundated in late March and was dry by late April. The maximum inundation area was 0.012 acres. Water quality was not measured due to insufficient depth.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected January - April, four monitoring events
  - Inundated in late March, dry by late April



- Inundation range 0-05 acres, mean 0.05 acres
  - Estimated depth value of 5 cm
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 74 did not fill
  - Data collected Jan-March, three monitoring events

**Table B-4. Pond 101 East (West) (Year 3 Post-Mastication) Historical Hydrology Results on Former Fort Ord 1992-2020**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1992	4/20/1992	-	24	-	slight*	91	5**
2001	1/12/2001	-	-	-	-y	-	-
	2/12/2001-2/13/2001	-	-	-	-	36 y	0.11
	3/26/2001	-	-	-	-	>46 y	0.14
	4/18/2001-4/19/2001	-	-	-	-	>5 y	-
	5/23/2001-5/24/2001	-	-	-	-	- y	-
2007	-	-	-	-	-	0	0.00
2015	3/18/2015	-	-	-	-	0	0.00
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2016	4/5/2016	6.43	13.95	0.0	5.7	70	1.89
	4/19/2016	6.67	23.28	6.4	204.0	58	0.20
	5/9/2016	6.22	17.22	2.9	77.1	54	0.67
	6/8/2016	6.55	22.9	3.4	525.0	20	0.07
	7/7/2016	-	-	-	-	0	0.00
2017	1/24/2017	5.81	10.61	1.99	13.7	79	Connected to 101 East (East), total 5.02
	2/27/2017	6.21	10.39	6.18	10.8	88	Connected to 101 East (East), total 9.37
	3/20/2017	6.13	14.67	5.80	2.8	84	Connected to 101 East (East), total 8.87
	4/20/2017	6.10	15.27	5.28	10.0	86	Connected to 101 East (East), total 9.38
	5/25/2017	6.02	18.65	1.68	36.6	74	0.95
	6/21/2017	6.53	26.63	2.97	79.8	18	0.17
	7/27/2017	-	-	-	-	0	0.00
2018	1/19/2018	-	-	-	-	0	0.00
	2/21/2018	-	-	-	-	0	0.00
	3/21/2018	6.62	13.58	3.09	39.5	16	0.004
	4/17/2018	7.20	21.74	10.95	16.6	24	0.09
	5/21/2018	-	-	-	-	0	0.00
2019	1/14/2019	-	-	-	-	0	0.00
	2/14/2019	6.50	11.84	7.61	7.7	70	1.20 <sup>‡</sup>
	3/7/2019	6.12	14.31	4.48	2.9	76	1.86 <sup>‡</sup>

**Table B-4. Pond 101 East (West) (Year 3 Post-Mastication) Historical Hydrology Results on Former Fort Ord 1992-2020**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
	4/4/2019	6.44	14.46	3.89	3.0	71	1.18 <sup>‡</sup>
	5/9/2019	6.28	15.94	3.97	1.8	46	0.35
	6/11/2019	6.35	23.74	6.35	64.9	23	0.02
	7/9/2019	-	-	-	-	0	0.00
2020	12/4/2019	-	-	-	-	10	-
	12/13/2019	-	-	-	-	0	0
	12/20/2019	-	-	-	-	0	0
	12/23/2019	-	-	-	-	0	0
	12/31/2019	6.67	13.2	11.67	22.86	14	0.0032
	1/6/2020	-	-	-	-	5	-
	1/30/2020 <sup>#</sup>	6.67	11.4	9.47	16.82	19	0.0031
	2/19/2020	-	-	-	-	0	0
	3/11/2020	-	-	-	-	0	0
	3/20/2020	-	-	-	-	26	0.0825
	3/30/2020	5.99	14.7	8.86	12.68	49	0.4425
	4/17/2020	-	-	-	-	60	-
	4/28/2020	6.04	15.8	0.73	5.31	50	0.469
	5/19/2020	-	-	-	-	27	-
	5/26/2020	-	-	-	-	0	0
	1/7/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	2/12/2021	-	-	-	-	0	0
2021	3/10/2021	-	-	-	-	0	0
	3/29/2021	-	-	-	-	0	0

\* In 1992, turbidity was measured qualitatively.

\*\* The 1992 acreage includes Ponds 101 East (East) and 101 East (West).

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

#Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

#Probe not fully submerged

^Peripheral inundation present

Pond 101 East (West) was monitored ten years between 1992 and 2021. Mastication activities occurred in 2018. Pond 101 East (West) is a post-mastication vernal pool and was in year 3 of monitoring in 2021. It should be noted that Pond 101 East (West) was previously considered a reference vernal pool. The Historical data and precipitation are summarized below:

- 1992 (Jones & Stokes, 1992)

- In a year with near-normal precipitation, Pond 101 East (West) was surveyed once in April 1992. It should be noted that data collection did not start with the first storms or inundation.
  - Yearly cumulative precipitation near-normal (17.84 inches)
  - Data collected April, one monitoring event
  - Inundated April, 5 acres (acreage includes Pond 101 East (East))
  - Depth 91 cm
  - temperature 24°C
  - pH, turbidity, and dissolved oxygen data were not collected
- 2001 (Harding ESE, 2002)
  - In a year with early storms followed by below normal precipitation, Pond 101 East (West) was recorded as inundated 0.11 acres in February and March as part of the Pond 101 complex
  - Early storms with cumulative precipitation below normal (15.52 inches)
  - Data collected January-May, five monitoring events
  - Inundated for two monitoring events, 0.11 acres and 0.14 acres
  - No water quality data collected
- 2007 (Shaw, 2008)
  - In a below normal water-year, Pond 101 East (West) was not inundated
  - Cumulative precipitation was below normal (10.13 inches)
  - No water quality data collected specifically for 101 East (West)
- 2015 (Burleson, 2016)
  - In a 0 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
  - 0 in all monitoring events
  - No water quality data collected
- 2016 (Burleson, 2017)
  - 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 April through June
  - Inundation range 0.07-1.89 acres, mean 0.71 acres
  - Depth range 20-70 cm, mean 51 cm
  - pH range 6.22-6.67, mean 6.47
  - temperature range 14.0°-23.3° C, mean 19.3° C
  - dissolved oxygen range 0.00-6.40 mg/L, mean 3.18 mg/L
  - turbidity range 5.7-525.0 FNU, mean 203 FNU
- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 101 East (West) was inundated from the first recorded monitoring in January through June. The maximum inundation area was 9.37 acres (101EW was connected to 101EE). Water

quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a small range, with moderate levels.

- Yearly cumulative precipitation 22.92 inches
- Data collected January - July, seven monitoring events
- Inundated January through June
- Inundation range 0.17-9.37 acres, mean 5.63 acres (pond connected to 101EE for upper range value and mean acreage)
- Depth range 18-88 cm, mean 72 cm
- pH range 5.81-6.53, mean 6.13
- temperature range 10.4°-26.6° C, mean 16.0° C
- dissolved oxygen range 1.68-6.18 mg/L, mean 3.98 mg/L
- turbidity range 2.8-79.8 FNU, mean 25.6 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 101 East (West) was inundated for the third and fourth monitoring in March and April, respectively, but was 0 in January, February, and May. The maximum inundation area was 0.09 acres. Water quality was within normal ranges. Neutral pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a wide range. Turbidity had a small range, with moderate levels.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - May, five monitoring events
  - Inundated March and April
  - Inundation range 0.004-0.09 acres, mean 0.05 acres
  - Depth range 16-24 cm, mean 20 cm
  - pH range 6.62-7.20, mean 6.91
  - temperature range 13.58°-21.74° C, mean 17.66° C
  - dissolved oxygen range 3.09-10.95 mg/L, mean 7.02 mg/L
  - turbidity range 16.6-39.5 FNU, mean 28.1 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 101 East (West) was inundated from the second recorded monitoring in February through June. The maximum inundation area was 1.86 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range. Turbidity had a large range, with moderate levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - July, seven monitoring events
  - Inundated February through June
  - Inundation range 0.02-1.86 acres, mean 0.92 acres
  - Depth range 23-76 cm, mean 57 cm
  - pH range 6.12-6.50, mean 6.34
  - temperature range 11.84°-23.74° C, mean 16.06° C
  - dissolved oxygen range 3.89-7.61 mg/L, mean 5.26 mg/L
  - turbidity range 1.8-64.9 FNU, mean 16.1 FNU
- 2020
  - In a close to normal water year, Pond 101 East (West) was inundated intermittently from the first recorded monitoring in December through mid-May. The maximum inundation area was 0.47 acres. Water quality was generally within Historical ranges.

Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen in December was highest on record, but otherwise within the Historical range. Turbidity values were within the Historical range.

- Yearly cumulative precipitation 18.08 inches
- Data collected December - May, 15 monitoring events
- Inundated intermittently from December through May, dried out three times
- Inundation range 0-0.47 acres, mean 0.09 acres
- Depth range 0-60 cm, mean 17.33 cm
- pH range 5.99-6.67, mean 6.34
- temperature range 11.4°-15.8° C, mean 13.78° C
- dissolved oxygen range 0.73-11.67 mg/L, mean 7.68 mg/L
- turbidity range 5.31-22.86 FNU, mean 14.42 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 74 did not fill
  - Data collected Jan-March, five monitoring events



**Table B-5. Pond 101 West (Year 3 Post-Mastication) Historical Hydrology Results on Former Fort Ord 2001-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2001	2/12/2001-2/13/2001	-	-	-	-	36 †	0.05
	3/26/2001	-	-	-	-	>46 †	0.06
	4/18/2001-4/19/2001	-	-	-	-	>5 †	-
2015	3/18/2015	-	-	-	-	10§	0.01
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2016	4/5/2016	6.53	14.85	0.00	36.7	43	0.09
	4/18/2016	6.45	17.46	0.00	354.0	33	0.05
	5/9/2016	-	-	-	-	0	0.00
2019	1/14/2019	-	-	-	-	0	0.00
	2/14/2019	6.44	13.32	7.45	26.7	54	0.11‡
	3/5/2019	6.53	13.58	5.13	100.0	51	0.11‡
	4/4/2019	6.68	14.69	4.77	90.8	47	0.09
	5/8/2019	6.69†	24.35†	5.40†	202.0†	10	0.01‡
	6/2019	-	-	-	-	0	0.00
2020	1/8/2020	-	-	-	-	0	0
	1/30/2020*#	6.46	12.5	9.96	6.27	10	0.0019
	2/19/2020	-	-	-	-	0	0
	3/11/2020	-	-	-	-	0	0
	3/20/2020^	-	-	-	-	25	0.0271
	3/30/2020	6.03	15.9	3.34	7.93	50	0.0958
	4/17/2020*	-	-	-	-	49	-
	4/28/2020	6.45	17.9	3.43	3.54	38	0.0633
	5/19/2020*	-	-	-	-	7	-
	5/26/2020	-	-	-	-	0	0
	1/7/2021	-	-	-	-	0	0
2021	2/1/2021	-	-	-	-	0	0
	2/12/2021	-	-	-	-	0	0
	3/10/2021	-	-	-	-	0	0
	3/29/2021	-	-	-	-	0	0

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

§No staff gauge. Cannot access ponds to measure depth due to potential for subsurface unexploded ordnance and other hazards. Depths are estimations

†Water quality probe was on its side for measurements.

‡Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

#Probe not fully submerged

\*taken during Burleson surveys, ^Peripheral inundation present

Pond 101 West was monitored six years between 2001 and 2021 water years. Mastication activities occurred in 2018. Pond 101 West is a post-mastication vernal pool and was in year 3 of monitoring in 2020. The Historical data and precipitation are summarized below:

- 2001 (Harding ESE, 2002)
  - In a year with early storms followed by below normal precipitation, Pond 101 West was recorded as inundated 0.05 acres in February
  - Early storms with cumulative precipitation below normal (15.52 inches)
  - Data collected January-May, five monitoring events
  - Inundated for two monitoring events, 0.05 acres and 0.06 acres
  - Depth range 5-46 cm, mean 29 cm
  - No water quality data collected
- 2015 (Burleson, 2016)
  - In a 0 consecutive drought year with below normal precipitation, Pond 101 West held water only in March. It should be noted that data collection did not start with the first storms or inundation. Maximum inundation could have been missed.
  - 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
  - Inundated in March, 0.01 acres
  - Depth in March 10 cm
  - No water quality data collected
- 2016 (Burleson, 2017)
  - In a consecutive drought year with cumulative precipitation above normal, Pond 101 West held water in April. Water quality results had a slightly acidic pH, normal temperature, and low dissolved oxygen. Turbidity had a high reading in during the mid-April monitoring event. 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-May, three monitoring events
  - Inundated in April
  - Inundation range 0.05-0.09 acres, mean 0.07 acres
  - Depth range 33-43 cm, mean 38 cm
  - pH range 6.45-6.53, mean 6.49
  - temperature range 14.85°-17.46° C, mean 16.16° C
  - dissolved oxygen 0.00 mg/L
  - turbidity range 36.7-354.0 FNU, mean 195.4 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 101 West was inundated from the second recorded monitoring in February through May. The maximum inundation area was 0.11 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range. Turbidity had a wide range, with high March and May readings.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - June, six monitoring events
  - Inundated February through May
  - Inundation range 0.01-0.11 acres, mean 0.08 acres
  - Depth range 10-54 cm, mean 41 cm

- pH range 6.44-6.69, mean 6.59
  - temperature range 13.32°-24.35° C, mean 16.49° C
  - dissolved oxygen range 4.77-7.45 mg/L, mean 5.69 mg/L
  - turbidity range 26.7-202.0 FNU, mean 104.9 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 101 West was inundated intermittently from the first recorded monitoring in December through mid-May. The maximum inundation area was 0.096 acres. Water quality was generally within historical ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen in January was highest on record, but otherwise within the historical range. Turbidity values were within the historical range.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 10 monitoring events
  - Inundated intermittently from December through May, dried out two times
  - Inundation range 0-0.096 acres, mean 0.023 acres
  - Depth range 0-50 cm, mean 17.90 cm
  - pH range 6.03-6.46, mean 6.31
  - temperature range 12.5°-17.9° C, mean 15.43° C
  - dissolved oxygen range 3.34-9.96 mg/L, mean 5.58 mg/L
  - turbidity range 3.54-7.93 FNU, mean 5.91 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 74 did not fill
  - Data collected Jan-March, five monitoring events

**Table B-6. Pond 3 North (Year 3 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1997-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1998	Jan	-	-	-	26.9 (NTU)	55	0.34
	Feb	7.57-7.95	-	-	40.1 (NTU)	46	0.38
	Apr		-	-	-	48	0.38
2015	2/24/2015	-	-	-	-	~40§	-
	3/18/2015	-	-	-	-	30§	0.07
	4/16/2015	7.60	26.30	11.80	104.0 (NTU)	15§	0.03
	5/28/2015	-	-	-	-	0	0.00
2016	3/31/2016	6.75	18.40	5.61	56.7	54	0.22
	4/19/2016	6.12	15.50	3.67	45.4	45	0.11
	5/9/2016	6.28	15.56	2.11	9.6	29	0.07
	6/7/2016	6.07	18.71	3.88	24.2	16	0.03
	7/7/2016	-	-	-	-	0	0.00
2018	1/16/2018	-	-	-	-	0	0.00
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018	6.27	11.33	8.75	57.4	10	0.02
	4/16/2018	6.61	13.33	7.60	5.3	24	0.05
	5/21/2018	-	-	-	-	0	0.00
2019	1/16/2019	6.55	12.08	10.04	13.6	14	0.02‡
	2/11/2019	6.89	8.81	7.80	43.9	61	Connected to 3 South, total 0.86‡
	3/7/2019	6.62	13.37	5.64	1.7	62	Connected to 3 South, total 1.14‡
	4/3/2019	6.64	16.26	5.43	0.3	59	0.27‡
	5/7/2019	6.84	18.90	9.20	0.5	40	0.09‡
	6/11/2019	6.27	20.89	7.14	0.9	26	0.05
	7/9/2019	-	-	-	-	0	0.00
2020	12/6/2019^	-	-	-	-	30	0.0563
	1/6/2020^	-	-	-	-	26	-
	1/29/2020^#	7.54	19.5	12.79	8.76	29	0.0513
	2/21/2020	-	-	-	-	17	-
	2/27/2020	7.06	19.6	7.2	12.71	15	0.0163
	3/12/2020	-	-	-	-	5	-
	3/17/2020*	-	-	-	-	30	-
	3/20/2020^	-	-	-	-	30	-
	3/31/2020^	6.91	23.6	8.11	22.2	52	0.1568
2020	4/16/2020*	-	-	-	-	55	-

	4/29/2020 <sup>^</sup>	6.36	19	2.4	1.51	46	0.1086
	5/20/2020 <sup>*</sup>	-	-	-	-	31	-
	5/26/2020	6.59	28	4.29	0.94	26	0.04
	6/10/2020	-	-	-	-	11	-
	6/25/2020 <sup>*</sup>	-	-	-	-	0	0
	6/30/2020	-	-	-	-	0	0
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021 <sup>^</sup>	6.29	13.9	3.59	106.23	0.0165	13
	2/10/2021 <sup>^</sup>	-	-	-	-	NS	5
	2/24/2021	-	-	-	-	0	0
	3/02/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0

§No staff gauge. Cannot access ponds to measure depth due to potential for subsurface unexploded ordnance and other hazards. Depths are estimations

‡Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

#Probe not fully submerged

\*taken during Burleson surveys

<sup>^</sup>Peripheral inundation present

Pond 3 North was monitored seven years between 1997 and 2021. Burn activities occurred in 2017 and munitions remediation activities occurred in 2018. In 2021, Pond 3 North was in year 3 of monitoring for post-subsurface munitions remediation. The Historical data and precipitation are summarized below:

- 1998 (HLA, 1998)
  - In an El Niño year with yearly cumulative precipitation significantly above normal, Pond 3 North held water January through April. Turbidity and pH were the only water quality parameters collected in January and February.
  - El Niño year with yearly cumulative precipitation above normal (40.54 inches)
  - Data collected January-April, three monitoring events
  - Inundated from January through April
  - Inundation range 0.34-0.38 acres, mean 0.37 acres
  - Depth range 46-55 cm, mean 50 cm
  - pH range 7.57-7.95
  - turbidity range 26.9-40.1 NTU, mean 33.5 NTU
- 2015 (Burleson, 2016)
  - In a 0 consecutive drought year with below normal precipitation, Pond 3 North was inundated February through May. Water quality data were collected only in April.
  - Early storms pushed early cumulative precipitation above normal while total yearly cumulative precipitation fell below normal (14.35 inches)
  - Data collected February to May, four monitoring events
  - Inundated February to May
  - Inundation range 0.03-0.07 acres, mean 0.05 acres
  - Depth range 15-~40 cm, mean ~28 cm (depths are estimations)
  - Water quality data were collected only in April
  - pH 7.6
  - temperature 26.3° C

- dissolved oxygen 11.8 mg/L
  - turbidity 104 NTU
- 2016 (Burleson, 2017)
  - In a consecutive drought with precipitation above normal, Pond 3 North was inundated from the first recorded monitoring in March through June. The maximum inundation area was 0.22 acres. Water quality was within normal ranges. Slightly acidic to neutral pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range. Turbidity was low on average. It is likely that Pond 3 North 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 March-July, five monitoring events
  - Inundated March through June
  - Inundation range 0.03-0.22 acres, mean 0.11 acres
  - Depth range 16-54 cm, mean 36 cm
  - pH range 6.07-6.75, mean 6.31
  - temperature range 15.50°-18.71° C, mean 17.04° C
  - dissolved oxygen range 2.11-5.61 mg/L, mean 3.82 mg/L
  - turbidity range 9.6-56.7 FNU, mean 34.0 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 3 North was not inundated until March and April. The maximum inundation area was 0.05 acres. Water quality was within normal ranges. Slightly acidic to neutral pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a moderate range, with low levels.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - May, five monitoring events
  - Inundated March and April
  - Inundation range 0.02-0.05 acres, mean 0.03 acres
  - Depth range 10-24 cm, mean 17 cm
  - pH range 6.27-6.61, mean 6.44
  - temperature range 11.33°-13.33° C, mean 12.33° C
  - dissolved oxygen range 7.60-8.75 mg/L, mean 8.18 mg/L
  - turbidity range 5.3-57.4 FNU, mean 31.5 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 3 North was inundated from the first recorded monitoring in January through June. The maximum inundation area was 1.14 acres (pond was connected to 3 South). Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with low levels. Turbidity had a moderate range, with low levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - July, seven monitoring events
  - Inundated January through June
  - Inundation range 0.02-1.14 acres, mean 0.41 acres (pond connected to 3 South for upper range value and mean acreage)
  - Depth range 26-62 cm, mean 44 cm



- pH range 6.27-6.89, mean 6.64
  - temperature range 8.81°-20.89° C, mean 15.05° C
  - dissolved oxygen range 5.43-10.04 mg/L, mean 7.54 mg/L
  - turbidity range 0.3-43.9 FNU, mean 10.2 FNU
- 2020
  - In a close to normal water year, Pond 3 North was inundated from the first recorded monitoring in December through mid-June. The maximum inundation area was 0.16 acres. Water quality was within Historical ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature, dissolved oxygen, and turbidity were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - June, 15 monitoring events
  - Inundated from December through June
  - Inundation range 0-0.16 acres, mean 0.05 acres
  - Depth range 0-55 cm, mean 25.19 cm
  - pH range 6.36-7.54, mean 6.89
  - temperature range 19°-28° C, mean 21.94° C
  - dissolved oxygen range 2.4-12.79 mg/L, mean 6.96 mg/L
  - turbidity range 0.94-22.2 FNU, mean 9.22 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 3 North was briefly inundated in February
  - Maximum inundation area was 0.0165, and maximum depth was 13 cm

**Table B-7. Pond 3 South (Year 3 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1997-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1998	Dec	7.89	-	-	43.0-60.0 (NTU)	32	0.69
	Jan	-	-	-	27.1 (NTU)	32	0.71
	Feb	7.40-7.70	-	-	45.5 (NTU)	30	0.78
	Apr	-	-	-	-	33	0.78
2015	3/18/2015	-	-	-	-	0	0.00
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2016	3/31/2016	7.00	16.42	9.87	12.2	30	0.52
	4/19/2016	6.38	14.44	4.00	10.2	30	0.41
	5/9/2016	6.39	13.85	1.31	4.0	11	0.01
	6/7/2016	-	-	-	-	0	0.00
2018	1/16/2018	-	-	-	-	0	0.00
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018	-	-	-	-	0	0.00
	4/16/2018	7.13	15.67	8.75	77.7	8	0.001 <sup>‡</sup>
	5/21/2018	-	-	-	-	0	0.00
2019	1/16/2019	6.71 <sup>†</sup>	12.46 <sup>†</sup>	9.03 <sup>†</sup>	6.9 <sup>†</sup>	10	0.01 <sup>‡</sup>
	2/11/2019	6.43	9.99	9.39	26.1	33	Connected to 3 North, total 0.86 <sup>‡</sup>
	3/7/2019	6.33	12.98	5.60	6.2	35	Connected to 3 North, total 1.14 <sup>‡</sup>
	4/3/2019	6.70	15.87	6.91	27.9	33	0.44 <sup>‡</sup>
	5/7/2019	-	-	-	-	9	0.004 <sup>‡</sup>
	6/11/2019	-	-	-	-	0	0.00
2020	12/6/2019 <sup>^</sup>	-	-	-	-	14	0.0136
	1/6/2020 <sup>^</sup>	-	-	-	-	11	-
	1/29/2020 <sup>^</sup>	6.83	11	4.38	1.12	16	0.0141
	2/21/2020	-	-	-	-	0	0
	3/19/2020 <sup>^</sup>	-	-	-	-	20	0.0285
	3/31/2020 <sup>^</sup>	6.74	20.7	10.34	16.8	29	0.3869
	4/16/2020 <sup>*</sup>	-	-	-	-	29	-
	4/29/2020 <sup>^</sup>	7.28	20.8	10.28	1.76	18	0.0168
	5/26/2020	-	-	-	-	0	0
	1/5/2021	-	-	-	-	0	0
2021	2/1/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0

†Water quality probe was on its side for measurements.

‡Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

#Probe not fully submerged, \*taken during Burleson surveys, ^Peripheral inundation present

Pond 3 South was monitored seven years between 1997 and 2021. Burn activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2021, Pond 3 South was in year 3 of monitoring for post-subsurface Munitions remediation. The Historical data and precipitation are summarized below:

- 1998 (HLA, 1998)
  - In an El Niño year with yearly cumulative precipitation significantly above normal, Pond 3 South held water December through April. Turbidity and pH the only water quality parameters collected.
  - El Niño year with yearly cumulative precipitation above normal (40.54 inches)
  - Data collected December-April, four monitoring events
  - Inundated from December through April
  - Inundation range 0.69-0.78 acres, mean 0.74 acres
  - Depth range 31-33 cm, mean 32 cm
  - pH range 7.40-7.89, mean 7.66
  - turbidity range 27.1-60 NTU, mean 43.9 NTU
- 2015 (Burleson, 2016)
  - In a 0 consecutive drought year with below normal precipitation, Pond 3 South did not hold water. No water quality data were collected.
  - 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
  - 0 during all monitoring events
- 2016 (Burleson, 2017)
  - In a consecutive drought with precipitation above normal, Pond 3 South was inundated from the first recorded monitoring in March through June. The maximum inundation area was 0.52 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range. Turbidity was low on average. It is likely that Pond 3 South 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 March-June, four monitoring events
  - Inundated March through May
  - Inundation range 0.01-0.52 acres, mean 0.31 acres
  - Depth range 11-30 cm, mean 24 cm
  - pH range 6.38-7.00, mean 6.59
  - temperature range 13.85°-16.42° C, mean 14.90° C
  - dissolved oxygen range 1.31-9.87 mg/L, mean 5.06 mg/L
  - turbidity range 4.0-12.2 FNU, mean 8.8 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 3 South was inundated only in April. The maximum inundation area was 0.001 acres. Water quality was collected in April and was within

- normal ranges. Neutral pH value, temperature within normal averages for Fort Ord, moderate dissolved oxygen, and low turbidity were observed.
- Yearly cumulative precipitation 12.57 inches
  - Data collected January - May, five monitoring events
  - Inundated April
  - Inundation 0.001 acres
  - Depth 8 cm
  - pH 7.13
  - temperature 15.67° C
  - dissolved oxygen 8.75 mg/L
  - turbidity 77.7 FNU
- 2019 (Burleson, 2020)
    - In an above normal water-year, Pond 3 South was inundated from the first recorded monitoring in January through May. The maximum inundation area was 1.14 acres (pond was connected to 3 North). Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range. Turbidity was low on average.
    - Yearly cumulative precipitation 21.97 inches
    - Data collected January - June, six monitoring events
    - Inundated January through May
    - Inundation range 0.004-1.14 acres, mean 0.49 acres (pond connected to 3 North for upper range value and mean acreage)
    - Depth range 9-35 cm, mean 24 cm
    - pH range 6.33-6.71, mean 6.54
    - temperature range 9.99°-15.87° C, mean 12.83° C
    - dissolved oxygen range 5.60-9.39 mg/L, mean 7.73 mg/L
    - turbidity range 6.2-27.9 FNU, mean 16.8 FNU
  - 2020 (Chenega, 2021)
    - In a close to normal water year, Pond 3 South was inundated intermittently from the first recorded monitoring in December through April. The maximum inundation area was 0.39 acres. Water quality was within Historical ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historical ranges.
    - Yearly cumulative precipitation 18.08 inches
    - Data collected December - May, 9 monitoring events
    - Inundated intermittently from December through April, dried out two times
    - Inundation range 0-0.39 acres, mean 0.07 acres
    - Depth range 0-29 cm, mean 15.22 cm
    - pH range 6.74-7.28, mean 6.95
    - temperature range 11°-20.8° C, mean 17.5° C
    - dissolved oxygen range 4.38-10.34 mg/L, mean 7.5 mg/L
    - turbidity range 1.12-16.8 FNU, mean 6.56 FNU
  - 2021
    - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 3 South did not fill
    - Data collected Jan-March, three monitoring events

**Table B-8. Pond 16 (Year 3 Post-Subsurface Munitions Remediation)**  
**Historical Hydrology Results on Former Fort Ord 1992-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1992	3/26/1992	-	20	-	extreme <sup>z</sup>	91	-
1994	3/15/1994	-	-	-	-	>102	-
	3/29/1994	-	-	-	-	>102	-
	4/13/1994	-	-	-	-	>102	-
1995	1/11/1995	-	-	-	-	>102	-
	1/26/1995	-	-	-	-	>102	-
	2/10/1995	-	-	-	-	>102	-
	2/24/1995	-	-	-	-	>102	-
	3/10/1995	-	-	-	-	>102	-
	3/24/1995	-	-	-	-	>102	-
		-	-	-	-	>102	-
1996	1/3/1996	-	-	-	-	15	-
	1/31/1996	-	-	-	-	>91	-
	2/14/1996	-	-	-	-	>91	-
	2/29/1996	-	-	-	-	>91	-
	3/14/1996	-	-	-	-	>91	-
	3/28/1996	-	-	-	-	>91	-
	4/11/1996	-	-	-	-	>91	-
2009	4/25/1996	-	-	-	-	>91	-
	3/12/2009	-	-	-	-	76	-
	4/2/2009	-	-	-	-	61	-
2015	12/22/2014-12/23/2014	-	-	-	-	~43*	-
	2/24/2015	-	-	-	-	~45*	-
	3/18/2015	-	-	-	-	20-30*	0.27
	4/16/2015	6.40	18.30	13.90	572.0 (NTU)	15-20*	0.16
	5/28/2015	-	-	-	-	0	0.00
2017	1/23/2017	6.84	8.87	1.80	188.0	142	1.29
	2/21/2017	6.09	12.42	4.87	584.0	144	2.57
	3/22/2017	6.22	13.45	0.66	182.0	142	2.17
	4/18/2017	6.78	14.40	0.05	66.6	140	0.80
	5/25/2017	6.96	18.64	1.55	33.8	109	0.57
	6/21/2017	6.98	19.97	1.40	121.0	98	0.51
	7/27/2017	-	-	-	-	90	-
	8/15/2017	-	-	-	-	40	-
2018	9/6/2017	-	-	-	-	28	-
	11/20/2017	-	-	-	-	0	0.00
	1/18/2018	-	-	-	-	0	0.00
	2/22/2018	-	-	-	-	0	0.00
	3/20/2018	6.65†	10.24†	5.29†	140.0†	12	0.11
	4/16/2018	6.10	17.99	8.43	33.8	28	0.26
	5/22/2018	-	-	-	-	0	0.00
2020	12/13/2019	-	-	-	-	15	0.1438
2020	12/27/2019	-	-	-	-	12	-
	1/8/2020	-	-	-	-	12	-
	1/29/2020 <sup>^#</sup>	6.81	13.2	11.38	43.8	12	0.097
	2/21/2020	-	-	-	-	0	0
	3/19/2020	-	-	-	-	16	0.1734
	3/31/2020	6.28	18.8	4.38	156	44	0.3271
	4/20/2020	-	-	-	-	101	-

**Table B-8. Pond 16 (Year 3 Post-Subsurface Munitions Remediation)**  
**Historical Hydrology Results on Former Fort Ord 1992-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
	5/4/2020	6.21	15.3	0.06	122.01	88	0.5172
	5/27/2020	6.66	18.7	1.34	85.23	69	0.4311
	6/30/2020	7.09	25.1	7.19	18.31	41	0.3156
	7/14/2020	-	-	-	-	29	-
	8/3/2020^	-	-	-	-	11	0.031
2021	1/7/2021	-	-	-	-	0	0
	2021-02-02	-	-	-	-	0	0
	2/12/2021	-	-	-	-	0	0

\* In 1992, turbidity was measured qualitatively.

\* No staff gauge. Cannot access ponds to measure depth due to potential for subsurface unexploded ordnance and other hazards. Depths are estimations

#Probe not fully submerged

^Peripheral inundation present

Pond 16 was monitored ten years between 1992 and 2021 water years. Mastication activities occurred in 2016 and Munitions remediation activities occurred in 2018. In 2019, Pond 16 was in year 3 of monitoring for post-subsurface Munitions remediation. The Historical data and precipitation are summarized below:

- 1992 (Jones & Stokes, 1992)
  - In a year with near-normal precipitation, Pond 16 was surveyed once in March 1992. It should be noted that data collection did not start with the first storms or inundation.
  - Yearly cumulative precipitation near-normal (17.84 inches)
  - Data collected March, one monitoring event
  - Inundated March
  - Depth 91 cm
  - temperature 20°C
  - pH, turbidity, and dissolved oxygen data were not collected
- 1994 (Jones & Stokes, 1996)
  - In a precipitation year below normal, Pond 16 held water during both monitoring events in March and April.
  - Yearly cumulative precipitation 13.96 inches
  - Data collected in March and April, three monitoring events
  - Inundated during all monitoring events
  - No inundation areas recorded
  - Depth during all monitoring events >102 cm
  - No water quality data were collected
- 1995 (Jones & Stokes, 1996)
  - In a water-year that was above normal, Pond 16 was inundated by January monitoring and stayed inundated through March.
  - Yearly cumulative precipitation 23.38 inches
  - Data collected January-March, six monitoring events
  - Inundated during all monitoring events



- No inundation areas recorded
  - Depth during all monitoring events >102 cm
  - No water quality data were collected
- 1996 (Jones & Stokes, 1996)
  - In a water-year that was approximately normal, Pond 16 was inundated from January to April. The maximum depth was lower but similar to previous years.
  - Yearly cumulative precipitation 16.96 inches
  - Data collected January-April, eight monitoring events
  - Inundated early-January to late-April
  - No inundation areas recorded
  - Depth range 15- >91 cm, mean 73 cm
  - No water quality data collected
- 2009 (Shaw, 2010)
  - In a water-year that was below normal, Pond 16 was inundated in March and April. Depth was recorded during wildlife surveys, which occurred three times, but depth was recorded only twice. No inundation area or water quality were measured. Depth values were taken from data sheets not included in the report.
  - Depth range 61-76 cm, mean 67.5 cm
- 2015 (Burleson, 2016)
  - In a consecutive drought year with cumulative precipitation below normal, Pond 16 was inundated at the first survey in April and held water through April. Maximum inundation was 0.27 acres. Water quality data were collected once, in April.
  - Consecutive drought year with yearly cumulative precipitation of 14.35 inches
  - Data collected December - May, five monitoring events
  - Inundated December - April
  - Inundation range 0-0.27 acres, mean 0.14 acres
  - Depth range ~15-~45 cm, mean ~26 cm
  - pH 6.4 in April
  - temperature 18.3°C in April
  - dissolved oxygen 13.9 mg/L in April
  - turbidity 572 NTU in April
- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 16 was inundated from the first recorded monitoring in January through September (pond did not 0 by last recorded monitoring in September). The maximum inundation area was 2.57 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord, with a few high readings in the middle of the season. Dissolved oxygen had a small range, with moderate levels. Turbidity had a large range, with high readings at the beginning of the season.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected January - September, nine monitoring events
  - Inundated January through September (pond did not 0 by last recorded monitoring in September)
  - Inundation range 0.51-2.57 acres, mean 1.32 acres
  - Depth range 28-144 cm, mean 104 cm
  - pH range 6.09-6.98, mean 6.65
  - temperature range 8.9°-20.0° C, mean 14.6° C

- dissolved oxygen range 0.05-4.87 mg/L, mean 1.72 mg/L
  - turbidity range 33.8-584.0 FNU, mean 195.9 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 16 was inundated in March and April. The maximum inundation area was 0.26 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal range for Fort Ord. Dissolved oxygen had a small range and moderate levels. Turbidity had moderate levels.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected November, January - May, six monitoring events
  - Inundated March and April
  - Inundation range 0.11-0.26 acres, mean 0.18 acres
  - depth range 12-28 cm, mean 20 cm
  - pH range 6.10-6.65, mean 6.38
  - temperature range 10.24°-17.99° C, mean 14.12° C
  - dissolved oxygen range 5.29-8.43 mg/L, mean 6.86 mg/L
  - turbidity range 33.8-140 FNU, mean 86.9 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 16 was inundated from the second recorded monitoring in February through September. The maximum inundation area was 0.74 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal range for Fort Ord, with higher readings in May and June. Dissolved oxygen had a small range and low levels. Turbidity had a moderate range, with high readings in February, March, and April.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - September, six monitoring events
  - Inundated February through September
  - Inundation range 0.54-0.74 acres, mean 0.67 acres
  - Depth range 18-139 cm, mean 93 cm
  - pH range 6.15-6.61, mean 6.40
  - temperature range 7.33°-17.94° C, mean 13.07° C
  - dissolved oxygen range 2.75-6.68 mg/L, mean 4.29 mg/L
  - turbidity range 60.1-360.0 FNU, mean 176.6 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 16 was inundated intermittently from the first recorded monitoring in December through beginning of August. The maximum inundation area was 0.52 acres. Water quality was within Historical ranges. Slightly acidic pH to normal values were observed. Temperature reached a record value of 25.1 °C in June, but otherwise was within normal averages for Fort Ord. Dissolved oxygen and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - August, 14 monitoring events
  - Inundated intermittently from December through August, dried out two times
  - Inundation range 0-0.52 acres, mean 0.19 acres
  - Depth range 0-101 cm, mean 30 cm
  - pH range 6.21-7.09, mean 6.61
  - temperature range 13.2°-25.1° C, mean 18.22° C
  - dissolved oxygen range 0.06-11.38 mg/L, mean 4.87 mg/L

- turbidity range 18.31-156 FNU, mean 85.07 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 16 did not fill
  - Data collected Jan-February, three monitoring events

**Table B-9. Pond 35 (Year 3 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1992-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1992	3/27/1992	-	18	-	extreme*	91	-
1994	3/15/1994	-	-	-	-	46	0.2
	3/29/1994	-	-	-	-	61	-
	4/13/1994-4/14/1994	-	-	-	-	33	-
1995	1/11/1995	-	-	-	-	76	-
	1/26/1995	-	-	-	-	102	-
	2/10/1995	-	-	-	-	51	-
	2/24/1995	-	-	-	-	38	-
	3/10/1995	-	-	-	-	>102	-
	3/24/1995	-	-	-	-	>102	-
1996	1/3/1996	-	-	-	-	3	-
	1/18/1996	-	-	-	-	5	-
	1/31/1996	-	-	-	-	41	-
	2/14/1996	-	-	-	-	41	-
	2/29/1996	-	-	-	-	>91	-
	3/14/1996	-	-	-	-	>91	-
	3/28/1996	-	-	-	-	33	-
	4/11/1996	-	-	-	-	0	-
	4/25/1996	-	-	-	-	0	-
	5/9/1996	-	-	-	-	0	-
2015	2/24/2015	-	-	-	-	0	0.00
	3/18/2015	-	-	-	-	0	0.00
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2016	3/31/2016	6.76	17.76	0.00	230.0	5	0.001
	4/19/2016	-	-	-	-	0	0.00
2018	1/16/2018	-	-	-	-	0	0.00
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018	-	-	-	-	0	0.00
	4/16/2018	-	-	-	-	0	0.00
2019	1/16/2019	-	-	-	-	0	0.00
	2/11/2019	6.91	7.64	8.48	193.0	88	0.42 <sup>‡</sup>
	3/6/2019	6.84	16.30	5.61	25.7	47	0.19 <sup>‡</sup>
	4/3/2019	6.81	13.88	2.35	27.4	16	0.01 <sup>‡</sup>
	5/7/2019	-	-	-	-	0	0.00
2020	12/6/2019	-	-	-	-	0	0
	12/23/2019	-	-	-	-	0	0

**Table B-9. Pond 35 (Year 3 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1992-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
	12/31/2019	-	-	-	-	0	0
	1/8/2020	-	-	-	-	0	0
	1/29/2020	-	-	-	-	0	0
	2/21/2020	-	-	-	-	0	0
2020	3/19/2020	-	-	-	-	27	0.0666
	4/3/2020	6.56	15.1	6.23	63.53	32	0.0872
	4/16/2020*	-	-	-	-	37	-
	4/29/2020	6.88	18.1	1.67	49.77	25	0.0561
	5/21/2020*	-	-	-	-	0	0
	5/26/2020	-	-	-	-	0	0
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	3/02/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0

\* In 1992, turbidity was measured qualitatively.

\*taken during Burleson survey

Pond 35 was monitored ten years between 1992 and 2021. Mastication activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2021, Pond 35 was in year 3 of monitoring for post-subsurface Munitions remediation. The Historical data and precipitation are summarized below:

- 1992 (Jones & Stokes, 1992)
  - In a year with near-normal precipitation, Pond 35 was surveyed once in March 1992. It should be noted that data collection did not start with the first storms or inundation.
  - Yearly cumulative precipitation near-normal (17.84 inches)
  - Data collected March, one monitoring event
  - Inundated March
  - Depth 91 cm
  - temperature 18°C
  - pH, turbidity, and dissolved oxygen data were not collected
- 1994 (Jones & Stokes, 1996)
  - In a precipitation year below normal, Pond 35 held water during both monitoring events in March and April. No water quality data were collected.
  - Yearly cumulative precipitation 13.96 inches
  - Data collected in March and April, two monitoring events
  - Inundated during both monitoring events
  - No inundation areas recorded
  - depth range 33.02-60.96 cm, mean 46.57
  - No water quality data collected
- 1995 (Jones & Stokes, 1996)

- In a water-year that was above normal, Pond 35 was inundated by January monitoring and stayed inundated through March. No water quality data were collected
  - Yearly cumulative precipitation 23.38 inches
  - Data collected January-March, six monitoring events
  - Inundated during all monitoring events
  - No inundation areas recorded
  - depth range 38.10 - >101.6 cm, mean 78.32 cm
  - No water quality data collected
- 1996 (Jones & Stokes, 1996)
  - In a water-year that was approximately normal, Pond 35 was inundated from the first monitoring in January through March. The maximum depth was lower than the previous year but similar to the 1994 water-year.
  - Yearly cumulative precipitation 16.96 inches
  - Data collected January-May, ten monitoring events
  - Inundated January to March
  - No inundation area recorded
  - depth range 2.58- >91.44 cm, mean 43.54 cm
  - no water quality data collected
- 2015 (Burleson, 2016)
  - In a 0, consecutive drought year with cumulative precipitation below normal, Pond 35 did not fill.
  - Consecutive drought year with yearly cumulative precipitation 14.35 inches
  - Data collected February-May, four monitoring events
  - 0 though the entire monitoring season
- 2016 (Burleson, 2017)
  - In a consecutive drought with precipitation above normal, Pond 35 was inundated only for March monitoring. The maximum inundation area was 0.001 acres. Water quality data were collected once in March and were within normal ranges. Neutral pH value, moderate temperature, low dissolved oxygen, and medium turbidity were observed. 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 March-April, two monitoring events
  - Inundated in March
  - Inundation 0.001 acres
  - depth 5 cm
  - pH 6.76
  - temperature range 17.76° C
  - dissolved oxygen 0.0 mg/L
  - turbidity 230.0 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 35 did not hold water.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January-April, four monitoring events
  - 0 in all monitoring events
  - No water quality data collected
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 35 was inundated from the second recorded monitoring in February through April. The maximum inundation area was 0.42 acres.



Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range with low levels. Turbidity was moderate, with a high reading in February.

- Yearly cumulative precipitation 21.97 inches
- Data collected January - May, five monitoring events
- Inundated February through April
- Inundation range 0.01-0.42 acres, mean 0.21 acres
- Depth range 16-88 cm, mean 50 cm
- pH range 6.81-6.91, mean 6.85
- temperature range 7.64°-16.30° C, mean 12.61° C
- dissolved oxygen range 2.35-8.48 mg/L, mean 5.48 mg/L
- turbidity range 25.7-193.0 FNU, mean 82.0 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 35 was inundated from March through April. The maximum inundation area was 0.38 acres. Water quality was within Historical ranges. Slightly acidic pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 11 monitoring events
  - Inundated from March through May, dried out twice
  - Inundation range 0-0.09 acres, mean 0.02 acres
  - Depth range 0-37 cm, mean 10.08 cm
  - pH range 6.56-6.88, mean 6.72
  - temperature range 15.1°- 18.1° C, mean 18.1° C
  - dissolved oxygen range 1.67-6.23 mg/L, mean 3.95 mg/L
  - turbidity range 49.77-63.53 FNU, mean 56.65 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 35 did not fill
  - Data collected Jan-March, four monitoring events

**Table B-10. Pond 39 (Year 3 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1997-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1998	Dec	7.58-7.95	-	-	>100.0 (NTU)	36	0.24
	Jan	-	-	-	27.0-204.0 (NTU)	35	0.44
	Feb	7.57-8.00	-	-	48.7 (NTU)	48	0.49
	April	-	-	-	-	48	0.49
2015	2/24/2015	-	-	-	-	0	0.00
	3/18/2015	-	-	-	-	0	0.00
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2016	3/31/2016	6.31	13.85	2.25	177.0	38 <sup>§</sup>	0.03
	4/19/2016	6.37	11.31	2.29	23.8	36 <sup>§</sup>	0.01
	5/9/2016	-	-	-	-	0	0.00
2018	11/20/2017	-	-	-	-	0	0.00
	1/16/2018	5.94	11.78	2.36	43.1	15	0.002
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018	6.51	8.35	4.59	142.0	38	0.01
	4/16/2018	6.21	12.68	5.81	66.2	34	0.01
	5/21/2018	-	-	-	-	0	0.00
2019	12/13/2018	-	-	-	-	25	-
	1/16/2019	6.47	10.40	5.91	13.0	43	0.01 <sup>‡</sup>
	2/11/2019	6.63	7.18	5.26	574.0	50	0.31 <sup>‡</sup>
	3/6/2019	6.38	13.80	4.29	528.0	50	0.25 <sup>‡</sup>
	4/3/2019	6.52	13.98	4.33	460.0	44	0.01 <sup>‡</sup>
	5/7/2019	-	-	-	-	7	-
	6/10/2019	6.34	30.37	8.20	>1000	14	0.002
	7/9/2019	-	-	-	-	0	0.00
2020	12/6/2019 <sup>^</sup>	-	-	-	-	42	0.0079
	1/8/2020	-	-	-	-	37	-
	1/29/2020	6.25	11.2	2.35	74.97	38	0.0055
	2/21/2020	-	-	-	-	20	-
	2/27/2020 <sup>#</sup>	6.42	16.7	7.65	34.17	15	8e-04
	3/12/2020	-	-	-	-	0	0
	3/17/2020 <sup>*</sup>	-	-	-	-	44	-
	3/19/2020 <sup>^</sup>	-	-	-	-	43	0.0075
	4/3/2020 <sup>^</sup>	6.37	14.1	6.22	43.27	43	0.0089
	4/16/2020 <sup>*</sup>	-	-	-	-	45	-
2020	4/29/2020 <sup>^</sup>	6.38	17.4	4.86	3.32	34	0.005

2021	5/20/2020 <sup>‡</sup>	-	-	-	-	0	0
	5/26/2020	-	-	-	-	0	0
	1/5/2021	-	-	-	-	0	0
	2/1/2021 <sup>^</sup>	8	10.4	3.75	38.62	0.006	38
	2/10/2021	-	-	-	-	-	27
	2/24/2021	-	-	-	-	-	13
	3/02/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0

§ A second gauge was added in 2017 at the deepest point of the pool. A difference of 30 cm was measured between the prior gauge and new gauge in 2018. Depths in 2016 were adjusted to reflect the offset.

‡Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

#Probe not fully submerged

\*taken during Burleson surveys

^Peripheral inundation present

Pond 39 was monitored seven years between 1997 and 2020. Burn activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2021, Pond 39 was in year 3 of monitoring for post-burn and year 2 for post-subsurface Munitions remediation. The Historical data and precipitation are summarized below:

- 1998 (HLA, 1998)
  - In an El Niño year with yearly cumulative precipitation significantly above normal, Pond 39 held water December through April. Turbidity and pH were the only water quality parameters collected.
  - El Niño year with yearly cumulative precipitation above normal (40.54 inches)
  - Data collected December-April, four monitoring events
  - Inundated from December through April
  - Inundation range 0.24-0.49 acres, mean 0.41 acres
  - Depth range 35-48 cm, mean 42 cm
  - pH range 7.57-8.00, mean 7.78
  - turbidity range 27.0-204.0 NTU, mean 95.0 NTU
- 2015 (Burleson, 2016)
  - In a 0 consecutive drought year with below normal precipitation, Pond 39 remained 0. No water quality data were collected.
  - Early storms pushed early cumulative precipitation above normal while total yearly cumulative precipitation fell below normal (14.35 inches)
  - Data collected February to May, four monitoring events
  - No water quality data were collected
- 2016 (Burleson, 2017)
  - In a consecutive drought with precipitation above normal, Pond 39 was inundated from the first recorded monitoring in March and April and was 0 by May monitoring. The maximum inundation area was 0.03 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range. Turbidity had a moderate reading in March and a low reading in April. It is likely that Pond 39 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 March - May, three monitoring events
  - Inundated March through May
  - Inundation range 0.01-0.03 acres, mean 0.02 acres
  - Depth range 6-8 cm, mean 7 cm
  - pH range 6.31-6.37, mean 6.34
  - temperature range 11.31°-13.85° C, mean 12.58° C
  - dissolved oxygen range 2.25-2.29 mg/L, mean 2.27 mg/L
  - turbidity range 23.8-177.0 FNU, mean 100.4 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 39 was inundated in January, March, and April, but was 0 in February and May. The maximum inundation area was 0.01 acres. Water quality was within normal ranges. Moderately to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range and relatively low. Turbidity had moderate to low levels.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected November - May, six monitoring events
  - Inundated January, March, and April
  - Inundation range 0.002-0.01 acres, mean 0.01 acres
  - Depth range 15-38 cm, mean 29 cm
  - pH range 5.94-6.51, mean 6.22
  - temperature range 8.35°-12.68° C, mean 10.94° C
  - dissolved oxygen range 2.36-5.81 mg/L, mean 4.25 mg/L
  - turbidity range 43.1-142.0 FNU, mean 83.8 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 39 was inundated from the first recorded monitoring in January through June. The maximum inundation area was 0.31 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord, with a high reading in June. Dissolved oxygen had a small range and relatively low. Turbidity had moderate levels with a high reading in June.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected December - July, eight monitoring events
  - Inundated January through June
  - Inundation range 0.002-0.31 acres, mean 0.12 acres
  - Depth range 7-50 cm, mean 33 cm
  - pH range 6.34-6.63, mean 6.47
  - temperature range 7.18°-30.37° C, mean 15.15° C
  - dissolved oxygen range 4.29-8.20 mg/L, mean 5.60 mg/L
  - turbidity range 13->1000 FNU, mean 393.8 FNU
- 2020
  - In a close to normal water year, Pond 39 was inundated intermittently from the first recorded monitoring in December through April. The maximum inundation area was 0.009 acres. Water quality was within Historical ranges. Slightly acidic pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 12 monitoring events
  - Inundated from December through April

- Inundation range 0-0.009 acres, mean 0.004 acres
  - Depth range 0-45 cm, mean 27.77 cm
  - pH range 6.25-6.42, mean 6.36
  - temperature range 11.2°-17.4° C, mean 14.85° C
  - dissolved oxygen range 2.35-7.65 mg/L, mean 5.27 mg/L
  - turbidity range 3.32-74.97 FNU, mean 38.93 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 39 was briefly inundated in February
  - Maximum inundation area was 0.006, and maximum depth was 38 cm

**Table B-11. Pond 40 South (Year 3 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1997-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1998	Dec	8.67	-	-	>100.0 (NTU)	27	0.12
	Jan	-	-	-	27.0 (NTU)	27	0.21
	Feb	7.60	-	-	50.4 (NTU)	32	0.21
	April	-	-	-	-	33	0.21
2015	3/18/2015	-	-	-	-	0	0.00
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2016	3/31/2016	6.71	16.59	0.08	84.6	20	0.08
	4/19/2016	-	-	-	-	0	0.00
2017	1/23/2017	6.36	10.26	1.83	135.0	29	0.30
	2/28/2017	6.79	6.61	11.62	56.1	31	0.61
	3/22/2017	6.47	13.50	4.88	596.0	34	0.96
	4/18/2017	6.57	16.58	4.81	37.6	28	0.12
	5/25/2017	-	-	-	-	0	0.00
2018	1/16/2018	-	-	-	-	0	0.00
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018	-	-	-	-	0	0.00
	4/16/2018	-	-	-	-	0	0.00
2019	1/16/2019	-	-	-	-	0	0.00 <sup>‡</sup>
	2/11/2019	6.55	7.58	7.63	381.0	28	0.22 <sup>‡</sup>
	3/6/2019	6.80	17.36	9.75	19.2	28	0.11 <sup>‡</sup>
	4/3/2019	6.75	13.63	3.30	3.3	20	0.05 <sup>‡</sup>
	5/7/2019	-	-	-	-	0	0.00
2020	12/6/2019	-	-	-	-	0	0
	1/8/2020	-	-	-	-	0	0
	1/29/2020	-	-	-	-	0	0
	2/21/2020	-	-	-	-	0	0
	3/19/2020 <sup>^</sup>	-	-	-	-	14	0.0167
	4/3/2020 <sup>^</sup>	6.04	13.8	1.31	70.47	17	0.0247
	4/16/2020 <sup>*</sup>	-	-	-	-	20	-
	4/29/2020	-	-	-	-	0	0
	5/26/2020	-	-	-	-	0	0
	1/5/2021	-	-	-	-	0	0
2021	2/1/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0

<sup>‡</sup>Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

<sup>\*</sup>taken during Burleson surveys

<sup>^</sup>Peripheral inundation present

Pond 40 South was monitored eight years between 1997 and 2021. Burn activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2021, Pond 40 South was in year 3 of monitoring for post-subsurface Munitions remediation. The Historical data and precipitation are summarized below:

- 1998 (HLA, 1998)
  - In an El Niño year with yearly cumulative precipitation significantly above normal, Pond 40 South held water through April. Turbidity and pH were collected December through February.
  - El Niño year with yearly cumulative precipitation above normal (40.54 inches)
  - Data collected December-April, four monitoring events
  - Inundated from December through April
  - Inundation range 0.12-0.21 acres, mean 0.19 acres
  - Depth range 27-33 cm, mean 30 cm
  - pH range 7.60-8.67, mean 8.14
  - turbidity range 27- >100 NTU, mean 59.1 NTU
- 2015 (Burleson, 2016)
  - In a consecutive drought year with cumulative precipitation below normal, Pond 40 South did not fill.
  - Consecutive drought year with yearly cumulative precipitation 14.35 inches
  - Data collected March-May, three monitoring events
  - 0 though the entire monitoring season
- 2016 (Burleson, 2017)
  - In a consecutive drought year with cumulative precipitation above normal, Pond 40 South held water through March. Water quality data were collected once, in March. It is likely that Pond 40 South was inundated earlier in the water-year and maximum inundation was not captured. It should be noted that data collection did not start with the first storm or inundation.
  - Drought year with cumulative precipitation above normal (21.21 inches)
  - Data collected March-April, two monitoring events
  - Inundated from March-April
  - Inundation 0.08 acres in March
  - Depth 20 cm in March
  - pH 6.71 in March
  - temperature 16.59° C
  - dissolved oxygen 0.08 mg/L
  - turbidity range 84.6 FNU
- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 40 South was inundated from the first recorded monitoring in January through May. The maximum inundation area was 0.96 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a large range. Turbidity was moderate on average, with a few high readings in January and March.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected January - May, five monitoring events
  - Inundated January through April
  - Inundation range 0.12-0.96 acres, mean 0.50 acres
  - Depth range 28-34 cm, mean 31 cm



- pH range 6.36-6.79, mean 6.55
  - temperature range 6.6°-16.6° C, mean 11.7° C
  - dissolved oxygen range 1.83-11.62 mg/L, mean 5.79 mg/L
  - turbidity range 37.6-596.0 FNU, mean 206.2 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 40 South did not hold water. No water quality data were collected.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - April, four monitoring events
  - 0 during all monitoring events
  - No water quality data were collected
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 40 South was inundated from the second recorded monitoring in February through April. Peripheral ponding not hydrologically connected to the staff gauge was observed in January. The maximum inundation area was 0.22 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range with low levels. Turbidity was moderate on average, with a high reading in February.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - May, five monitoring events
  - Inundated February through April
  - Inundation range 0.05-0.22 acres, mean 0.12 acres
  - Depth range 20-28 cm, mean 25 cm
  - pH range 6.55-6.80, mean 6.70
  - temperature range 7.58°-17.36° C, mean 12.86° C
  - dissolved oxygen range 3.30-9.75 mg/L, mean 6.89 mg/L
  - turbidity range 3.3-381.0 FNU, mean 134.5 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 40 South was inundated from March through April. The maximum inundation area was 0.025 acres. Water quality was within Historical ranges. Slightly acidic pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 12 monitoring events
  - Inundated from December through April
  - Inundation range 0-0.009 acres, mean 0.004 acres
  - Depth range 0-45 cm, mean 27.77 cm
  - pH range 6.25-6.42, mean 6.36
  - temperature range 11.2°-17.4° C, mean 14.85° C
  - dissolved oxygen range 2.35-7.65 mg/L, mean 5.27 mg/L
  - turbidity range 3.32-74.97 FNU, mean 38.93 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 40 South did not fill
  - Data collected Jan-March, three monitoring events

**Table B-12. Pond 41 (Year 3 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1997-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1998	Dec	7.53	-	-	25 (NTU)	52	1.45
	Jan	-	-	-	3.48 (NTU)	61	1.70
	Feb	7.48	-	-	3.82 (NTU)	102	2.13
	April	-	-	-		>127	2.13
2015	2/24/2015	-	-	-	-	0	0.00
	3/18/2015	-	-	-	-	0	0.00
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2016	4/4/2016	6.56	12.64	2.40	124.0	60	1.44
	4/18/2016	6.73	14.73	1.58	15.8	46	1.28
	5/9/2016	6.79	15.01	1.75	54.3	34	0.33
	6/7/2016	-	-	-		0	0.00
2019	2/14/2019	6.34	13.03	7.99	3.00	61	1.29 <sup>‡</sup>
	3/6/2019	6.70	13.54	7.09	2.1	69	1.43
	4/2/2019	6.28	14.20	5.65	0.9	63	1.31 <sup>‡</sup>
	5/7/2019	6.27	16.13	3.30	1.7	38	0.18 <sup>‡</sup>
	6/11/2019	6.45	18.59	8.18	31.4	12	0.002
	7/9/2019	-	-	-	-	0	0.00
2020	12/6/2019	-	-	-	-	0	0
	12/20/2019	-	-	-	-	0	0
	12/23/2019	-	-	-	-	0	0
	12/31/2019 <sup>^</sup>	-	-	-	-	0	0
	1/29/2020 <sup>^#</sup>	7.08	11.9	17.16	1.46	15	0.0011
	2/19/2020	-	-	-	-	0	0
	3/11/2020	-	-	-	-	0	0
	3/19/2020 <sup>^</sup>	-	-	-	-	44	0.1503
	4/3/2020 <sup>^</sup>	6.26	12.9	1.58	151.21	49	0.4961
	4/16/2020 <sup>*</sup>	-	-	-	-	56	-
	4/29/2020 <sup>^</sup>	6.26	17.6	0.01	7.62	47	0.4152
	5/26/2020	-	-	-	-	0	0
	6/16/2020 <sup>*</sup>	-	-	-	-	0	0
	1/5/2021	-	-	-	-	0	0
2021	2/1/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0

<sup>‡</sup>Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

<sup>#</sup>Probe not fully submerged

<sup>\*</sup>taken during Burleson surveys, <sup>^</sup>Peripheral inundation present

Pond 41 was monitored six years between 1997 and 2021 water years. Munitions remediation activities occurred in 2018. Pond 41 is a post-subsurface Munitions remediation vernal pool and was in year 3 of monitoring in 2021. The Historical data and precipitation are summarized below:

- 1998 (HLA, 1998)
  - In an El Niño year with yearly cumulative precipitation significantly above normal, Pond 41 held water December through April. Turbidity and pH were the only water quality parameters collected in December and February.
  - El Niño year with yearly cumulative precipitation above normal (40.54 inches)
  - Data collected December-April, four monitoring events
  - Inundated from December through April
  - Inundation range 1.45-2.13 acres, mean 1.85 acres
  - Depth range 52 - >127 cm, mean 85 cm
  - pH range 7.48-7.53, mean 7.51
  - turbidity range 3.48-25.0 NTU, mean 1.08 NTU
- 2015 (Burleson, 2016)
  - In a 0 consecutive drought year with below normal precipitation, Pond 41 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 February to May, four monitoring events
  - 0 in all monitoring events
  - No water quality data collected
- 2016 (Burleson, 2017)
  - In a consecutive drought year with cumulative precipitation above normal, Pond 41 held water from April-May. Water quality results had a slightly acidic pH, normal temperature, low 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-June, four monitoring events
  - Inundated April through May
  - Inundation range 0.33-1.44 acres, mean 1.02 acres
  - Depth range 34-60 cm, mean 47 cm
  - pH range 6.56-6.79, mean 6.69
  - temperature range 12.64°-15.01° C, mean 14.13° C
  - dissolved oxygen range 1.58-2.40 mg/L, mean 1.91 mg/L
  - turbidity range 15.8-124.0 FNU, mean 64.7 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 41 was inundated from the first recorded monitoring in February through June. The maximum inundation area was 1.43 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range. Turbidity had a small range, with low levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected February through July, six monitoring events
  - Inundated February through June
  - Inundation range 0.18-1.43 acres, mean 0.84 acres

- Depth range 12-69 cm, mean 49 cm
- pH range 6.27-6.70, mean 6.41
- temperature range 13.03°-18.59° C, mean 15.10° C
- dissolved oxygen range 3.30-8.18 mg/L, mean 6.44 mg/L
- turbidity range 0.9-31.4 FNU, mean 7.8 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 41 was inundated intermittently from the end of January through the end of April. The maximum inundation area was 0.50 acres. Water quality was generally within Historical ranges. Slightly acidic pH to normal values were observed. Dissolved oxygen in January and turbidity in April were highest on record, but otherwise water quality parameters were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 12 monitoring events
  - Inundated intermittently from January through August, dried out two times
  - Inundation range 0-0.50 acres, mean 0.09 acres
  - Depth range 0-56 cm, mean 16.23 cm
  - pH range 6.26-7.08, mean 6.53
  - temperature range 11.9°-17.6° C, mean 14.13° C
  - dissolved oxygen range 0.01-17.16 mg/L, mean 4.87 mg/L
  - turbidity range 1.46-151.21 FNU, mean 53.43 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 41 did not fill
  - Data collected Jan-March, three monitoring events

**Table B-13. Pond 42 (Year 3 Post-Subsurface Munitions Remediation)  
Historical Hydrology Results on Former Fort Ord 1997-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1998	Dec	8.90	-	-	40.0 (NTU)	68	0.46
	Jan	-	-	-	4.5-5.0 (NTU)	75	0.77
	Feb	7.40	-	-	3.0 (NTU)	76	0.96
	April	-	-	-	-	74	0.96
2000	1/26/2000	-	-	-	-	41	0.46
	2/23/2000	-	-	-	-	-	0.69
	3/13/2000	5.91	-	-	2.42 (NTU)	>76	0.82
	6/15/2000	-	-	-	-	20	0.01
2001	1/12/2001	-	-	-	-	41	0.34
	3/26/2001	6.30	-	-	-	46	0.11
	4/18/2001- 4/19/2001	7.40	-	-	-	15	-
	5/23/2001- 5/24/2001	0.00	-	-	-	0	0.00
2002	1/23/2002	-	-	-	10.8 (NTU)	18	0.07
	2/25/2002	-	-	-	12.0 (NTU)	13	0.04
	3/27/2002	0.00	-	-	0	0	0.00
	4/17/2002	0.00	-	-	0	0	0.00
	5/1/2002	0.00	-	-	0	0	0.00
2003	1/28/2003	6.30	-	-	16.0 (NTU)	25	0.11
	2/24/2003	-	-	-	-	15	0.05
	3/29/2003	-	-	-	-	0	0.000
2015	3/18/2015	-	-	-	-	0	0.00
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2017	1/23/2017	6.47	10.36	2.60	51.3	58	0.52
	2/28/2017	6.86	9.39	6.55	2.0	76	0.81
	3/22/2017	6.08	13.28	4.26	>1000	72	0.77
	4/18/2017	6.97	16.53	11.15	57.3	62	0.58
	5/25/2017	5.97	17.60	5.27	60.1	38	0.30
	6/15/2017	5.54	17.01	2.63	70.4	~28'	0.34
	7/7/2017	-	-	-	-	0	0.00
2018	1/15/2018	6.82	18.26	0.65	93.9	5	0.001
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018	6.78	15.61	6.85	40.3	13	0.02‡
	4/16/2018	6.79	12.18	8.69	16.1	24	0.24
	5/21/2018	-	-	-	-	0	0.00

**Table B-13. Pond 42 (Year 3 Post-Subsurface Munitions Remediation)  
Historical Hydrology Results on Former Fort Ord 1997-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2019	1/16/2019	6.84	11.99	9.94	14.8	15	0.03 <sup>‡</sup>
	2/11/2019	7.14	10.40	8.12	28.2	63	0.54 <sup>‡</sup>
	3/6/2019	6.85	12.82	7.29	15.3	64	0.59 <sup>‡</sup>
	4/3/2019	6.96	14.51	4.42	1.6	55	0.48 <sup>‡</sup>
	5/7/2019	6.80	17.50	7.36	0.8	34	0.38 <sup>‡</sup>
	6/11/2019	6.45	19.59	5.36	3.7	20	0.13 <sup>‡</sup>
	7/9/2019	-	-	-	-	0	0.00
2020	12/6/2019 <sup>^</sup>	-	-	-	-	28	0.276
	12/31/2019 <sup>^</sup>	7.54	14.7	10.24	2.89	22	0.1418
	1/6/2020 <sup>^</sup>	-	-	-	-	20	-
	1/29/2020 <sup>^</sup>	6.75	15.3	6.56	4.87	21	0.1088
	2/19/2020 <sup>^</sup>	-	-	-	-	0	0
	2/27/2020 <sup>^</sup>	-	-	-	-	0	0.012
	3/11/2020	-	-	-	-	0	0
	3/19/2020 <sup>^</sup>	-	-	-	-	22	0.1075
	4/3/2020 <sup>^</sup>	7.21	20.1	9.86	1.62	36	0.3487
	4/15/2020 <sup>‡</sup>	-	-	-	-	51	-
	4/29/2020 <sup>^</sup>	7.17	18.1	9.23	0.74	41	0.3787
	5/19/2020 <sup>‡</sup>	-	-	-	-	26	-
	5/26/2020	7.95	31.6	8.15	0.05	19	0.1015
	6/10/2020 <sup>^</sup>	-	-	-	-	0	0
	6/26/2020 <sup>‡</sup>	-	-	-	-	0	0
	6/30/2020	-	-	-	-	0	0
	1/5/2021	-	-	-	-	0	0
2021	2/1/2021 <sup>^</sup>	6.84	18.9	5.56	449.52	0.0082	10
	2/10/2021	-	-	-	-	0	0
	2/12/2021	-	-	-	-	-	2
	3/10/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0

<sup>‡</sup>Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

<sup>\*</sup>taken during Burleson surveys

<sup>^</sup>Peripheral inundation present

<sup>‡</sup>Decreased visibility due to emergent vegetation.

Pond 42 was monitored eleven years between 1997 and 2021. Burn activities occurred in October 2017 and mastication and Munitions remediation activities occurred in the summer of 2018. In 2021, Pond 42 was in year 3 of monitoring for post-subsurface Munitions remediation. All years prior to 2018 are baseline. The Historical data and precipitation are summarized below:

- 1998 (HLA, 1998)
  - In an El Niño year with yearly cumulative precipitation significantly above normal, Pond 42 held water through April. Turbidity and pH were collected December through February.
  - El Niño year with yearly cumulative precipitation above normal (40.54 inches)
  - Data collected December-April, four monitoring events
  - Inundated from December through April
  - Inundation range 0.46-0.96 acres, mean 0.79 acres
  - Depth range 68->76 cm, mean 73 cm
  - pH range 7.40-8.90, mean 8.15
  - turbidity range 3.0-40.0 NTU, mean 15.9 NTU
- 2000 (Harding Lawson Associates, 2001)
  - In a precipitation year below normal, Pond 42 held water from January through June with a maximum recorded inundation of 0.82 acres. Water quality data were only collected once, in March.
  - Yearly cumulative precipitation 16.13 inches
  - Data collected January-June, four monitoring events
  - Inundated January through April
  - Inundation range 0.01-0.82 acres, mean 0.49 acres
  - Depth range 20- >76 cm, mean 46 cm
  - pH 5.91 in March
  - turbidity 2.42 NTU in March
- 2001 (Harding ESE, 2002)
  - In a precipitation year below normal, Pond 42 held water from January through April with a maximum recorded inundation of 0.11 acres. Water quality data were only collected twice.
  - Yearly cumulative precipitation 15.52 inches
  - Data collected January- May, five monitoring events
  - Inundated January through April
  - Inundation range 0.11-0.34, mean 0.15 acres
  - Depth range 15-46 cm, mean 34 cm
  - pH range 6.30-7.40, mean 6.85
- 2002 (Mactec, 2003)
  - In a precipitation year below normal, Pond 42 held water from January through April with a maximum recorded inundation of 0.07 acres. Turbidity was the only water quality parameter measured.
  - Yearly cumulative precipitation 11.42 inches
  - Data collected January-May, five monitoring events
  - Inundated January through February
  - Inundation range 0.04-0.07 acres, mean 0.06 acres
  - Depth range 13-18 cm, mean 16 cm
  - Turbidity range 10.8-12.0 NTU, mean 11.4 NTU
- 2003 (Mactec, 2004)
  - In a precipitation year below normal, Pond 42 held water from January through April with a maximum recorded inundation of 0.11 acres. Water quality data were only collected once, in January.
  - Yearly cumulative precipitation 15.02 inches



- Data collected January-March, three monitoring events
  - Inundated January through February
  - Inundation range 0.05-0.11 acres, mean 0.08 acres
  - Depth range 15-25 cm, mean 20 cm
  - pH 6.3 in January
  - turbidity 16.0 NTU in January
- 2015 (Burleson, 2016)
  - In a 0, consecutive drought year with cumulative precipitation below normal, Pond 42 did not fill.
  - Consecutive drought year with yearly cumulative precipitation 14.35 inches
  - Data collected March-May, three monitoring events
  - 0 through the entire monitoring season
- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 42 was inundated from the first recorded monitoring in January through July. The maximum inundation area was 0.806 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a large range, with a very high reading in March.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected January - July, seven monitoring events
  - Inundated January through June
  - Inundation range 0.30-0.81 acres, mean 0.55 acres
  - Depth range ~28-76 cm, mean 56 cm
  - pH range 5.54-6.97, mean 6.32
  - temperature range 9.4°-17.6° C, mean 14.0° C
  - dissolved oxygen range 2.60-11.15 mg/L, mean 5.41 mg/L
  - turbidity range 2.0 - >1000 FNU, mean 206.9 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 42 held water for the January, March, and April monitoring, but was 0 in February and May. The maximum inundation area was 0.24 acres. Water quality was within normal ranges. Neutral pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a large range and turbidity had a small range, with moderate levels.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - May, five monitoring events
  - Inundated January, March-April
  - Inundation range 0.001-0.24 acres, mean 0.09 acres
  - Depth range 5-24 cm, mean 14 cm
  - pH range 6.78-6.82, mean 6.80
  - temperature range 12.18°-18.26° C, mean 15.35° C
  - dissolved oxygen range 0.65-8.69 mg/L, mean 5.40 mg/L
  - turbidity range 16.1-93.9 FNU, mean 50.1 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 42 was inundated from the first recorded monitoring in January through June. The maximum inundation area was 0.59 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were

observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen and turbidity had small ranges, with moderate levels.

- Yearly cumulative precipitation 21.97 inches
- Data collected January - July, seven monitoring events
- Inundated January through June
- Inundation range 0.03-0.59 acres, mean 0.36 acres
- Depth range 15-64 cm, mean 42 cm
- pH range 6.45-7.14, mean 6.84
- temperature range 10.40°-19.59° C, mean 14.47° C
- dissolved oxygen range 4.42-9.94 mg/L, mean 7.08 mg/L
- turbidity range 0.8-28.2 FNU, mean 10.7 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 42 was inundated intermittently from the first recorded monitoring in December through May. The maximum inundation area was 0.38 acres. Water quality was within Historical ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature value in May was highest on record. Dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - June, 15 monitoring events
  - Inundated intermittently from December through May, dried out twice
  - Inundation range 0-0.38 acres, mean 0.11 acres
  - Depth range 0-51 cm, mean 17.88 cm
  - pH range 6.75-7.95, mean 7.32
  - temperature range 14.7°- 31.6° C, mean 19.96° C
  - dissolved oxygen range 6.86-10.24 mg/L, mean 8.81 mg/L
  - turbidity range 0.05-4.87 FNU, mean 2.03 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 42 was intermittently inundated in February
  - Maximum inundation area was 0.008, and maximum depth was 10 cm

**Table B-14. Pond 43 (Year 3 Post-Subsurface Munition Remediation) Historical Hydrology Results on Former Fort Ord 1997-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1998	Dec	9.72	-	-	75.0 (NTU)	24	0.04
	Jan	-	-	-	5.5 (NTU)	29	0.04
	Feb	7.31	-	-	10.7 (NTU)	36	0.04
	Apr	-	-	-	-	36	0.04
2000	1/26/2000	-	-	-	-	25	0.04
2015	3/18/2015	-	-	-	-	0	0.00
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2016	4/4/2016	6.46	15.35	4.56	33.5	18	0.02
	4/19/2016	-	-	-	-	0	0.00
2018	1/16/2018	-	-	-	-	0	0.00
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018	-	-	-	-	0	0.00
	4/16/2018	-	-	-	-	0	0.00
2019	1/16/2019	-	-	-	-	6	0.002 <sup>‡</sup>
	2/12/2019	6.83	10.59	8.91	35.0	34	0.06 <sup>‡</sup>
	3/6/2019	7.05	14.47	8.73	4.4	28	0.05 <sup>‡</sup>
	4/2/2019	7.47	20.00	9.93	1.0	19	0.01 <sup>‡</sup>
	5/7/2019	-	-	-	-	0	0.00
2020	12/6/2019 <sup>^</sup>	-	-	-	-	19	0.0113
	12/31/2019	-	-	-	-	16	-
	1/8/2020 <sup>^</sup>	-	-	-	-	9	-
	1/29/2020 <sup>^</sup>	9.08	18.2	16.63	1.51	16	0.0077
	2/19/2020	-	-	-	-	0	0
	3/11/2020	-	-	-	-	0	0
	3/19/2020 <sup>^</sup>	-	-	-	-	21	0.0117
	4/3/2020	7.99	21.7	11.17	0.49	28	0.0404
	4/15/2020 <sup>*</sup>	-	-	-	-	31	-
	4/29/2020	7.84	21.7	11:05	0.62	17	0.0084
	5/26/2020	-	-	-	-	0	0
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0

<sup>‡</sup>Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

<sup>\*</sup>taken during Burleson surveys

<sup>^</sup>Peripheral inundation present

Pond 43 was monitored six years between 1997 and 2021. Burn activities occurred in 2017 and munition remediation activities occurred in 2018. In 2021, Pond 43 was in year 3 of monitoring for post-subsurface munition remediation. The Historical data and precipitation are summarized below:

- 1998 (HLA, 1998)
  - In an El Niño year with yearly cumulative precipitation significantly above normal, Pond 43 held water through April. Turbidity and pH were collected December through February.
  - El Niño year with yearly cumulative precipitation above normal (40.54 inches)
  - Data collected December-April, four monitoring events
  - Inundated from December through April
  - Inundation 0.04 acres during all monitoring events
  - Depth range 24-36 cm, mean 31 cm
  - pH range 7.31-9.72, mean 8.52
  - turbidity range 5.45-75 NTU, mean 30.4 NTU
- 2000 (Harding Lawson Associates, 2001)
  - In a precipitation year below normal, Pond 43 held water in January. No water quality data were collected.
  - Yearly cumulative precipitation 16.13 inches
  - Data collected only in January, one monitoring event
  - Inundated January
  - Inundation 0.04 acres in January
  - Depth 25.4 cm in January
  - No water quality data were collected
- 2015 (Burleson, 2016)
  - In a 0, consecutive drought year with cumulative precipitation below normal, Pond 43 did not fill.
  - Consecutive drought year with yearly cumulative precipitation 14.35 inches
  - Data collected March-May, three monitoring events
  - 0 though the entire monitoring season
- 2016 (Burleson, 2017)
  - In a consecutive drought year with cumulative precipitation above normal, Pond 43 held water through the first monitoring in early April and was 0 by mid-April. Water quality data were collected once, in early April. It is likely that Pond 43 was inundated earlier in the water-year and maximum inundation was not captured. It should be noted that data collection did not start with the first storm or inundation.
  - Drought year with cumulative precipitation above normal (21.21 inches)
  - Data collected April, two monitoring events
  - Inundated first monitoring in April
  - Inundation 0.02 acres in early April
  - Depth 18 cm in early April
  - pH 6.46 in early April
  - temperature 15.35° C in early April
  - dissolved oxygen 4.56 mg/L in early April
  - turbidity range 33.5 FNU in early April
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 43 did not hold water. No water quality data were collected.

- Yearly cumulative precipitation 12.57 inches
  - Data collected January - April, four monitoring events
  - 0 during all monitoring events
  - No water quality data were collected
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 43 was inundated from the first recorded monitoring in January through April. The maximum inundation area was 0.06 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range with low levels. Turbidity was moderate.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - May, five monitoring events
  - Inundated January through April
  - Inundation range 0.002-0.06 acres, mean 0.03 acres
  - Depth range 6-34 cm, mean 22 cm
  - pH range 6.83-7.47, mean 7.12
  - temperature range 10.59°-20.00° C, mean 15.02° C
  - dissolved oxygen range 8.73-9.93 mg/L, mean 9.19 mg/L
  - turbidity range 1.0-35.0 FNU, mean 13.5 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 43 was inundated intermittently from the first recorded monitoring in December through April. The maximum inundation area was 0.04 acres. Water quality was generally within Historical ranges. Slightly alkaline pH values were observed. Dissolved oxygen value in January was highest on record. Temperature and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 11 monitoring events
  - Inundated from December through April
  - Inundation range 0-0.04 acres, mean 0.01 acres
  - Depth range 0-31 cm, mean 14.27 cm
  - pH range 7.84-9.08, mean 8.3
  - temperature range 18.2°-21.7° C, mean 20.53° C
  - dissolved oxygen range 11.17-16.63 mg/L, mean 13.9 mg/L
  - turbidity range 0.49-1.51 FNU, mean 0.87 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 43 did not fill
  - Data collected Jan-March, three monitoring events

**Table B-15. Pond 44 (Year 3 Post-Subsurface Munitions Remediation)  
Historical Hydrology Results on Former Fort Ord 1997-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2003	Dec	8.15	-	-	60.0 (NTU)	25	0.19
	Jan	-	-	-	2.9 (NTU)	31	0.19
	Feb	7.50	-	-	3.8 (NTU)	37	0.19
	Apr	-	-	-	-	33	0.19
2015	2/24/2015	-	-	-	-	0	0.00
	3/18/2015	-	-	-	-	0	0.00
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2016	4/4/2016	6.54	16.94	5.34	23.0	0 at gauge, 8.9 max	0.03
	4/19/2016	-	-	-	-	0	0.00
2018	1/18/2018	-	-	-	-	0	0.00
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018	-	-	-	-	0	0.00
	4/16/2018	-	-	-	-	0	0.00 <sup>‡</sup>
2019	1/16/2019	-	-	-	-	0	0.00 <sup>‡</sup>
	2/12/2019	6.71	10.75	8.16	20.3	24	0.18 <sup>‡</sup>
	3/6/2019	7.07 <sup>†</sup>	15.55 <sup>†</sup>	9.43 <sup>†</sup>	5.1 <sup>†</sup>	15	0.02 <sup>‡</sup>
	4/2/2019	-	-	-	-	0	0.00 <sup>‡</sup>
2020	12/6/2019 <sup>^</sup>	-	-	-	-	12	0.0085
	12/31/2019 <sup>^</sup>	-	-	-	-	9	-
	1/8/2020	-	-	-	-	0	0
	1/29/2020 <sup>#</sup>	7.46	16.9	11.31	2.93	7	0.005
	2/19/2020	-	-	-	-	0	0
	3/11/2020	-	-	-	-	0	0
	3/19/2020 <sup>^</sup>	-	-	-	-	14	0.0126
	4/3/2020 <sup>^</sup>	7.54	22.5	10.91	1.05	17	0.0151
	4/15/2020 <sup>*</sup>	-	-	-	-	21	-
	4/29/2020 <sup>^</sup>	-	-	-	-	2	0.0018
	5/26/2020	-	-	-	-	0	0
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0

<sup>†</sup>Water quality probe was on its side for measurements.

<sup>‡</sup>Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

<sup>#</sup>Probe not fully submerged

<sup>\*</sup>taken during Burleson surveys

<sup>^</sup>Peripheral inundation present

Pond 44 was monitored seven years between 1997 and 2021. Mastication activities occurred in 2017 and Munitions remediation occurred in 2018. In 2021, Pond 44 was in year 3 for post-subsurface Munitions remediation. The Historical data and precipitation are summarized below:

- 2003 (HLA, 1998)
  - In an El Niño year with yearly cumulative precipitation significantly above normal, Pond 44 held water December through February. Turbidity and pH were collected December through February.
  - El Niño year with yearly cumulative precipitation above normal (40.54 inches)
  - Data collected December-April, four monitoring events
  - Inundated from December through April
  - Inundation 0.19 acres
  - Depth range 25-37 cm, mean 31 cm
  - pH range 7.50-8.15, mean 7.83
  - turbidity range 2.9-60.0 NTU, mean 22.2 NTU
- 2015 (Burleson, 2016)
  - In a 0, consecutive drought year with cumulative precipitation below normal, Pond 44 did not fill.
  - Consecutive drought year with yearly cumulative precipitation 14.35 inches
  - Data collected February-May, four monitoring events
  - 0 though the entire monitoring season
  - No water quality data were collected
- 2016 (Burleson, 2017)
  - In a consecutive drought with precipitation above normal, Pond 44 was inundated only for the first April monitoring. The maximum inundation area was 0.031 acres. Water quality data were collected during the first April monitoring, and were within normal ranges. A slightly acidic pH value, moderate temperature, low dissolved oxygen, and low turbidity were observed. 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, two monitoring events
  - Inundated in first April monitoring
  - Inundation 0.03 acres
  - depth 0 cm at gauge, maximum depth 8.9 cm
  - pH 6.54
  - temperature range 16.94° C
  - dissolved oxygen 5.34 mg/L
  - turbidity 23.0 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 44 held water only in peripheral puddles they were not have surface hydrological connectivity to the staff gauge.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January-April, four monitoring events
  - 0 in all monitoring events
  - No water quality data collected
- 2019 (Burleson, 2019)



- In an above normal water-year, Pond 44 was inundated only for February and March. Peripheral ponding that was not hydrologically connected to the staff gauge was observed in January and April. The maximum inundation area was 0.18 acres. Water quality data were collected in February and March and were within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen and turbidity had small ranges, with moderate levels.
- Yearly cumulative precipitation 21.97 inches
- Data collected January - April, four monitoring events
- Inundated February and March
- Inundation range 0.02-0.18 acres, mean 0.10 acres
- Depth range 15-24 cm, mean 20 cm
- pH range 6.71-7.07, mean 6.89
- temperature range 10.75°-15.55° C, mean 13.15° C
- dissolved oxygen range 8.16-9.43 mg/L, mean 8.80 mg/L
- turbidity range 5.1-20.3 FNU, mean 12.7 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 44 was inundated intermittently from the first recorded monitoring in December through April. The maximum inundation area was 0.02 acres. Water quality was within Historical ranges. Slightly alkaline pH values were observed. Temperature value in April was highest on record. Dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 11 monitoring events
  - Inundated intermittently from December through April, dried out twice
  - Inundation range 0-0.02 acres, mean 0.01 acres
  - Depth range 0-21 cm, mean 7.46 cm
  - pH range 7.46-7.54, mean 7.5
  - temperature range 16.9°- 22.5° C, mean 19.7° C
  - dissolved oxygen range 10.91-11.31 mg/L, mean 11.11 mg/L
  - turbidity range 1.05-2.93 FNU, mean 1.99 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 44 did not fill
  - Data collected Jan-March, three monitoring events

**Table F-16. Pond 54 (Year 3 Post-Subsurface Munitions Remediation) Historic Hydrology Results on Former Fort Ord from 2004-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2004	1/27/2004	7.12	-	-	120.0 (NTU)	13	0.001
	3/3/2004	7.42	-	-	143.7 (NTU)	23	1.37
	3/24/2004	6.83	-	-	1000.0 (NTU)	15	0.003
	April	-	-	-	-	DRY	0.00
2009	3/12/2009	-	-	-	-	8	-
	4/2/2009	-	-	-	-	10	-
	4/22/2009	-	-	-	-	0	-
2017	1/23/2017	6.64	10.13	2.82	8.4	54	1.60
	2/28/2017	6.63	8.26	4.92	5.3	112	3.09
	3/22/2017	6.51	13.78	0.04	29.7	111	3.10
	4/18/2017	6.85	15.06	5.55	37.6	108	2.95
	5/25/2017	6.69	17.32	6.08	69.3	78	2.21
	6/21/2017	6.98	23.28	7.22	10.5	~60†	1.90
	7/31/2017	-	-	-	-	DRY	0.00
2018	1/18/2018	-	-	-	-	DRY	0.00
	2/22/2018	-	-	-	-	DRY	0.00
	3/20/2018	6.19	10.07	3.82	35.2	22	0.001
	4/16/2018	6.47	12.90	13.76	24.1	28	0.003
	5/22/2018	-	-	-	-	DRY	0.00
2019	1/17/2019	6.13	12.09	6.62	127.0	28	0.002‡
	2/12/2019	6.62	9.37	9.16	12.7	46	1.62‡
	3/4/2019	6.70	17.73	11.26	9.1	58	1.95‡
	4/2/2019	6.34†	15.88†	6.82†	2.6†	63	2.00‡
	5/6/2019	5.98	15.57	4.49	6.1	40	1.66‡
	6/10/2019	5.92	20.45	4.99	28.6	15	0.0003
	7/9/2019	-	-	-	-	DRY	0.00
2021	1/7/2021						0
	2/2/2021						0

‡Decreased visibility due to emergent vegetation.

†Water quality probe was on its side for measurements.

‡Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

Pond 54 was monitored four six years between 2004 and 2021. Mastication activities occurred in 2015. In 2021, Pond 54 was in year 3 of monitoring for post-subsurface munitions remediation. The historic data and precipitation are summarized below:

- 2004 (Mactec, 2005)

- In a below-normal water year, Pond 54 was inundated from the first recorded monitoring in January through March. The maximum inundation area was 1.37 acres. Water quality was within normal ranges, with slightly acidic pH values and relatively high turbidity. Temperature and dissolved oxygen were not measured.
  - Yearly cumulative precipitation 13.45 inches
  - Data collected January - April, four monitoring events
  - Inundated January through March
  - Inundation range 0.00-1.37 acres, mean 0.34 acres
  - Depth range 13-23 cm, mean 17 cm
  - pH range 6.83-7.42, mean 7.12
  - turbidity range 120-1000 NTU, mean 421 NTU
- 2009 (Shaw, 2010)
  - Depth values were taken from data sheets not included in the report.
  - Maximum depth was 10 cm
- 2017 (Burleson, 2018)
  - After the end of a historic drought with precipitation above-normal, Pond 54 was inundated from the first recorded monitoring in January through July. The maximum inundation area was 3.10 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a wide range, with moderate levels. Turbidity had a moderate range.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected January - July, seven monitoring events
  - Inundated January through June
  - Inundation range 1.60-3.10 acres, mean 2.47 acres
  - Depth range 54-112 cm, mean 87 cm
  - pH range 6.51-6.98, mean 6.72
  - temperature range 8.3°-23.3° C, mean 14.6° C
  - dissolved oxygen range 0.04-7.22 mg/L, mean 4.44 mg/L
  - turbidity range 5.3-69.3 FNU, mean 26.8 FNU
- 2018 (Burleson, 2019)
  - In a below-normal water-year, Pond 54 was inundated in March and April. The maximum inundation area was 0.003 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal ranges for Fort Ord. Dissolved oxygen had a large range. Turbidity had low levels.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - May, five monitoring events
  - Inundated March and April
  - Inundation range 0.001-0.003 acres, mean 0.002 acres
  - Depth range 22-28 cm, mean 25 cm
  - pH range 6.19-6.47, mean 6.33
  - temperature range 10.07°-12.90° C, mean 11.49° C
  - dissolved oxygen range 3.82-13.76 mg/L, mean 8.79 mg/L
  - turbidity range 24.1-35.2 FNU, mean 29.7 FNU
- 2019 (Burleson, 2020)
  - In an above-normal water-year, Pond 54 was inundated from the first recorded monitoring in January through June. The maximum inundation area was 2.00 acres. Water quality was within normal ranges. Moderately to slightly acidic pH values were

observed. Temperature was within normal ranges for Fort Ord, with a high reading in June. Dissolved oxygen had a small range with low levels. Turbidity was low on average, with a high reading in January.

- Yearly cumulative precipitation 21.97 inches
- Data collected January - July, seven monitoring events
- Inundated January through June
- Inundation range 0.0003-2.00 acres, mean 1.21 acres
- Depth range 15-63 cm, mean 42 cm
- pH range 5.92-6.70, mean 6.28
- temperature range 9.37°-20.45° C, mean 15.18° C
- dissolved oxygen range 4.49-11.26 mg/L, mean 7.22 mg/L
- turbidity range 2.6-127.0 FNU, mean 31.0 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 54 did not fill
  - Data collected Jan-Feb, two monitoring events

**Table B-17. Pond 60 (Year 3 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 2015-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2015	2/24/2015	-	-	-	-	~45§	-
	3/18/2015	-	-	-	-	>50§	1.31
	4/16/2015	6.40	25.70	8.90	238.0 (NTU)	~35§	0.27
	5/28/2015	-	-	-	-	~25§	0.14
2016	4/4/2016	6.35	15.03	0.00	7.6	130	2.65
	4/19/2016	6.39	18.27	2.64	51.0	110	2.57
	5/9/2016	6.36	15.75	2.16	27.2	80	2.44
	6/7/2016	6.18	22.50	3.66	46.8	80	2.13
	7/7/2016	6.58	20.15	4.61	70.3	62	1.04
	8/10/2016	6.32	26.38	10.86	246.0	38	0.22
	9/12/2016	7.41	19.34	3.68	415.0	12	0.01
	10/11/2016	-	-	-	-	0	0.00
2018	1/18/2018	6.29	11.00	3.60	25.7	20	0.07
	2/22/2018	-	-	-	-	0	0.00
	3/19/2018	6.40	14.82	8.71	12.1	38	0.20
	4/17/2018	6.33	11.36	3.66†	1.2	59	0.77
	5/21/2018	6.36	14.99	5.01	7.6	38	0.19
	6/19/2018	6.74	28.26	8.41	0.0	18	0.02
	7/19/2018	-	-	-	-	0	0.00
2019	12/12/2018	-	-	-	-	10	-
	1/14/2019	6.84	11.36	8.47	1.2	33	0.18
	2/13/2019	6.58	9.23	9.10	9.3	84	2.17 <sup>‡</sup>
	3/6/2019	6.36	12.94	5.85	11.5	98	2.48 <sup>‡</sup>
	4/3/2019	6.39	15.04	4.80	3.1	98	2.43 <sup>‡</sup>
	5/8/2019	6.57	16.37	4.12	2.2	84	2.32
	6/11/2019	6.53	20.01	4.27	67.1	76	1.89
	7/9/2019	-	-	-	-	60	-
	8/13/2019	-	-	-	-	37	-
2020	12/4/2019	-	-	-	-	41	-
	12/6/2019	-	-	-	-	44	0.2278
	12/20/2019	6.77	12.7	2.64	34.54	45	0.2388
	1/6/2020	-	-	-	-	42	-
	1/30/2020	6.66	11.2	4.34	8.74	58	0.6746
	2/19/2020	-	-	-	-	53	-
	2/27/2020	7.76	13.5	5	11.18	50	0.2661
	3/16/2020*	-	-	-	-	60	-

2020	3/27/2020	6.56	16.4	5.51	13.3	70	1.4878
	4/14/2020*	-	-	-	-	79	-
	4/28/2020	6.37	16.7	1.75	18.65	73	1.6664
	5/18/2020*	-	-	-	-	61	-
	5/26/2020	-	-	-	-	55	-
	5/27/2020	6.65	18.8	0.63	2.01	54	0.2889
	6/10/2020	-	-	-	-	54	-
	6/30/2020	6.96	20.5	1.14	11.78	29	0.1207
	7/14/2020	-	-	-	-	0	0
2021	1/7/2021	-	-	-	-	0	0
	2/1/2021	6.14	15	0.43	283.97	0.1411	26
	2/10/2021	-	-	-	-	-	25
	2/12/2021	-	-	-	-	-	25
	2/24/2021	-	-	-	-	-	26
	3/02/2021	7.15	12.6	10.94	57.68	0.085	20
	3/10/2021	-	-	-	-	-	21
	3/24/2021	6.57	8.2	4.45	5.02	0.1346	26
	3/29/2021	-	-	-	-	-	24
	4/05/2021	-	-	-	-	-	19
	4/16/2021	-	-	-	-	0	0

§No staff gauge. Cannot access ponds to measure depth due to potential for subsurface unexploded ordnance and other hazards. Depths are estimations

†Water quality probe was on its side for measurements.

‡Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

#Probe not fully submerged

\*taken during Burleson surveys

^Peripheral inundation present

Pond 60 was monitored six years between 2015 and 2021. Mastication activities occurred in 2017. Pond 60 was in year 3 of monitoring for post-subsurface munitions remediation in 2021. The Historical data and precipitation are summarized below:

- 2015 (Burleson, 2016)
  - In a consecutive drought year with below normal precipitation, Pond 60 was inundated February through May, and did not 0 by the last monitoring in May. Water quality data were collected only in April.
  - Early storms pushed early cumulative precipitation above normal while total yearly Cumulative precipitation fell below normal (14.35 inches)
  - Data collected February to May, four monitoring events
  - Inundated February to May (did not 0 by last monitoring event in May)
  - Inundation range 0.14-1.31 acres, mean 0.57 acres
  - depth range ~25- >50 cm, mean 39 cm (depths are estimations)
  - Water quality data were collected only in April
  - pH 6.40
  - temperature 25.70° C
  - dissolved oxygen 8.90 mg/L
  - turbidity 238 NTU

- 2016 (Burleson, 2017)
  - In a consecutive drought with precipitation above normal, Pond 60 was inundated from the first recorded monitoring in April through September. The maximum inundation area was 2.646 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a moderate range. Turbidity was low on average with a few high readings in August and September. It is likely that Pond 60 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 - October, eight monitoring events
  - Inundated April through September
  - Inundation range 0.01-2.65 acres, mean 1.58 acres
  - depth range 12-130 cm, mean 73 cm
  - pH range 6.18-7.41, mean 6.51
  - temperature range 15.03°-26.38° C, mean 19.63° C
  - dissolved oxygen range 0.00-10.86 mg/L, mean 3.94 mg/L
  - turbidity range 7.6-415 FNU, mean 123.4 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 60 was inundated from the first recorded monitoring in January through July. The maximum inundation area was 0.77 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord with a relatively high temperature in June. Dissolved oxygen had a small range, with moderate levels. Turbidity had low levels.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - July, seven monitoring events
  - Inundated January, and March through June
  - Inundation range 0.02-0.77 acres, mean 0.25 acres
  - Depth range 18-59 cm, mean 35 cm
  - pH range 6.29-6.74, mean 6.42
  - temperature range 11.00°-28.26° C, mean 16.09° C
  - dissolved oxygen range 3.60-8.71 mg/L, mean 5.88 mg/L
  - turbidity range 00.0-25.7 FNU, mean 9.32 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 60 was inundated from the first recorded monitoring in December through September. The maximum inundation area was 2.48 acres. Water quality was within normal ranges.
  - Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord with a relatively high temperature in June. Dissolved oxygen had a small range, with moderate levels. Turbidity had moderate range, with low levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected December - September, ten monitoring events
  - Inundated January through September
  - Inundation range 0.18-2.48 acres, mean 1.91 acres
  - Depth range 10-98 cm, mean 59 cm
  - pH range 6.36-6.84, mean 6.55
  - temperature range 9.23°-20.01° C, mean 14.16° C



- dissolved oxygen range 4.12-9.10 mg/L, mean 6.10 mg/L
  - turbidity range 1.2-67.1 FNU, mean 15.7 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 60 was inundated from the first recorded monitoring in December through June. The maximum inundation area was 1.67 acres. Water quality was within Historical ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - September, 17 monitoring events
  - Inundated from December through June
  - Inundation range 0-1.67 acres, mean 0.55 acres
  - Depth range 0-79 cm, mean 51.06 cm
  - pH range 6.37-7.76, mean 6.82
  - temperature range 11.2°- 20.5° C, mean 15.69° C
  - dissolved oxygen range 0.63-5.51 mg/L, mean 3.0 mg/L
  - turbidity range 2.01-34.54 FNU, mean 14.31 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 60 was inundated from February through April
  - Maximum inundation area was 0.14 ac, and maximum depth was 26 cm
  - Data collected January -April, 11 monitoring events
  - Inundation range 0-0.14 acres, mean 0.07 acres
  - Depth range 0-26 cm, mean 19.27 cm
  - pH range 6.14-7.15, mean 6.62
  - temperature range 8.2°- 15° C, mean 11.93° C
  - dissolved oxygen range 0.43-10.94 mg/L, mean 5.27 mg/L
  - turbidity range 5.02-283.97 FNU, mean 115.56 FNU

**Table B-18. Pond 61 East (Year 3 Post-Subsurface Munitions Remediation)  
Historical Hydrology Results on Former Fort Ord 2017-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2017	1/24/2017	5.61	7.00	1.76	59.1	21	0.70
	2/28/2017	6.66	11.13	10.54	31.3	21	0.52
	3/22/2017	6.16	15.89	4.08	76.7	21	0.62
	4/19/2017	6.48	12.26	4.31	28.8	10	0.05
	5/25/2017	-	-	-	-	0	0.00
2018	1/16/2018	-	-	-	-	0	0.00
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018	-	-	-	-	0	0.00‡
	4/17/2018	-	-	-	-	0	0.00‡
2019	1/15/2019	-	-	-	-	0	0.00‡
	2/13/2019	6.46	9.42	9.34	52.3	20	0.06‡
	3/6/2019	6.48	12.40	5.94	21.1	19	0.12‡
	4/3/2019	6.79†	14.15†	6.01†	17.1†	8	0.04‡
	5/8/2019	-	-	-	-	0	0.00
2020	12/6/2019^	-	-	-	-	0	0.1092
	12/23/2019^	-	-	-	-	0	0
	1/8/2020^	-	-	-	-	0	0
	1/30/2020^	-	-	-	-	0	0
	2/27/2020^	-	-	-	-	0	0.009
	3/20/2020^	-	-	-	-	0	0
	3/30/2020	5.71	16.7	2.78	106.68	18	0.0801
	4/14/2020*	-	-	-	-	17	-
	4/29/2020	-	-	-	-	0	0
	1/5/2021	-	-	-	-	0	0
2021	2/1/2021	-	-	-	-	0	0
	3/24/2021	-	-	-	-	0	0

†Water quality probe was on its side for measurements.

‡Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

\*taken during Burleson surveys

^Peripheral inundation present

Pond 61 East was monitored five years between 2016 and 2021. Mastication activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2021, Pond 61 was in year 3 for post-subsurface Munitions remediation. The Historical data and precipitation are summarized below:

- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 61 was inundated from the first recorded monitoring in January through April. The maximum inundation area was 0.695 acres. Water quality was within normal ranges. Slightly

acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a large range, with moderate levels.

- Yearly cumulative precipitation 22.92 inches
  - Data collected January - May, five monitoring events
  - Inundated January through April
  - Inundation range 0.05-0.70 acres, mean 0.47 acres
  - Depth range 10-21 cm, mean 18 cm
  - pH range 5.61-6.66, mean 6.23
  - temperature range 7.0°-15.9° C, mean 11.6° C
  - dissolved oxygen range 1.76-10.54 mg/L, mean 5.17 mg/L
  - turbidity range 28.8-76.7 FNU, mean 48.98 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 60 did not hold water. No water quality data were collected.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - April, four monitoring events
  - 0 in all monitoring events
  - No water quality data collected
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 61 was inundated from the second recorded monitoring in February through April. Peripheral ponding that was not hydrologically connected to the staff gauge was observed in January. The maximum inundation area was 0.12 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a small range, with moderate levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - May, five monitoring events
  - Inundated February through April
  - Inundation range 0.04-0.12 acres, mean 0.07 acres
  - Depth range 8-20 cm, mean 16 cm
  - pH range 6.46-6.79, mean 6.58
  - temperature range 9.42°-14.15° C, mean 11.99° C
  - dissolved oxygen range 5.94-9.34 mg/L, mean 7.10 mg/L
  - turbidity range 17.1-52.3 FNU, mean 30.2 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 61 was inundated from late March to mid-April. The maximum inundation area was 0.11 acres. Water quality was within Historical ranges. Slightly acidic pH value was observed. Temperature, dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - April, nine monitoring events
  - Inundated from late March to mid-April
  - Inundation range 0-0.1 acres, mean 0.03 acres
  - Depth range 0-18 cm, mean 3.89 cm
  - pH value of 5.71
  - temperature value of 16.7° C
  - dissolved oxygen value 2.78 mg/L

- turbidity value of 106.7 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 61 East did not fill
  - Data collected Jan-March, three monitoring events

**Table B-19. Pond 61 West (Year 3 Post-Subsurface Munitions Remediation)  
Historical Hydrology Results on Former Fort Ord 2017-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021^	6.91	15.1	10.59	16.63	38	0.0214
	2/10/2021	-	-	-	-	34	NS
	3/02/2021	7.07	14.8	11.96	1.3	18	0.0048
	3/24/2021	6.95	10.7	10.14	0.07	16	0.0045
	4/05/2021	-	-	-	-	0	0

^Peripheral inundation present

- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 61 West was inundated from February through March
  - Maximum inundation area was 0.02 ac, and maximum depth was 38 cm
  - Data collected January - April, six monitoring events
  - Inundation range 0-0.02 acres, mean 0.006 acres
  - Depth range 0-38 cm, mean 17.67 cm
  - pH range 6.91-7.07, mean 6.98
  - temperature range 10.7°- 15.1° C, mean 13.53° C
  - dissolved oxygen range 10.14-11.96 mg/L, mean 10.9 mg/L
  - turbidity range 0.07-16.63 FNU, mean 6 FNU

**Table B-20. Pond 73 (Year 3 Post-Subsurface Munitions Remediation)  
Historical Hydrology Results on Former Fort Ord 2017-2021**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2017	5/15/2017	-	-	-	-	-	0.636
2018	11/20/2017	-	-	-	-	0	0.00
	1/18/2018	-	-	-	-	0	0.00
	2/22/2018	-	-	-	-	0	0.00
	3/19/2018	-	-	-	-	0	0.00
	4/17/2018	6.33	11.33	5.63	9.5	14	0.001‡
	5/21/2018	-	-	-	-	0	0.00
2019	1/14/2019	-	-	-	-	0	0.00‡
	2/13/2019	6.53	9.75	9.59	43.5	52	0.74‡
	3/6/2019	6.38	12.31	4.97	10.8	56	0.85‡
	4/3/2019	6.42	14.12	2.93	2.4	49	0.76‡
	5/8/2019	6.00	15.39	4.66	2.6	27	0.57
	6/11/2019	-	-	-	-	0	0.00
2020	12/6/2019^	-	-	-	-	8	3e-04
	12/23/2019	-	-	-	-	7	-
	1/6/2020^	-	-	-	-	10	-
	1/30/2020^#	6.56	13.6	11.81	20.69	15	5e-04
	2/19/2020^	-	-	-	-	0	0
	2/27/2020	-	-	-	-	0	0
	3/20/2020^	-	-	-	-	15	5e-04
	3/27/2020	6.61	18.1	13.06	12.06	26	0.4167
	4/20/2020*	-	-	-	-	33	-
	4/28/2020	6.18	23.1	8.36	1.15	25	0.4074
2021	1/7/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	3/29/2021	-	-	-	-	0	0

‡Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.

#Probe not fully submerged

\*taken during Burleson surveys

^Peripheral inundation present

Pond 73 was monitored five years between 2017 and 2021. Mastication activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2021, Pond 73 was in year 3 of monitoring for post-subsurface Munitions remediation. The Historical data and precipitation are summarized below:

- 2017 (Burleson, 2018)

- After the end of a Historical drought with precipitation above normal, Pond 73 was monitored once for inundation in May with an area of 0.636 acres. No depth or water quality data were collected.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected in May, one monitoring event
  - Inundated January through April
  - Inundation 0.636 acres
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 73 was inundated only in April. The maximum inundation area was 0.001 acres. Water quality data were collected in April.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected November, January - May, six monitoring events
  - Inundated in April
  - Inundation 0.001 acres
  - Depth 14 cm
  - pH 6.33
  - temperature 11.33° C
  - dissolved oxygen 5.63mg/L
  - turbidity 9.5 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 73 was inundated from the second recorded monitoring in February through May. Peripheral ponding that was not hydrologically connected to the staff gauge was observed in January. The maximum inundation area was 0.85 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with low levels. Turbidity had a large range, with low to moderate levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - June, six monitoring events
  - Inundated February through May
  - Inundation range 0.57-0.85 acres, mean 0.73 acres
  - Depth range 27-56 cm, mean 46 cm
  - pH range 6.00-6.53, mean 6.33
  - temperature range 9.75°-15.39° C, mean 12.89° C
  - dissolved oxygen range 2.93-9.59 mg/L, mean 5.54 mg/L
  - turbidity range 2.4-43.5 FNU, mean 14.8 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 73 was inundated intermittently from the first recorded monitoring in December through April. The maximum inundation area was 0.42 acres. Water quality was within Historical ranges. Slightly acidic pH values were observed. Temperature value in April was highest on record. Dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 10 monitoring events
  - Inundated intermittently from December through April, dried out twice
  - Inundation range 0-0.42 acres, mean 0.12 acres
  - Depth range 0-33 cm, mean 13.9 cm
  - pH range 6.18-6.61, mean 6.45
  - temperature range 13.6°- 23.1° C, mean 18.27° C



- dissolved oxygen range 8.36-13.06 mg/L, mean 11.08 mg/L
  - turbidity range 1.15-20.69 FNU, mean 11.3 FNU
- 2021
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 73 did not fill
  - Data collected Jan-March, three monitoring events

## **APPENDIX C**

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### **Site Photos**



**Figure C-1.** Pond 5 (Reference): Hydrology Survey on 2/1/2021





**Figure C-2.** Pond 101 East (East) (Reference): Hydrology Survey on 3/29/2021





**Figure C-3.** Pond 997 (Reference): Hydrology Photo Point 1 on 2/1/2021





**Figure C-4.** Pond 75 (Baseline) Hydrology Photo Point 1 on 2/1/2021





**Figure C-3.** Pond 74 (Year 3 Post Mastication) Hydrology Photo Point 2 on 2/1/2021





**Figure C-6.** Pond 101 East (West) (Year 3 Post Mastication) Hydrology Survey on 2/1/2021





**Figure C-7.** Pond 101 West (Year 3 Post Mastication) Hydrology Photo Point 1 on 2/1/2021





**Figure C-8.** Pond 3 North (Year 3 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 2/1/2021





**Figure C-9.** Pond 3 South (Year 3 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 2/1/2021





**Figure C-10.** Pond 16 (Year 3 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 2/2/2021





**Figure C-11.** Pond 35 (Year 3 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 2/1/2021





**Figure C-12.** Pond 39 (Year 3 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 2/1/2021





**Figure C-13.** Pond 40 South (Year 3 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 2/1/2021





**Figure C-4.** Pond 41 (Year 3 Post Subsurface munitions remediation) Hydrology Survey on 2/1/2021





**Figure C-15.** Pond 42 (Year 3 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 2/1/2021





**Figure C-16.** Pond 43 (Year 3 Post Subsurface munitions remediation) Hydrology Photo Point on 2/1/2021





**Figure C-5.** Pond 44 (Year 3 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 2/1/2021





**Figure C-6.** Pond 54 (Year 3 Post Subsurface munitions remediation) Hydrology Survey on 2/2/2021





**Figure C-7.** Pond 60 (Year 3 Post Subsurface munitions remediation) Hydrology Photo Point on 2/1/2021





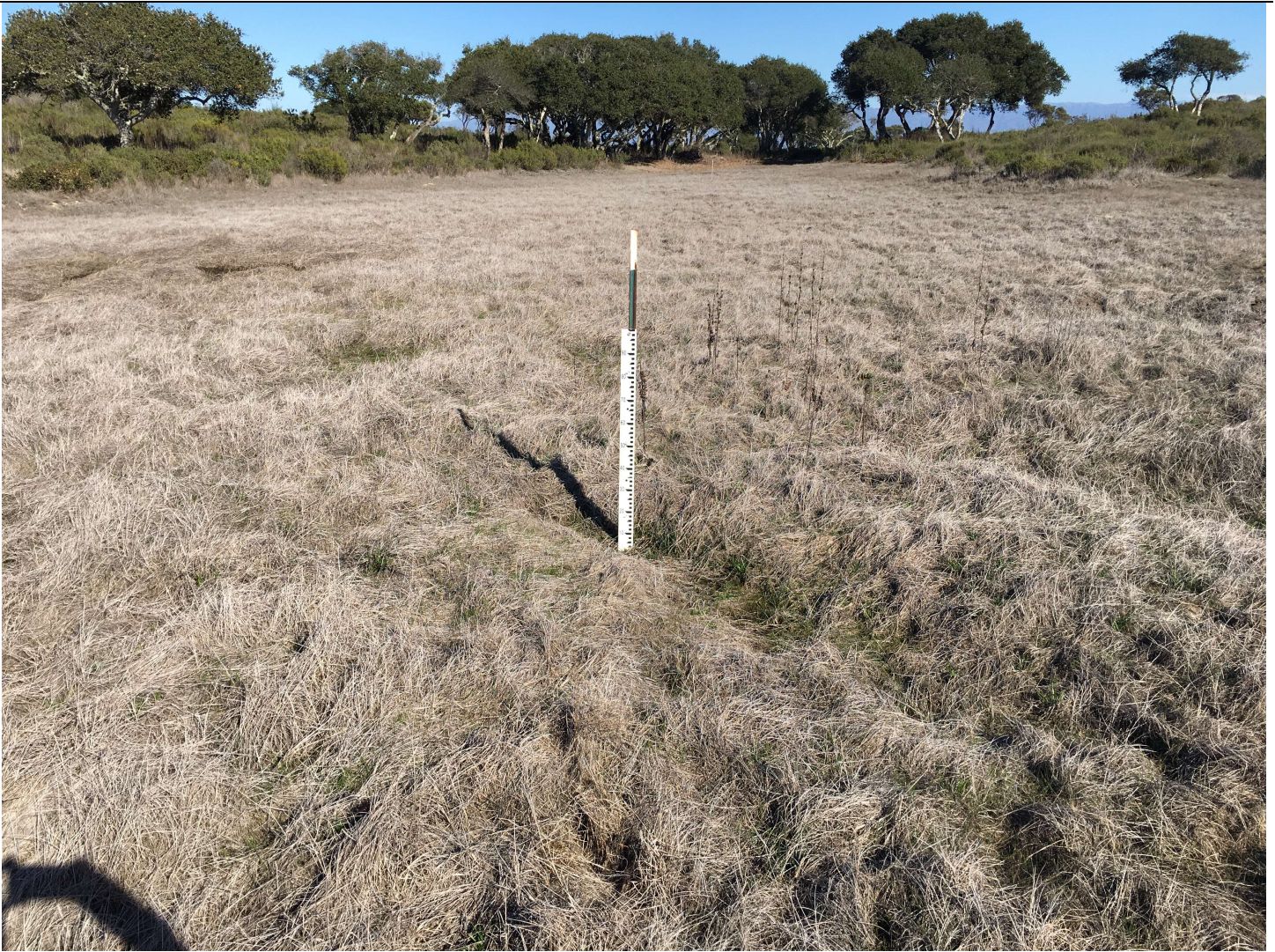
**Figure C-8.** Pond 61 East (Year 3 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 2/1/2021





**Figure C-21.** Pond 61 West (Year 3 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 2/1/2021





**Figure C-9.** Pond 73 (Year 3 Post Subsurface munitions remediation) Hydrology Survey on 2/1/2021