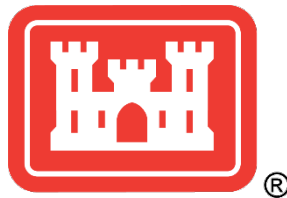


**2020 ANNUAL REPORT  
WETLAND HYDROLOGY AND WATER QUALITY MONITORING  
FORMER FORT ORD, CALIFORNIA**

**Prepared for:**



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## APPENDICES

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- 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 2020 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 (Burleson, 2021).

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, Burleson, 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). 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, 2021).

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 2020 water year included three reference ponds 5, 101 East (East), 997; and 19 remediated ponds 74, 101 East (West), 101 West, 16, 41, 40 North, 3 North, 3 South, 39, 40 South, 43, 56, Machine Gun Flats, 42, 35, 44, 60, 61, and 73 (Table 1-1). Ponds 40 North, 56, and Machine Gun Flats 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.

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

Vernal Pool		Monitoring Status
Pond 5		Reference
Pond 101 East (East)		Reference
Pond 997		Reference
Pond 74		Year 2 Post Mastication
Pond 101 East (West)		Year 2 Post Mastication
Pond 101 West		Year 2 Post Mastication
Pond 16		Year 2 Post Subsurface munitions remediation
Pond 41		Year 2 Post Subsurface munitions remediation
Pond 40 North		Year 3 Post Burn
Pond 3 North		Year 3 Post Burn, Year 2 Post Subsurface munitions remediation
Pond 3 South		Year 3 Post Burn, Year 2 Post Subsurface munitions remediation
Pond 39		Year 3 Post Burn, Year 2 Post Subsurface munitions remediation
Pond 40 South		Year 3 Post Burn, Year 2 Post Subsurface munitions remediation
Pond 43		Year 3 Post Burn, Year 2 Post Subsurface munitions remediation
Pond 56		Year 3 Post Mastication
Machine Gun Flats		Year 3 Post Mastication
Pond 42		Year 3 Post Mastication and Post Burn, Year 2 Post Subsurface munitions remediation
Pond 35		Year 3 Post Mastication, Year 2 Post Subsurface munitions remediation
Pond 44		Year 3 Post Mastication, Year 2 Post Subsurface munitions remediation
Pond 60		Year 3 Post Mastication, Year 2 Post Subsurface munitions remediation
Pond 61		Year 3 Post Mastication, Year 2 Post Subsurface munitions remediation
Pond 73		Year 3 Post Mastication, Year 2 Post Subsurface munitions remediation

## 2 SITE DESCRIPTION

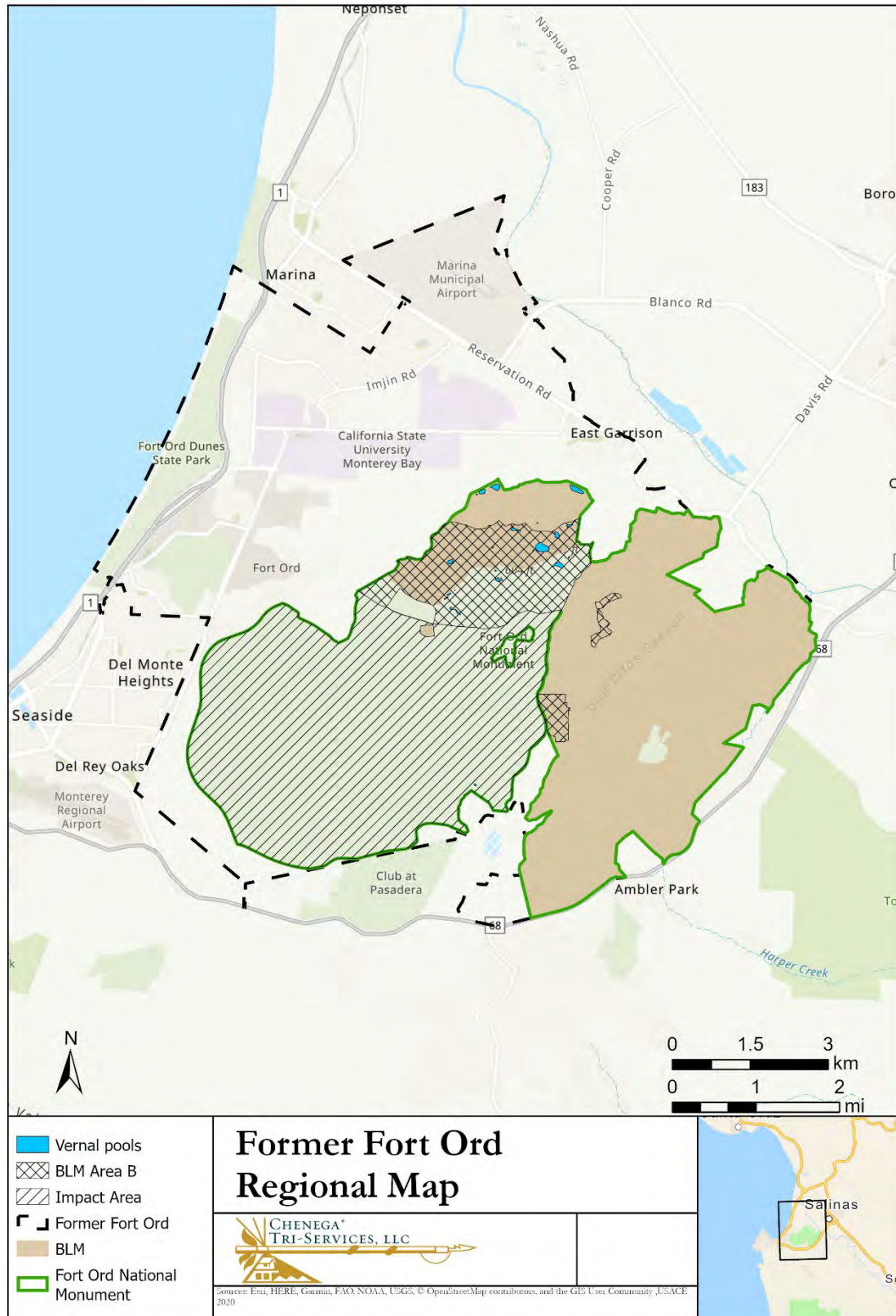
Former Fort Ord is located in the northwestern part of Monterey County, California, on the boundary of Monterey Bay, approximately 80 miles south of San Francisco. Fort Ord was established in 1917 as a military training base for infantry troops. In January 1991, the U.S. Secretary of Defense announced 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).

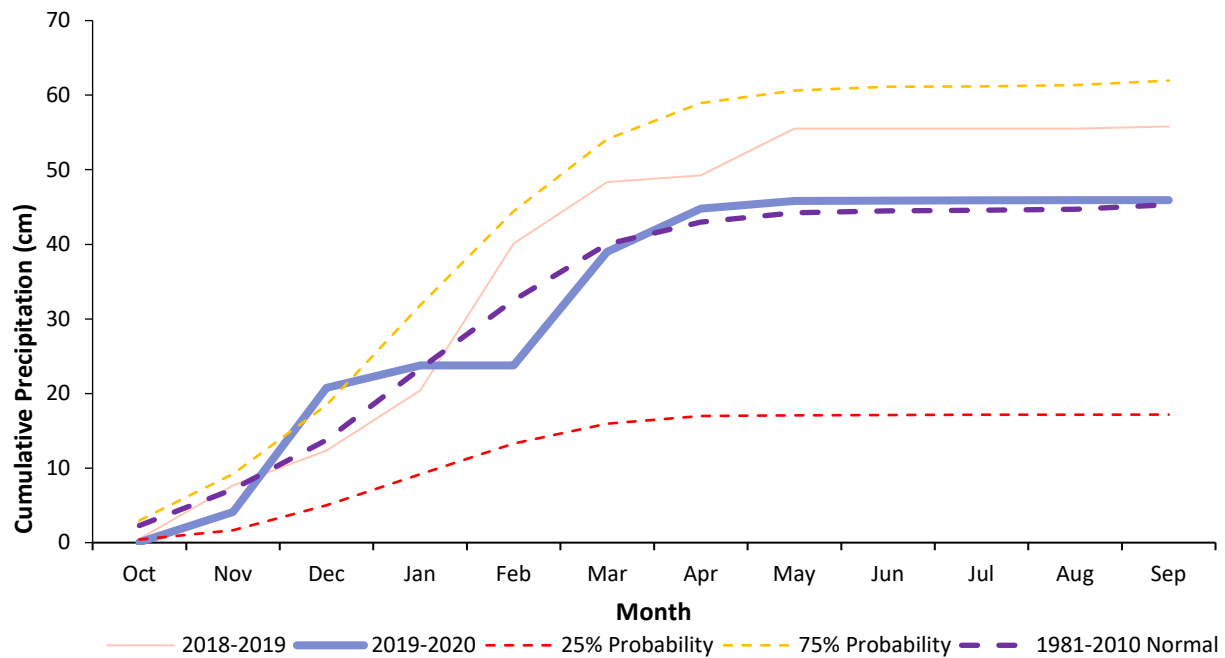
The area's maritime climate is characterized by cool, overcast, foggy summers, and cool rainy winters, with the warmest days generally occurring in late summer and early fall. In the 2020 water year (Oct 2019 to Sept 2020), the Monterey area received close to normal cumulative precipitation (Naval Postgraduate School Department of Meteorology, 2020; Figure 2-2). The water year exhibited an uncommon annual timing and frequency of precipitation. Initial precipitation occurred in November, which was followed by a significant precipitation in December. However, January precipitation was below normal, and there was not a single rain event in February. This was followed by twice the normal precipitation in March and nearly twice the normal in April. Last significant rain events occurred in May (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.

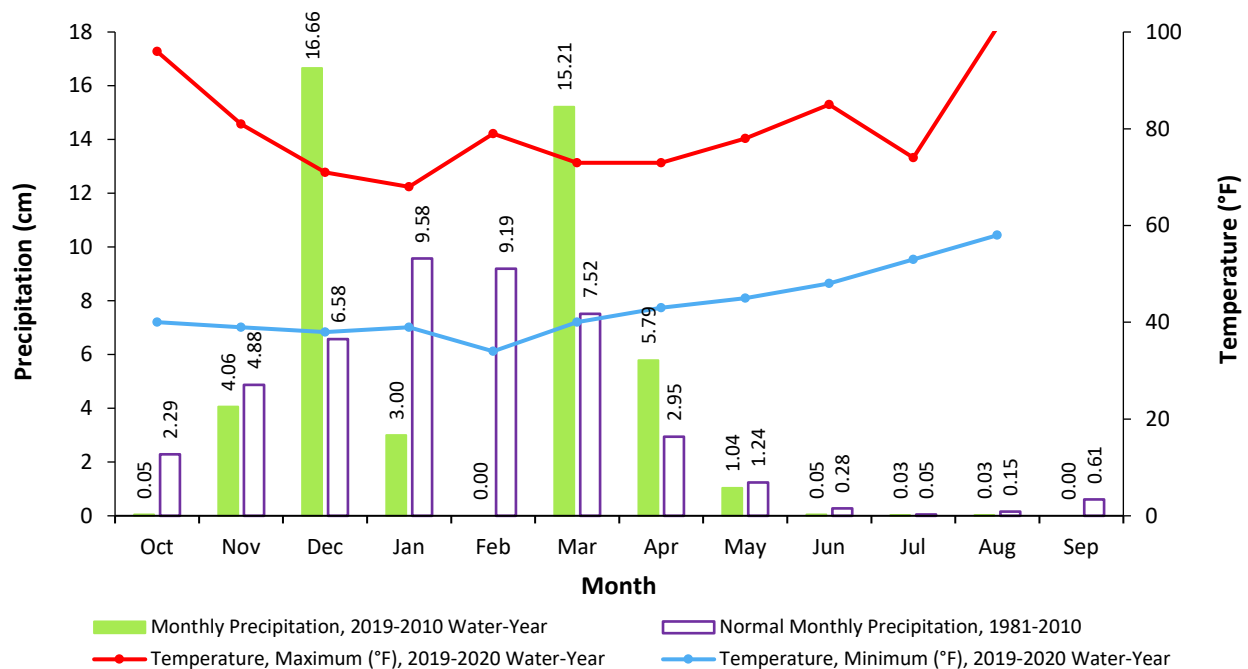
Fort Ord vernal pools are most common in areas containing Antioch soils in isolated grassland patches within a matrix of maritime chaparral and oak woodlands. All but one of the vernal pools monitored in 2020 water year are located in the northern portion of FONM, while Pond 16 is located in the southern section inside the Impact Area (Figure 2-4).



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

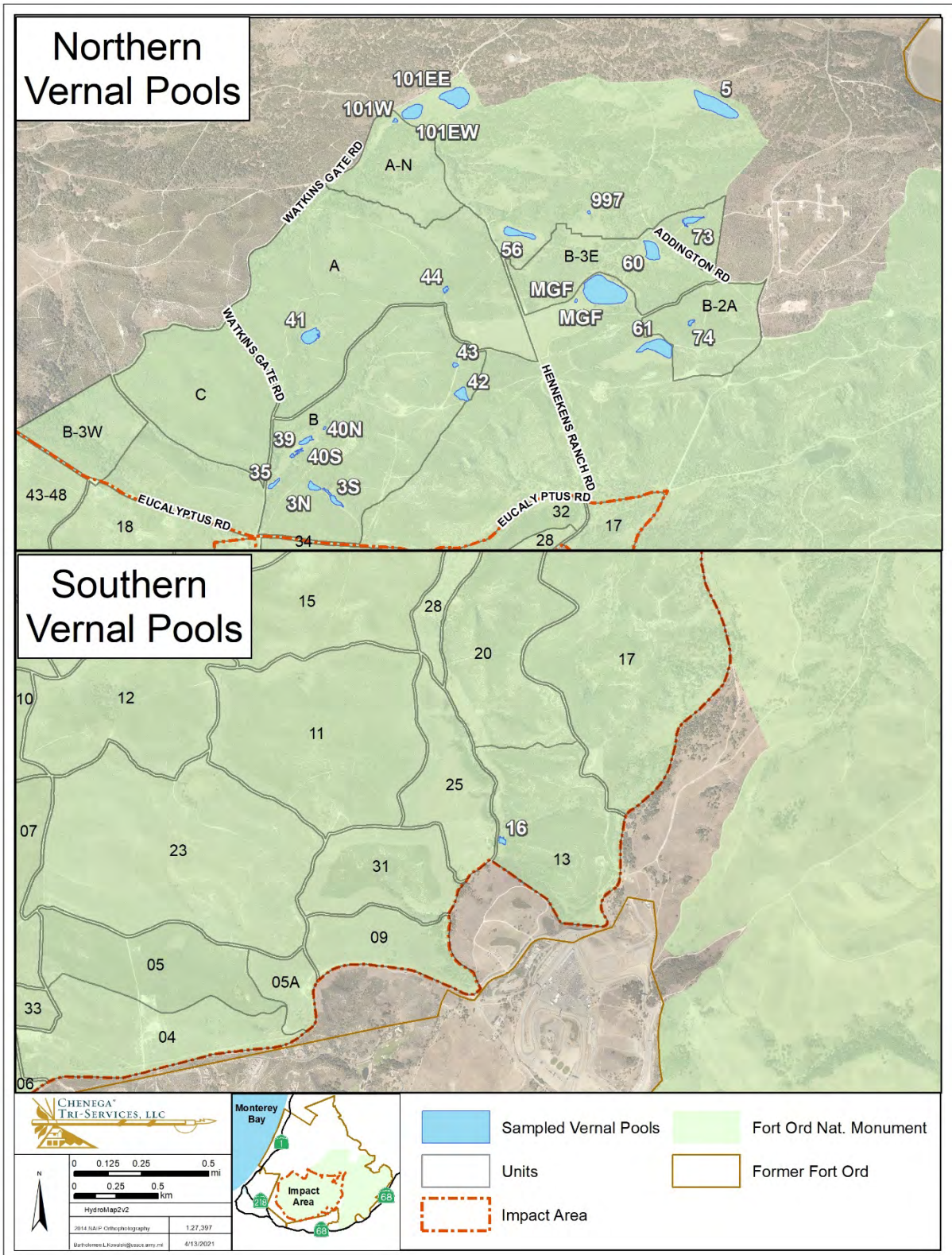


**Figure 2-2.** Cumulative Monthly Precipitation for the 2020 Water-Year compared to the 30-Year Normal (mean 1981-2010), the 2020 Water-Year, and the 25% and 75% Probabilities (NPS, 2021; National Climatic Data Center [NCDC] and National Oceanic and Atmospheric Administration [NOAA], 2021)



**Figure 2-3.** Monthly Precipitation, Maximum and Minimum Temperatures for the 2020 Water-Year, and Normal Monthly Precipitation (NPS, 2020; 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, 101 East (West), 101 West, 41, 3 North, 3 South, 16, 39, 40 North, 40 South, 43, 35, 42, 44, 56, 60, 61, 73, 74, and Machine Gun Flats



### 3 METHODS

Sampling methods for wetland vegetation monitoring and aquatic surveys were consistent with the PBO and 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; thus, vernal pools may be monitored multiple years for baseline (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 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 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, 56, 60, 61, 73, and Machine Gun Flats was masticated. In the same year, vegetation within watersheds of Ponds 3 North, 3 South, 39, 40 North, 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, 2020). 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 in January of 2019. Inundation extent, vegetation, and wildlife surveys occurred following the discovery of the vernal pool in 2019.

In 2020 water year, Ponds 74, 101 East (West), and 101 West were monitored for year 2 post mastication. Ponds 16 and 41 were monitored for year 2 post-subsurface munitions remediation. Pond 40 North was monitored for year 3 post-burn. Ponds 3 North, 3 South, 39, 40 South, and 43 were monitored for year 3 post-burn and year 2 post-subsurface munitions remediation. Ponds 56 and Machine Guns Flats were monitored for year 3 post-mastication. Pond 42 was monitored for year 3 post-mastication and post-burn and year 2 post-subsurface munitions remediation. Ponds 35, 44, 60, 61, and 73 were monitored for year 3 post-mastication and year 2 post-subsurface munitions remediation. 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 the historical conductivity data are not available for comparison. 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 Wetland Plan (Burleson, 2006). Recommendations were to collect data 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 2020 were deemed safe to enter by the Base Realignment and Closure (BRAC) office (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 except for Pond 61 in December and February. 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 1981-2010.

### 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, 2021).

In addition to the Wetland Plan, the PBO outlines 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

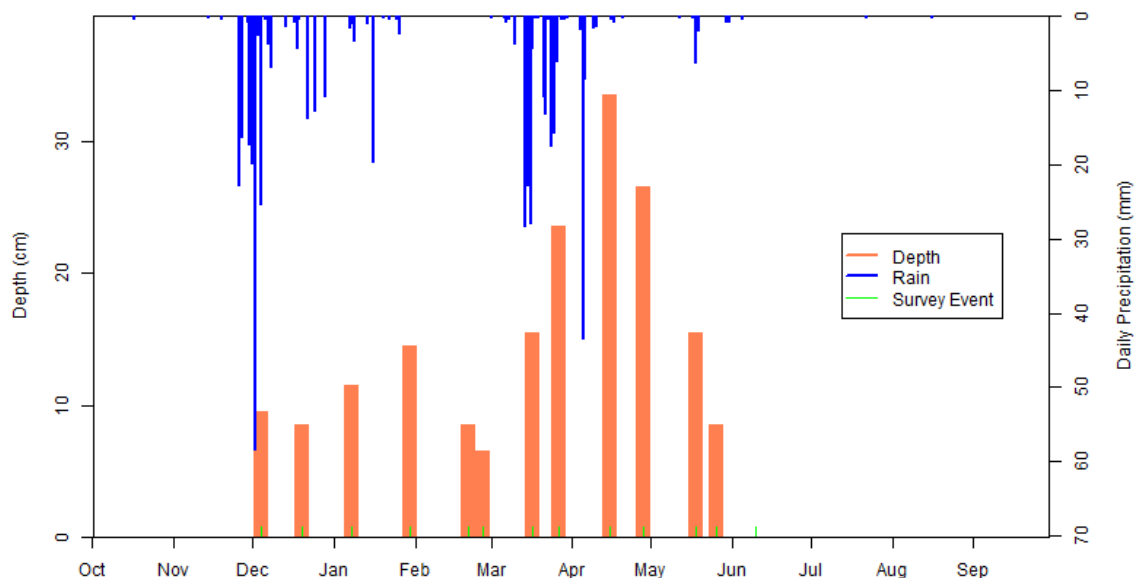
Hydrology surveys were conducted monthly from December through September when water was present at reference Ponds 5, 101 East (East), 997; and remediated Ponds 74, 101 East (West), 101 West, 16, 41, 40 North, 3 North, 3 South, 39, 40 South, 43, 56, Machine Gun Flats, 42, 35, 44, 60, 61, and 73. Measurable ponding was observed in all of the 22 vernal pools monitored in 2020 water year.

The inundation patterns of monitored vernal pools reflected the unusual frequency of precipitation events in 2020 water year, and can be grouped into three classes; those that became inundated following first major rain events and remained inundated through the spring and summer (Ponds 5, 3 North, 39, 56, 60, and Machine Gun Flats), those that became inundated in December, dried out, and became inundated again (Ponds 101 East (East), 101 East (West), 101 West, 3 South, 16, 40 North, 41, 42, 43, 44, 73), and those that became inundated for a short period of time between March and April (Ponds 997, 35, 40 South, 61, 74). Among the vernal pools that dried out more than once, ponds 101 West, 3 South, 16, 40 North, 41, 42, 43, and 73 dried out and became re-inundated twice, and ponds 101 East (East), 101 East (West), and 44 dried out and became re-inundated three times.

Observed water quality measurements were similar to previous years for all vernal pools (Appendix B). Mean temperature for all vernal pools gradually increased from 13.38 °C in December to 22.65 °C in June. Mean dissolved oxygen values reached maximum 10.6 milligrams per liter (mg/L) in January and then ranged from 6.92 mg/L in March to 2.71 mg/L in May. The mean pH value ranged between 6.35 to 7.00 throughout the water-year. Mean turbidity values were generally lower in the beginning of the season and increased to maximum in February after which they decreased to their lowest value in July. February mean turbidity was measured at 38.8 formazin nephelometric units (FNU), and the minimum mean turbidity value was 9.11 FNU in July.

### 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 thirteen times and water quality parameters were measured six times. Pond 5 was inundated by the time of first survey in December, which followed first significant precipitation event of the season, and it dried out by mid-June (Table 4-1 and Figure 4-1).



**Figure 4-1.** Pond 5 (Reference) Depth and Precipitation on Former Fort Ord, 2020

**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)
12/04/19	NS	9	NS	NS	NS	NS	NS
12/20/19 <sup>#</sup>	0.7359	8	6.01	15.3	18.37	7.28	529
01/08/20	NS	11	NS	NS	NS	NS	NS
01/30/20	1.9979	14	20.16	14.6	16.54	7.41	631
02/21/20	NS	8	NS	NS	NS	NS	NS
02/27/20	0.751	6	6.87	16.5	91.61	6.52	533
03/17/20 <sup>*</sup>	NS	15	NS	NS	NS	NS	NS
03/27/20	3.0472	23	8.89	15.2	7.82	6.33	558
04/15/20 <sup>*</sup>	NS	33	NS	NS	NS	NS	NS
04/28/20	3.1494	26	2.9	24.2	1.63	6.57	619
05/18/20 <sup>*</sup>	NS	15	NS	NS	NS	NS	NS
05/26/20	0.7328	8	3.51	28.7	74.48	6.71	11.9
06/10/20	0	0					

NS = Not Surveyed

<sup>\*</sup>taken during Burleson surveys<sup>#</sup>Probe not fully submerged

## 4.2 Pond 101 East (East)

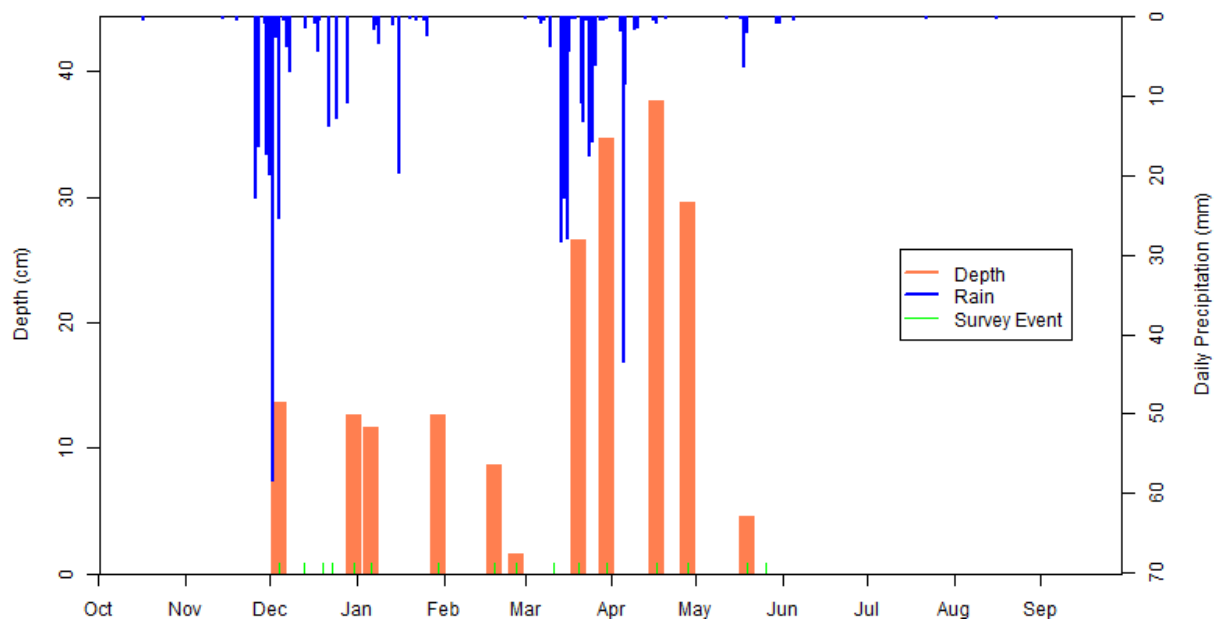
Pond 101 East (East) is a reference vernal pool that was monitored as a control for comparison to the remediated vernal pools. Depth of Pond 101 East (East) was monitored sixteen times and water quality parameters were measured four times. Pond 101 East (East) was inundated by the time of first survey in December, and it dried out three times within the 2020 water year; first following initial inundation in December, second time in March, and third time by the end of May (Table 4-2 and Figure 4-2).

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

Pond 101 East (East)							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
12/04/19	NS	13	NS	NS	NS	NS	NS
12/13/2020	0	0					
12/20/19	0	0					
12/23/19	0	0					
12/31/19	0.0715	12	9.98	13.3	5.46	6.84	560
01/06/20	NS	11	NS	NS	NS	NS	NS

Pond 101 East (East)							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
02/19/20	NS	8	NS	NS	NS	NS	NS
02/27/20	0.0032	1	NS	NS	NS	NS	NS
03/11/20	0	0					
03/20/20 <sup>^</sup>	0.6504	26	NS	NS	NS	NS	NS
03/30/20	1.6103	34	3.28	16.2	3.31	6.36	275.5
04/17/20 <sup>*</sup>	NS	37	NS	NS	NS	NS	NS
04/28/20	1.0074	29	2.24	23.1	4.72	6.56	330.7
05/19/20 <sup>*</sup>	NS	4	NS	NS	NS	NS	NS
05/26/20	0	0					

NS = Not Surveyed

<sup>\*</sup>taken during Burleson surveys<sup>^</sup>Peripheral inundation present<sup>#</sup>Probe not fully submerged

**Figure 4-2.** Pond 101 East (East) (Reference) Depth and Precipitation on Former Fort Ord, 2020

### 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 nine times and water quality parameters were measured once. This was due to the fact that Pond 997 did not become inundated until the end of March, and it dried by the end of April (Table 4-3 and Figure 4-3).

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)
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>	0.0507	7	8.44	19.6	49.45	6.06	95.9
04/17/20 <sup>*</sup>	NS	6	NS	NS	NS	NS	NS
04/28/20	0	0					

NS = Not Surveyed

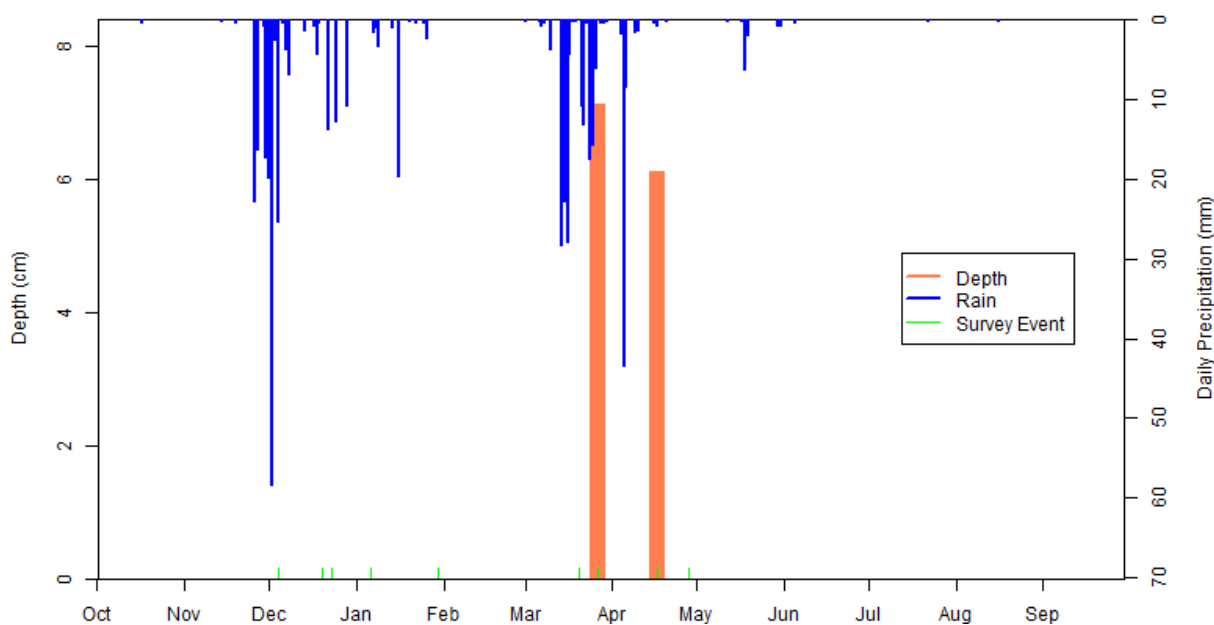
<sup>\*</sup>taken during Burleson surveys<sup>^</sup>Peripheral inundation present<sup>#</sup>Probe not fully submerged

Figure 4-3. Pond 997 (Reference) Depth and Precipitation on Former Fort Ord, 2020

#### 4.4 Pond 74

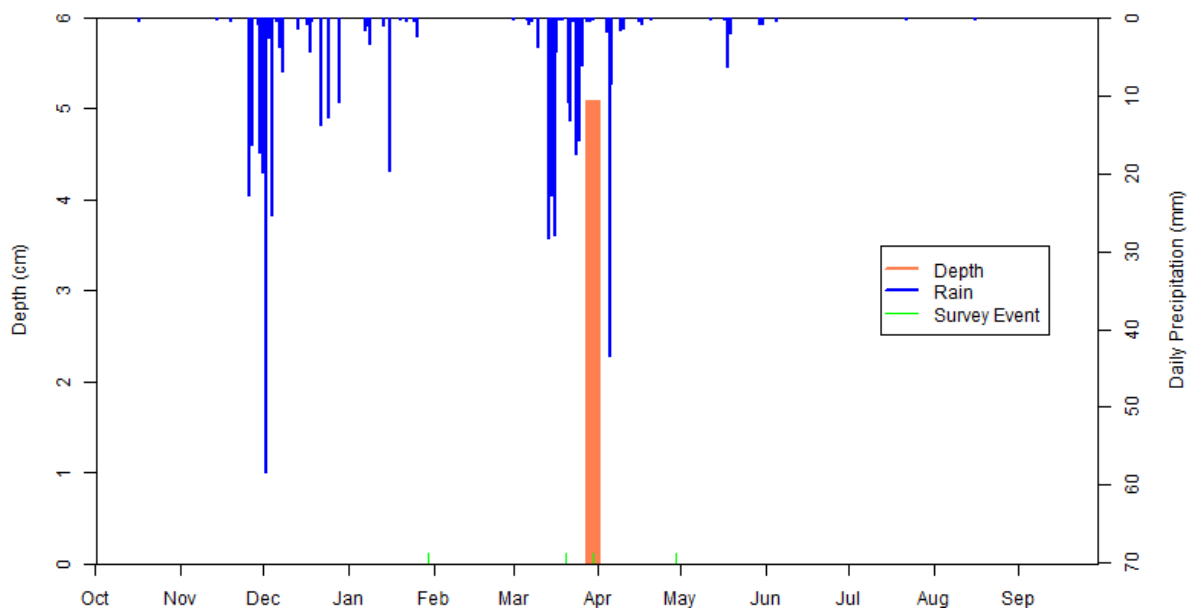
Pond 74, a post-mastication remediation vernal pool, was in year 2 of monitoring in 2020. Depth of Pond 74 was monitored four times and water quality parameters were not measured because it was too shallow to fully submerge the water quality probe. Pond 74 did not become inundated until the end of March and it was dry by the end of April (Table 4-4 and Figure 4-4).

**Table 4-4. Pond 74 (Year 2 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)
01/30/20	0	0					
03/20/20	0	0					
03/30/20*	0.0116	5	NS	NS	NS	NS	NS
04/29/20	0	0					

NS = Not Surveyed

\*Depth measurement was visually estimated

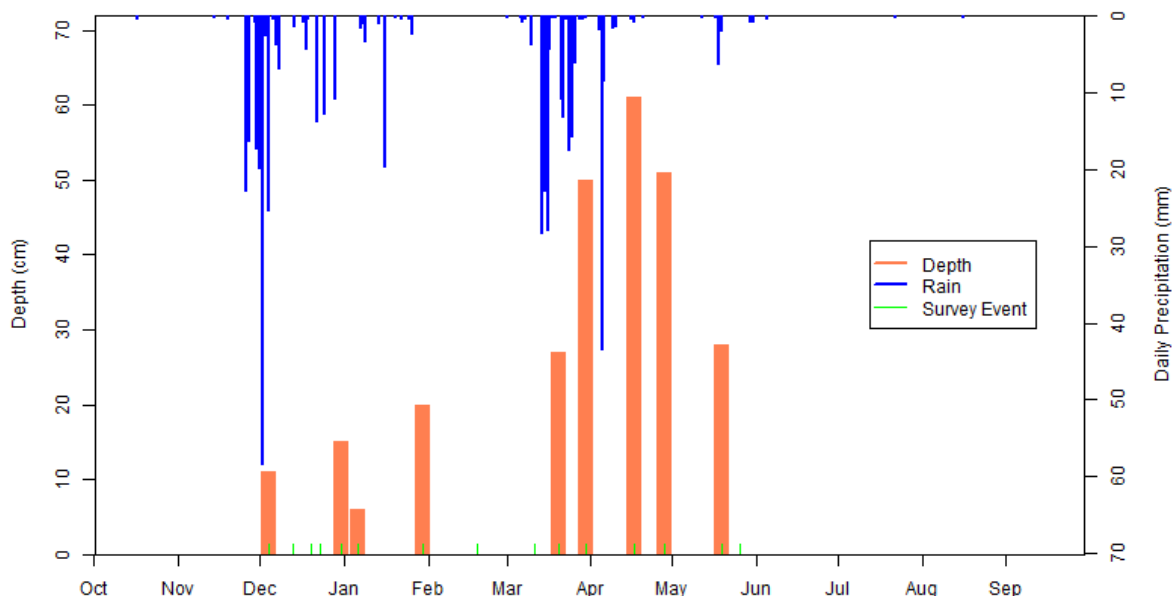


**Figure 4-4.** Pond 74 (Year 2 Post-Mastication) Depth and Precipitation on Former Fort Ord, 2020

#### 4.5 Pond 101 East (West)

Pond 101 East (West), a post-mastication remediation vernal pool, was in year 2 of monitoring in 2020. Depth of Pond 101 East (West) was monitored fifteen times and water quality parameters were measured four times. Pond 101 East (West) was inundated by the time of first survey in December, which followed the first significant precipitation event of the season and it dried out three times within the 2020 water year; first following initial inundation in December, second time by mid-February, and the third and final time by the end of May (Table 4-5 and Figure 4-5).





**Figure 4-5.** Pond 101 East (West) (Year 2 Post-Mastication) Depth and Precipitation on Former Fort Ord, 2020

**Table 4-5. Pond 101 East (West) (Year 2 Post-Mastication) Hydrology Monitoring Results**

Pond 101 East (West)							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
12/04/19	NS	10	NS	NS	NS	NS	NS
12/13/19	0	0					
12/20/19	0	0					
12/23/19	0	0					
12/31/19	0.0032	14	11.67	13.2	22.86	6.67	447.1
01/06/20	NS	5	NS	NS	NS	NS	NS
01/30/20 <sup>#</sup>	0.0031	19	9.47	11.4	16.82	6.67	480.1
02/19/20	0	0					
03/11/20	0	0					
03/20/20	0.0825	26	NS	NS	NS	NS	NS
03/30/20	0.4425	49	8.86	14.7	12.68	5.99	154
04/17/20 <sup>*</sup>	NS	60	NS	NS	NS	NS	NS
04/28/20	0.469	50	0.73	15.8	5.31	6.04	190.8
05/19/20 <sup>*</sup>	NS	27	NS	NS	NS	NS	NS
05/26/20	0	0					

NS = Not Surveyed

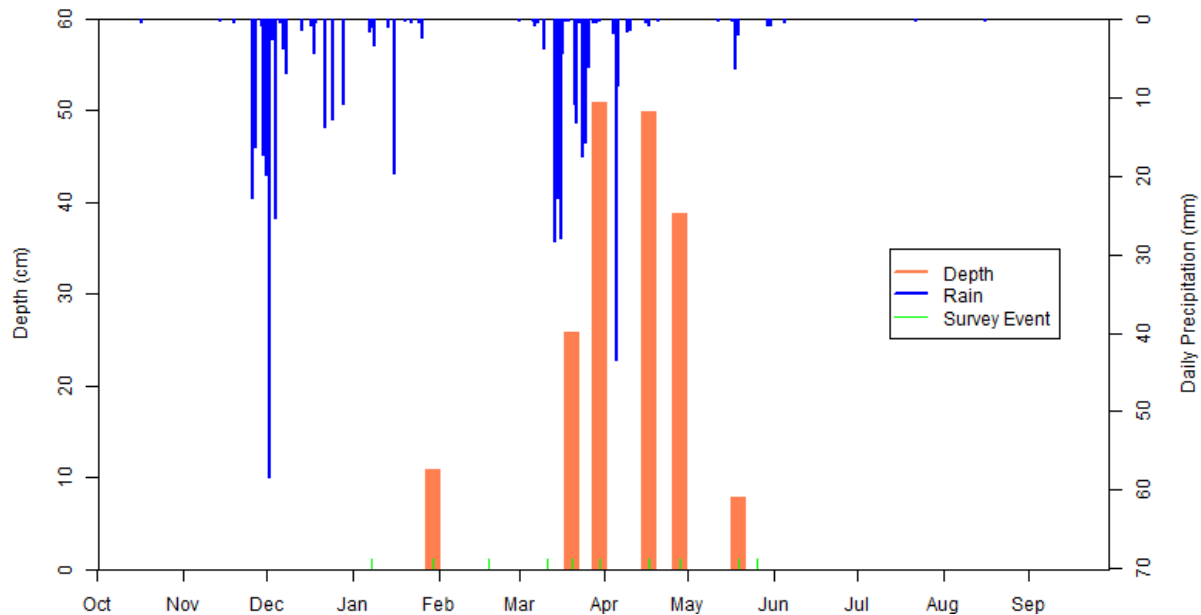
<sup>\*</sup>taken during Burleson surveys

<sup>^</sup>Peripheral inundation present

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

#### 4.6 Pond 101 West

Pond 101 West, a post-mastication remediation vernal pool, was in year 2 of monitoring in 2020. Depth of Pond 101 West was monitored ten times and water quality parameters were measured three times. Pond 101 West became inundated in January and it dried out twice within the 2020 water year; first following initial inundation in February, and second time by the end of May (Table 4-6 and Figure 4-6).



**Figure 4-6.** Pond 101 West (Year 2 Post-Mastication) Depth and Precipitation on Former Fort Ord, 2020

**Table 4-6. Pond 101 West (Year 2 Post-Mastication) Hydrology Monitoring Results**

Pond 101 West							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
01/08/20	0	0					
01/30/20	0.0019	10	9.96	12.5	6.27	6.46	319.7
02/19/20	0	0					
03/11/20	0	0					
03/20/20	0.0271	25	NS	NS	NS	NS	NS
03/30/20	0.0958	50	3.34	15.9	7.93	6.03	127.3
04/17/20	NS	49	NS	NS	NS	NS	NS
04/28/20	0.0633	38	3.43	17.9	3.54	6.45	218.8
05/19/20	NS	7	NS	NS	NS	NS	NS
05/26/20	0	0					

NS = Not Surveyed

## 4.7 Pond 16

Pond 16 was in year 2 for post-subsurface munitions remediation in 2020. Depth of Pond 16 was monitored fourteen times and water quality parameters were measured five times. Pond 16 was inundated by the time of first December surveys, and it dried out twice within the 2020 water year; first following initial inundation in February, and second time by mid-August (Table 4-7 and Figure 4-7).

**Table 4-7. Pond 16 (Year 2 Post-Subsurface Munitions Remediation) Hydrology Monitoring Results**

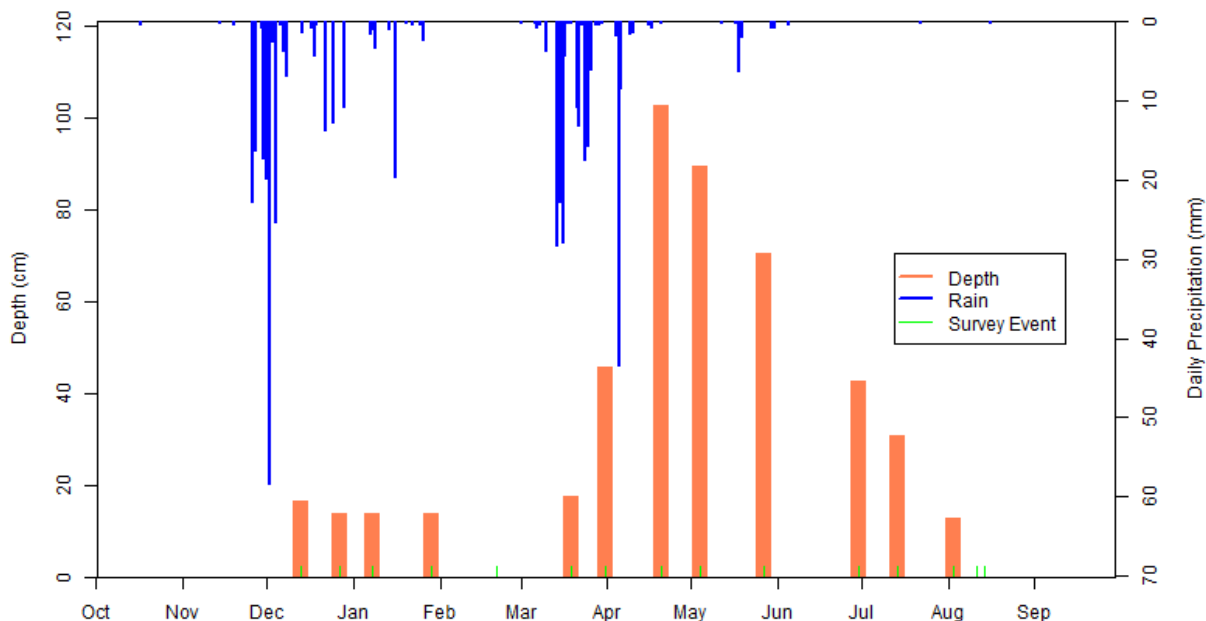
Pond 16							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
12/13/19	0.1438	15	NS	NS	NS	NS	NS
12/27/19	NS	12	NS	NS	NS	NS	NS
01/08/20	NS	12	NS	NS	NS	NS	NS
01/29/20 <sup>#</sup>	0.097	12	11.38	13.2	43.8	6.81	1666
02/21/20	0	0					
03/19/20	0.1734	16	NS	NS	NS	NS	NS
03/31/20	0.3271	44	4.38	18.8	156	6.28	384.3
04/20/20 <sup>*</sup>	NS	101	NS	NS	NS	NS	NS
05/04/20	0.5172	88	0.06	15.3	122.01	6.21	300
05/27/20	0.4311	69	1.34	18.7	85.23	6.66	392.1
06/30/20	0.3156	41	7.19	25.1	18.31	7.09	703
07/14/20	NS	29	NS	NS	NS	NS	NS
08/03/20 <sup>^</sup>	0.031	11	NS	NS	NS	NS	NS
08/11/20 <sup>*</sup>	0	0					

NS = Not Surveyed

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

<sup>^</sup>Peripheral inundation present

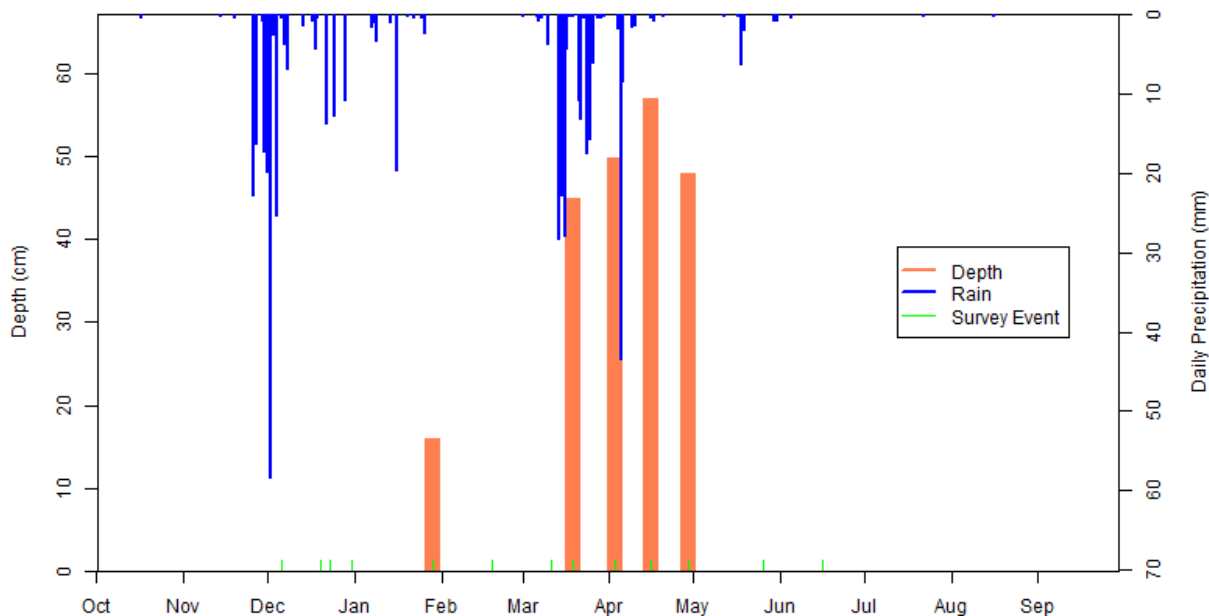
<sup>#</sup>Probe not fully submerged



**Figure 4-7.** Pond 16 (Year 2 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2020

#### 4.8 Pond 41

Pond 41, a post-subsurface munitions remediation vernal pool, was in year 2 of monitoring in 2020. Depth of Pond 41 was monitored twelve times and water quality parameters were measured three times. Pond 41 became inundated in January and it dried out twice within the 2020 water year; first following initial inundation in February, and second time dried by the end of May (Table 4-8 and Figure 4-8).



**Figure 4-8.** Pond 41 (Year 2 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2020

**Table 4-8. Pond 41 (Year 2 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)
12/06/19	0	0					
12/20/19	0	0					
12/23/19	0	0					
12/31/19 <sup>^</sup>	0	0					
01/29/20 <sup>#</sup>	0.0011	15	17.16	11.9	1.46	7.08	258.7
02/19/20	0	0					
03/11/20	0	0					
03/19/20 <sup>^</sup>	0.1503	44	NS	NS	NS	NS	NS
04/03/20 <sup>^</sup>	0.4961	49	1.58	12.9	151.21	6.26	157.6
04/16/20 <sup>*</sup>	NS	56	NS	NS	NS	NS	NS
04/29/20 <sup>^</sup>	0.4152	47?	0.01	17.6	7.62	6.26	192.8
05/26/20	0	0					

NS = Not Surveyed

<sup>\*</sup>taken during Burleson surveys<sup>^</sup>Peripheral inundation present<sup>#</sup>Probe not fully submerged

#### 4.9 Pond 40 North

Pond 40 North, a post-burn vernal pool, was in year 3 of monitoring in 2020. Depth of Pond 40 North was monitored eleven times and water quality parameters were measured three times. Pond 40 North was inundated by the time of first December surveys, and it dried out twice in 2020 water year; first following initial inundation in February, and second time by mid-June (Table 4-9 and Figure 4-9).

**Table 4-9. Pond 40 North (Year 3 Post-Burn) Hydrology Monitoring Results**

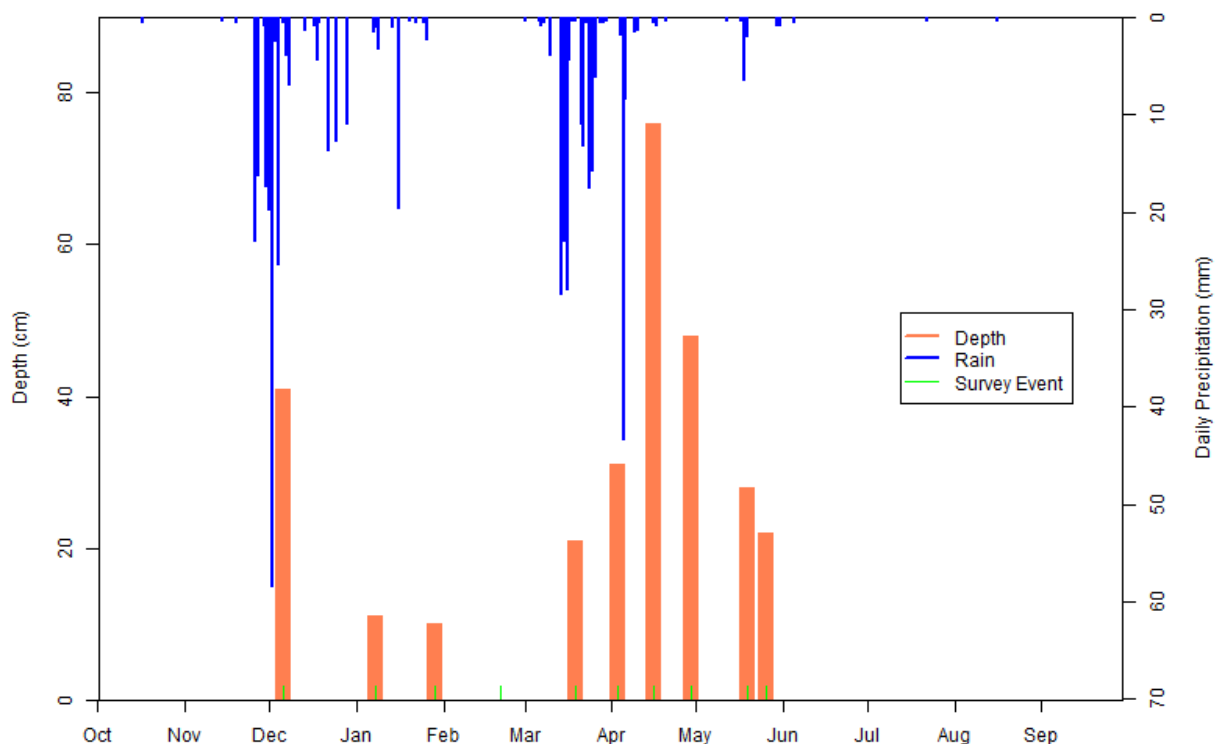
Pond 40 North							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
12/06/19	0.0198	40	NS	NS	NS	NS	NS
01/08/20	NS	10	NS	NS	NS	NS	NS
01/29/20	0.002	9	NS	NS	NS	NS	NS
02/21/20	0	0					
03/19/20 <sup>^</sup>	0.0058	20	NS	NS	NS	NS	NS
04/03/20 <sup>^</sup>	0.009	30	7.6	13.2	112.67	6.51	137.7
04/16/20 <sup>*</sup>	NS	75	NS	NS	NS	NS	NS

Pond 40 North							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
04/29/20	0.0246	47	0.88	15.3	101.99	6.56	244.1
05/19/20*	NS	27	NS	NS	NS	NS	NS
05/26/20	0.006	21	3.09	20.8	89.21	6.71	369.2
06/16/20*	0	0					

NS = Not Surveyed

\*taken during Burleson surveys

\*Peripheral inundation present



**Figure 4-9.** Pond 40 North (Year 3 Post-Burn) Depth and Precipitation on Former Fort Ord, 2020

#### 4.10 Pond 3 North

Pond 3 North was in year 3 of monitoring for post-burn and year 2 for post-subsurface munitions remediation in 2020. Depth of Pond 3 North was monitored fifteen times and water quality parameters were measured five times. Pond 3 North was inundated by the time of first December surveys, and it dried by the end of June (Table 4-10 and Figure 4-10).

**Table 4-10. Pond 3 North (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation)  
Hydrology Monitoring Results**

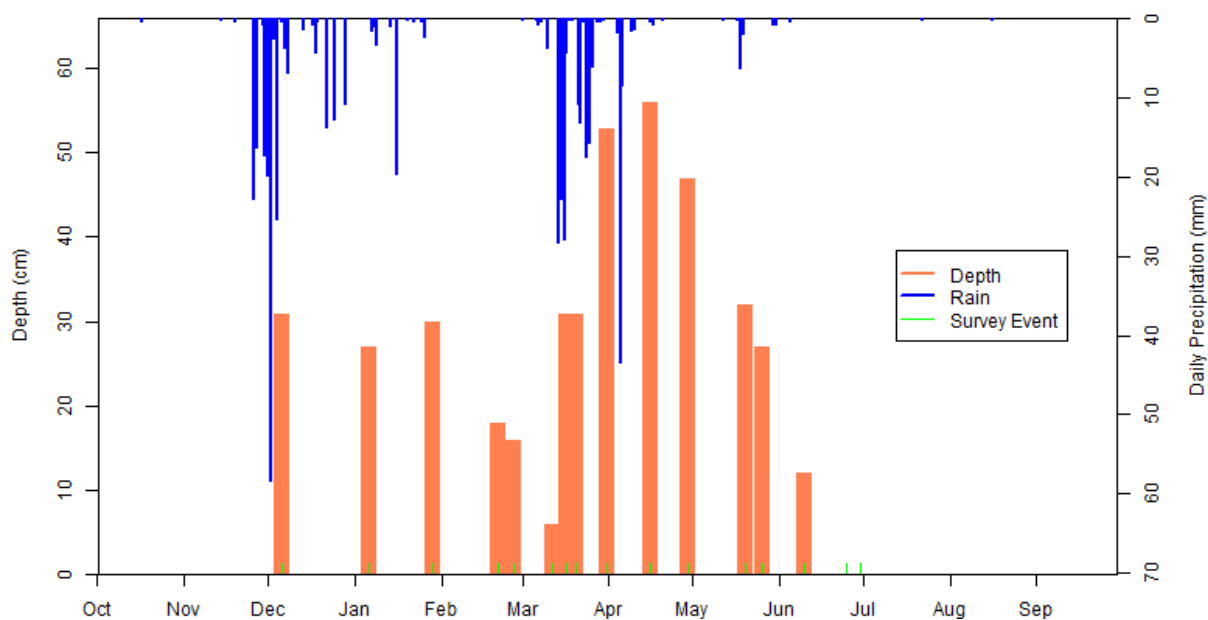
Pond 3 North							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
12/06/19 <sup>^</sup>	0.0563	30	NS	NS	NS	NS	NS
01/06/20 <sup>^</sup>	NS	26	NS	NS	NS	NS	NS
01/29/20 <sup>^#</sup>	0.0513	29	12.79	19.5	8.76	7.54	473.2
02/21/20	NS	17	NS	NS	NS	NS	NS
02/27/20	0.0163	15	7.2	19.6	12.71	7.06	271.9
03/12/20	NS	5	NS	NS	NS	NS	NS
03/17/20 <sup>*</sup>	NS	30	NS	NS	NS	NS	NS
03/20/20 <sup>^</sup>	NS	30	NS	NS	NS	NS	NS
03/31/20 <sup>^</sup>	0.1568	52	8.11	23.6	22.2	6.91	159
04/16/20 <sup>*</sup>	NS	55	NS	NS	NS	NS	NS
04/29/20 <sup>^</sup>	0.1086	46	2.4	19	1.51	6.36	324.1
05/20/20 <sup>*</sup>	NS	31	NS	NS	NS	NS	NS
05/26/20	0.04	26	4.29	28	0.94	6.59	253.1
06/10/20	NS	11	NS	NS	NS	NS	NS
06/25/20 <sup>*</sup>	0	0					

NS = Not Surveyed

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

<sup>^</sup>Peripheral inundation present

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



**Figure 4-10.** Pond 3 North (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2020

#### 4.11 Pond 3 South

Pond 3 South was in year 3 of monitoring for post-burn and year 2 for post-subsurface munitions remediation in 2020. Depth of Pond 3 North was monitored nine times and water quality parameters were measured three times. Pond 3 South was inundated by the time of first survey in December, which followed first significant precipitation event of the season, and it dried two times within the 2020 water year; first following initial inundation in February, and second time by the end of May (Table 4-11 and Figure 4-11).

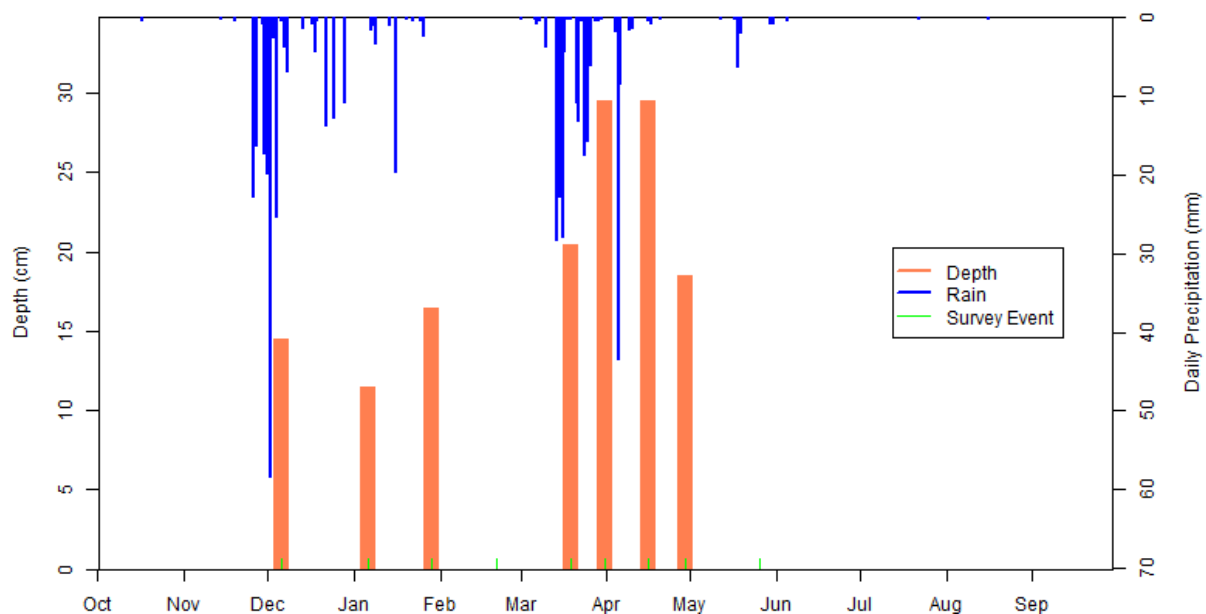
**Table 4-11. Pond 3 South (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation)**  
**Hydrology Monitoring Results**

Pond 3 South							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
12/06/19 <sup>^</sup>	0.0136	14	NS	NS	NS	NS	NS
01/06/20 <sup>^</sup>	NS	11	NS	NS	NS	NS	NS
01/29/20 <sup>^</sup>	0.0141	16	4.38	11	1.12	6.83	200.2
02/21/20	0	0					
03/19/20 <sup>^</sup>	0.0285	20	NS	NS	NS	NS	NS
03/31/20 <sup>^</sup>	0.3869	29	10.34	20.7	16.8	6.74	442.1
04/16/20 <sup>*</sup>	NS	29	NS	NS	NS	NS	NS
04/29/20 <sup>^</sup>	0.0168	18	10.28	20.8	1.76	7.28	358.3
05/26/20 <sup>*</sup>	0	0					

NS = Not Surveyed

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

<sup>^</sup>Peripheral inundation present



**Figure 4-11. Pond 3 South (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Depth and Precipitation Former Fort Ord, 2020**



#### 4.12 Pond 39

Pond 39 was in year 3 of monitoring for post-burn and year 2 for post-subsurface munitions remediation in 2020. Depth of Pond 39 was monitored twelve times and water quality parameters were measured four times. Pond 39 was inundated by the time of first survey in December, which followed first significant precipitation event of the season, and it dried two times within the 2020 water year; first in March, and the second time by late May (Table 4-12 and Figure 4-12).

**Table 4-12. Pond 39 (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation)**  
**Hydrology Monitoring Results**

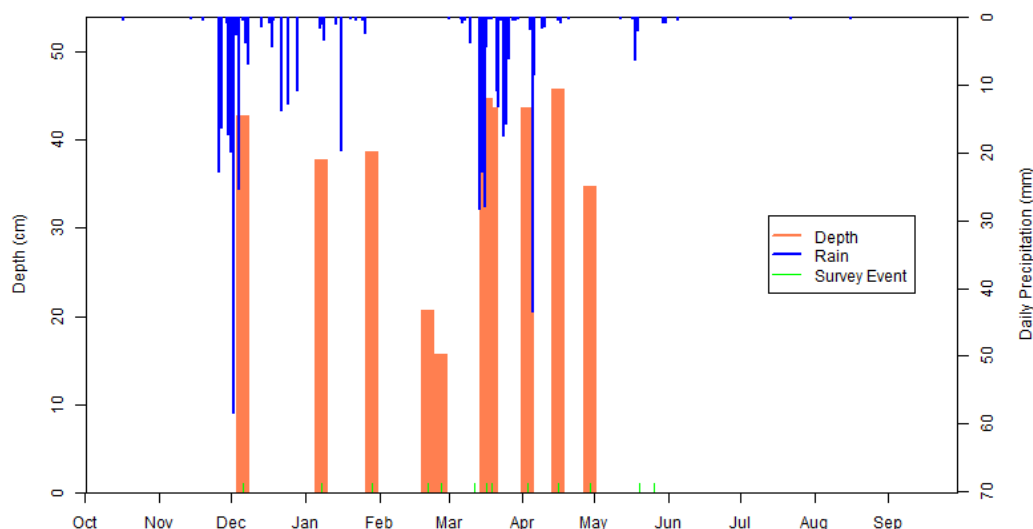
Pond 39							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
12/06/19 <sup>^</sup>	0.0079	42	NS	NS	NS	NS	NS
01/08/20	NS	37	NS	NS	NS	NS	NS
01/29/20	0.0055	38	2.35	11.2	74.97	6.25	94.5
02/21/20	NS	20	NS	NS	NS	NS	NS
02/27/20 <sup>#</sup>	8e-04	15	7.65	16.7	34.17	6.42	113.4
03/12/20	0	0					
03/17/20 <sup>*</sup>	NS	44	NS	NS	NS	NS	NS
03/19/20 <sup>^</sup>	0.0075	43	NS	NS	NS	NS	NS
04/03/20 <sup>^</sup>	0.0089	43	6.22	14.1	43.27	6.37	86.4
04/16/20 <sup>*</sup>	NS	45	NS	NS	NS	NS	NS
04/29/20 <sup>^</sup>	0.005	34	4.86	17.4	3.32	6.38	134.3
05/26/20	0	0					

NS = Not Surveyed

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

<sup>^</sup>Peripheral inundation present

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



**Figure 4-12.** Pond 39 (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2020

### 4.13 Pond 40 South

Pond 40 South was in year 3 of monitoring for post-burn and year 2 for post-subsurface munitions remediation in 2020. Depth of Pond 40 South was monitored eight times and water quality parameters was measured one time. Pond 40 South was inundated for a short time between mid-March to mid-April, and it dried by the end of April (Table 4-13 and Figure 4-13).

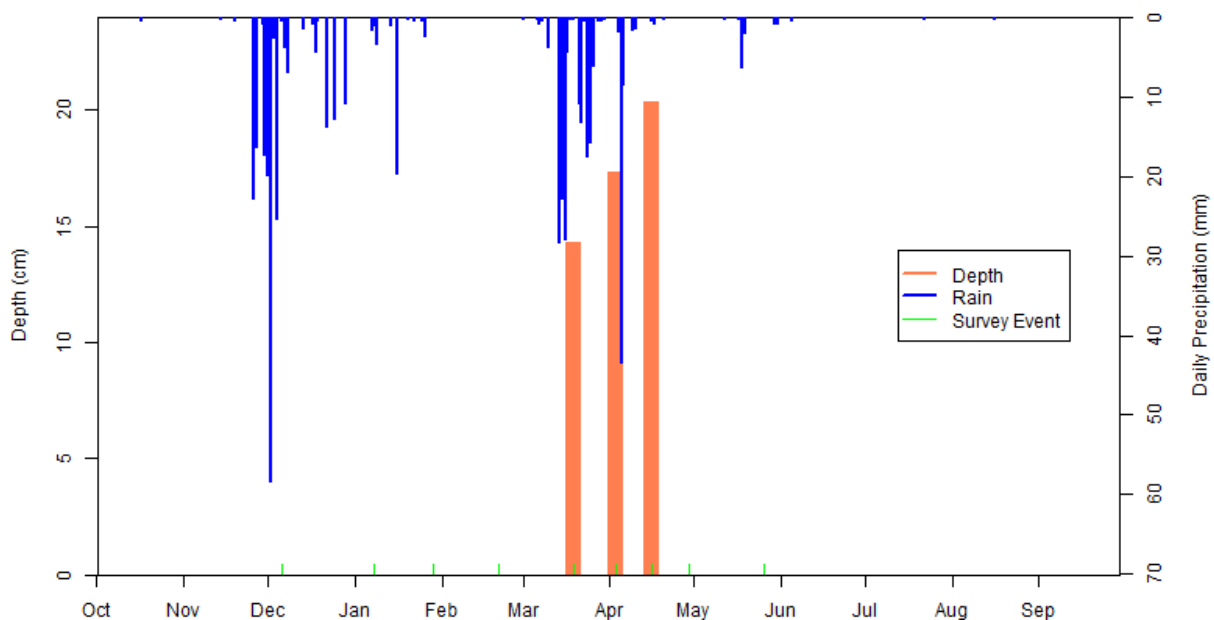
**Table 4-13. Pond 40 South (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation)  
Hydrology Monitoring Results**

Pond 40 South							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
12/06/19	0	0					
01/08/20	0	0					
01/29/20	0	0					
02/21/20	0	0					
03/19/20^	0.0167	14	NS	NS	NS	NS	NS
04/03/20^	0.0247	17	1.31	13.8	70.47	6.04	300.4
04/16/20*	NS	20	NS	NS	NS	NS	NS
04/29/20	0	0					

NS = Not Surveyed

\*taken during Burleson surveys

^Peripheral inundation present



**Figure 4-13.** Pond 40 South (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2020

#### 4.14 Pond 43

Pond 43 was in year 3 of monitoring for post-burn and year 2 for post-subsurface munitions remediation in 2020. Depth of Pond 43 was monitored eleven times and water quality parameters were measured three times. Pond 43 was inundated by the time of first survey in December, which followed first significant precipitation event of the season, and it dried two times within the 2020 water year; first in February, and second time by end of May (Table 4-14 and Figure 4-14).

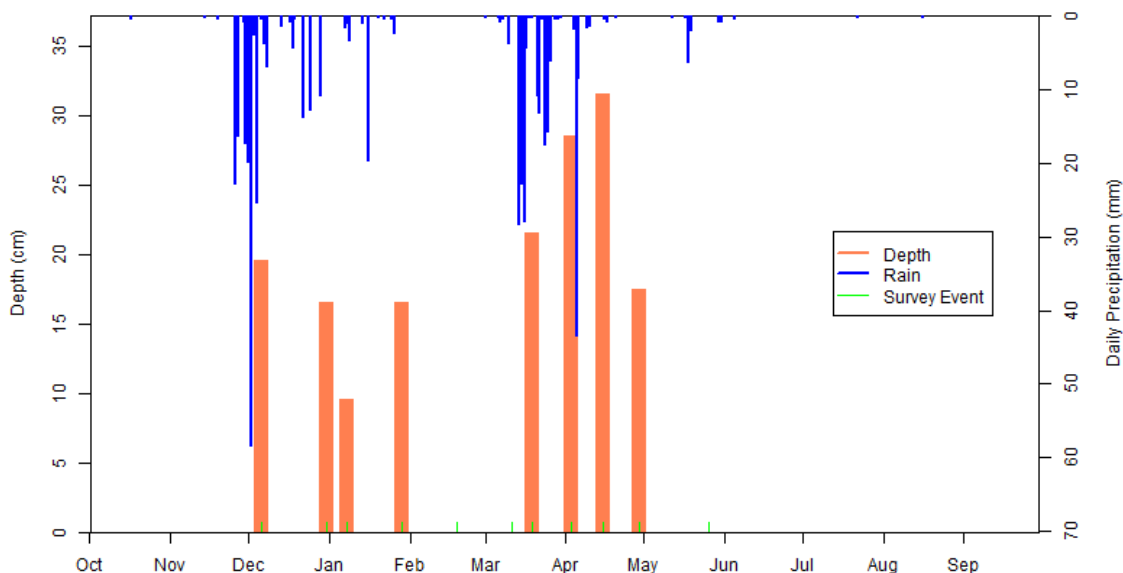
**Table 4-14. Pond 43 (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation)**  
**Hydrology Monitoring Results**

Pond 43							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
12/06/19 <sup>^</sup>	0.0113	19	NS	NS	NS	NS	NS
12/31/19	NS	16	NS	NS	NS	NS	NS
01/08/20 <sup>^</sup>	NS	9	NS	NS	NS	NS	NS
01/29/20 <sup>^</sup>	0.0077	16	16.63	18.2	1.51	9.08	176.2
02/19/20	0	0					
03/11/20	0	0					
03/19/20 <sup>^</sup>	0.0117	21	NS	NS	NS	NS	NS
04/03/20	0.0404	28	11.17	21.7	0.49	7.99	172
04/15/20 <sup>*</sup>	NS	31	NS	NS	NS	NS	NS
04/29/20	0.0084	17	11.05	21.7	0.62	7.84	261
05/26/20	0	0					

NS = Not Surveyed

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

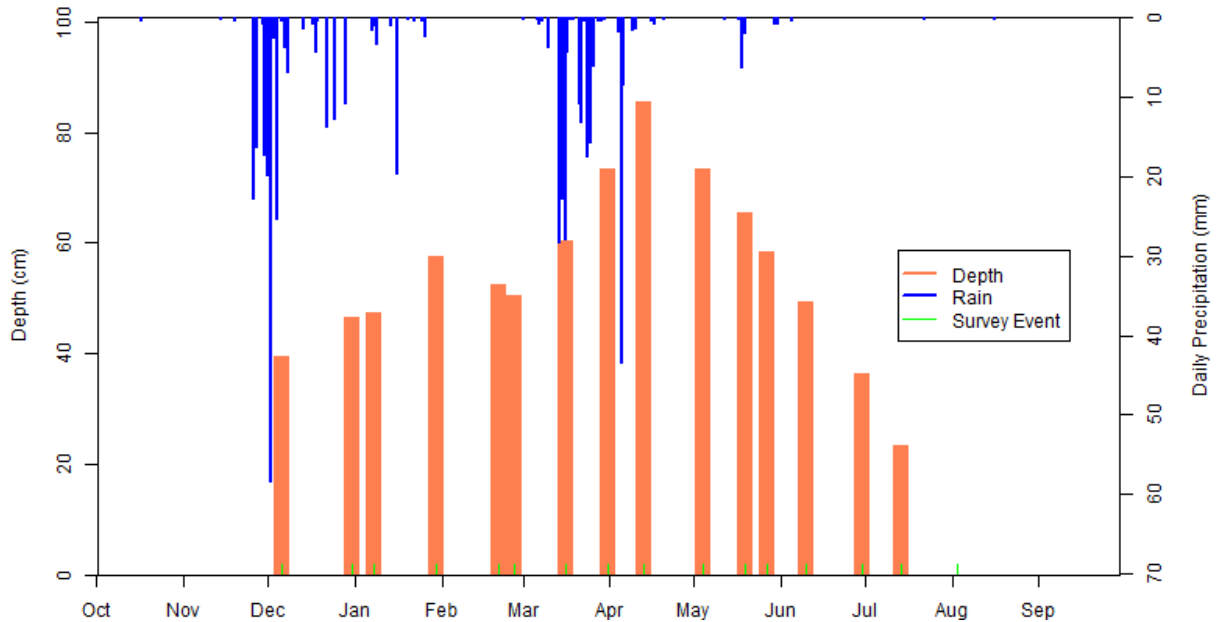
<sup>^</sup>Peripheral inundation present



**Figure 4-14.** Pond 43 (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2020

#### 4.15 Pond 56

Pond 56, a post-mastication vernal pool, was in year 3 of monitoring in 2020. Depth of Pond 56 was monitored sixteen times and water quality parameters were measured seven times (Table 4-15 and Figure 4-15). Pond 56 was inundated by the time of first survey in December, which followed first significant precipitation event of the season, and it dried by beginning of August.



**Figure 4-15.** Pond 56 (Year 3 Post-Mastication) Depth and Precipitation on Former Fort Ord, 2020

**Table 4-15. Pond 56 (Year 3 Post-Mastication) Hydrology Monitoring Results**

Pond 56							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
12/06/19	0.2573	38	NS	NS	NS	NS	NS
12/31/19 <sup>a</sup>	0.3266	45	14.55	11.1	10.81	6.89	570
01/08/20	NS	46	NS	NS	NS	NS	NS
01/30/20	0.6023	56	3.87	12.5	3.37	6.46	447.7
02/21/20	NS	51	NS	NS	NS	NS	NS
02/27/20	0.3487	49	2.43	12.1	1.75	6.7	513
03/16/20 <sup>b</sup>	NS	59	NS	NS	NS	NS	NS
03/31/20	3.0134	72	6.18	23.6	1.22	6.6	311.4
04/13/20 <sup>c</sup>	NS	84	NS	NS	NS	NS	NS
05/04/20	2.9339	72	0.82	17	1.97	6.26	307.9
05/19/20 <sup>d</sup>	NS	64	NS	NS	NS	NS	NS
05/27/20	0.5845	57	0.2	18.8	0.27	6.39	415.9
06/10/20	NS	48	NS	NS	NS	NS	NS

Pond 56							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
06/30/20	0.223	35	3.4	24.9	0.31	6.66	761
07/14/20	NS	22	NS	NS	NS	NS	NS
08/03/20	0	0					

NS = Not Surveyed

\*taken during Burleson surveys

^Peripheral inundation present

#### 4.16 Machine Gun Flats

Machine Gun Flats, a post-mastication vernal pool, was in year 3 of monitoring in 2020. Depth of Machine Gun Flats was monitored eighteen times and water quality parameters were measured seven times (Table 4-16 and Figure 4-16). Machine Gun Flats was inundated by the time of first survey in December, which followed first significant precipitation event of the season, and it did not dry before the last survey on September 4, 2020.

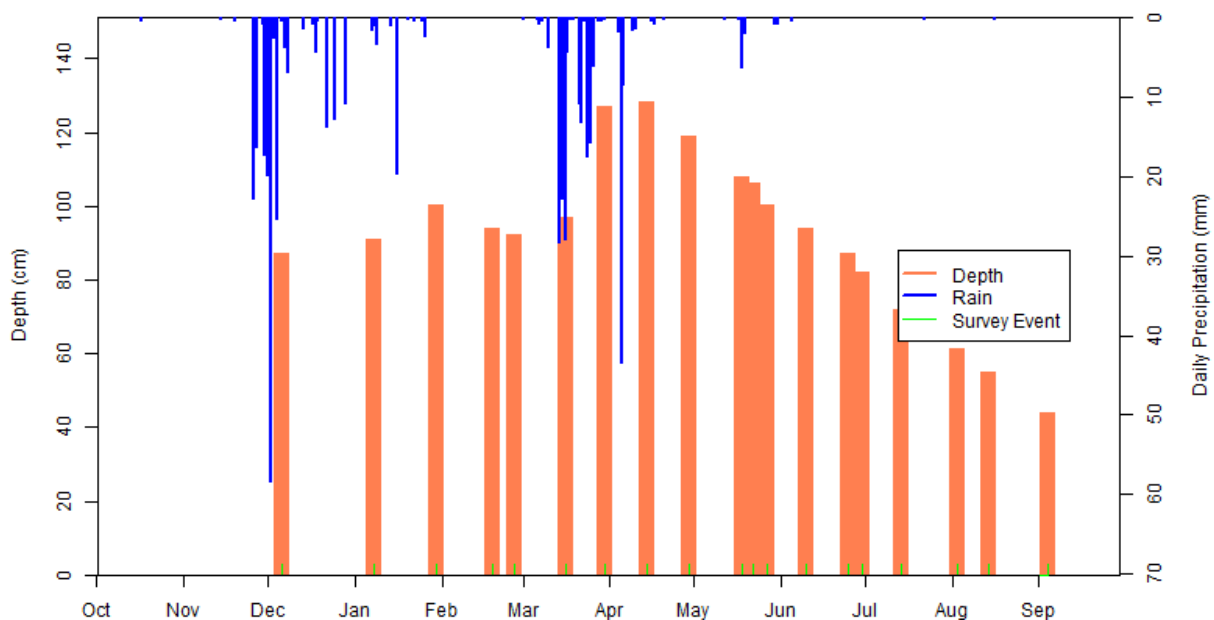


Figure 4-16. Machine Gun Flats (Year 3 Post-Mastication) Depth and Precipitation on Former Fort Ord, 2020

Table 4-16. Machine Gun Flats (Year 3 Post-Mastication) Hydrology Monitoring Results

Machine Gun Flats							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
12/06/19	0.0618	85	NS	NS	NS	NS	NS
01/08/20	NS	89	NS	NS	NS	NS	NS
01/30/20^	0.0776	98	4.09	13.4	81.68	7.06	454.7

Machine Gun Flats							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
02/19/20 <sup>^</sup>	NS	92	NS	NS	NS	NS	NS
02/27/20 <sup>^</sup>	0.0675	90	4.29	16	81.64	7.55	506
03/16/20 <sup>*</sup>	NS	95	NS	NS	NS	NS	NS
03/30/20	0.1168	125	6.78	19.2	55.84	6.42	116.5
04/14/20 <sup>*</sup>	NS	126	NS	NS	NS	NS	NS
04/29/20 <sup>^</sup>	0.105	117	7.93	19.2	13.49	7.23	155.1
05/18/20 <sup>*</sup>	NS	106	NS	NS	NS	NS	NS
05/22/20	NS	104	NS	NS	NS	NS	NS
05/27/20	0.0783	98	4.97	21	2.59	6.74	197.9
06/10/20	NS	92	NS	NS	NS	NS	NS
06/30/20	0.0532	80	5.74	20.1	6.03	7.19	267.5
07/14/20 <sup>^</sup>	NS	70	NS	NS	NS	NS	NS
08/03/20	0.037	59	6.58	22.9	11.55	7.1	352.1
08/14/20	NS	53	NS	NS	NS	NS	NS
09/04/20	0.0237	42					

NS = Not Surveyed

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

#### 4.17 Pond 42

Pond 42 was in year 3 for post-mastication and post-burn and year 2 for post-subsurface munitions remediation in 2020. Depth of Pond 42 was monitored fifteen times and water quality parameters were measured five times (Table 4-17 and Figure 4-17). Pond 42 was inundated by the time of first survey in December, which followed first significant precipitation event of the season, and it dried two times within the 2020 water year; first it dried out completely in March, and second time by the end of June.

**Table 4-17. Pond 42 (Year 3 Post-Mastication and Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Hydrology Monitoring Results**

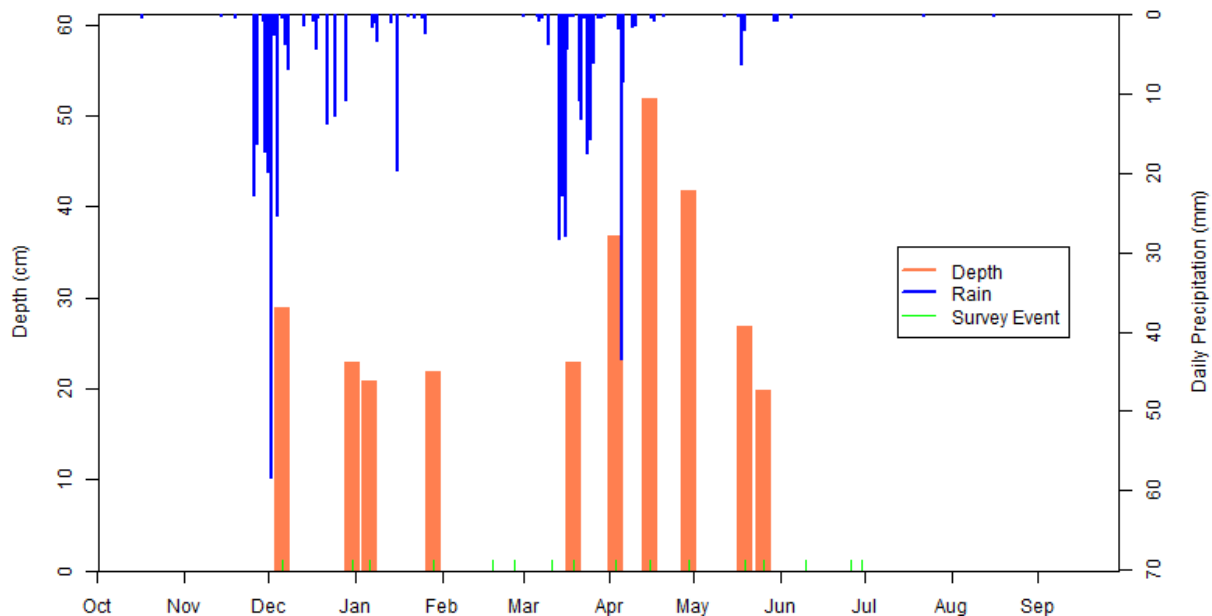
Pond 42							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
12/06/19 <sup>^</sup>	0.276	28	NS	NS	NS	NS	NS
12/31/19 <sup>^</sup>	0.1418	22	10.24	14.7	2.89	7.54	282
01/06/20 <sup>^</sup>	NS	20	NS	NS	NS	NS	NS
01/29/20 <sup>^</sup>	0.1088	21	6.56	15.3	4.87	6.75	276.4
02/19/20 <sup>^</sup>	0	0					
02/27/20 <sup>^</sup>	0.012	0					

Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
03/11/20	0	0					
03/19/20^	0.1075	22	NS	NS	NS	NS	NS
04/03/20^	0.3487	36	9.86	20.1	1.62	7.21	131.2
04/15/20*	NS	51	NS	NS	NS	NS	NS
04/29/20^	0.3787	41	9.23	18.1	0.74	7.17	136.5
05/19/20*	NS	26	NS	NS	NS	NS	NS
05/26/20	0.1015	19	8.15	31.6	0.05	7.95	200.8
06/10/20^	0	0					
06/26/20*	0	0					

NS = Not Surveyed

\*taken during Burleson surveys

^Peripheral inundation present



**Figure 4-17.** Pond 42 (Year 3 Post-Mastication and Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2020

#### 4.18 Pond 35

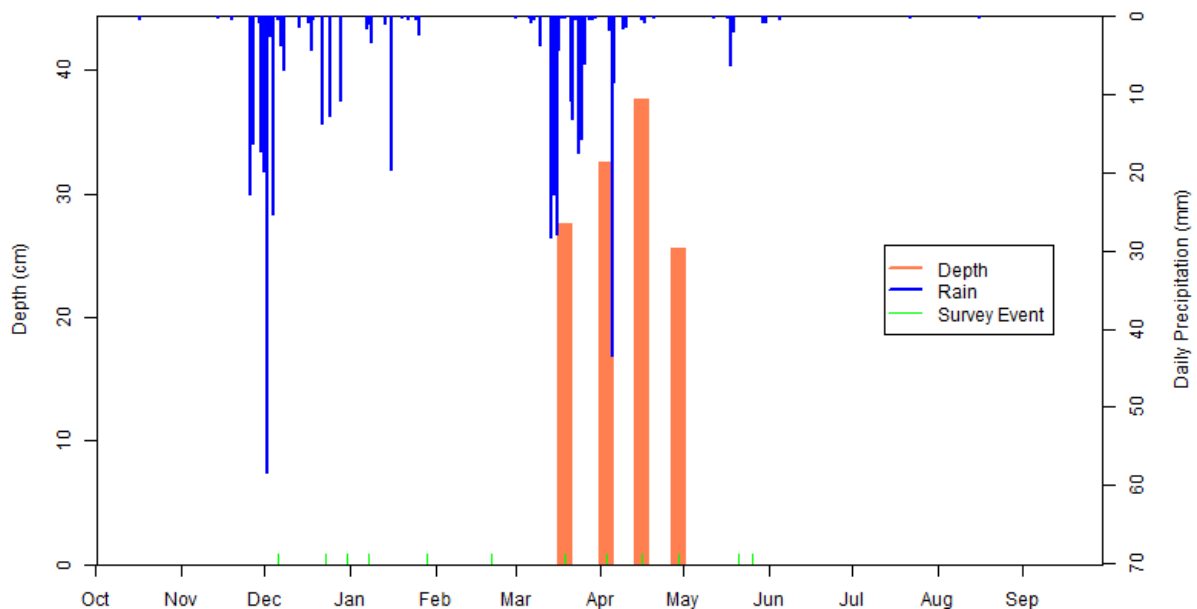
Pond 35 was in year 3 of monitoring for post-mastication and year 2 for post-subsurface munitions remediation in 2020. Depth of Pond 35 was monitored eleven times and water quality parameters were measured twice. Pond 35 was inundated for a short time between mid-March to late April, and it dried by the end of May (Table 4-18 and Figure 4-18).

**Table 4-18. Pond 35 (Year 3 Post-Mastication, Year 2 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)
12/06/19	0	0					
12/23/19	0	0					
12/31/19	0	0					
01/08/20	0	0					
01/29/20	0	0					
02/21/20	0	0					
03/19/20	0.0666	27	NS	NS	NS	NS	NS
04/03/20	0.0872	32	6.23	15.1	63.53	6.56	96.8
04/16/20*	NS	37	NS	NS	NS	NS	NS
04/29/20	0.0561	25	1.67	18.1	49.77	6.88	265.3
05/21/20*	0	0					

NS = Not Surveyed

\*taken during Burleson surveys



**Figure 4-18.** Pond 35 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2020.

#### 4.19 Pond 44

Pond 44 was in year 3 of monitoring for post-mastication and year 2 for post-subsurface munitions remediation in 2020. Depth of Pond 44 was monitored eleven times and water quality parameters were measured twice. Pond 44 was inundated by the time of first survey in December, which followed first



significant precipitation event of the season, and it dried three times within the 2020 water year; first in January, second by mid-February, and the third and final time by the end of May (Table 4-19 and Figure 4-19).

**Table 4-19. Pond 44 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Hydrology Monitoring Results**

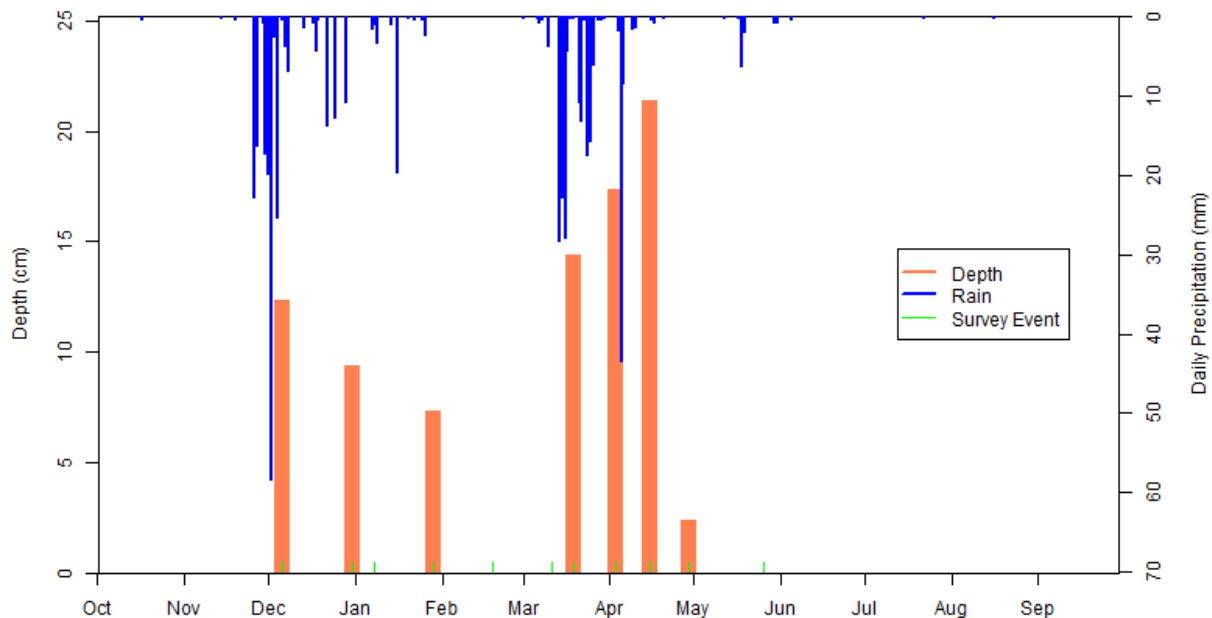
Pond 44							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
12/06/19 <sup>^</sup>	0.0085	12	NS	NS	NS	NS	NS
12/31/19 <sup>^</sup>	NS	9	NS	NS	NS	NS	NS
01/08/20	0	0					
01/29/20 <sup>^#</sup>	0.005	7	11.31	16.9	2.93	7.46	147.7
02/19/20	0	0					
03/11/20	0	0					
03/19/20 <sup>^</sup>	0.0126	14	NS	NS	NS	NS	NS
04/03/20 <sup>^</sup>	0.0151	17	10.91	22.5	1.05	7.54	106.6
04/15/20 <sup>*</sup>	NS	21	NS	NS	NS	NS	NS
04/29/20 <sup>^</sup>	0.0018	2	NS	NS	NS	NS	NS
05/26/20	0	0					

NS = Not Surveyed

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

<sup>^</sup>Peripheral inundation present

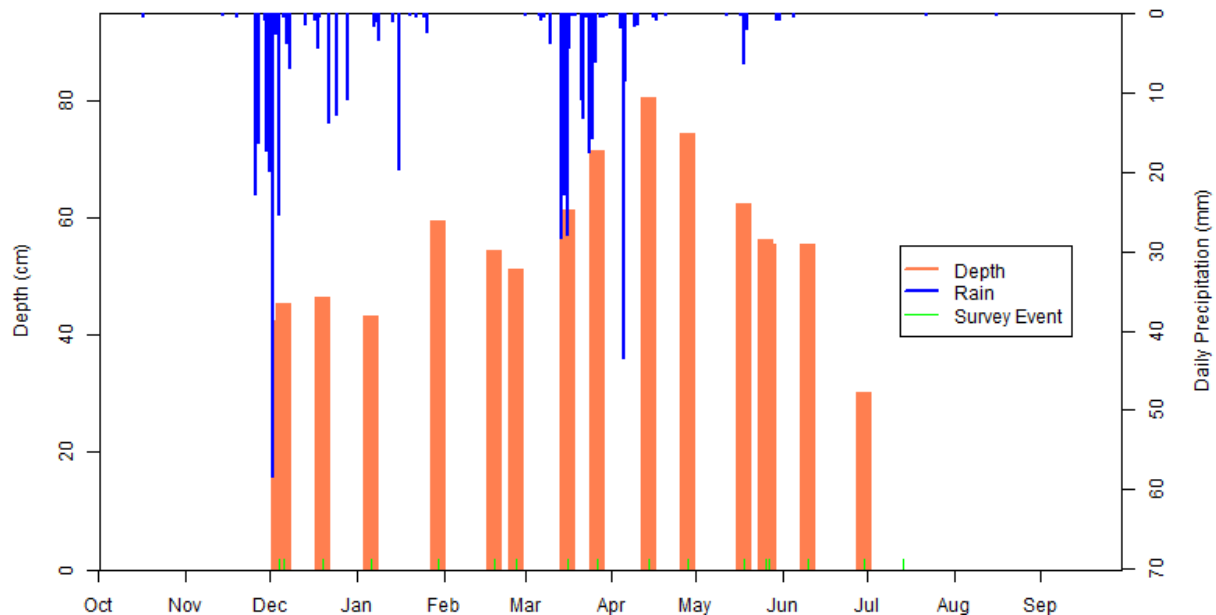
<sup>#</sup>Probe not fully submerged



**Figure 4-19. Pond 44 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2020**

#### 4.20 Pond 60

Pond 60 was in year 3 post-mastication vernal pool monitoring and year 2 for post-subsurface munitions remediation in 2020. In 2020, Pond 60 was monitored seventeen times and water quality parameters were measured seven times. Pond 60 was inundated by the time of first survey in December, which followed first significant precipitation event of the season, and it dried by mid July (Table 4-20 and Figure 4-20).



**Figure 4-20.** Pond 60 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2020

**Table 4-20. Pond 60 (Year 3 Post-Mastication, Year 2 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)
12/04/19	NS	41	NS	NS	NS	NS	NS
12/06/19	0.2278	44	NS	NS	NS	NS	NS
12/20/19	0.2388	45	2.64	12.7	34.54	6.77	736
01/06/20	NS	42	NS	NS	NS	NS	NS
01/30/20	0.6746	58	4.34	11.2	8.74	6.66	721
02/19/20	NS	53	NS	NS	NS	NS	NS
02/27/20	0.2661	50	5.00	13.5	11.18	7.76	856
03/16/20*	NS	60	NS	NS	NS	NS	NS
03/27/20	1.4878	70	5.51	16.4	13.3	6.56	547
04/14/20*	NS	79	NS	NS	NS	NS	NS
04/28/20	1.6664	73	1.75	16.7	18.65	6.37	497.6

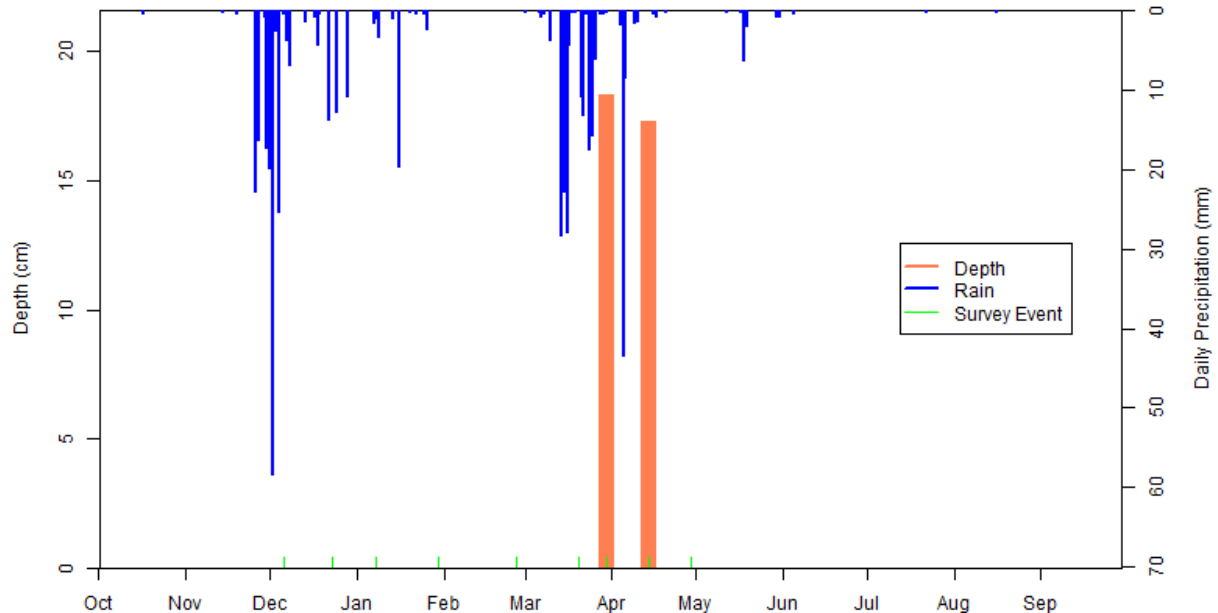
Pond 60							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
05/18/20*	NS	61	NS	NS	NS	NS	NS
05/26/20	NS	55	NS	NS	NS	NS	NS
05/27/20	0.2889	54	0.63	18.8	2.01	6.65	752
06/10/20	NS	54	NS	NS	NS	NS	NS
06/30/20	0.1207	29	1.14	20.5	11.78	6.96	1586
07/14/20	0	0					

NS = Not Surveyed

\*taken during Burleson surveys

#### 4.21 Pond 61

Pond 61 was in year 3 of monitoring for post-mastication and year 2 for post-subsurface munitions remediation in 2020. Depth of Pond 61 was monitored nine times and water quality parameters were measured once. Pond 61 consists of several depressions that fill with water at different rates. The staff gauge is installed in the most eastern depression. The eastern part of Pond 61 was inundated for a short period from the end of March through mid-April, while the most western depression was inundated from December (Table 4-21 and Figure 4-21).



**Figure 4-21.** Pond 61 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2020

**Table 4-21. Pond 61 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation)  
Hydrology Monitoring Results**

Pond 61							
Date	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
12/06/19 <sup>^</sup>	0.1092	0					
12/23/19 <sup>^</sup>	0	0					
01/08/20 <sup>^</sup>	0	0					
01/30/20 <sup>^</sup>	0	0					
02/27/20 <sup>^</sup>	0.009	0					
03/20/20 <sup>^</sup>	0	0					
03/30/20	0.0801	18	2.78	16.7	106.68	5.71	176.2
04/14/20 <sup>*</sup>	NS	17	NS	NS	NS	NS	NS
04/29/20	0	0					

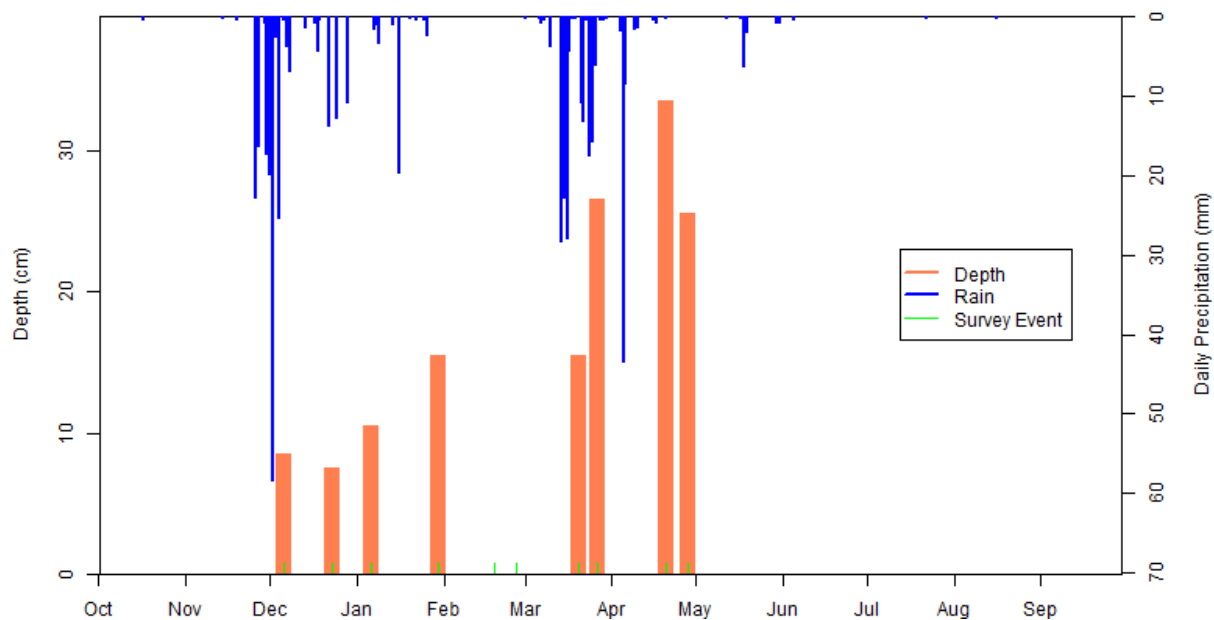
NS = Not Surveyed

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

<sup>^</sup>Peripheral inundation present

#### 4.22 Pond 73

Pond 73 was in year 3 of monitoring for post-mastication and year 2 for post-subsurface munitions remediation in 2020. In 2020, Pond 73 was monitored ten times and water quality parameters were measured three times. Pond 73 was inundated by the time of first survey in December, which followed first significant precipitation event of the season, and it dried two times within the 2020 water year; first following initial inundation in February, and second time by it dried completely by the beginning of June (Table 4-22 and Figure 4-22).



**Figure 4-22. Pond 73 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2020**

**Table 4-22. Pond 73 (Year 3 Post-Mastication, Year 2 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)
12/06/19 <sup>^</sup>	3e-04	8	NS	NS	NS	NS	NS
12/23/19	NS	7	NS	NS	NS	NS	NS
01/06/20 <sup>^</sup>	NS	10	NS	NS	NS	NS	NS
01/30/20 <sup>^#</sup>	5e-04	15	11.81	13.6	20.69	6.56	194.8
02/19/20 <sup>^</sup>	0	0					
02/27/20	0	0					
03/20/20 <sup>^</sup>	5e-04	15	NS	NS	NS	NS	NS
03/27/20	0.4167	26	13.06	18.1	12.06	6.61	108.1
04/20/20 <sup>^</sup>	NS	33	NS	NS	NS	NS	NS
04/28/20	0.4074	25	8.36	23.1	1.15	6.18	211
06/04/21 <sup>^</sup>	0	0					

NS = Not Surveyed

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

<sup>^</sup>Peripheral inundation present

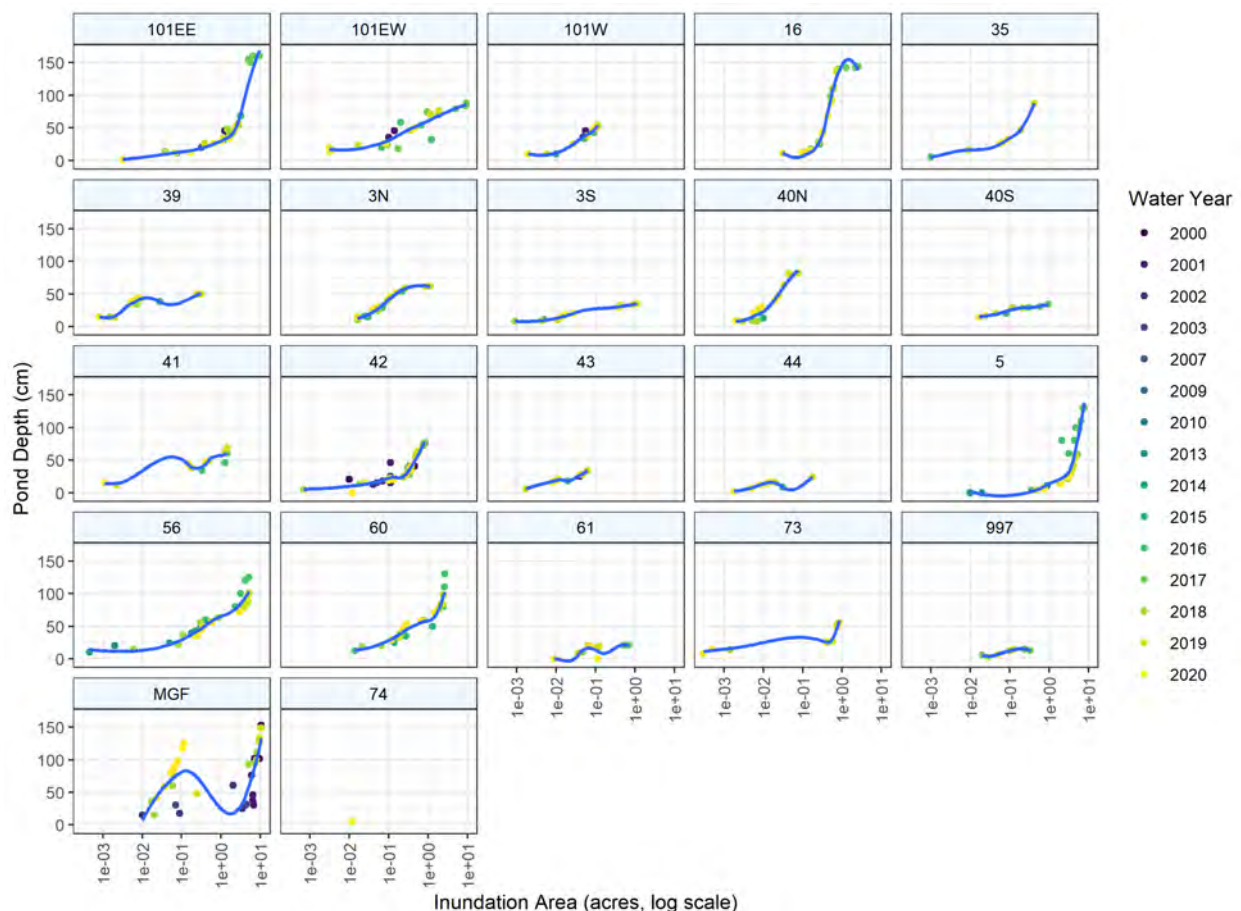
<sup>#</sup>Probe not fully submerged

## 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 2020 water year.



**Figure 5-1.** Plot of Historical Depth vs Inundation Area Data Going Back to Water Year 2000 for All Ponds Surveyed in the 2020 Water Year (Depth Axis is Presented on a Logarithmic Scale).

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 Ponds 3 North and 40 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 ponds that held enough water. 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 the historical conductivity data are not available for comparison. 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.

During 2020 water year, measured pH values were mostly within historical range, however there were a few individual measurements that stood out (Figure 5-2). Pond 43 had an unusually high pH = 9.08 (although a value of pH = 9.72 had been recorded at Pond 43 in 1997), and April values were higher than most historical data for that pond. Pond 60 had a highest value in February of pH = 7.76 out of all historical data.

Water temperature measurements were within historical ranges and showed a typical increasing pattern from month to month (Figure 5-3). Ponds 3 North, 5, 16, 42, 43, 44, and 73 had record values in their last month of monitoring, but they were within the observed trend and the high values can be explained by the shallow depths and the rising ambient temperatures as the seasons progress toward summer (Figure 2-3).

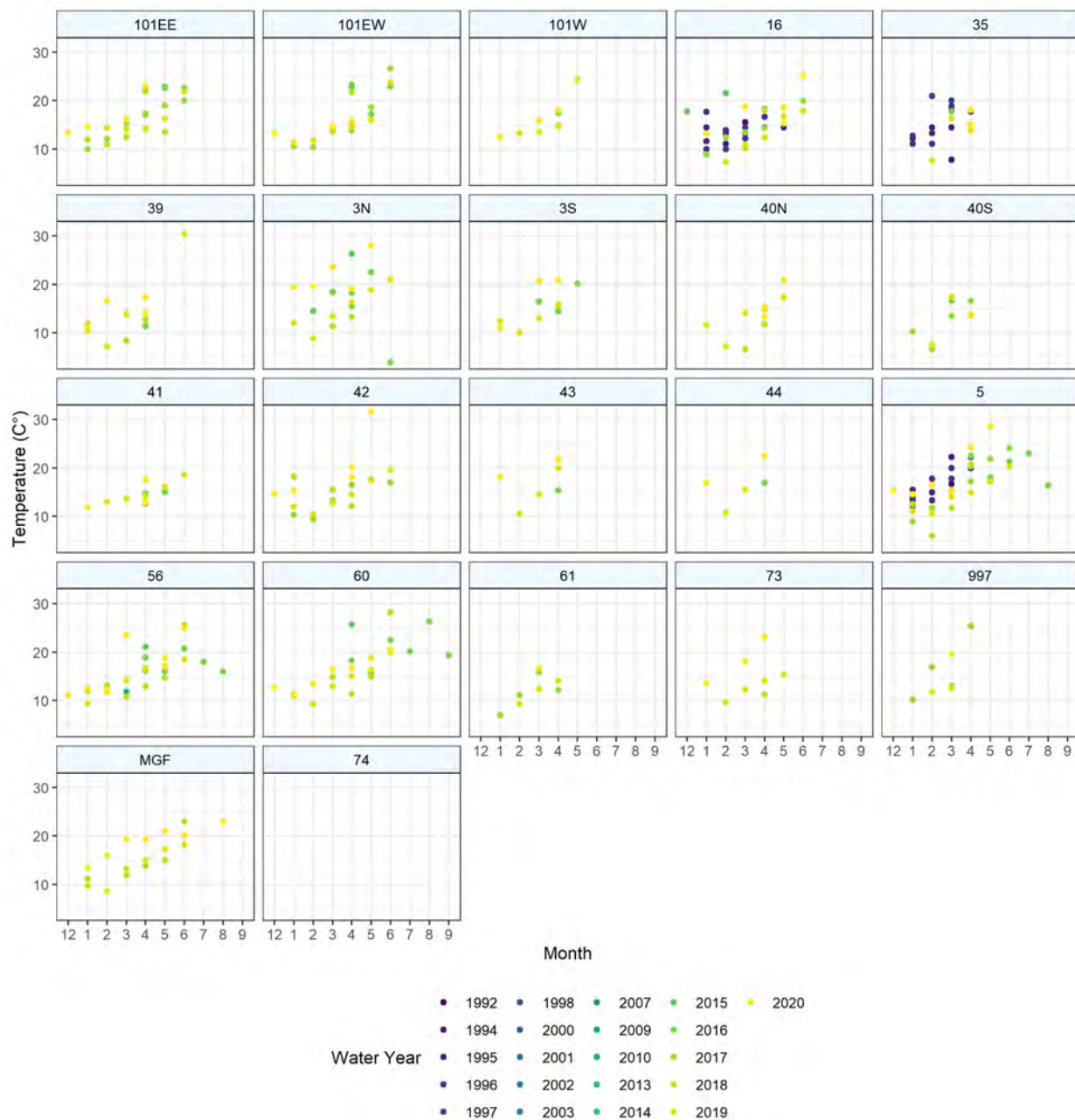
Turbidity values were also within historical ranges and in some vernal pools it decreased with time reaching very low values (Ponds 43 and 56; Figure 5-3)

Dissolved oxygen was generally within historical ranges, but in several vernal pools noticeably higher measurements were observed early in the season (Ponds 101 East (East), 41, 43, and 5; Figure 5-3).

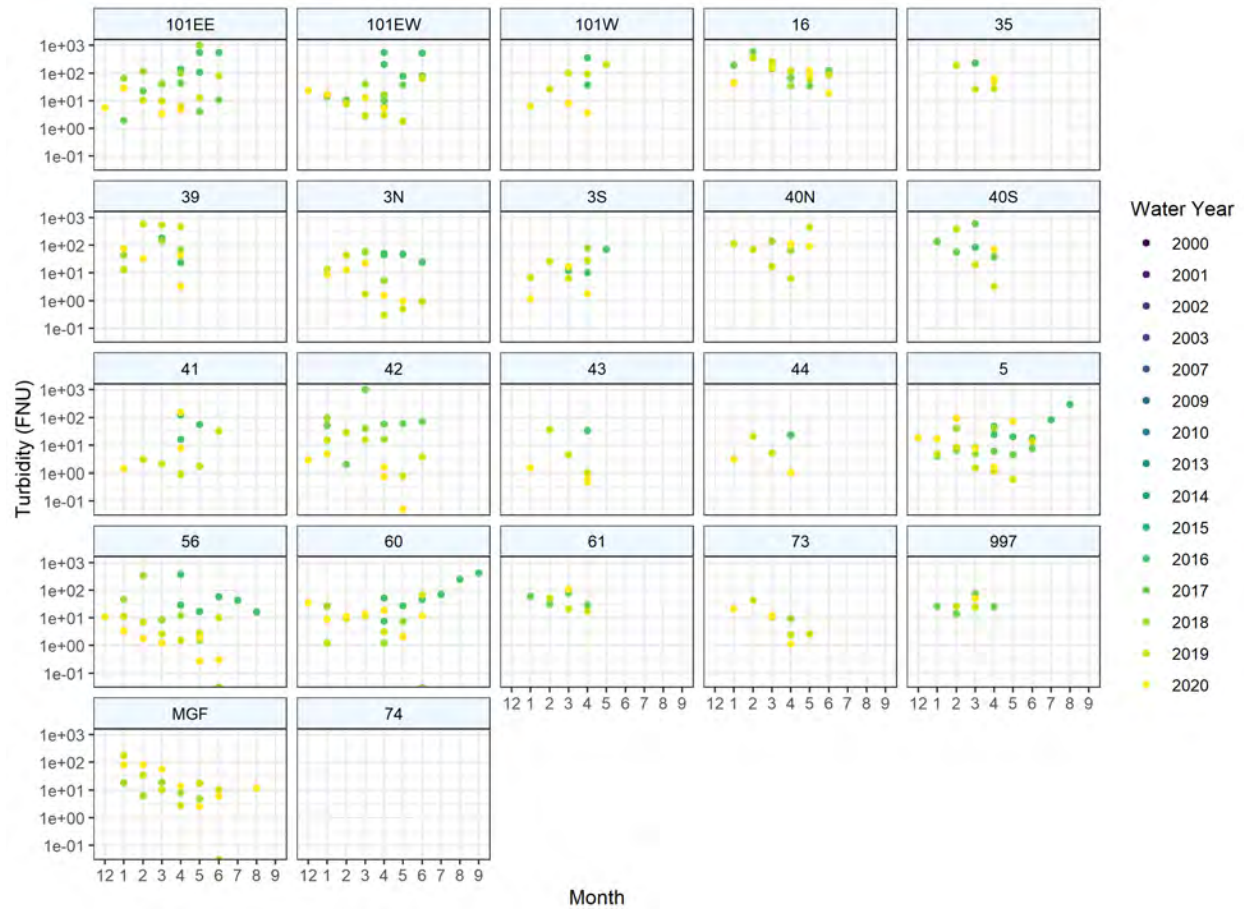


**Figure 5-2.** Plot of Historical pH Values Going Back to Water Year 1992 for All Ponds Surveyed in the 2020 Water Year. Water quality measurements were not taken at Pond 74 due to insufficient depth.

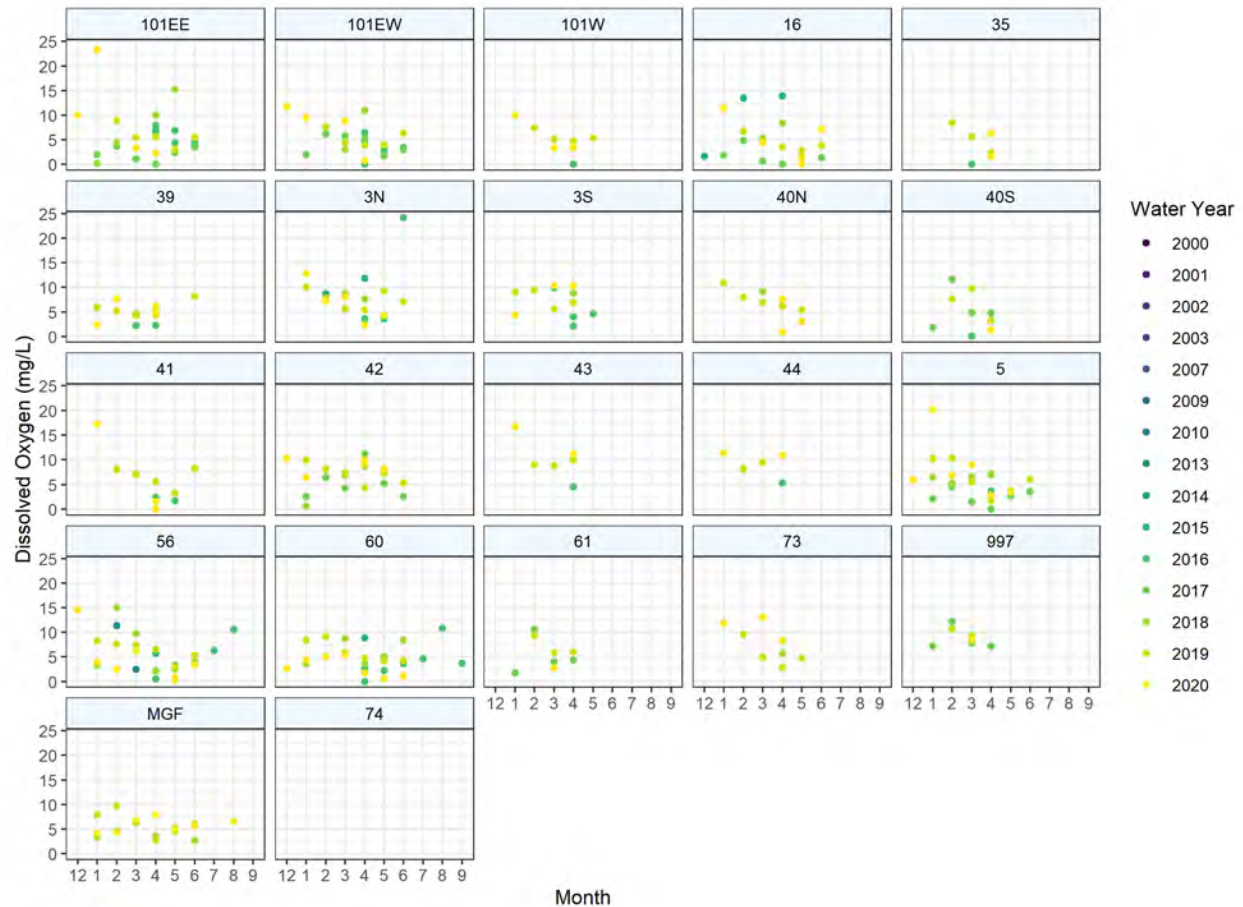




**Figure 5-3.** Plot of Historical Temperature Values Going Back to Water Year 1992 for All Ponds Surveyed in the 2020 Water Year. Water quality measurements were not taken at Pond 74 due to insufficient depth.



**Figure 5-4.** Plot of Historical Turbidity Values Going Back to Water Year 2000 for All Ponds Surveyed in the 2020 Water Year. Water quality measurements were not taken at Pond 74 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 2020 Water Year. Water quality measurements were not taken at Pond 74 due to insufficient depth.

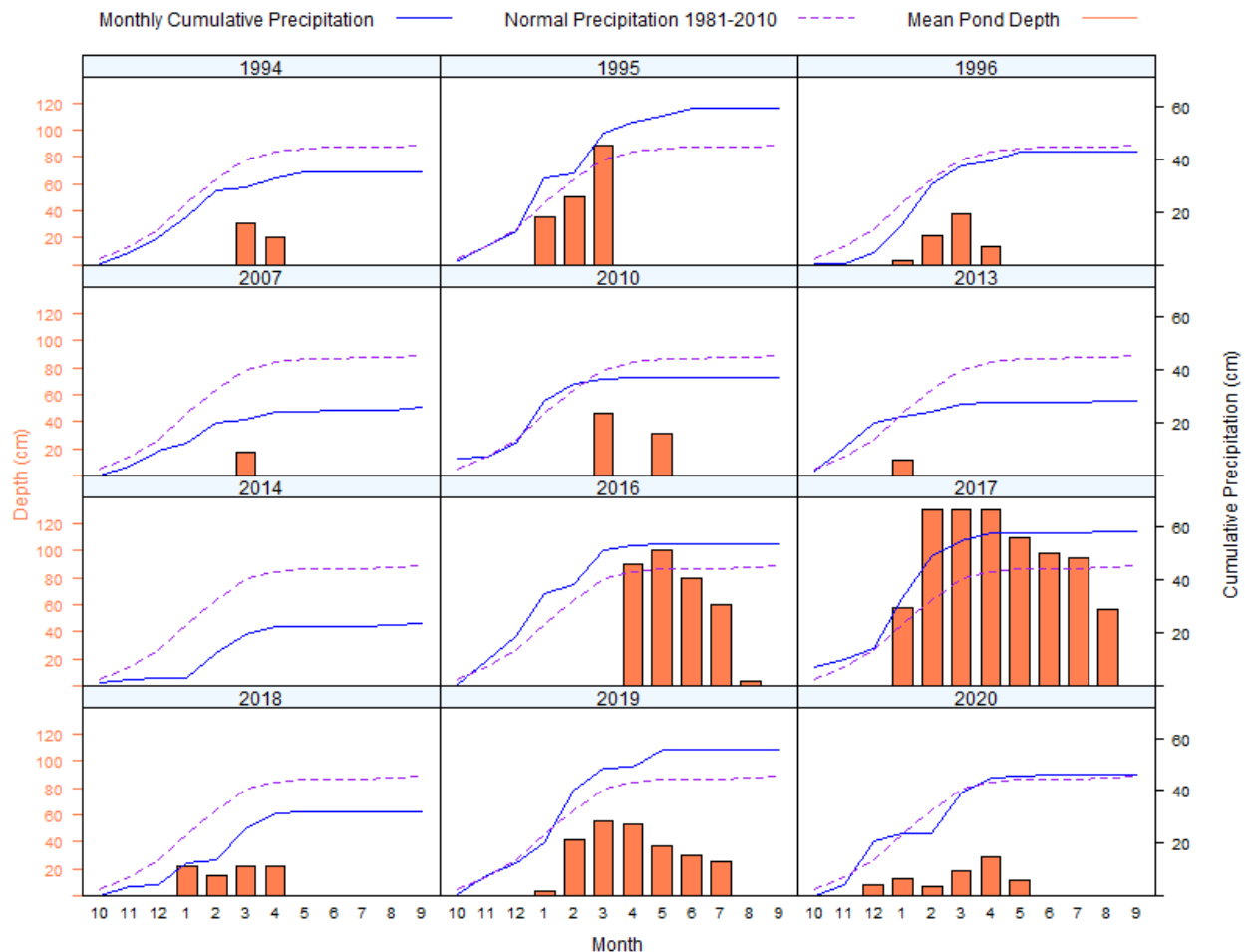
### 5.1 Pond 5 – Reference

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 twelve 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). The 2020 maximum depth of Pond 5 was 33 cm and maximum inundation was 3.15 acres (Table 4-1). The depth and inundation values were within range of previously recorded values (Figure 5-7). Pond 5 was inundated from the first recorded monitoring in December through May (Table 4-1 and Figure 4-1).

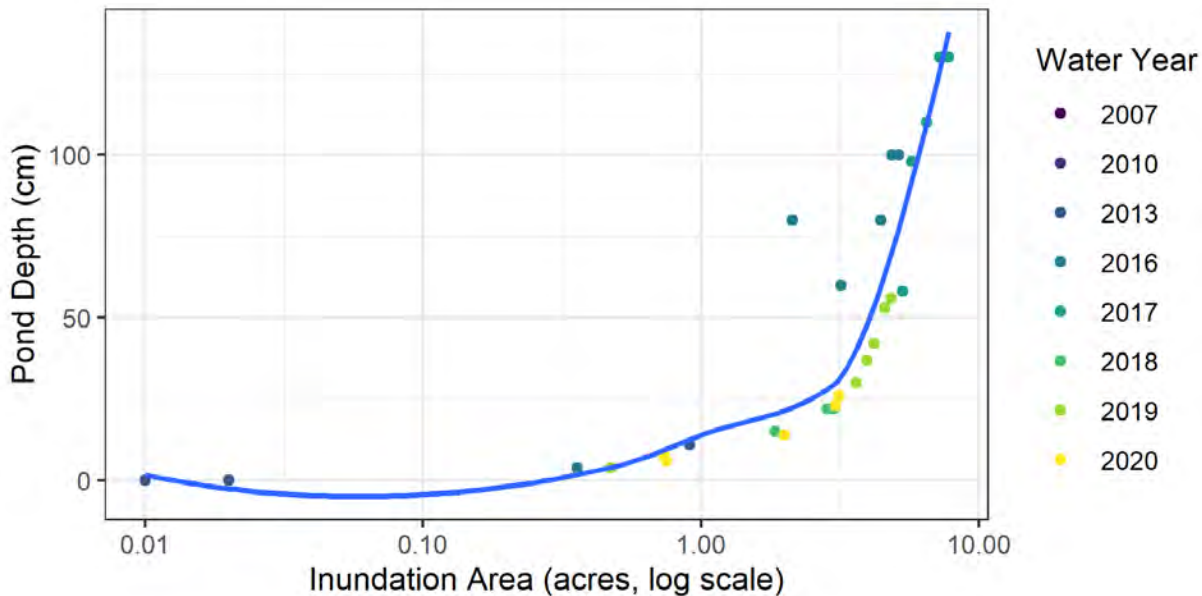
It is important to note that due to low precipitation in January and a completely dry February 2020, depth of Pond 5 decreased in February, before rising again in March and reaching maximum depth in April (Table 4-1 and Figure 4-1). This pattern was similar to 2018 when precipitation in February was also

very low, and it resulted in a decrease of pond depth that month (Figure 5-6). Although the cumulative precipitation in 2018 was 14 cm lower than in 2020, Pond 5 reached similar pond depths and inundation areas (Figures 5-6 through 5-8). This may be due to well above normal precipitation in 2017, which caused Pond 5 to stay inundated until summer, and likely resulted in the underlying clay layer containing high water content going into 2018 water year. This could explain why less precipitation was required for Pond 5 to reach similar inundation area that year when compared to 2020 water year.



**Figure 5-6.** Pond 5 (Reference) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)

Water quality parameters of Pond 5 were generally within the historical ranges. December and January pH values, and March and April temperature values were on the higher end of the observed range of historical values (Figure 5-9). Dissolved oxygen in January was measured at DO = 20.16 mg/L, which was a highest on record. However, when compared to measurements of other vernal pools, several of them had highest dissolved oxygen values in January as well, and thus this elevated reading was likely due to environmental factors (Ponds 41, 43, 101 East (East), and 101 East (West); Figure 5-5). Turbidity values were somewhat elevated in February and May, but not outside of historical range.



**Figure 5-7.** Pond 5 (Reference) Plot of Depth vs Inundation Area since 2007 Water Year (Depth Axis is Presented on a Logarithmic Scale).

#### 5.1.1.1 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, but it did meet the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 5 did not provide sufficient depth for CTS (12 cm through March), but it did provide sufficient depth for fairy shrimp (15 cm through May).

#### 5.1.1.2 Data Quality Objective 2

Pond 5 was inundated from December through May and was dry by June 10, 2020. Pond 5 depth and inundation metrics reflected the precipitation pattern of 2020 and were similar to those observed in 2018 (Figures 5-6 through 5-8), and within the historical range (Figure 5-7).

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

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.

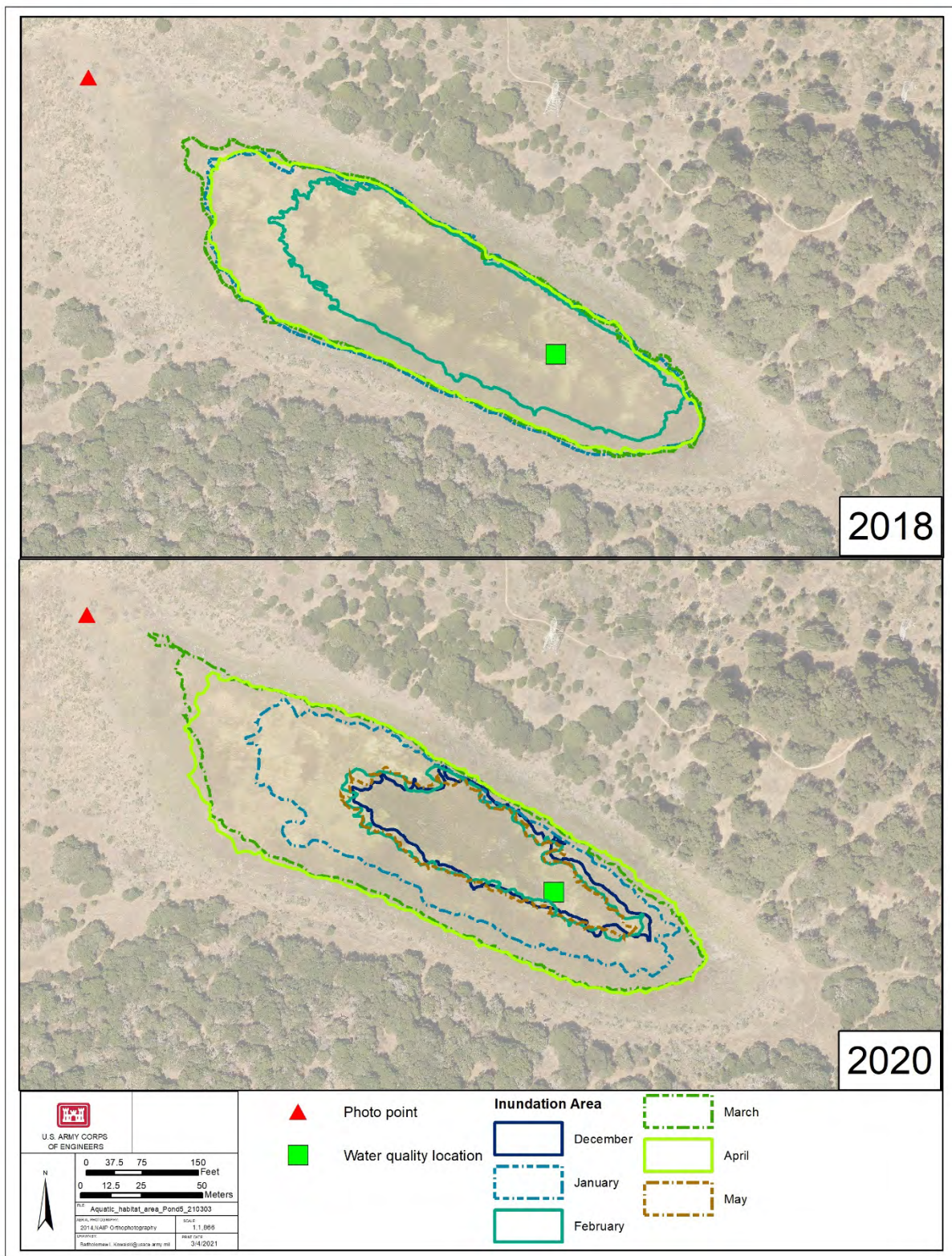
#### 5.1.1.4 Data Quality Objective 4

Water quality parameters of Pond 5 were generally within the historical ranges (Figure 5-9).

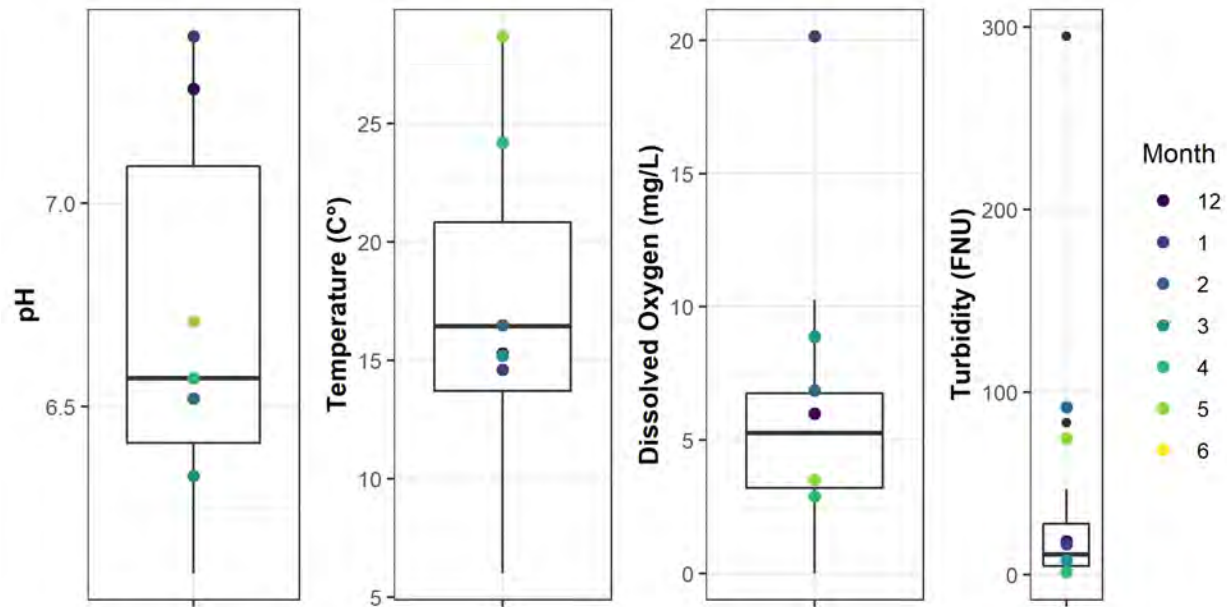
#### 5.1.1.5 Performance Standard: Wildlife Usage

Water quality was adequate to support wildlife. 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 for 2018 (below normal precipitation) and 2020 (close to normal precipitation).



**Figure 5-9.** Pond 5 (Reference) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent values outside of those statistics.

### 5.1.2 Conclusion

Pond 5 metrics were suitable for comparison to the remediated vernal pools (Table 5-1).

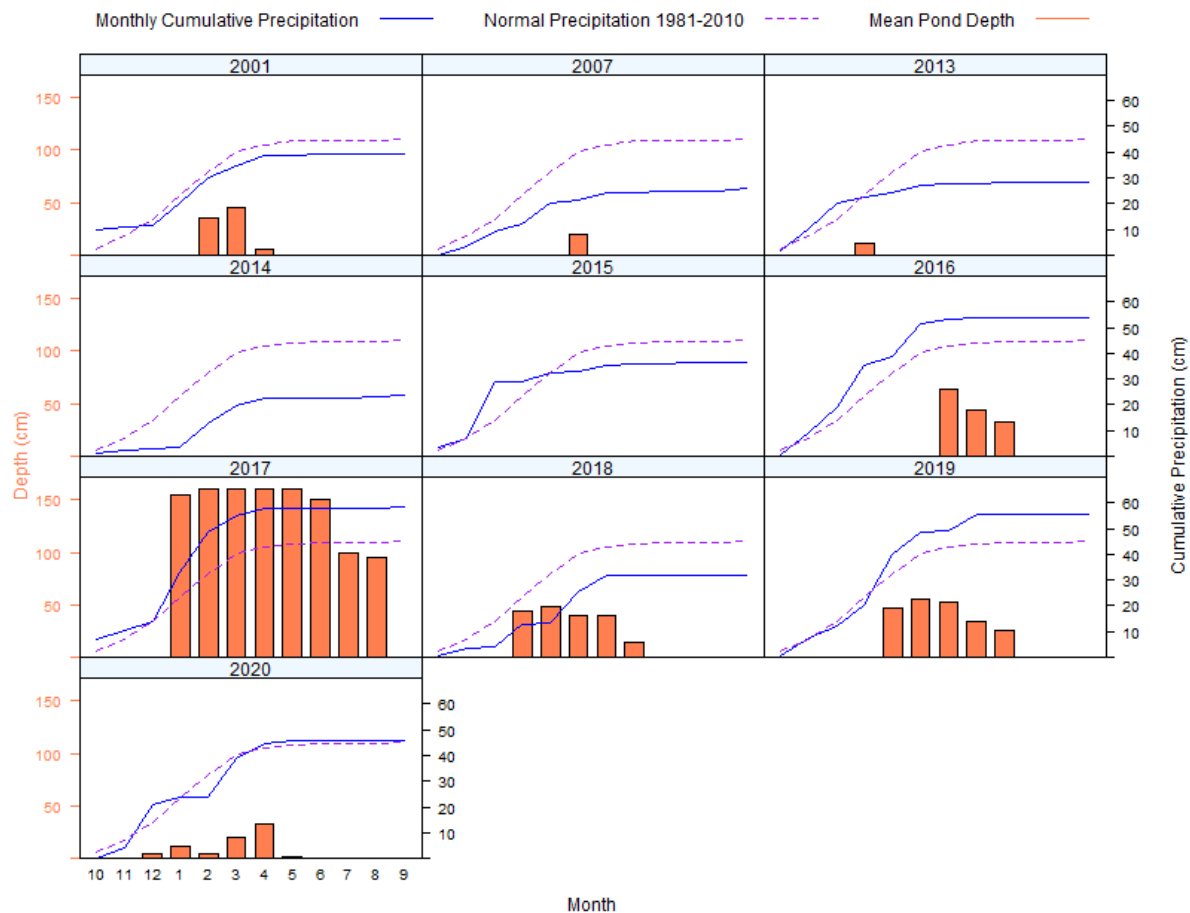
**Table 5-1. Success at Pond 5 (Reference) Based on Performance Standards and Applicable Data Quality Objectives**

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	Suitable for Comparison

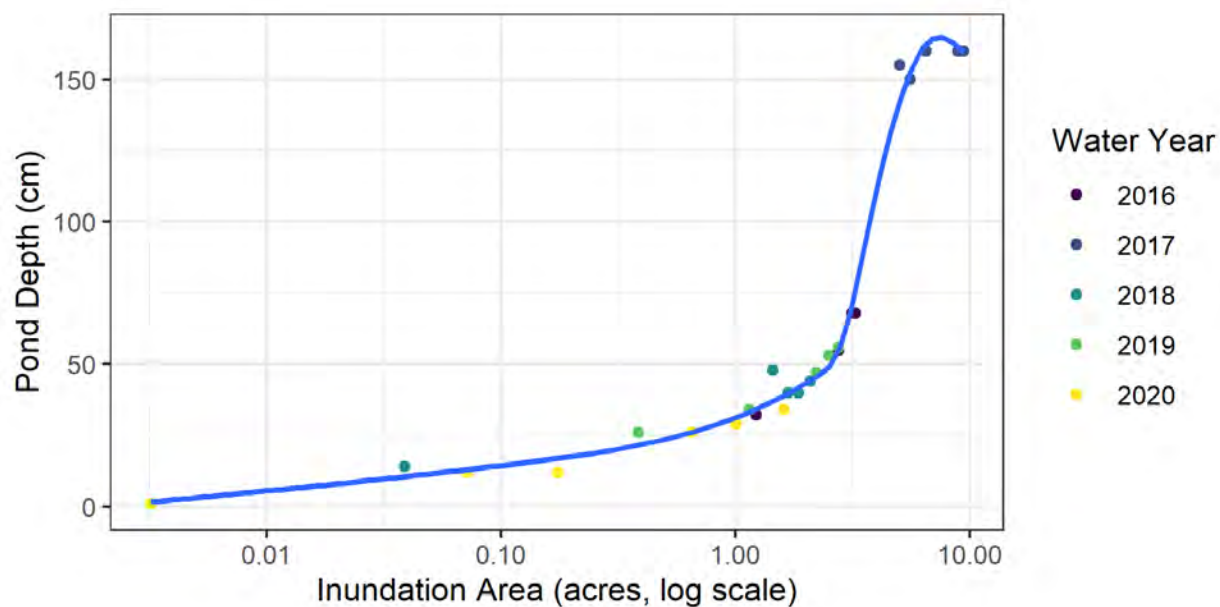
## 5.2 Pond 101 East (East) – Reference

### 5.2.1 Hydrologic Monitoring

Pond 101 East (East) is situated within a large and shallow basin in the northern tip of the Fort Ord National Monument. Depth and inundation of Pond 101 East (East) have been monitored for ten 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.



**Figure 5-10.** Pond 101 East (East) (Reference) Historic Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)



**Figure 5-11.** Pond 101 East (East) Plot of Depth vs Area since 2016 Water Year (Depth Axis is Presented on a Logarithmic Scale).



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 4-10). The 2020 maximum depth of Pond 101 East (East) was 37 cm and maximum inundation was 1.61 acres (Table 4-2). The depth and inundation values were within range of previously recorded values (Figure 5-11).

It is important to note that Pond 101 East (East) dried out three times during the 2020 water; first following initial inundation in December, second time in March, and third time by the end of May (Table 4-2 and Figure 4-2). Insufficient precipitation early in the season and low precipitation in January and a completely dry February 2020 were responsible for this intermittent inundation pattern of Pond 101 East (East). Low precipitation in February also occurred in 2018, and although the cumulative precipitation that year was 14 cm lower than in 2020, Pond 101 East (East) reached higher pond depths and inundation areas (Figures 5-10 through 5-12). This may be due to well above normal precipitation in 2017, which caused Pond 101 East (East) to stay inundated until summer, and likely resulted in the underlying clay layer containing high water content going into 2018 water year. This could explain why less precipitation was required for Pond 101 East (East) to become inundated that year when compared to 2020 water year.

Water quality parameters of Pond 101 East (East) were generally within the historical ranges (Figure 5-13). Dissolved oxygen in January was measured at DO = 23.33 mg/L, which was the highest on record. However, when compared to measurements of other vernal pools, several of them had highest dissolved oxygen values in January as well, and this elevated reading was likely due to environmental factors (Ponds 5, 41, 43, and 101 East West; Figure 5-5). Turbidity values were generally lower than historical values, but were within the historical range (Figure 5-4).

#### 5.2.1.1 *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, but it did meet the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond East (East) did not provide sufficient depth for CTS (8.7 cm through March), but it did provide sufficient depth for fairy shrimp (10 cm through May).

#### 5.2.1.2 *Data Quality Objective 2*

Pond 101 East (East) was intermittently inundated from December through May and was dry by May 26, 2020. Pond 101 East (East) depth and inundation metrics reflected the precipitation pattern of 2020 and were within the historical range (Figure 5-11). Maximum inundated area was smaller than in 2018.

#### 5.2.1.3 *Performance Standard: Hydrological Conditions and Inundation Area*

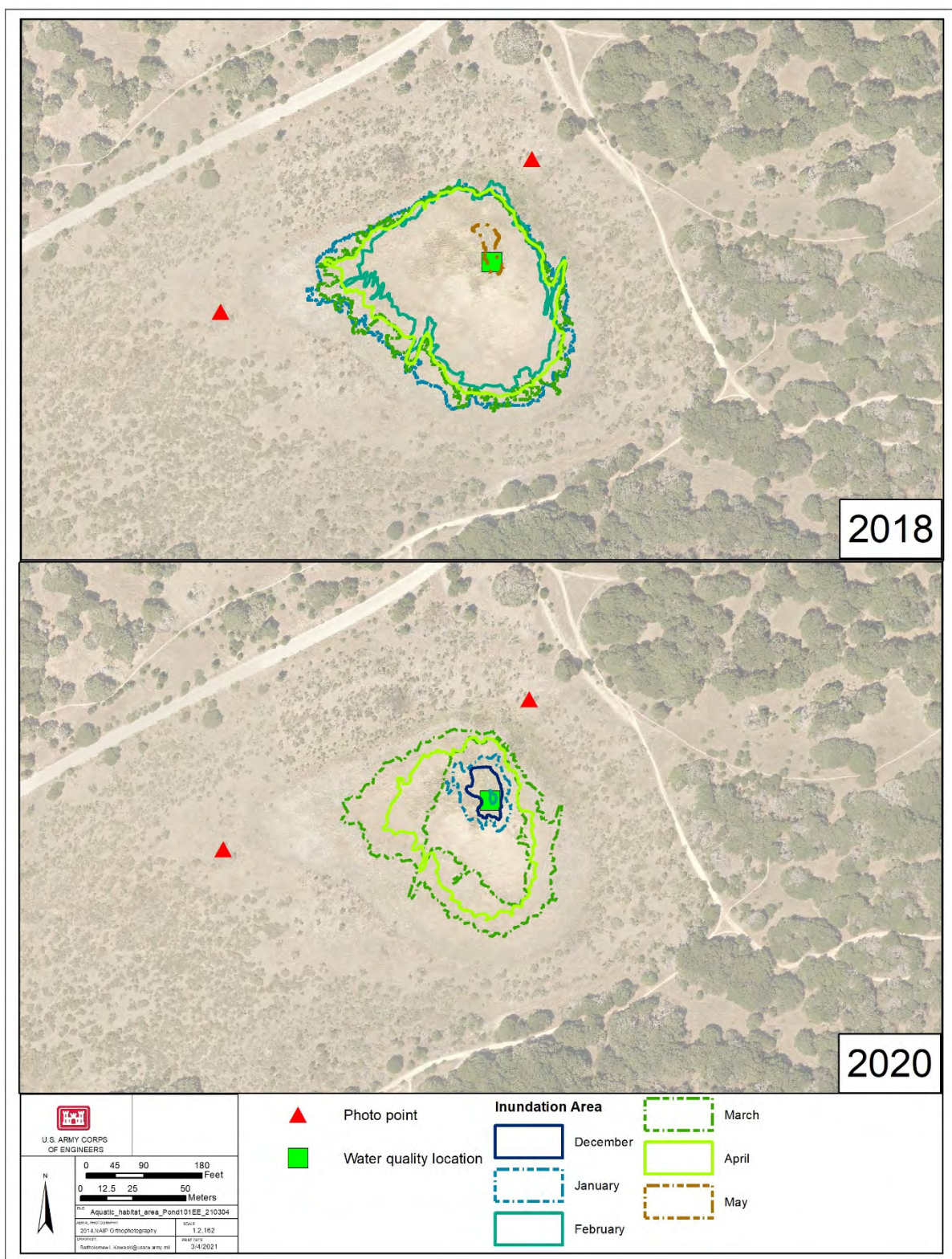
Pond 101 East (East) is a reference vernal pool and was not required to meet the performance standards. Instead, the vernal pool was used as a control for comparison to the remediated vernal pools.

#### 5.2.1.4 *Data Quality Objective 4*

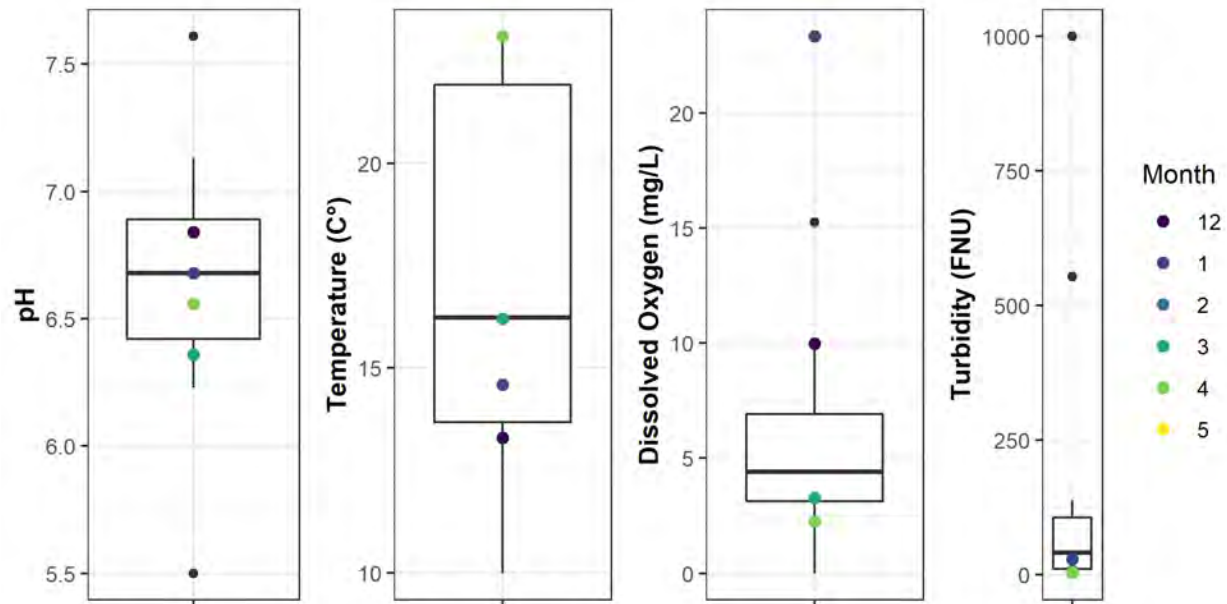
Water quality parameters of 101 Pond East (East) were within the historical ranges (Figure 5-13).

#### 5.2.1.5 *Performance Standard: Wildlife Usage*

Water quality was adequate to support wildlife, but depth and inundation period were not. 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 for 2018 (below normal precipitation) and 2020 (close to normal precipitation).



**Figure 5-13.** Pond 101 East (East) (Reference) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent values outside of those statistics.

### 5.2.2 Conclusion

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	Suitable for Comparison

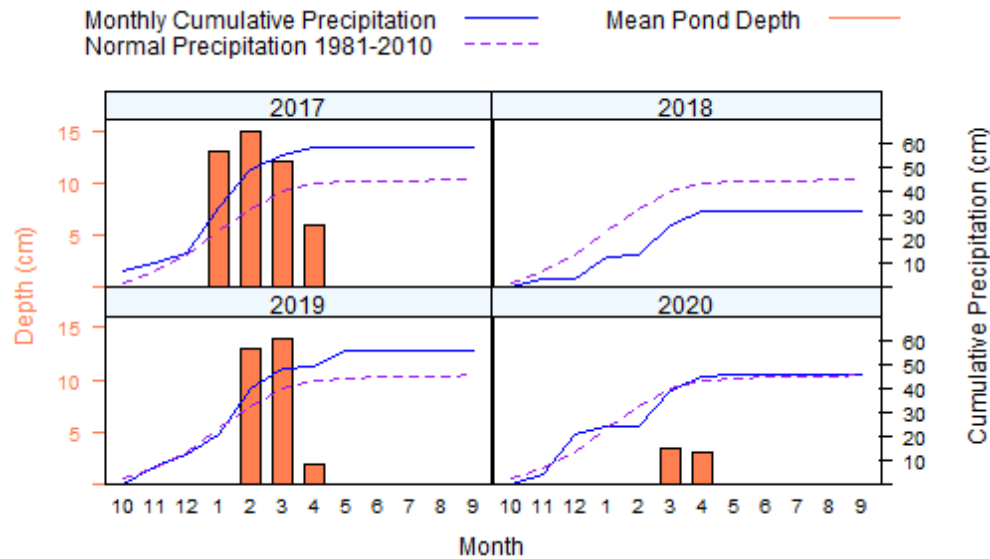
### 5.3 Pond 997 – Reference

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

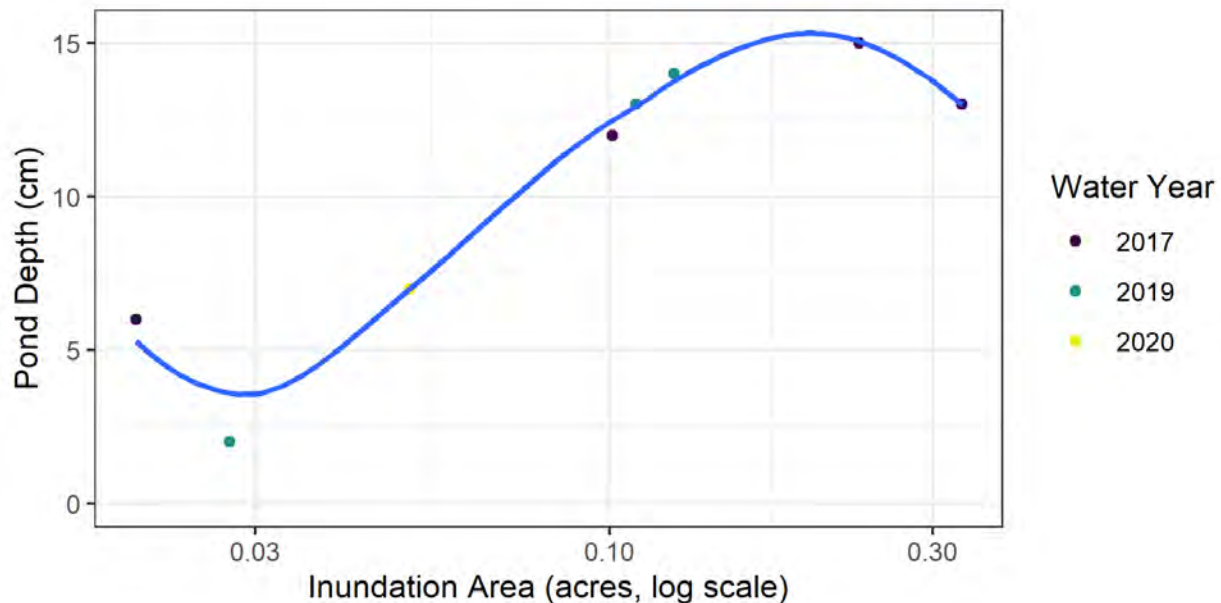
Historically, Pond 997 remained completely dry in a below normal water year (2018), and it reached a maximum depth of 15 cm and a maximum inundation of 0.33 acres in an above normal water year (2017; Figure 5-14). The 2020 maximum depth of Pond 997 was 7 cm and maximum inundation was 0.05



acres (Table 4-3). The depth and inundation values were within range of previously recorded values (Figure 5-15). Pond 997 was briefly inundated from late March through mid-April (Table 4-3 and Figure 4-3).

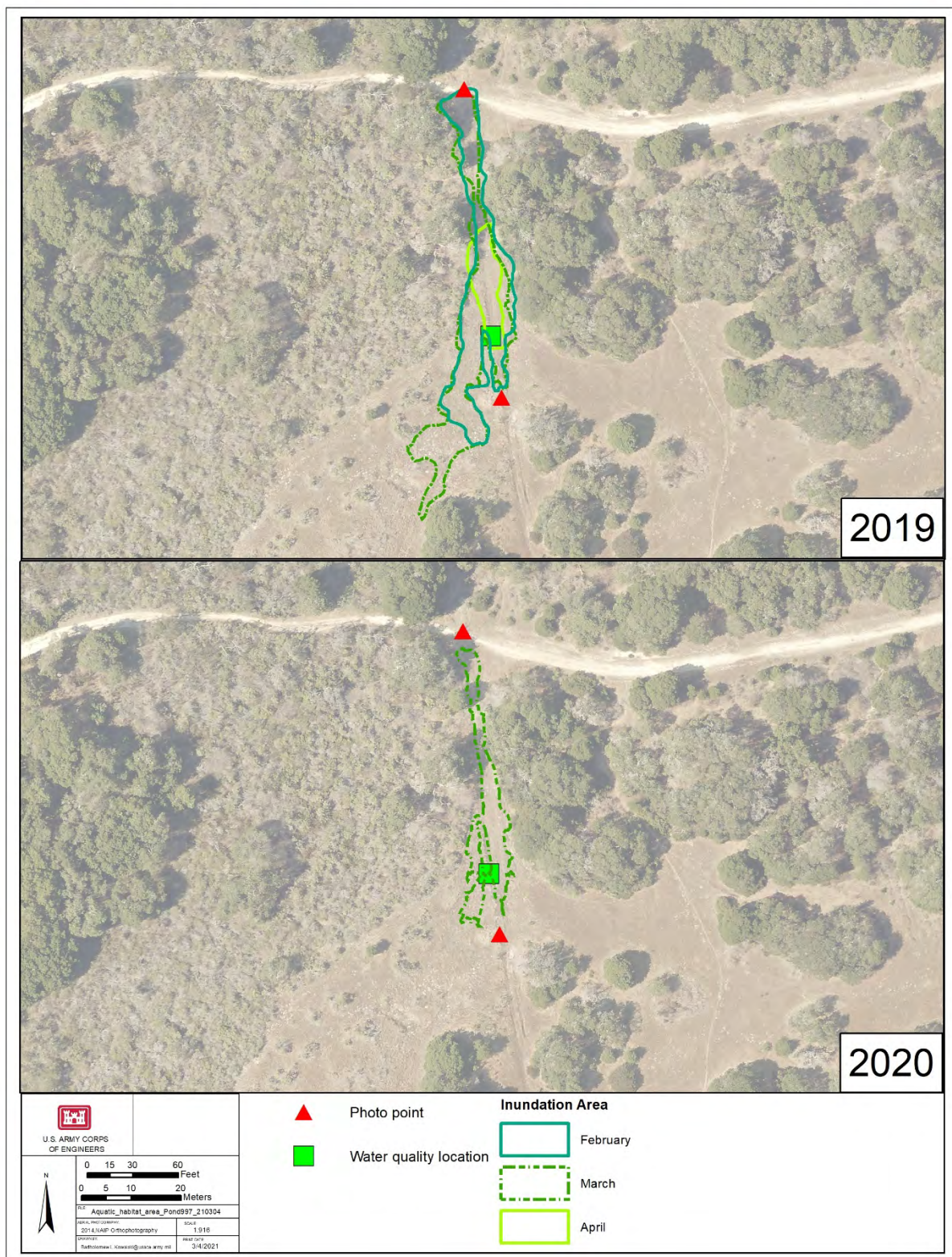


**Figure 5-14.** Pond 997 (Reference) Historic Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)

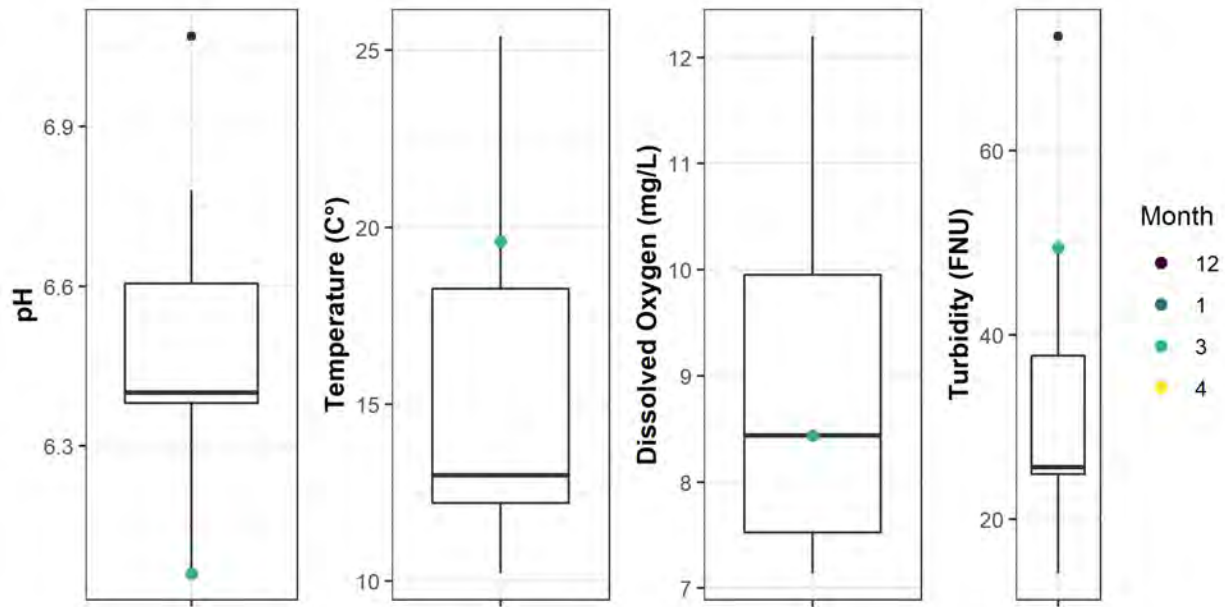


**Figure 5-15.** Pond 997 (Reference) Plot of Depth vs Area since 2017 Water Year (Depth Axis is Presented on a Logarithmic Scale).

Water quality parameters of Pond 997 were measured only once in late March, and were within the historical ranges (Figure 5-17). Value of pH was recorded at pH = 6.06, which was lowest on record, but it is likely due to a relatively small dataset for Pond 997.



**Figure 5-16.** Pond 997 (Reference) Inundations for 2019 (above normal precipitation) and 2020 (close to normal precipitation).



**Figure 5-17.** Pond 997 (Reference) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

#### 5.3.1.1 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 provide sufficient depth for either CTS (1 cm through March) nor fairy shrimp (1.6 cm through May) and was dry by late April.

#### 5.3.1.2 Data Quality Objective 2

Pond 997 was briefly inundated from late March through mid-April. The vernal pool was dry by late April. Pond 997 depth and inundation metrics reflected the precipitation pattern of 2020 and were within the historical range (Figure 5-15). Maximum inundated area was smaller than in 2019 (Figure 5-16).

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

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.

#### 5.3.1.4 Data Quality Objective 4

Water quality parameters of Pond 101 East (East) were within the historical ranges (Figure 5-17).

#### 5.3.1.5 Performance Standard: Wildlife Usage

Water quality was adequate to support wildlife, but the depth and inundation period were not. 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.



### 5.3.2 Conclusion

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	Suitable for Comparison

### 5.4 Pond 74 – Year 2

Pond 74 is situated within a small and shallow basin in the northern part of the Fort Ord National Monument. Due to its small size, 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. 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. 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, Pond 74 is the most similar reference vernal pool to Pond 997.

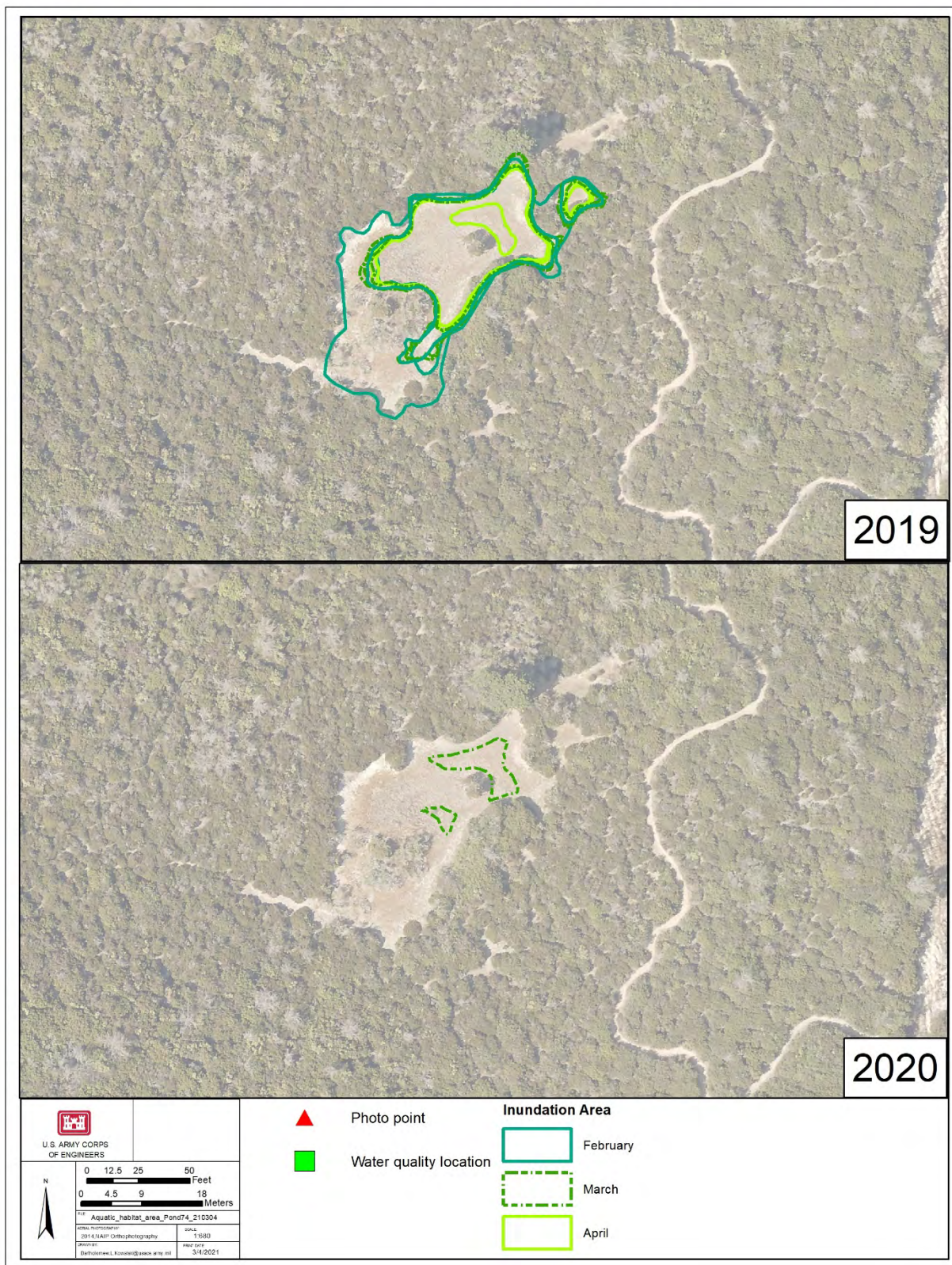
Pond 74 was briefly inundated at the end of March, but it was dry a month later. Maximum depth was visually estimated at 5 cm, and the maximum inundation areas was 0.01 acres. Inundation pattern of Pond 74 is similar to Reference Pond 997 as both ponds became inundated at the end of March and were dry by the end of April (Table 4-4 and Figure 4-4). The maximum inundation area was smaller in 2019 than in 2020 at both ponds, as cumulative precipitation was 9.88 cm lower in 2019 (Figure 5-18). Water quality measurements were not at Pond 74 in 2020, as the pond wasn't deep enough for probe submersion.

#### 5.4.1.1 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 or 10 cm for 18 consecutive days through May for fairy shrimp. Pond 74 did not provide sufficient depth for either CTS or fairy shrimp.

#### 5.4.1.2 Data Quality Objective 2

Pond 74 was inundated briefly from late March and was dry by the end of April. The maximum depth was estimated at 5 cm, and the inundated area was 0.01 acres, which was smaller than the maximum inundation area of 0.09 acres in 2019. Pond 74 had a similar inundation range and timing as reference Pond 997, both became inundated in late March and dried by the end of April, and both had small inundation areas. There is no baseline data for Pond 74.



**Figure 5-18.** Pond 74 (Year 2) Inundations for 2019 (above normal precipitation) and 2020 (close to normal precipitation).



#### 5.4.1.3 *Performance Standard: Hydrological Conditions and Inundation Area*

Pond 74, a post-mastication vernal pool, was partially on track to meet the performance standard for year 2 in 2020. Pond 74 did not meet DQO 1 indicating that it did not provide suitable habitat for CTS and fairy shrimp in 2020. Inundation pattern at Pond 74 was similar to reference Pond 997, and DQO 2 was met. The vernal pool will continue to be monitored in future years to evaluate its progress to meet the performance standard.

#### 5.4.1.4 *Data Quality Objective 4*

Water quality parameters could not be measured at Pond 74 in 2020 due to its shallow depth, and thus cannot be assessed.

#### 5.4.1.5 *Performance Standard: Wildlife Usage*

This performance standard was not met in 2020 at Pond 74 due to insufficient inundation depth and duration. Water quality measurements could not be assessed.

### 5.4.2 Conclusion

Pond 74, a post-mastication vernal pool, was in year 2 of monitoring in 2020. The vernal pool was partially on track to meet the performance standards (Table 5-4). Pond 74 will continue to be monitored in the future to evaluate its progress to meet the performance standards.

**Table 5-4. Success at Pond 74 (Year 2) Based on Performance Standards and Applicable Data Quality Objectives**

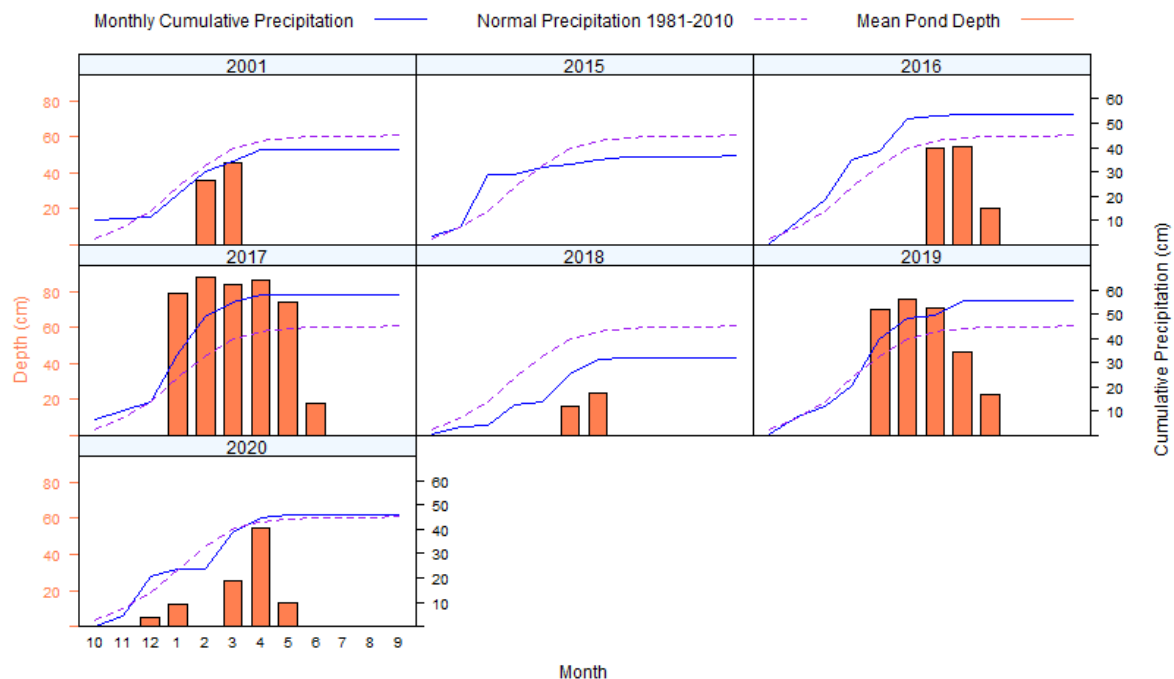
Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Not on track
	DQO 2	On track
Wildlife Usage	DQO 1	Not on track
	DQO 4	Cannot assess

## 5.5 Pond 101 East (West) – Year 2

Pond 101 East (West) is situated within a large and shallow basin in the northern tip of the Fort Ord National Monument. Depth and inundation of Pond 101 East (West) were monitored for seven years (Figure 5-19). 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), 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.

Pond 101 East (West) was monitored in 2020 as a year 2 post-mastication vernal pool. Vegetation within its basin was partially masticated in 2018 in preparation for conducting a prescribed burn. Historically, Pond 101 East (East) 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 5-19). The 2020 maximum depth of Pond 101 East (West) was 60 cm and maximum inundation was 0.47 acres (Table

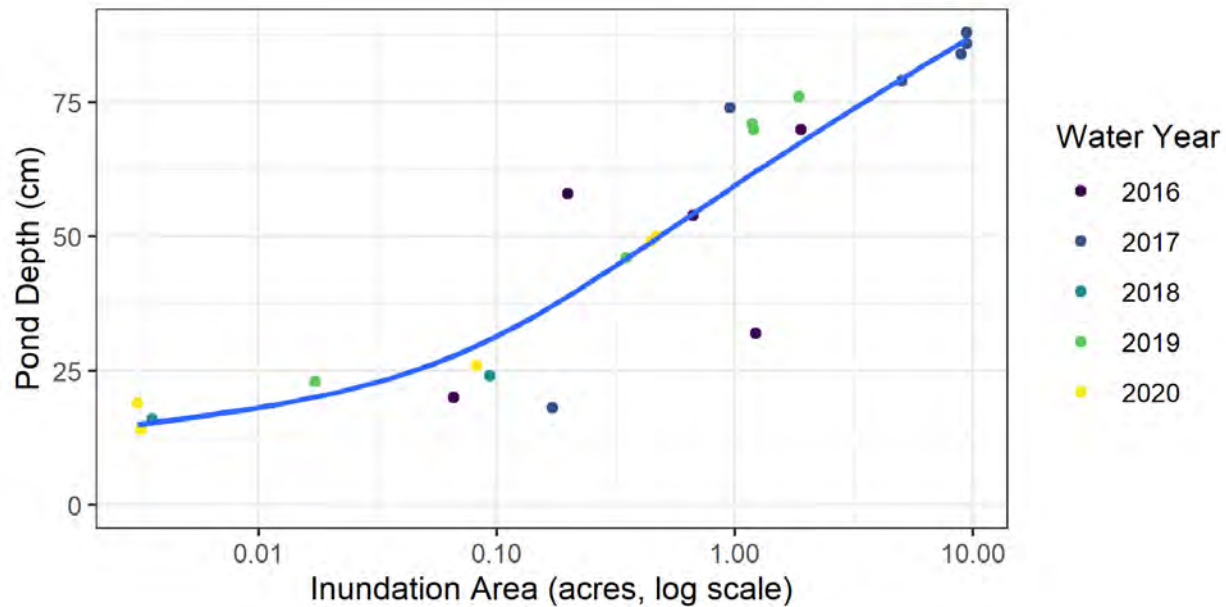
4-5). The depth and inundation values were within range of previously recorded values (Figure 5-20). Pond 101 East (West) is most similar to reference Pond 101 East (East).



**Figure 5-19.** 101 East (West) (Year 2 Post-Mastication) Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)

Pond 101 East (West) dried out three times during the 2020 water year; first following initial inundation in December, second time in February, and third time by the end of May (Table 4-5 and Figure 4-5). Insufficient precipitation early in the season and low precipitation in January and a completely dry February 2020 were responsible for this intermittent inundation pattern of Pond 101 East (West). Low precipitation was also observed in February 2018 (Figure 5-19). Cumulative precipitation in 2018 was 14 cm lower than in 2020 and Pond 101 East (West) reached higher pond depths and inundation areas in 2020 than in 2018 (Figures 5-19 through 5-21). This was the opposite of what happened at reference Pond 101 East (East) in 2018, when it reached greater depths and larger inundation areas than in 2020.

Water quality parameters of Pond 101 East (West) were within the historical ranges (Figure 5-22). Dissolved oxygen in December was measured at DO = 11.67 mg/L, which was highest on record. However, when compared to measurements of other vernal pools, several of them had highest dissolved oxygen values early in the season as well, and this elevated reading was likely due to environmental factors (Ponds 5, 41, 43, and 101 East (East); Figure 5-5).



**Figure 5-20.** Pond 101 East (West) (Year 2 Post-Mastication) Plot of Depth vs Area since 2016 Water Year (Depth Axis is Presented on a Logarithmic Scale).

#### 5.5.1.1 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, but it did meet the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 101 East (West) did not provide sufficient depth for CTS (11 cm through March), but it did provide sufficient depth for fairy shrimp (17 cm through May).

#### 5.5.1.2 Data Quality Objective 2

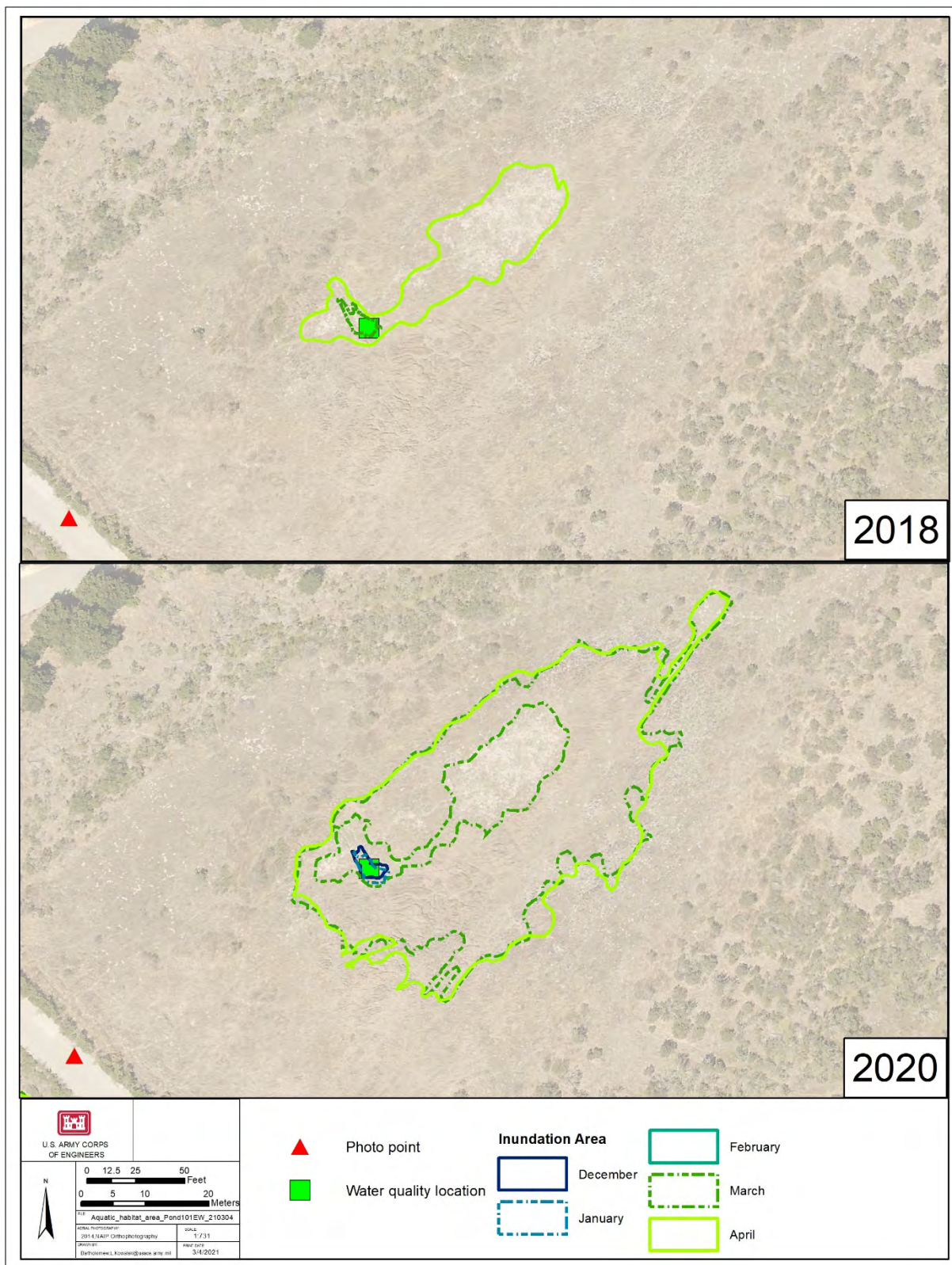
Pond East (West) was intermittently inundated from December through May and was dry by May 26, 2020. Pond 101 East (East) depth and inundation metrics reflected the precipitation pattern of 2020 and were within the historical range (Figure 5-20). Maximum inundated area was greater than in baseline year 2018 (Figure 5-21). Pond 101 East (West) had very similar hydroperiod as reference Pond 101 East (East); both were inundated in early December, dried out, became inundated again at the end of December and dried out by mid-February, and became inundated for the third time from late March through late May.

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

Pond 101 East (West), a post-mastication vernal pool, was partially on track to meet the performance standard for year 1 in 2020. Pond 101 East (West) partially met DQO 1; it did not provide suitable habitat for CTS, but it did provide suitable habitat for fairy shrimp in 2020. Hydroperiod of Pond 101 East (West) was similar to reference Pond 101 East (East) and congruent with baseline patterns, 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.

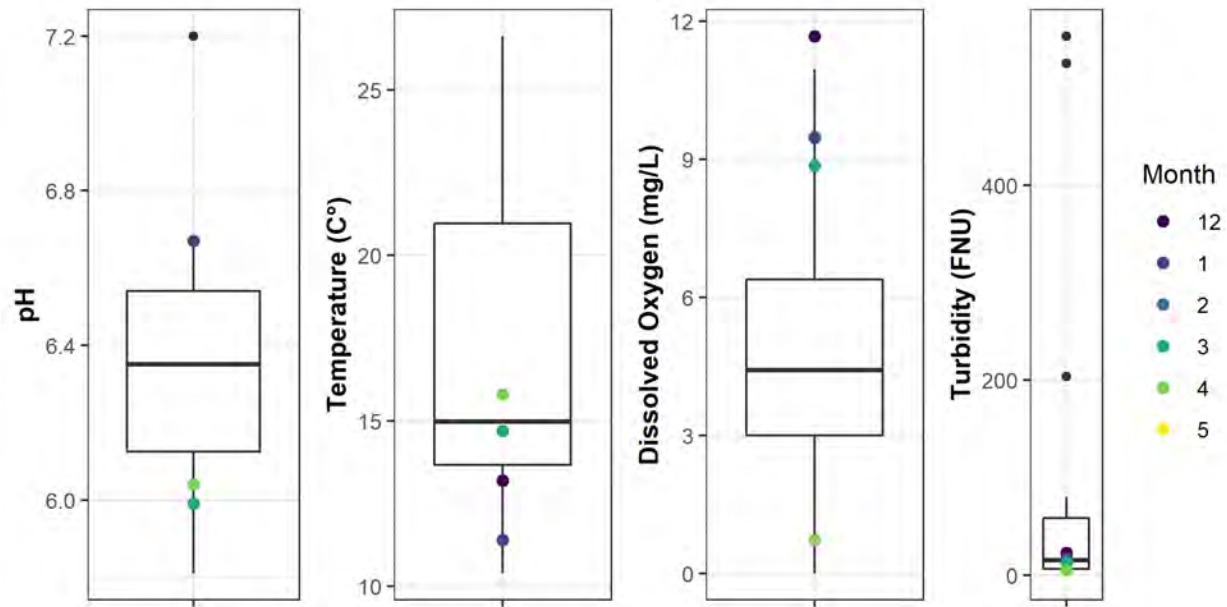
#### 5.5.1.4 Data Quality Objective 4

Water quality parameters of Pond 101 West were mostly within the historical ranges with the exception of dissolved oxygen value in December (Figure 5-22).



**Figure 5-21.** Pond 101 East (West) (Year 2 Post-Mastication) Inundations for 2018 (below normal precipitation) and 2020 (close to normal precipitation).





**Figure 5-22.** Pond 101 East (West) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

#### 5.5.1.5 Performance Standard: Wildlife Usage

This performance standard was partially met in 2020 at Pond 101 East (West) due to insufficient inundation depth and duration for CTS, but it provided sufficient depth and inundation for fairy shrimp. Water quality measurements were adequate for wildlife.

### 5.5.2 Conclusion

Pond 101 East (West), a post-mastication vernal pool, was in year 2 of monitoring in 2020. The vernal pool was partially on track to meet the performance standards (Table 5-5). Pond 101 East (West) will continue to be monitored in the future.

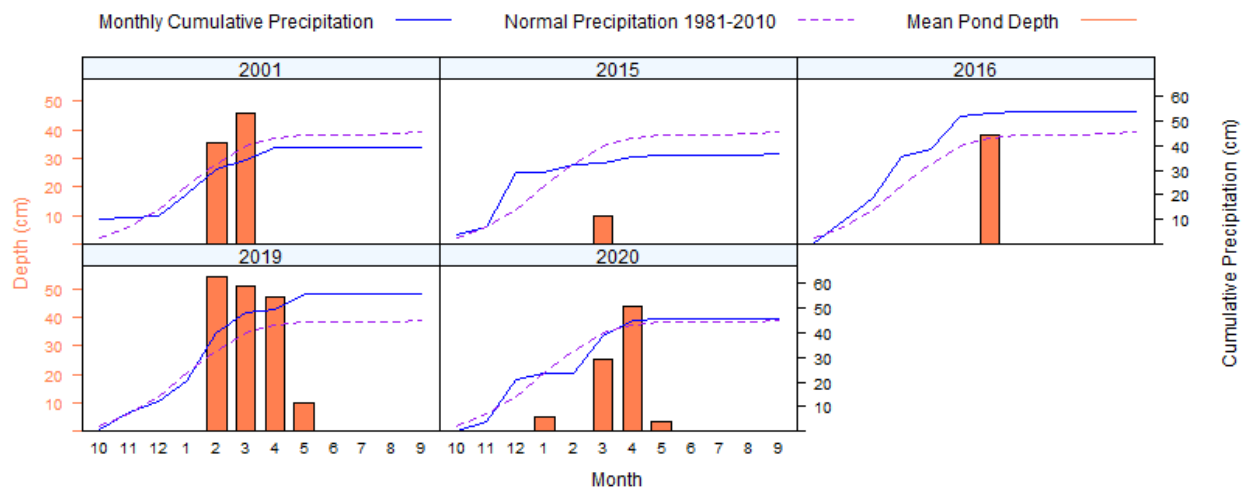
**Table 5-5. Success at Pond 101 East (West) (Year 2 Post-Mastication) Based on Performance Standards and Applicable Data Quality Objectives**

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

## 5.6 Pond 101 West – Year 2

Pond 101 West is situated within a small basin with a medium steep profile in the northern tip of the Fort Ord National Monument. Depth and inundation of Pond 101 West have been monitored for five years (Figure 5-23). Above normal water years were 2016, and 2019. Close to normal water years were 2001 and 2020. Year 2015 was a consecutive drought 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.

Pond 101 West was monitored in 2020 as a year 2 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, Figures 5-23 and 5-24). The 2020 maximum depth of Pond 101 West was 50 cm and maximum inundation area was 0.1 acres (Table 4-6). The depth and inundation values were within range of previously recorded values (Figure 5-24). By size, Pond 101 West is most similar to reference Pond 997, although it has a steeper profile (Figure 5-1).

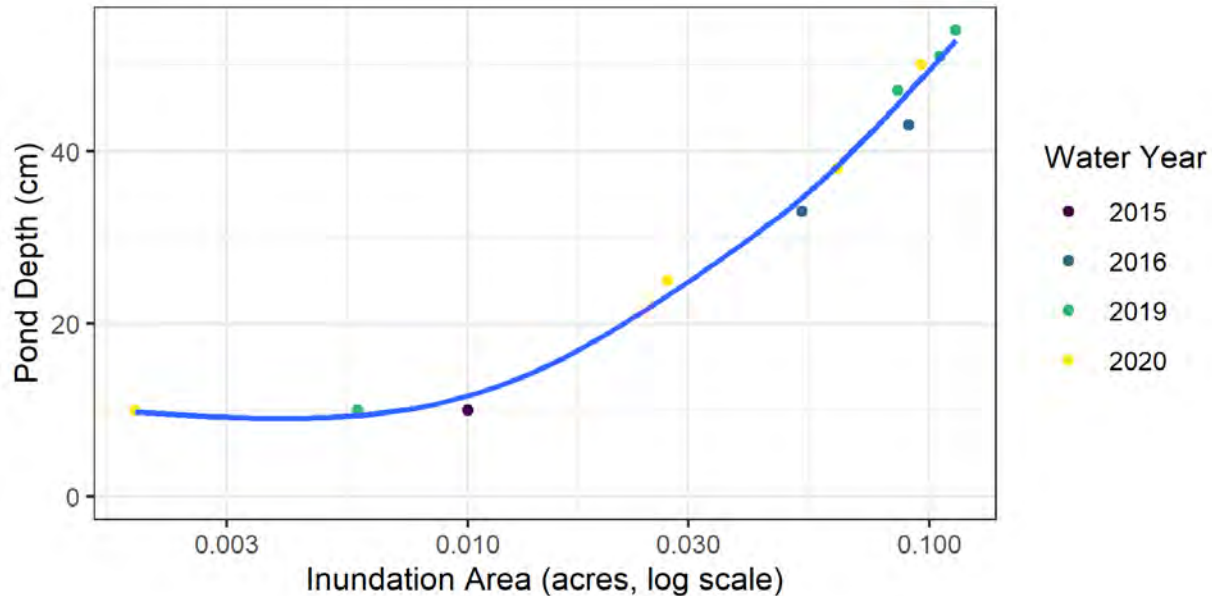


**Figure 5-23.** Pond 101 West (Year 2 Post-Mastication) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)

Pond 101 West dried out two times during the 2020 water year; first following initial inundation in February, and second time by the end of May (Figure 4-6 and Table 4-6). Insufficient precipitation early in the season and low precipitation in January and a completely dry February 2020 were responsible for this intermittent inundation pattern of Pond 101 West. Pond 101 West reached higher depths than in 2015, a below normal water year, and slightly higher depths than in 2016, an above normal water year. This may be due to a multi-year drought that preceded 2016 water year, while 2020 followed an above normal 2019 water year.

Water quality parameters of Pond 101 West were generally within the historical ranges with an exception of pH value in March, and dissolved oxygen value in January (Figure 5-26). March value of pH = 6.03 was the lowest on record at Pond 101 West. Dissolved oxygen in January was measured at DO = 9.96 mg/L, which was highest on record. However, when compared to measurements of other vernal pools, several of them had lowest pH values in March (Ponds 5, 61, 101 East (East), and Machine Gun

Flats; Figure 5-2), and highest dissolved oxygen values early in the season as well (Ponds 5, 41, 43, and 101 East (East); Figure 5-5). This implies that the observed readings were not likely remediation activities.



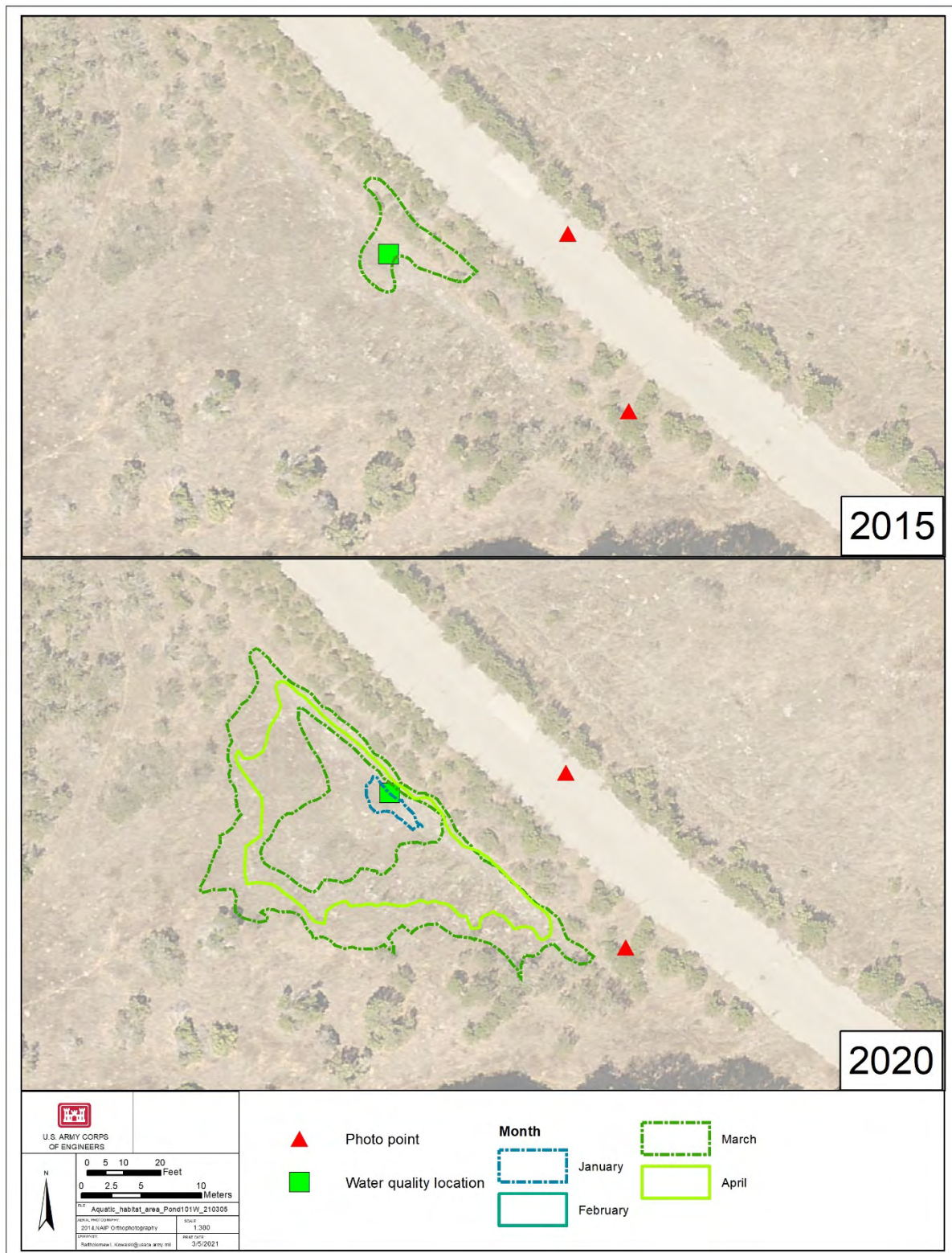
**Figure 5-24.** Pond 101 West (Year 2 Post-Mastication) Plot of Depth vs Area since 2015 Water Year (Depth Axis is Presented on a Logarithmic Scale).

#### 5.6.1.1 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, but it did meet the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 101 West did not provide sufficient depth for CTS (14 cm through March), but it did provide sufficient depth for fairy shrimp (17.9 cm through May).

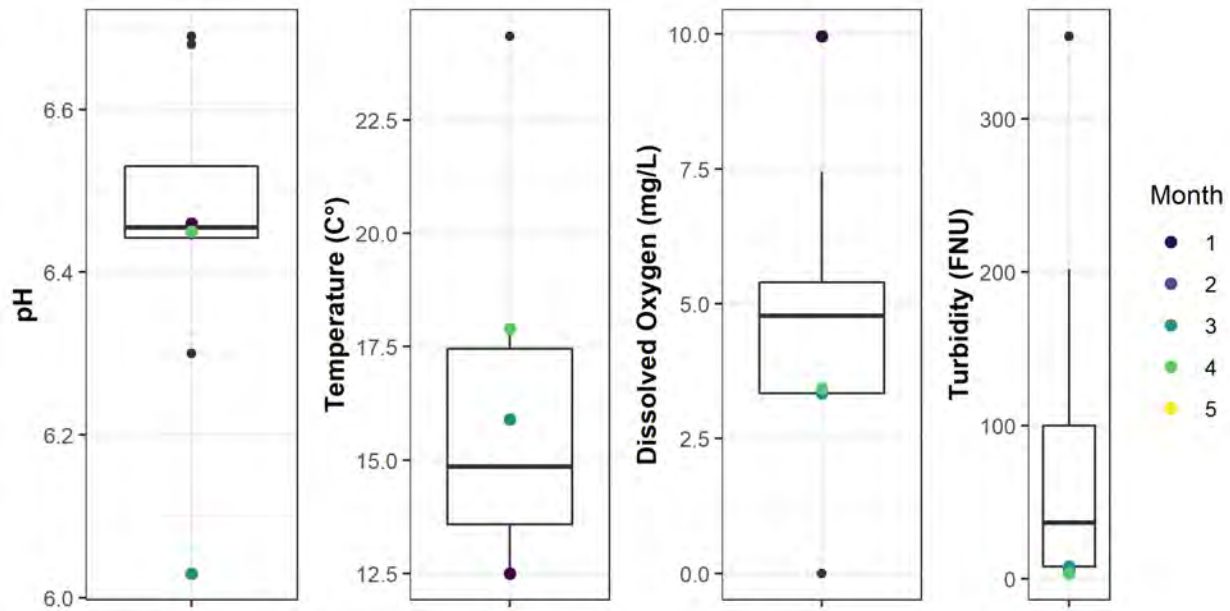
#### 5.6.1.2 Data Quality Objective 2

Pond 101 West was intermittently inundated from January through May and was dry by May 26, 2020. Pond 101 West depth and inundation metrics reflected the precipitation pattern of 2020 and were within the historical range (Figure 5-24). As would be expected due to a difference of 9.56 cm of cumulative rainfall, the maximum inundation area in 2020 was greater than in 2015 (Figure 5-25). Pond 101 West had similar hydroperiod as reference Pond 101 East (East); both were inundated intermittently, although Pond 101 East (West) became initially inundated in early December, whereas Pond 101 West did not hold water until late January.



**Figure 5-25.** Pond 101 West (Year 2 Post-Mastication) Inundations for 2015 (below normal precipitation) and 2020 (close to-normal precipitation).





**Figure 5-26.** Pond 101 West (Year 2 Post-Mastication) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

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

Pond 101 West, a post-mastication vernal pool, was partially on track to meet the performance standard for year 2 in 2020. Pond 101 West partially met DQO 1; it did not provide suitable habitat for CTS, but it did provide suitable habitat for fairy shrimp in 2020. Hydroperiod of Pond 101 West was similar to reference Pond 101 East (East) and congruent with baseline patterns, 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.

#### 5.6.1.4 Data Quality Objective 4

Water quality parameters of Pond 101 East (West) were within the historical ranges (Figure 5-26).

#### 5.6.1.5 Performance Standard: Wildlife Usage

This performance standard was partially met in 2020 at Pond 101 West due to insufficient inundation depth and duration for CTS, but it provided sufficient depth and inundation for fairy shrimp. Water quality measurements were adequate for wildlife.

### 5.6.2 Conclusion

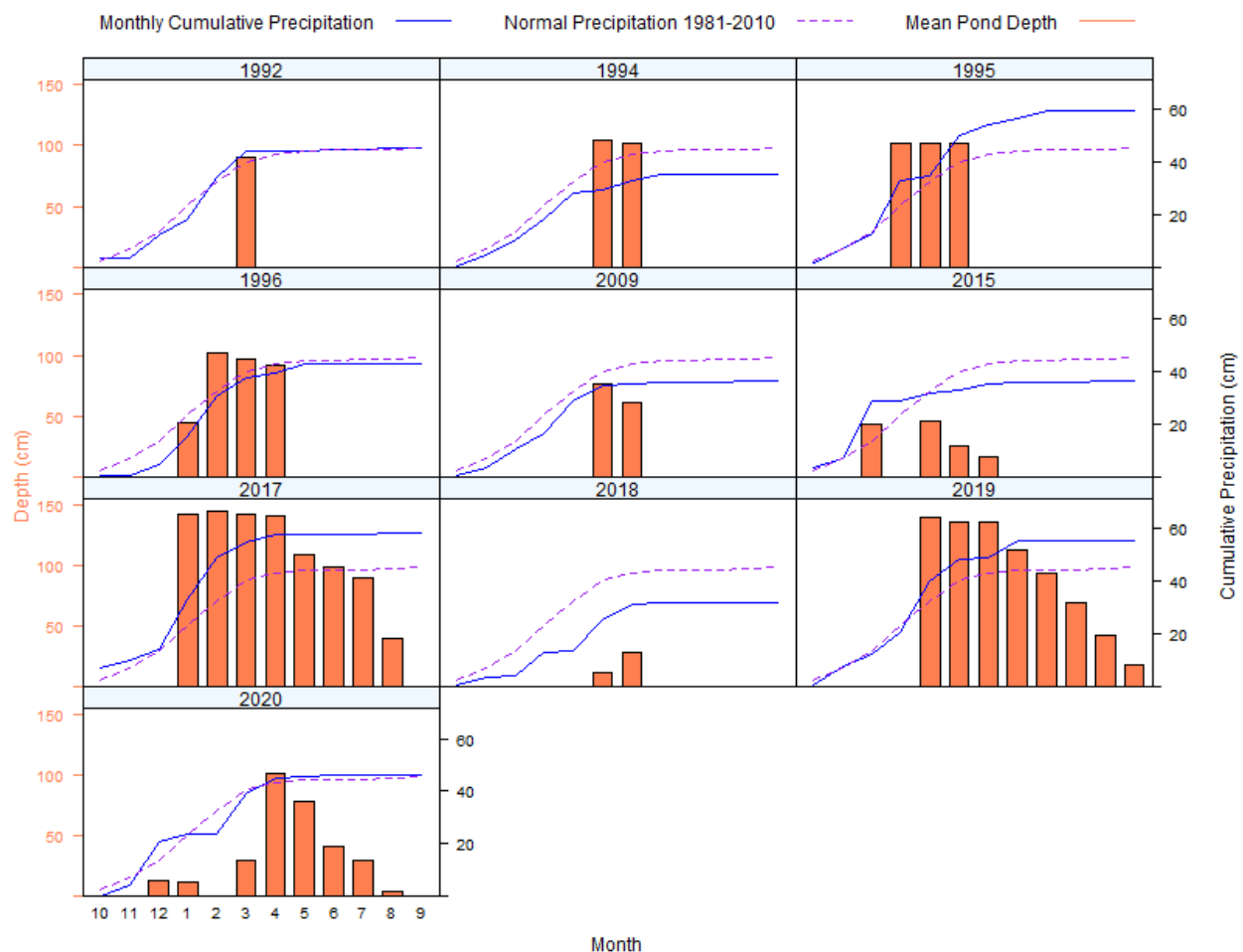
Pond 101 West, a post-mastication vernal pool, was in year 2 of monitoring in 2020. The vernal pool was partially on track to meet all performance standards (Table 5-6). Pond 101 West will continue to be monitored in the future years to evaluate its progress to meet the performance standards.

**Table 5-6. Success at Pond 101 West (Year 2 Post-Mastication) 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

## 5.7 Pond 16 – Year 2

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. Depth and inundation of Pond 16 have been monitored for ten years (Figure 5-27). 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) or consecutive drought years (2015). In above normal water years Pond 16 can spill out of its immediate basin and significantly expand its inundated area to the north which last time occurred in 2017.

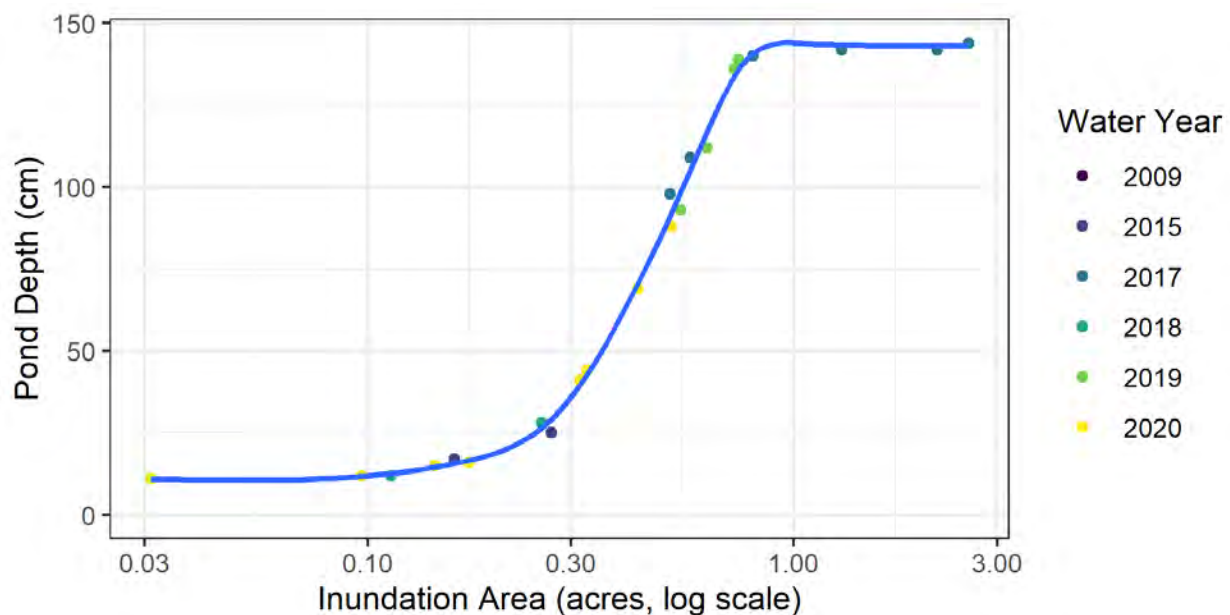


**Figure 5-27.** Pond 16 (Year 2 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)

Pond 16 was monitored in 2020 as a year 2 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, Figures 5-27 and 5-28). The 2020 maximum depth of Pond 16 reached 101 cm and maximum measured inundation was 0.52 acres (Table 4-7). The depth and inundation values were within range of previously recorded values (Figure 5-28). By size, Pond 16 is most similar to reference Pond 101 East (East), although it has a much steeper profile (Figure 5-1).

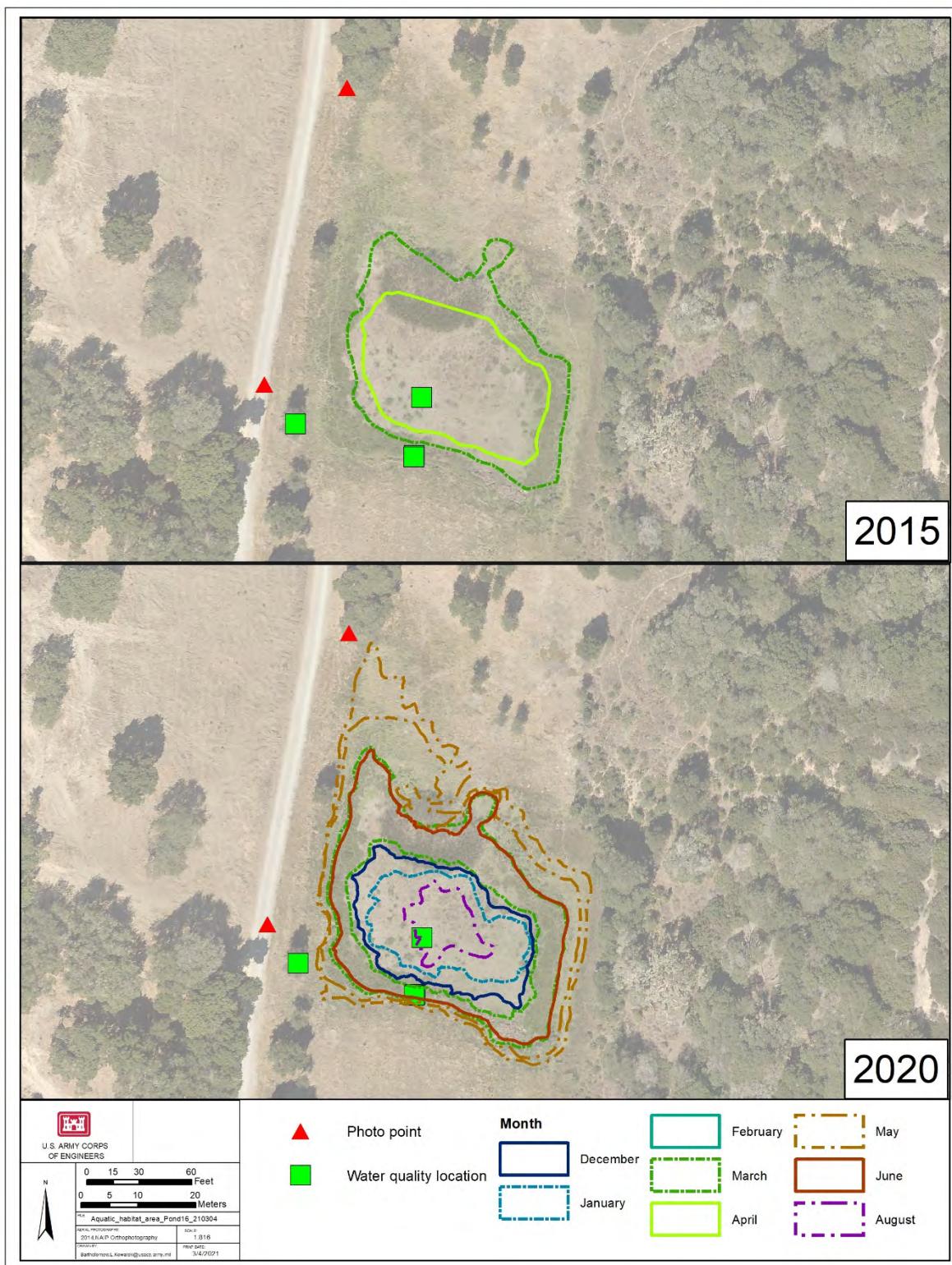
Pond 16 dried out twice during the 2020 water year due to low precipitation in January and a completely dry February 2020; first following initial inundation in February, and second time by mid-August (Table 4-7 and Figure 4-7). Low precipitation in February was also observed in 2018 (Figure 5-27). That year, Pond 16 did not become inundated until March. Maximum inundation area was greater in 2020 than in baseline year 2015, which was below normal water year (Figure 5-29). Inundation pattern of Pond 16 was most similar to that of reference Pond 101 East (East). Pond 101 East (East) dried for a brief period following dry February as did Pond 16, and both became inundated again in March.

Water quality parameters of Pond 16 were within the historical ranges (Figure 5-30). Although temperature reached a record value of 25.1 °C in June, that is likely due to it being recorded late in the season.



**Figure 5-28.** Pond 16 (Year 2 Post-Subsurface Munitions Remediation) Plot of Depth vs Area since 2009 Water Year (Depth Axis is Presented on a Logarithmic Scale).





**Figure 5-29.** Pond 16 (Year 2 Post-Subsurface Munitions Remediation) Inundations for 2015 (below normal precipitation) and 2020 (close to normal precipitation).

#### 5.7.1.1 *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, but it did meet the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 16 did not provide sufficient depth for CTS (16 cm through March), but it did provide sufficient depth for fairy shrimp (36.9 cm through May).

#### 5.7.1.2 *Data Quality Objective 2*

Pond 16 was intermittently inundated from December through August and was dry by August 11, 2020. Pond 16 depth and inundation metrics reflected the precipitation pattern of 2020 and were within the historical range (Figure 5-27). Pond 16 had similar hydroperiod as reference Pond 101 East (East); both were inundated intermittently since December. As would be expected due to a difference of 9.56 cm of cumulative rainfall, the maximum inundation area in 2020 was greater than in 2015 (Figure 5-29), and it reached similar depths as in 1996, which was also a close to normal water year (Figure 5-27).

#### 5.7.1.3 *Performance Standard: Hydrological Conditions and Inundation Area*

Pond 16, a post-subsurface munitions remediation vernal pool, was partially on track to meet the performance standard for year 2 in 2020. Pond 16 partially met DQO 1; it did not provide suitable habitat for CTS, but it did provide suitable habitat for fairy shrimp in 2020. Hydroperiod of Pond 16 was similar to reference Pond 101 East (East) and congruent with baseline patterns, 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.

#### 5.7.1.4 *Data Quality Objective 4*

Water quality parameters of Pond 16 were within the historical ranges (Figure 5-30).

#### 5.7.1.5 *Performance Standard: Wildlife Usage*

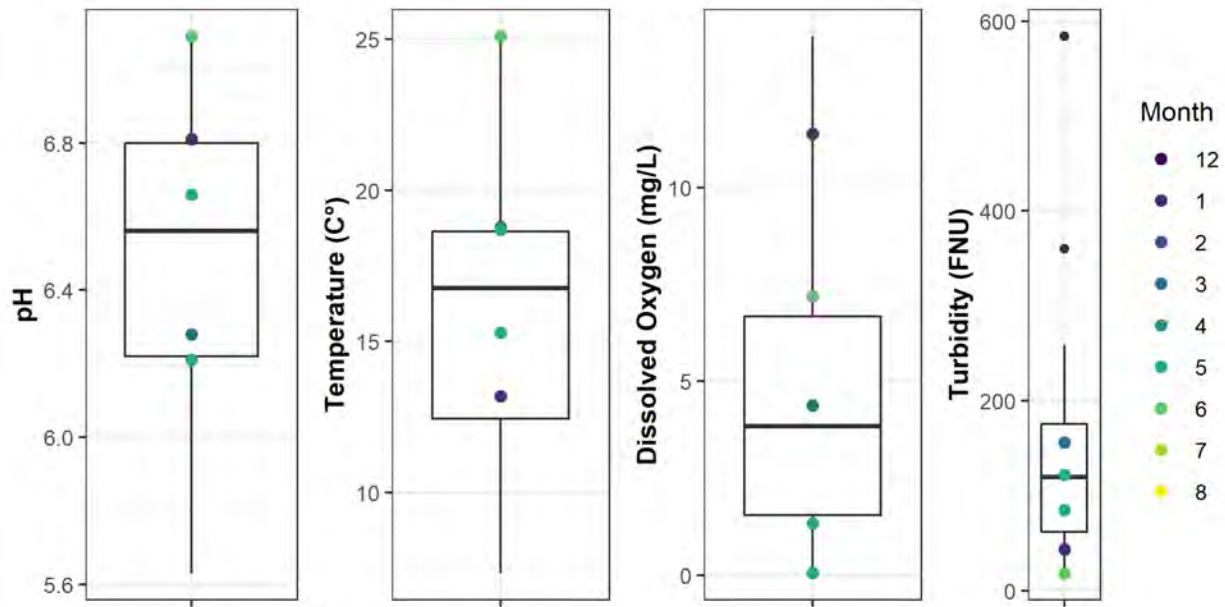
This performance standard was partially met in 2020 at Pond 16 due to insufficient inundation depth and duration for CTS, but it provided sufficient depth and inundation for fairy shrimp. Water quality measurements were adequate for wildlife.

### 5.7.2 **Conclusion**

Pond 16, a post-subsurface munitions remediation vernal pool, was in year 2 of monitoring in 2020. The vernal pool was partially on track to meet all performance standards (Table 5-7). Pond 16 will continue to be monitored in the future years to evaluate its progress to meet the performance standard.

**Table 5-7. Success at Pond 16 (Year 2 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



**Figure 5-30.** Pond 16 (Year 2 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

## 5.8 Pond 41 – Year 2

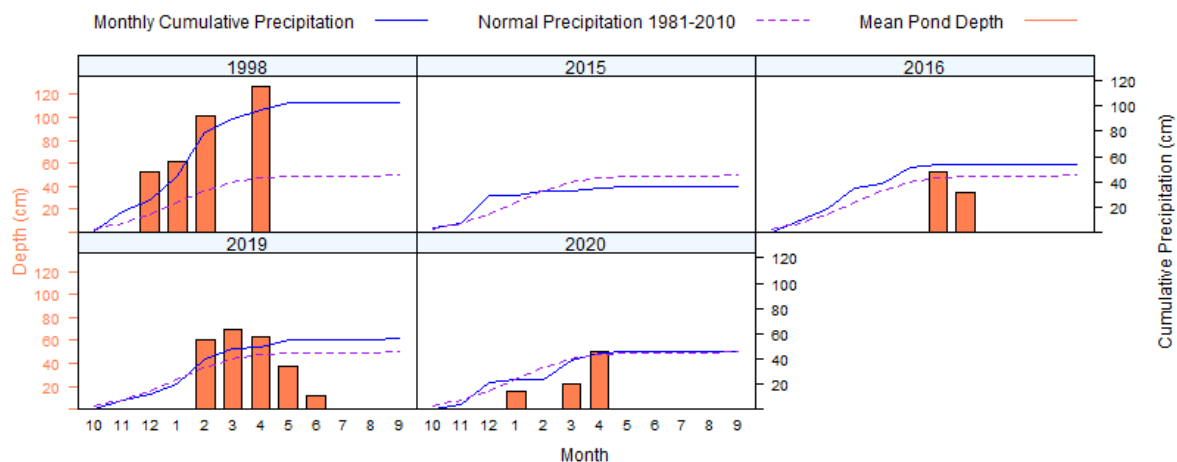
Pond 41 is situated within a medium size shallow basin in the northern part of the Fort Ord National Monument. Depth and inundation of Pond 41 have been monitored for five years (Figure 5-31). Above normal water years were 2016, and 2019, and 1998 was an El Niño water year. 2020 was close to normal water year, and 2015 was a consecutive drought year.

Pond 41 was monitored in 2020 as a year 2 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, Figures 5-31 and 5-32). The 2020 maximum depth of Pond 41 reached 56 cm and maximum measured inundation was 0.50 acres (Table 4-8). The depth and inundation values were within range of previously recorded values (Figure 5-32). By size, Pond 41 is most similar to reference Pond 101 East (East) (Figure 5-1).

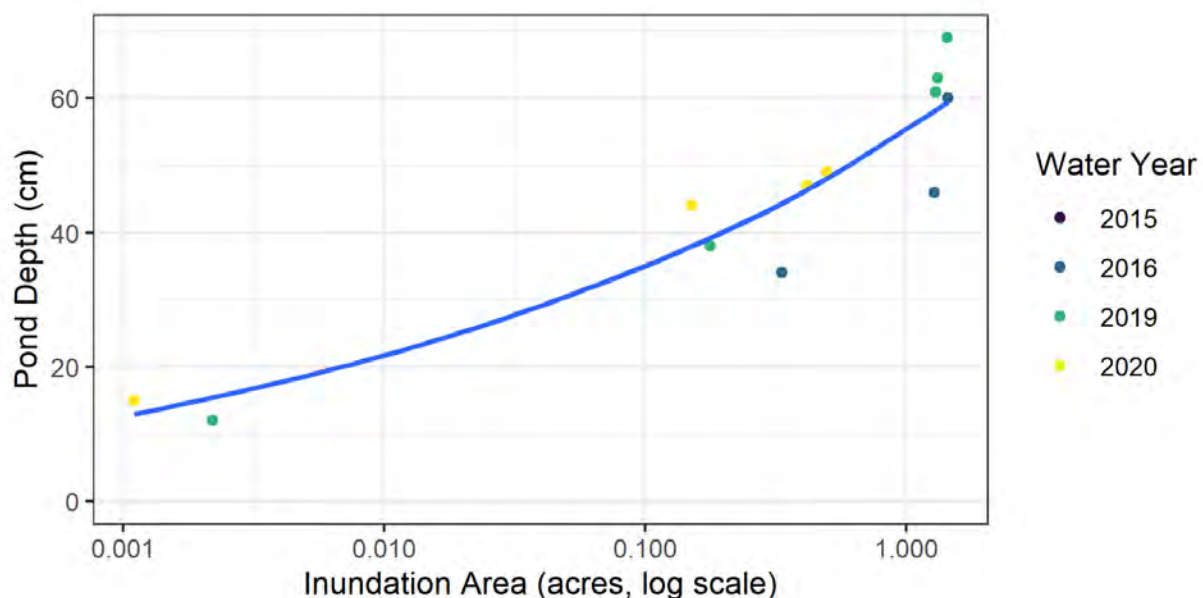
Pond 41 dried out twice during the 2020 water year due to low precipitation in January and a completely dry February 2020; first following initial inundation in February, and second time by the end of May (Table 4-8 and Figure 4-8). Maximum inundation area was smaller in 2020 than in baseline year 2016, which was an above normal water year (Figure 5-33). Inundation pattern of Pond 41 was most similar to that of reference Pond 101 East (East). Pond 101 East (East) dried for a brief period following dry February as did Pond 41, and both became inundated again in March.



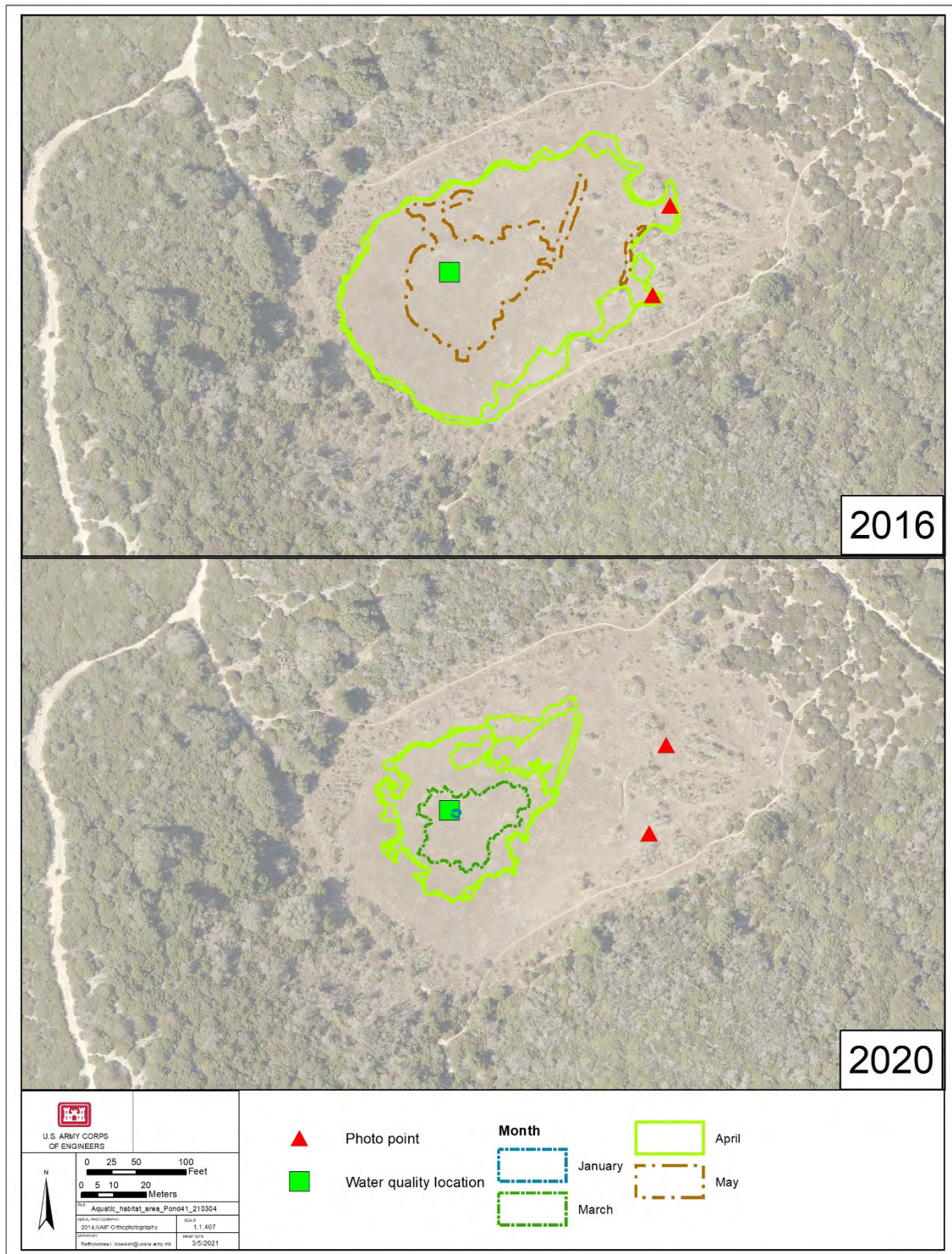
Water quality parameters of Pond 41 were generally within the historical ranges with an exception of dissolved oxygen value in January and turbidity in April (Figure 5-34). Dissolved oxygen in January was measured at DO = 17.16 mg/L, which was highest on record. However, several other vernal pools had highest dissolved oxygen values early in the season as well (Ponds 5, 43, and 101 East (East); Figure 5-5). This implies that the observed values were likely due to environmental factors. Turbidity value of 151 FNU on April 3 was somewhat out of range, especially since turbidity was measured at 7.62 FNU at the end of that month, and it could have been due to preceding rain events.



**Figure 5-31.** Pond 41 (Year 2 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)

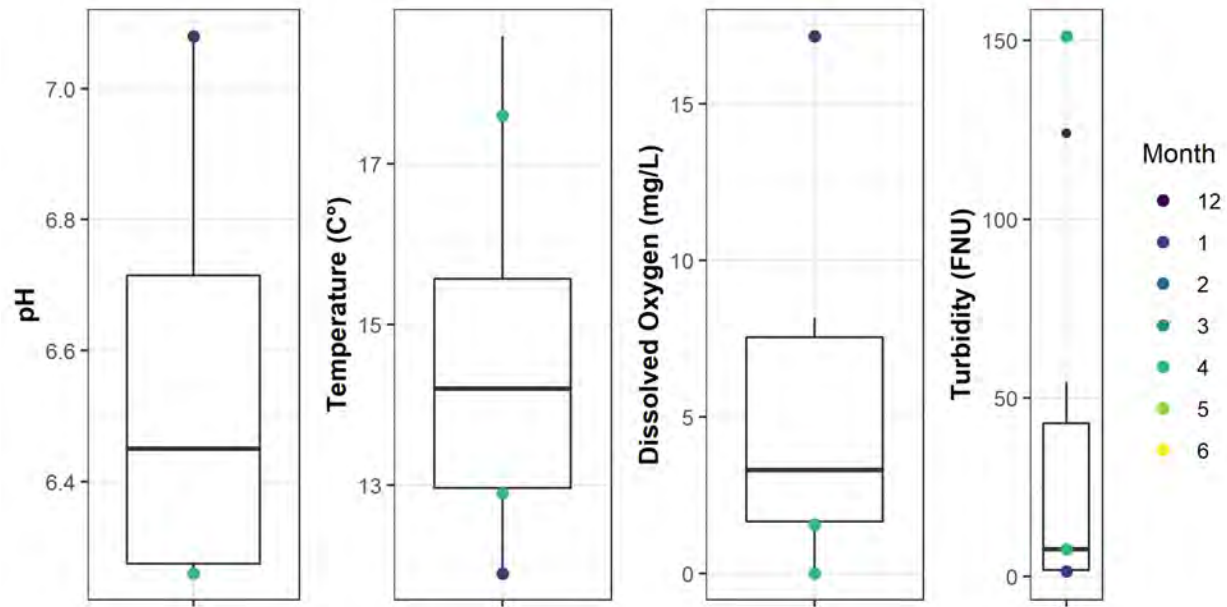


**Figure 5-32.** Pond 41 (Year 2 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2015 (Depth Axis is Presented on a Logarithmic Scale).



**Figure 5-33.** Pond 41 (Year 2 Post-Subsurface Munitions Remediation) Inundations for 2016 (above normal precipitation) and 2020 (close to normal precipitation).





**Figure 5-34.** Pond 41 (Year 2 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

#### 5.8.1.1 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, but it did meet the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 16 did not provide sufficient depth for CTS (15 cm through March), but it did provide sufficient depth for fairy shrimp (30 cm through May).

#### 5.8.1.2 Data Quality Objective 2

Pond 41 was intermittently inundated from February through May and was dry by May 26, 2020. Pond 41 depth and inundation metrics reflected the precipitation pattern of 2020 and were within the historical range (Figure 5-32). Pond 41 had similar hydroperiod as reference Pond 101 East (East); both were inundated intermittently, although Pond 101 East (West) became initially inundated in early December, whereas Pond 41 did not hold water until late January, after which it dried out and became inundated again from mid-March to May. As would be expected due to a difference of 7.95 cm of cumulative rainfall, the maximum inundation area in 2020 was slightly smaller than in 2016, and above normal water year (Figure 5-33).

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

Pond 41, a post-subsurface munitions remediation vernal pool, was partially on track to meet the performance standard for year 2 in 2020. Pond 41 partially met DQO 1; it did not provide suitable habitat for CTS, but it did provide suitable habitat for fairy shrimp in 2020. Hydroperiod of Pond 41 was similar to reference Pond 101 East (East) and congruent with baseline patterns, 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.

#### 5.8.1.4 Data Quality Objective 4

Water quality parameters of Pond 41 were generally within the historical ranges with the exception of dissolved oxygen in December (Figure 5-34).

#### 5.8.1.5 Performance Standard: Wildlife Usage

This performance standard was partially met in 2020 at Pond 16 due to insufficient inundation depth and duration for CTS, but it provided sufficient depth and inundation for fairy shrimp. Water quality measurements were adequate for wildlife.

### 5.8.2 Conclusion

Pond 41, a post-subsurface munitions remediation vernal pool, was in year 2 of monitoring in 2020. The vernal pool was partially on track to meet the performance standards (see Table 5-8). Pond 41 will continue to be monitored in the future.

**Table 5-8. Success at Pond 41 (Year 2 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

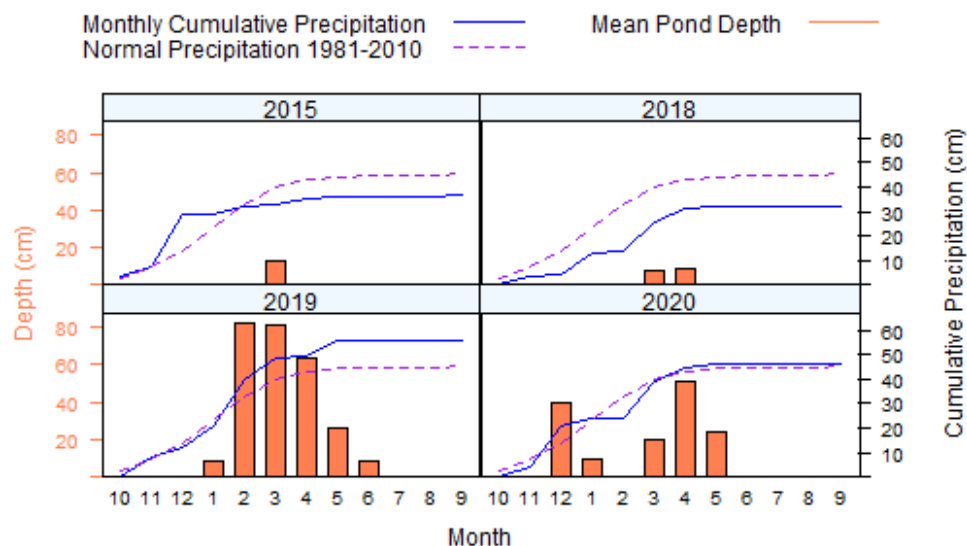
### 5.9 Pond 40 North – Year 3

Pond 40 North is situated within a small basin with a steep profile in the northern part of the Fort Ord National Monument. Depth and inundation of Pond 40 North have been monitored for four years (Figure 5-35). Year 2019 was an above normal water year, 2020 was close to normal water year, 2018 was a below normal water year, and 2015 was a consecutive drought year.

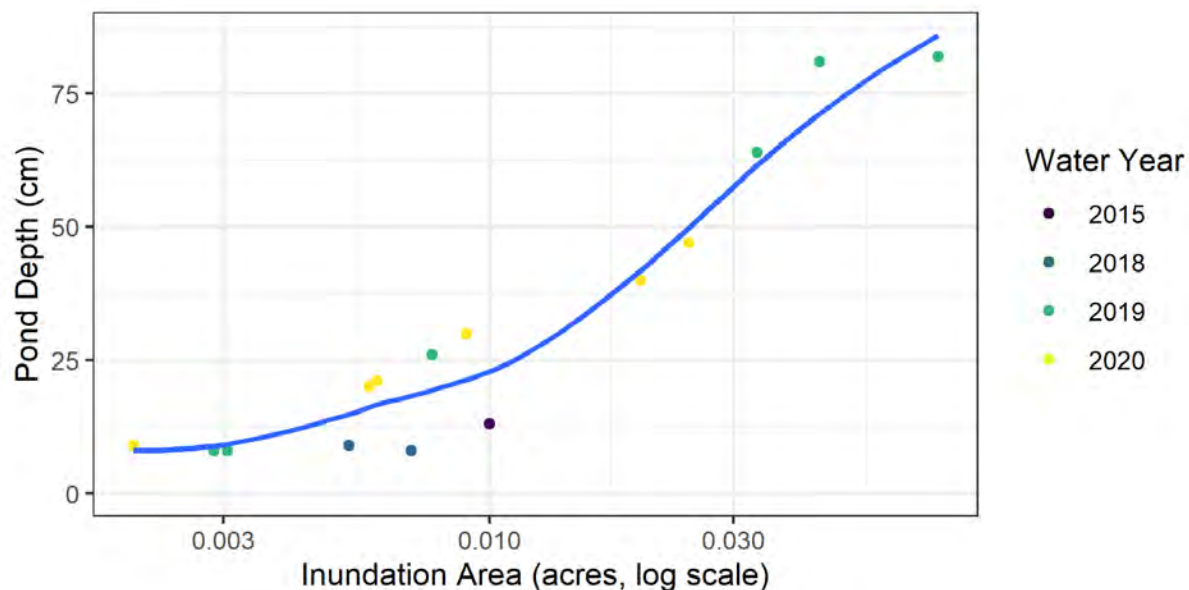
Pond 40 North was monitored in 2020 as a year 3 post-burn vernal pool. Pond 40 North was monitored for baseline conditions in 2015. Vegetation in Pond 40 North and within its watershed was burned in October 2017 as part of the prescribed burn of BLM Area B Subunit B. No subsurface remediation occurred within Pond 40 North. Historically, Pond 40 North reached a depth of 9 cm and 0.01 ac in 2018, a below normal year, and it reached a maximum depth of 82 cm and a maximum inundation of 0.08 acres in 2019, an above normal water year (Figure 5-37). The 2020 maximum depth of Pond 40 North reached 75 cm and maximum measured inundation was 0.03 acres (Table 4-9). Depth and inundation values were within range of previously recorded values (Figure 5-36). By size, Pond 40 North is most similar to reference Pond 997, but it has a much steeper profile (Figure 5-1).

Pond 40 North dried out twice during the 2020 water year due to low precipitation in January and a completely dry February 2020; first following initial inundation in February, and second time by the end of May (Table 4-9 and Figure 4-9). Maximum inundation area was larger in 2020 than in baseline year 2015, which was a below normal water year (Figure 5-35). Hydroperiod of Pond 40 North was most

similar to that of reference Pond 101 East (East). Pond 40 North dried for a brief period in February as did Pond 101 East (East), both became inundated again in March, and both dried out by June.

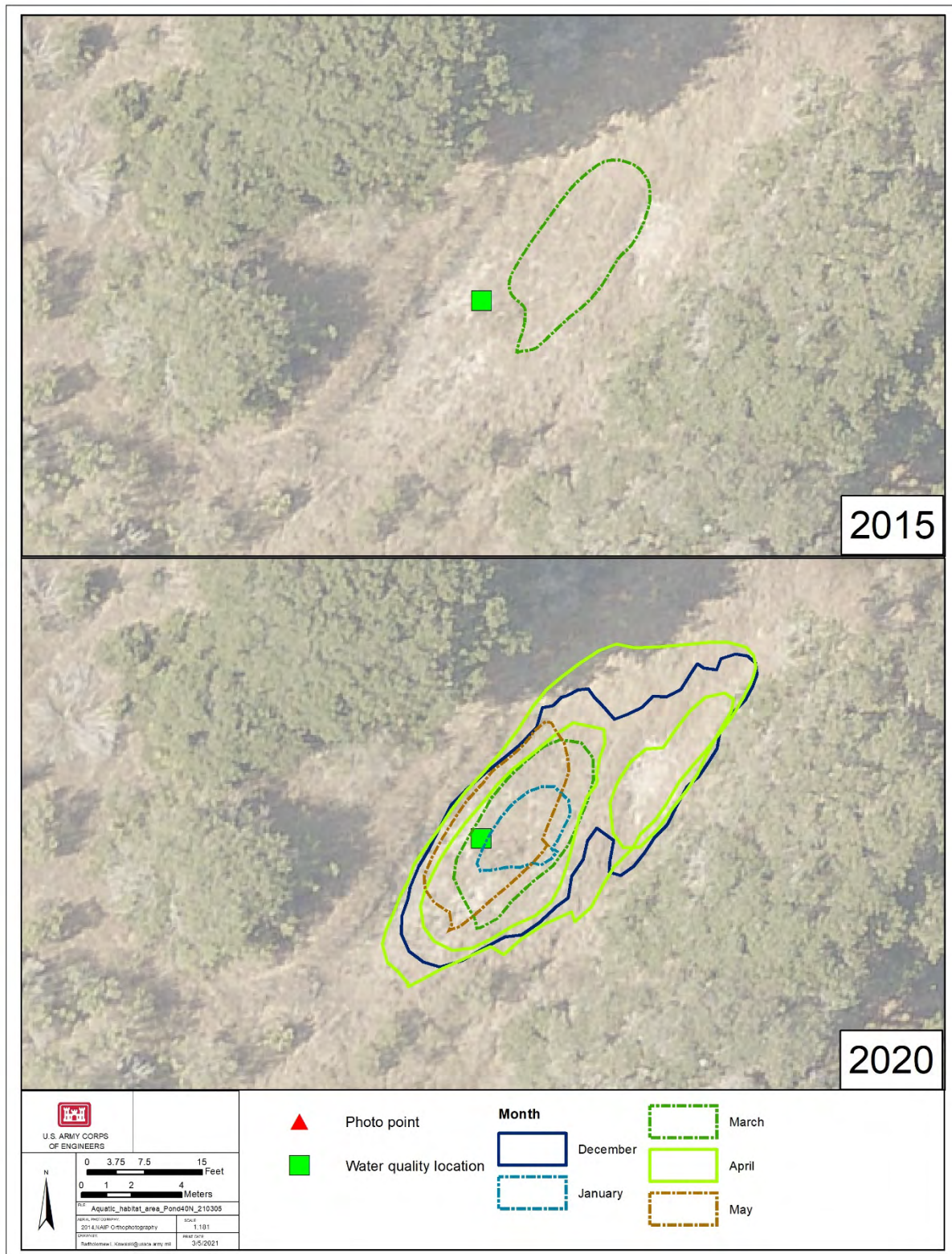


**Figure 5-35.** Pond 40 North (Year 3 Post-Burn) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)



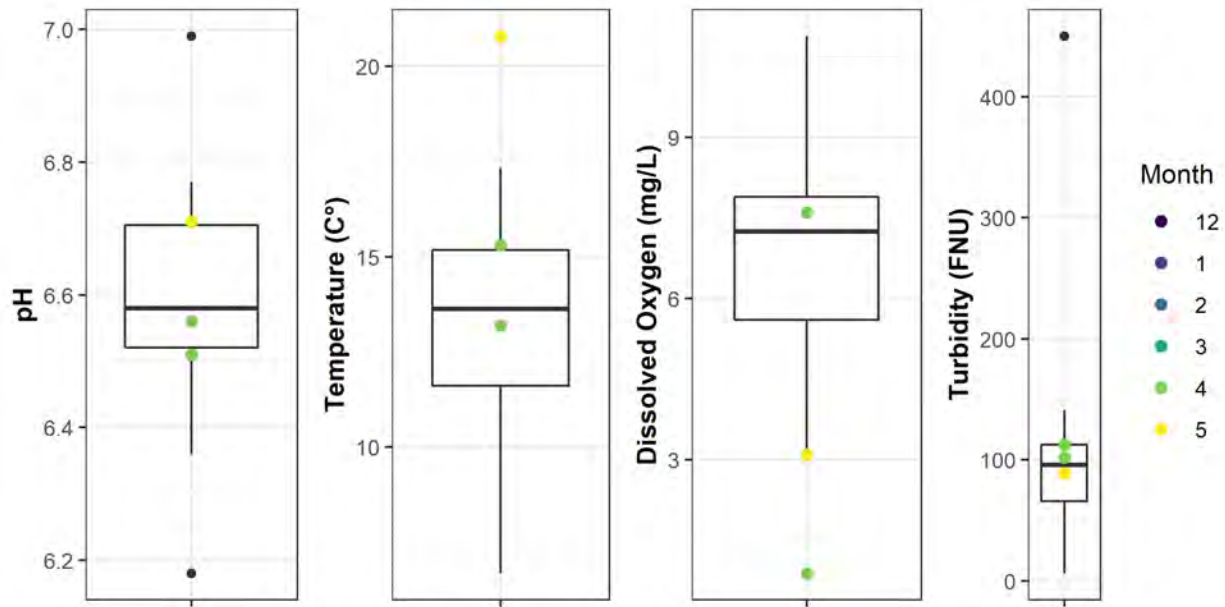
**Figure 5-36.** Pond 40 North (Year 3 Post-Burn) Plot of Depth vs Area Since Water Year 2015 (Depth Axis is Presented on a Logarithmic Scale).

Water quality parameters of Pond 40 North were generally within the historical ranges with an exception of temperature value in May, and dissolved oxygen value in April. Temperature reached a record value of 20.8 °C in May, but that is likely due to it being recorded late in the season (Figure 5-38). Dissolved oxygen in April 29 was measured at DO = 0.88 mg/L, which was lowest on record. However, measurements at the beginning of the month, and at the end of May were within the historical range.



**Figure 5-37.** Pond 40 North (Year 3 Post-Burn) Inundations for 2015 (below normal precipitation) and 2020 (close to normal precipitation).





**Figure 5-38.** Pond 41 (Year 2 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

#### 5.9.1.1 Data Quality Objective 1

Pond 40 North 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 40 North did not provide sufficient depth for CTS (15.8 cm through March), but it did provide sufficient depth for fairy shrimp (28 cm through May).

#### 5.9.1.2 Data Quality Objective 2

Pond 40 North was intermittently inundated from December through May and was dry by June 16, 2020. Pond 40 North depth and inundation metrics reflected the precipitation pattern of 2020 and were within the historical range (Figure 5-36). Pond 40 North had similar hydroperiod as reference Pond 101 East (East); both were inundated intermittently from early December through May. Although Pond 101 East (East) dried out following initial inundation in December, both ponds dried out in February, after which both became inundated again from mid-March to May. As would be expected due to a difference of 9.47 cm of cumulative rainfall, the maximum inundation area in 2020 was larger than in 2015, a below normal water year (Figure 5-37).

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

Pond 40 North, a post-burn vernal pool, was partially on track to meet the performance standard for year 3 in 2020. Pond 40 North partially met DQO 1; it did not provide suitable habitat for CTS, but it did provide suitable habitat for fairy shrimp in 2020. Hydroperiod of Pond 40 North was similar to reference Pond 101 East (East) and congruent with baseline patterns, thus DQO 2 was met.

#### 5.9.1.4 Data Quality Objective 4

Water quality parameters of Pond 40 North were within the historical ranges (Figure 5-38).

#### 5.9.1.5 Performance Standard: Wildlife Usage

This performance standard was partially met in 2020 at Pond 40 North due to insufficient inundation depth and duration for CTS, but it provided sufficient depth and inundation for fairy shrimp. Water quality measurements were adequate for wildlife.

### 5.9.2 Conclusion

Pond 40 North, a post-burn vernal pool, was in the final year of monitoring in 2020. This vernal pool met the performance standards in the period of three years following a prescribed burn in 2017 (Table 5-9). DQO 1 was met once in 2019, but only partially in 2020, and not in 2018 which was a below normal water year. Pond 40 North did not reach enough depth to support CTS in 2020 and 2018, or fairy shrimp in 2018. These patterns are congruent with those observed in baseline year and with reference vernal pools. The observed inundation patterns were a result of amount and frequency of precipitation, not burn activity. DQOs 2 and 4 were met in all follow up monitoring years. Year 2020 was the final year of required monitoring, and no further monitoring is recommended for Pond 40 North.

**Table 5-9. Success at Pond 40 North (Year 3 Post-Burn) Based on Performance Standards and Applicable Data Quality Objectives for All Follow up Monitoring Years**

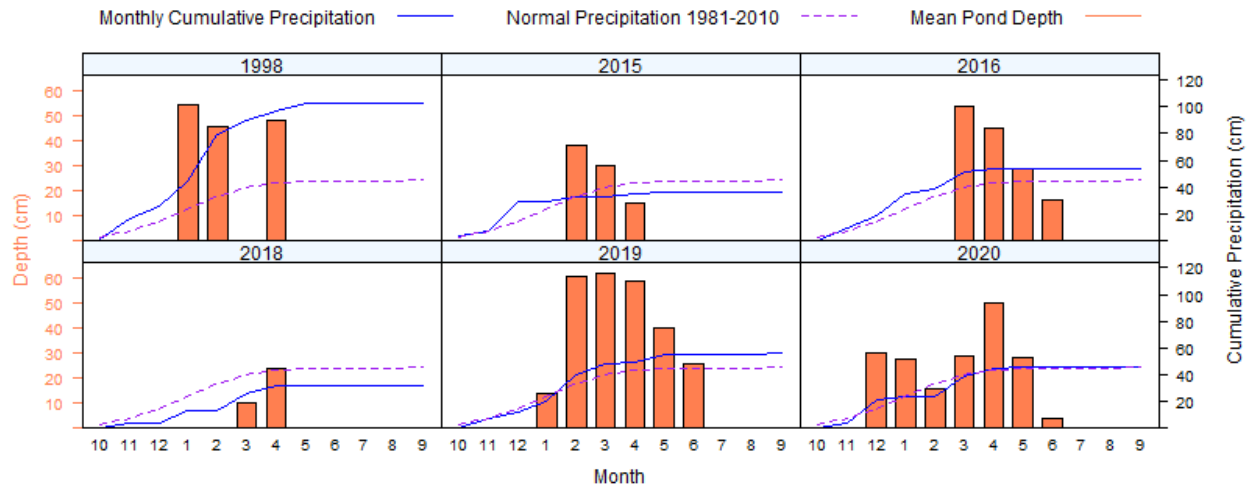
Performance Standard	Applicable DQO	2018	2019	2020
Hydrological Conditions & Inundation Area	DQO 1	Not on track	On track	Partially on track
	DQO 2	On track	On track	On track
Wildlife Usage	DQO 1	Not on track	On track	Partially on track
	DQO 4	On track	On track	On track

### 5.10 Pond 3 North – Year 3 and Year 2

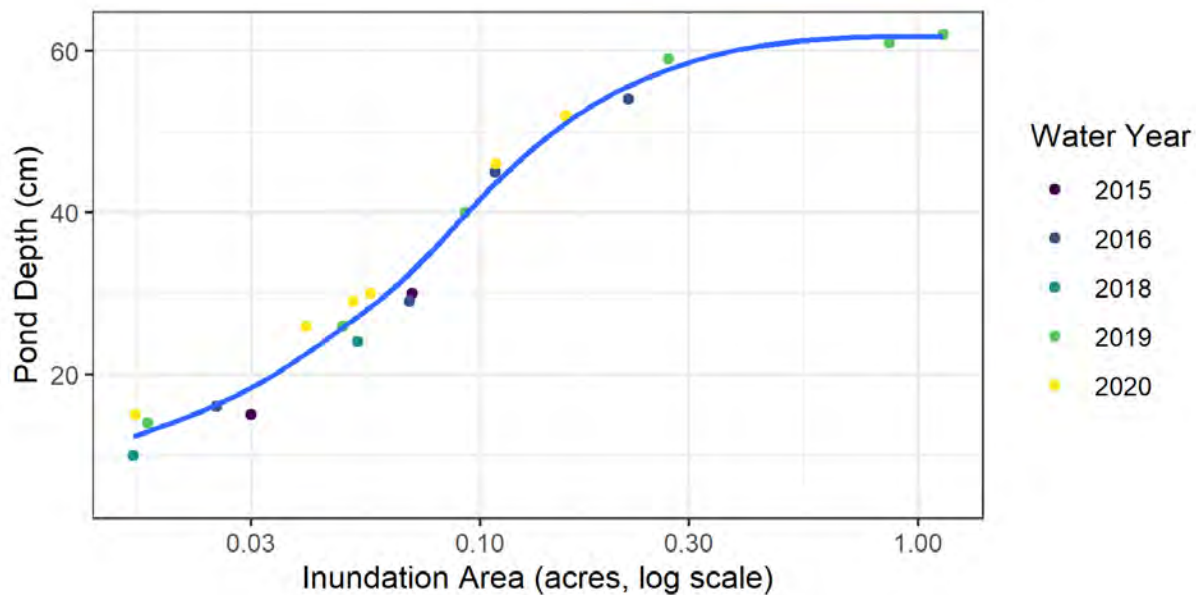
Pond 3 North is situated within a medium size basin in the northern part of the Fort Ord National Monument. Depth and inundation of Pond 3 North have been monitored for six years (Figure 5-39). Above normal water years were 1998, 2016, and 2019. Year 2020 was a close to normal water year. All other monitoring was conducted either in a below normal water year (2018), 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.

Pond 3 North was monitored in 2020 as a year 3 post-burn and year 2 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 2020 maximum depth of Pond 3 North was 55 cm and maximum measured inundation was 0.16 acres (Table 4-11). The depth and inundation values were within range of previously recorded values (Figure 5-40). By size, Pond 3 North is between reference Ponds 101 East (East) and 997.

Pond 3 North was inundated from early December to mid-June and its hydroperiod in 2020 mostly resembled that of Reference Pond 5. Maximum inundation area was greater in 2020 than in baseline year 2015, which was below normal water year (Figure 5-41).



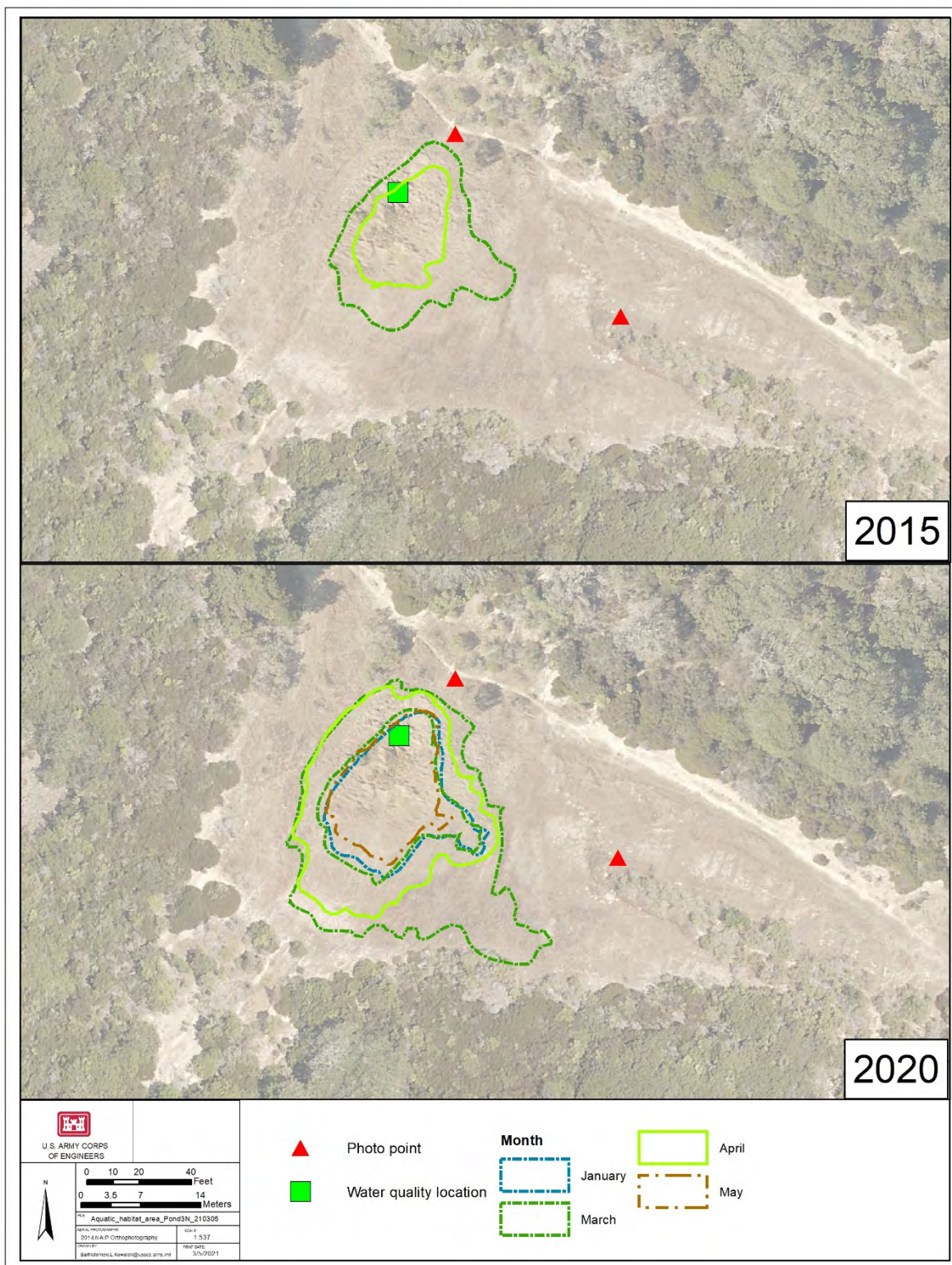
**Figure 5-39.** Pond 3 North (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)



**Figure 5-40.** Pond 3 North (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2015 (Depth Axis is Presented on a Logarithmic Scale).

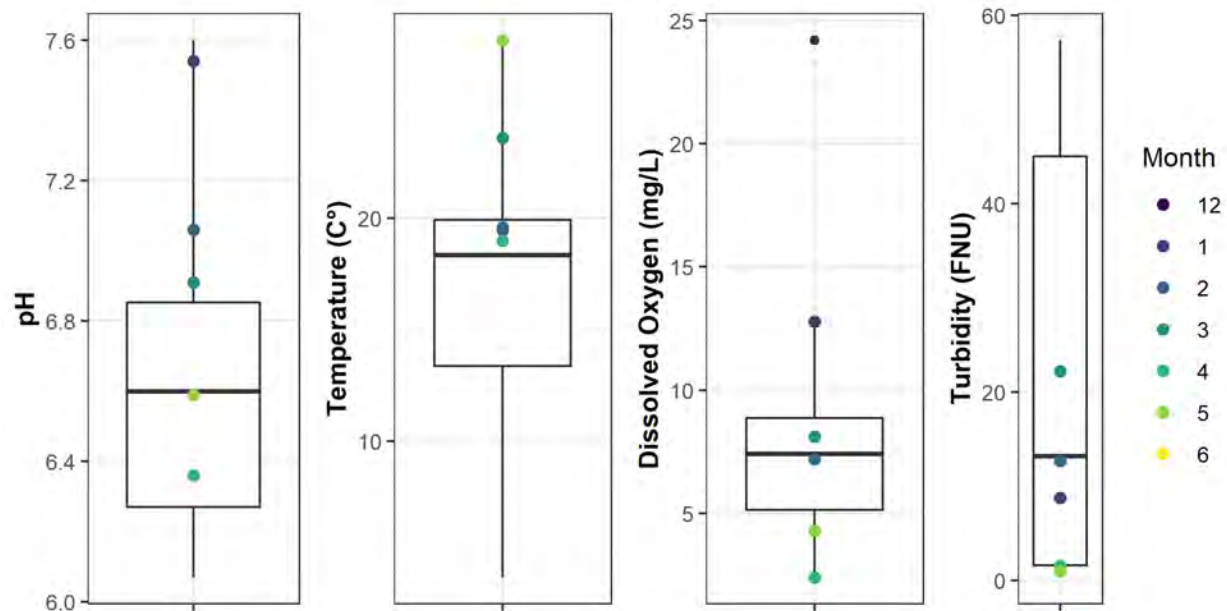
Water quality parameters of Pond 3 North were within the historical ranges. May temperature value was on the higher end of the observed historical values but in accord with temperature observed at other vernal pools (Figure 5-42 and Figure 5-3).





**Figure 5-41.** Pond 3 North (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Inundations for 2015 (below normal precipitation) and 2020 (close to normal precipitation).





**Figure 5-42.** Pond 3 North (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

#### 5.10.1.1 Data Quality Objective 1

Pond 3 North met the required average depths of 25 cm from the first rain event through March for CTS and 10 cm for 18 consecutive days through May for fairy shrimp. Pond 3 North provided sufficient depth for CTS (25 cm through March) and fairy shrimp (26 cm through May).

#### 5.10.1.2 Data Quality Objective 2

Despite low precipitation in January and a dry February, Pond 3 North was inundated from December through June, and its hydroperiod was similar to that of reference Pond 5. As would be expected due to a difference of 9.56 cm of cumulative rainfall, the maximum inundation area in 2020 was greater than in 2015 (Figure 5-41).

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

Pond 3 North, a post-burn and post-subsurface munitions remediation vernal pool, was on track to meet this performance standard for year 3 and year 2 in 2020. Pond 3 North met DQO 1 and DQO 2 indicating that it provided suitable habitat for CTS and fairy shrimp and its inundation pattern was similar to reference vernal pools and congruent with baseline. The vernal pool will continue to be monitored in future years to evaluate its progress to meet the performance standard.

#### 5.10.1.4 Data Quality Objective 4

Water quality parameters of Pond 3 North were within the historical ranges (Figure 5-42).

#### 5.10.1.5 *Performance Standard: Wildlife Usage*

Pond 3 North was on track to meet this performance standard as it provided sufficient depth and inundation for CTS and fairy shrimp. Water quality measurements were adequate for wildlife.

#### 5.10.2 **Conclusion**

Pond 3 North, a post-burn and post-subsurface munitions remediation vernal pool, was in years 3 and 2 of monitoring in 2020. The vernal pool was on track to meet the performance standards (Table 5-10). Pond 3 North will continue to be monitored in the future.

**Table 5-10. Success at Pond 3 North (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

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

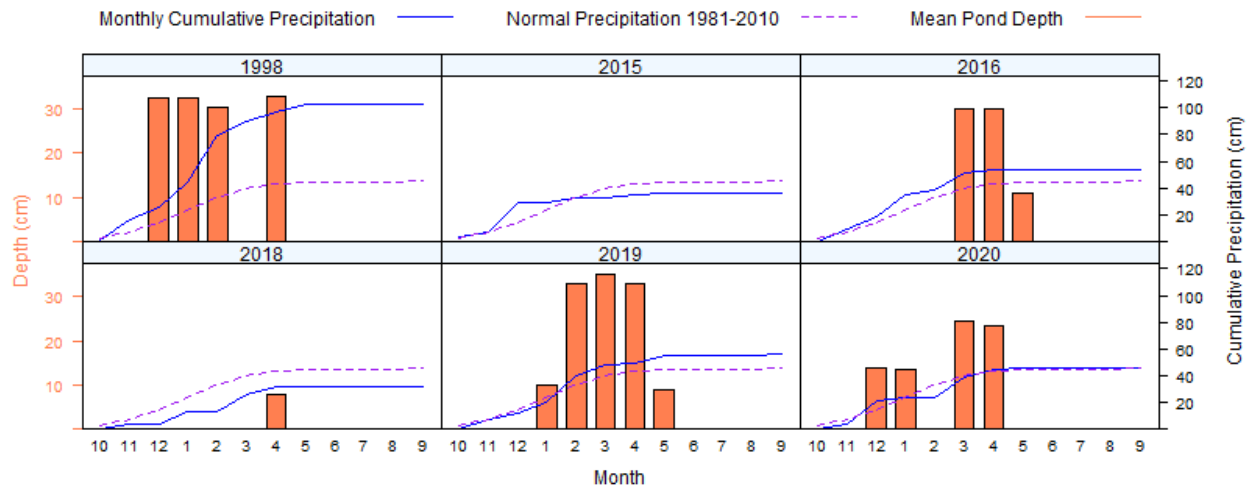
### 5.11 Pond 3 South – Year 3 and Year 2

Pond 3 South is situated within a medium size basin in the northern part of the Fort Ord National Monument. Depth and inundation of Pond 3 South have been monitored for six years (Figure 5-43). 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), 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.

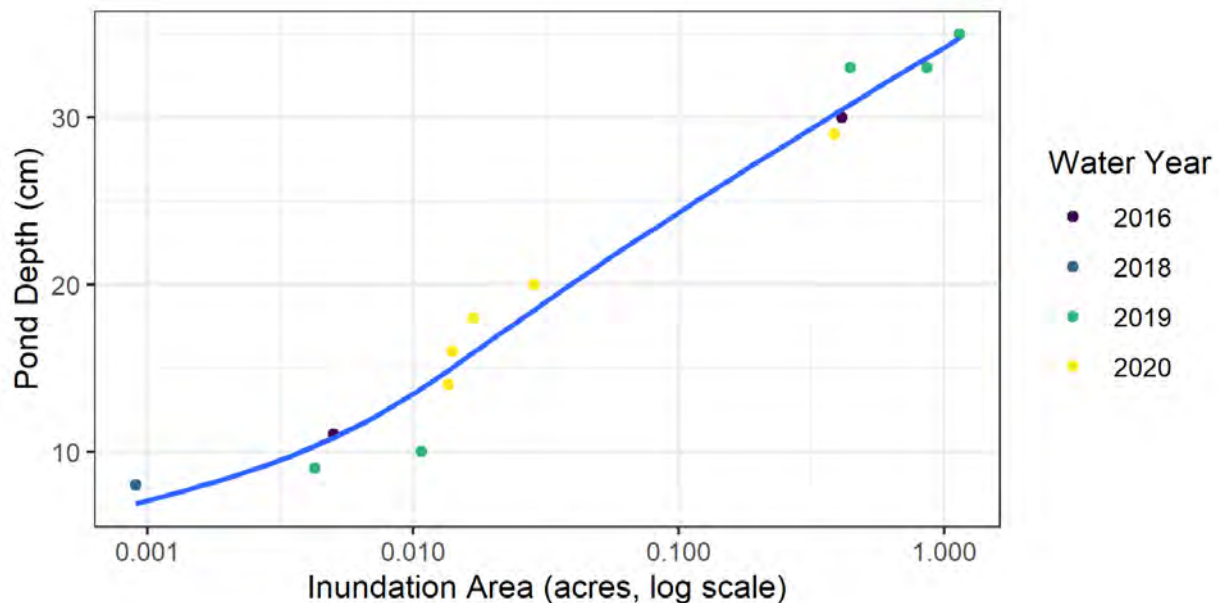
Pond 3 South was monitored in 2020 as a year 3 post-burn and year 2 post-subsurface munitions remediation vernal pool. Vegetation within Pond 3 South basin and its watershed was burned in October 2017 as part of the prescribed burn of BLM Area B Unit B. Subsurface anomaly investigations occurred in the 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). The 2020 maximum depth of Pond 3 South was 29 cm and maximum inundation was 0.39 acres (Table 4-11). The depth and inundation values were within range of previously recorded values (Figure 5-44). By size, Pond 3 South is between reference Ponds 101 East (East) and 997.

Pond 3 South was inundated from early December to late January, it dried out in February, and became inundated again from mid-March to the of April. Its hydroperiod in 2020 mostly resembled that of Reference Pond 101 East (East). Maximum inundation area was slightly smaller in 2020 than in baseline year 2016, which was an above normal water year (Figure 5-45).

Water quality parameters of Pond 3 South were within the historical ranges. Although pH, temperature and dissolved oxygen values were higher later in the season (Figure 5-46), they did not appear out of range when compared to the rest of the vernal pools (Figures 5-2 to 5-5).



**Figure 5-43.** Pond 3 South (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)

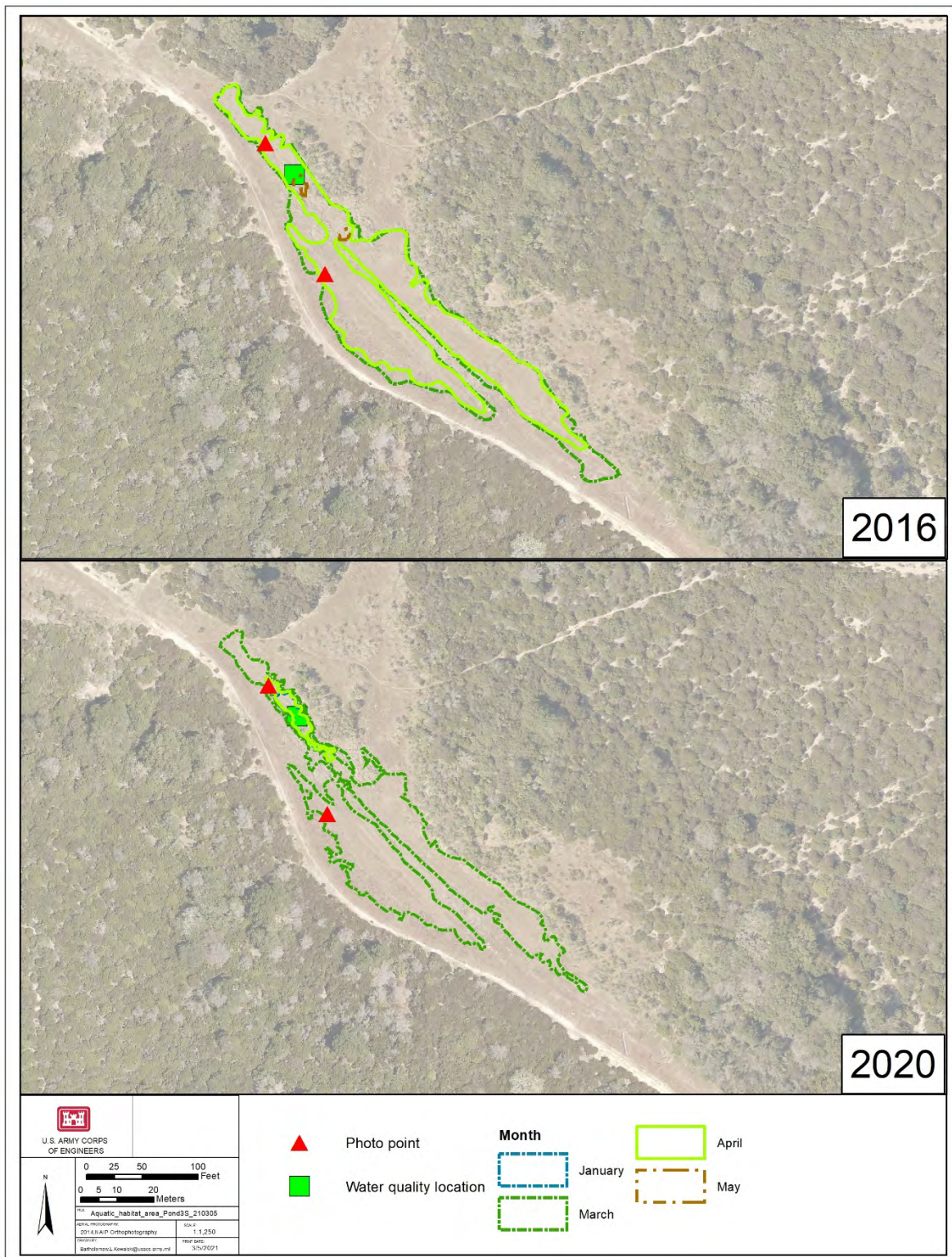


**Figure 5-44.** Pond 3 South (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2016 (Depth Axis is Presented on a Logarithmic Scale).

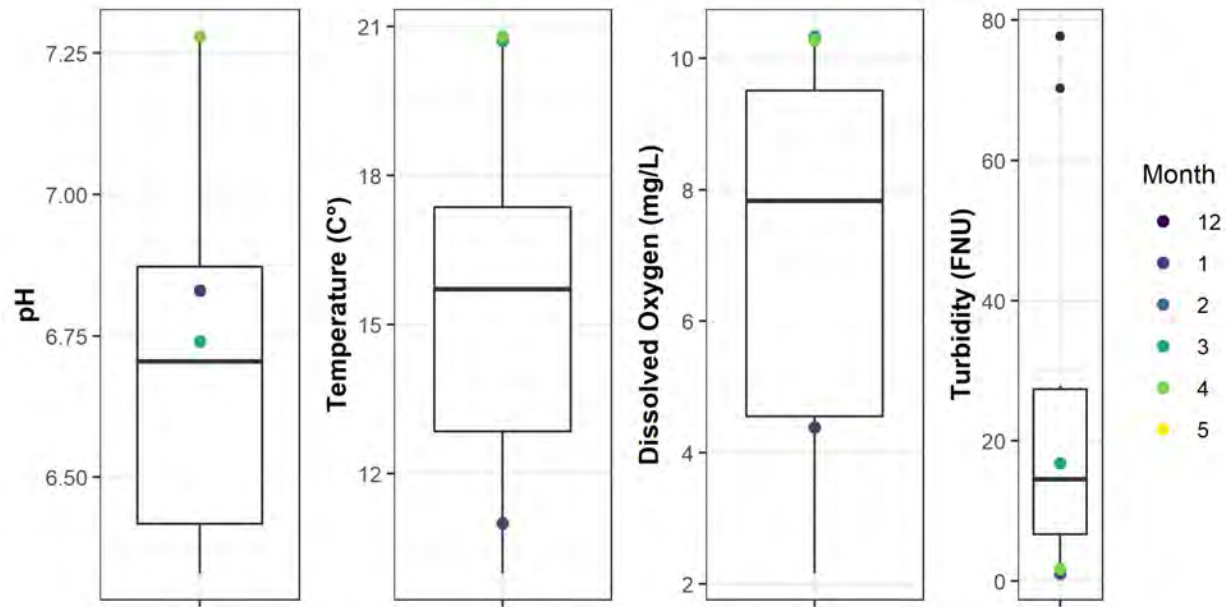
#### 5.11.1.1 Data Quality Objective 1

Pond 3 South did not meet the required average depths of 25 cm from the first rain event through March for CTS, but it did meet the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 3 South did not provide sufficient depth for CTS (17 cm through March), but it did provide sufficient depth for fairy shrimp (18.75 cm through May).





**Figure 5-45.** Pond 3 South (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Inundations for 2016 (above normal precipitation) and 2020 (close to normal precipitation).



**Figure 5-46.** Pond 3 South (Year 2 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

#### 5.11.1.2 Data Quality Objective 2

Pond 3 North was intermittently inundated from December through April and was dry by May 26, 2020. Its hydroperiod was most similar to that of reference Pond 101 East (East). As would be expected due to a difference of 7.95 cm of cumulative rainfall, the maximum inundation area in 2020 was slightly smaller than in 2016, and above normal water year (Figure 5-25).

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

Pond 3 South, a post-burn and post-subsurface munitions remediation vernal pool, was partially on track to meet the performance standard for year 3 and year 2 in 2020. Pond 3 South partially met DQO 1; it did not provide suitable habitat for CTS, but it did provide suitable habitat for fairy shrimp in 2020. Hydroperiod of Pond 3 North was similar to reference Pond 101 East (East) and congruent with baseline patterns, 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.

#### 5.11.1.4 Data Quality Objective 4

Water quality parameters of Pond 3 South were generally within the historical ranges (Figure 5-46).

#### 5.11.1.5 Performance Standard: Wildlife Usage

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

### 5.11.2 Conclusion

Pond 3 South, a post-burn and post-subsurface munitions remediation vernal pool, was in years 3 and 2 of monitoring in 2020. The vernal pool was partially on track to meet the performance standards (Table 5-11). Pond 3 South will continue to be monitored in the future.

**Table 5-11. Success at Pond 3 South (Year 3 Post-Burn, Year 2 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

### 5.12 Pond 39 – Year 3 and Year 2

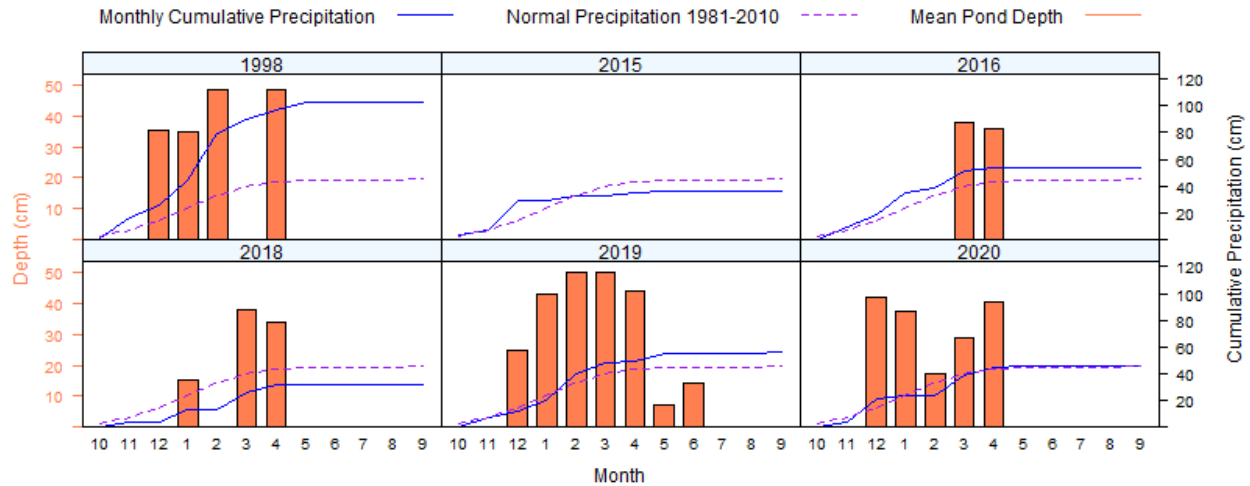
Pond 39 is situated within a very small basin with a steep profile, surrounded by topographically varied small inundations that in an above normal water year can become inundated and hydrologically connected. Pond 39 is located in the northern part of the Fort Ord National Monument. Depth and inundation of Pond 39 have been monitored for six years (Figure 5-47). 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), or a consecutive drought year (2015).

Pond 39 was monitored in 2020 as a year 3 post-burn, year 2 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 2020 maximum depth of Pond 39 was 45 cm and maximum inundation for was 0.009 acres (Table 4-12). The depth and inundation values were within range of previously recorded values (Figure 5-48). By size, Pond 39 is most similar to reference Pond 997.

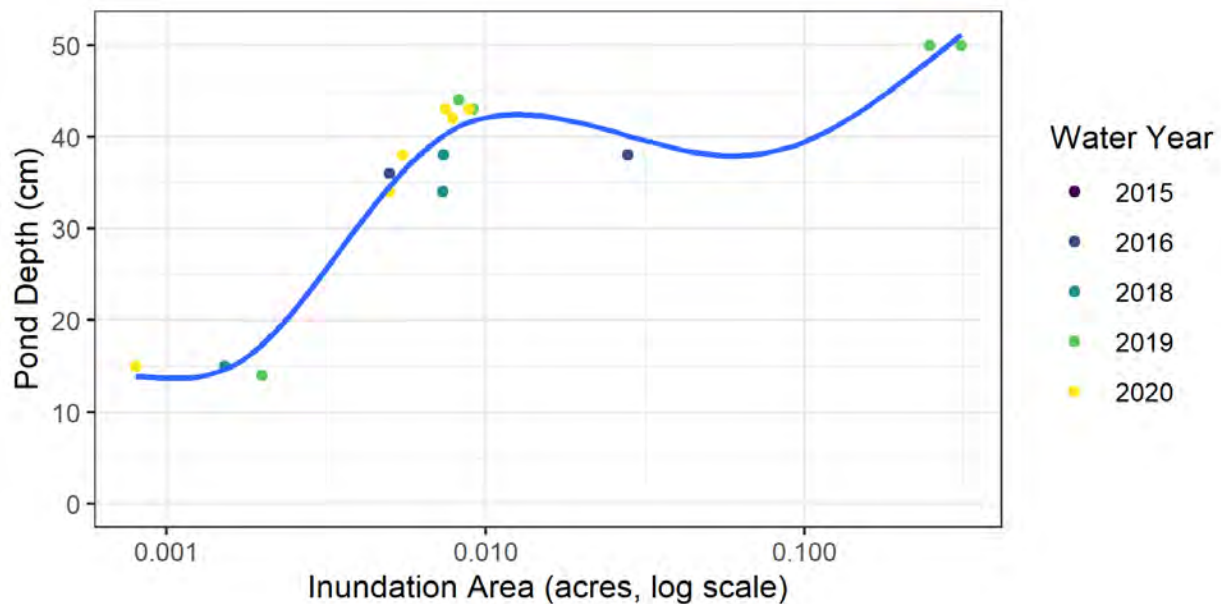
Pond 39 was inundated from early December to mid-March when it dried out for a short period before becoming inundated again from mid-March to the end of April. Its hydroperiod in 2020 mostly resembled that of Reference Pond 101 East (East). Maximum inundation area was smaller in 2020 than in baseline year 2016, which was an above normal water year (Figure 5-49).

Water quality parameters of Pond 39 were within the historical ranges and similar to other vernal pools (Figure 5-50 and Figure 5-2 to 5-5).

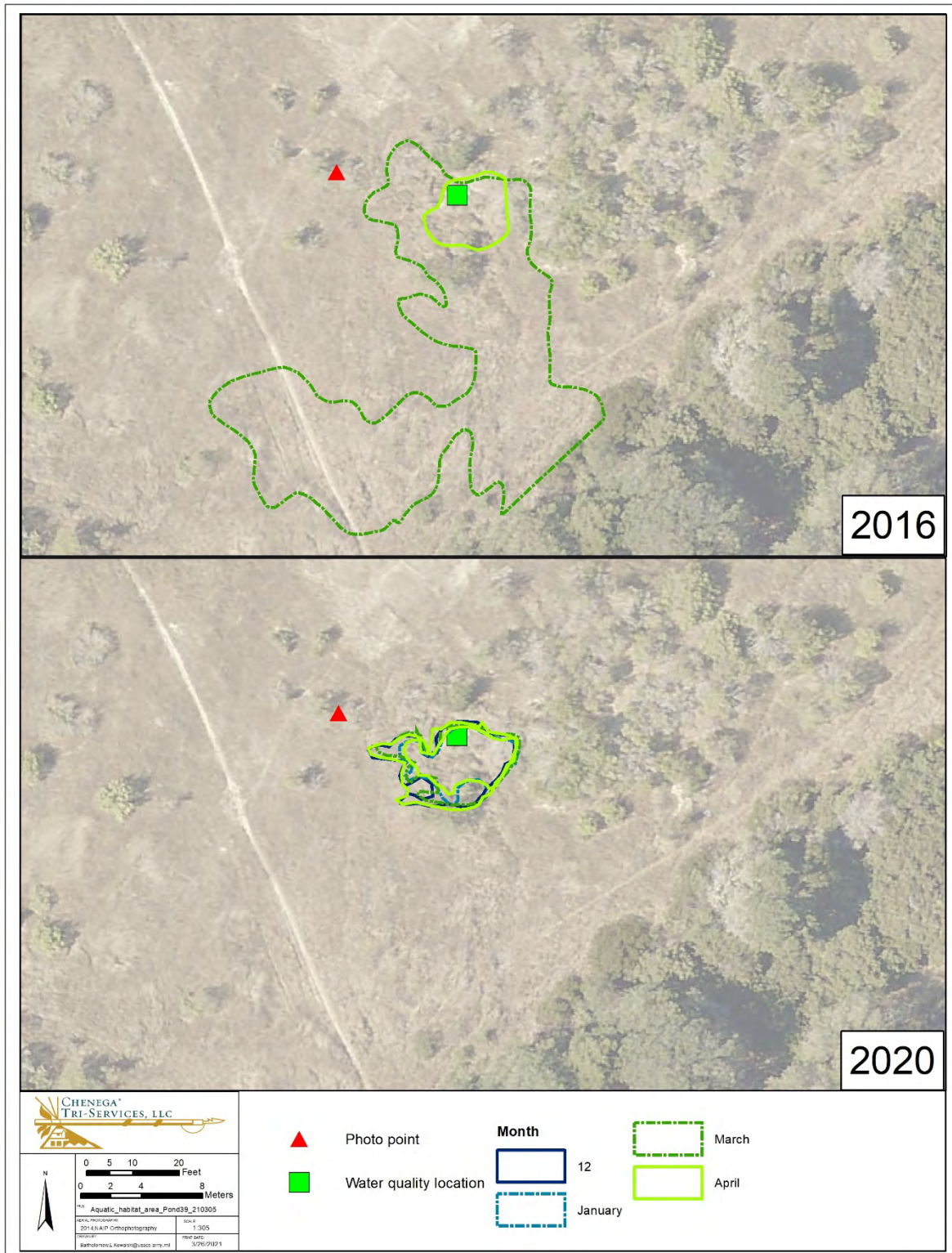




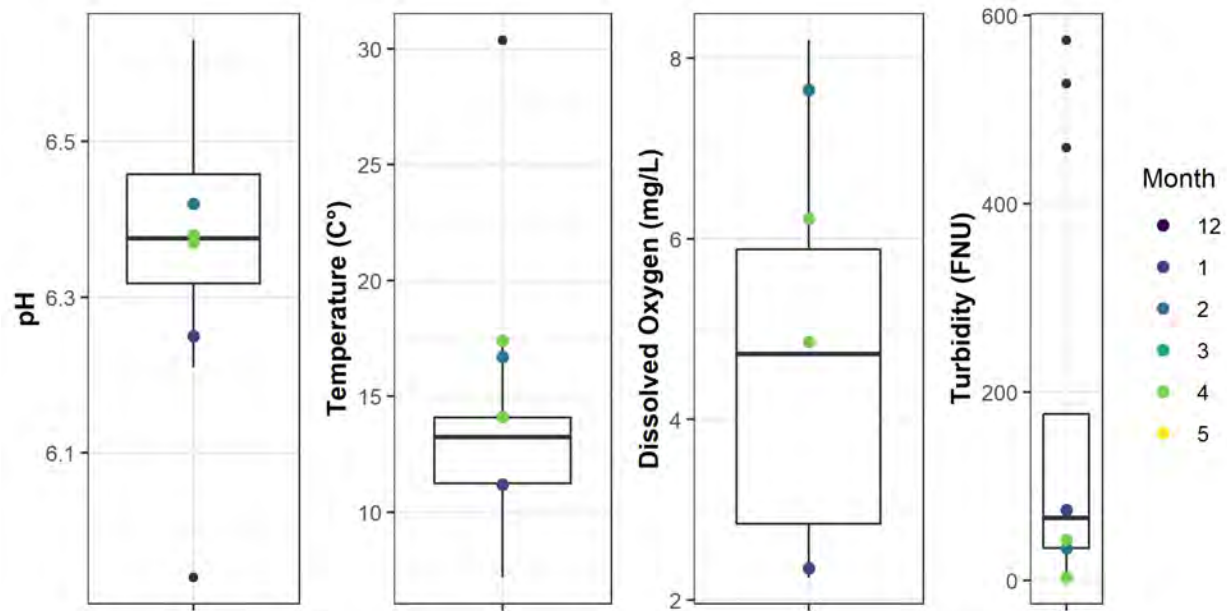
**Figure 5-47.** Pond 39 (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)



**Figure 5-48.** Pond 39 (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2015 (Depth Axis is Presented on a Logarithmic Scale).



**Figure 5-49.** Pond 39 (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Inundations for 2016 (above normal precipitation) and 2020 (close to normal precipitation).



**Figure 5-50.** Pond 39 (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

#### 5.12.1.1 Data Quality Objective 1

Pond 39 met the required average depths of 25 cm from the first rain event through March for CTS and 10 cm for 18 consecutive days through May for fairy shrimp. Although Pond 39 dried out by March 12 before becoming inundated again, it provided sufficient average depth for CTS (30.4 cm through end of February) for likely long enough duration (83 days) for metamorphosis of CTS. Pond 39 also provided sufficient average depth for fairy shrimp (30 cm through May).

#### 5.12.1.2 Data Quality Objective 2

Pond 39 was inundated from December through the end of May but dried out for a short period around mid-March. Its hydroperiod was similar to that of reference Pond 101 East (East). As would be expected due to a difference of 7.95 cm of cumulative rainfall, the maximum inundation area in 2020 was smaller than in 2016, an above normal water year (Figure 5-49).

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

Pond 39, a post-burn and post-subsurface munitions remediation vernal pool, was on track to meet the performance standard for years 3 and 2, respectively, in 2020. Pond 39 met DQO 1 and DQO 2 indicating that it provided suitable habitat for CTS and fairy shrimp. Hydroperiod of Pond 39 was similar to reference Pond 101 East (East). The vernal pool will continue to be monitored in future years to evaluate its progress to meet the performance standard.

#### 5.12.1.4 Data Quality Objective 4

Water quality parameters of Pond 39 were within the historical ranges (Figure 5-50).

#### 5.12.1.5 Performance Standard: Wildlife Usage

Pond 39 was on track to meet this performance standard as it provided sufficient depth and inundation for CTS and fairy shrimp. Water quality measurements were adequate for wildlife.

### 5.12.2 Conclusion

Pond 39, a post-burn and post-subsurface munitions remediation vernal pool, was in years 3 and 2 of monitoring in 2020. The vernal pool was 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-Burn, Year 2 Post-Subsurface Munitions Remediation)  
Based on Performance Standards and Applicable Data Quality Objectives**

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

### 5.13 Pond 40 South – Year 3 and Year 2

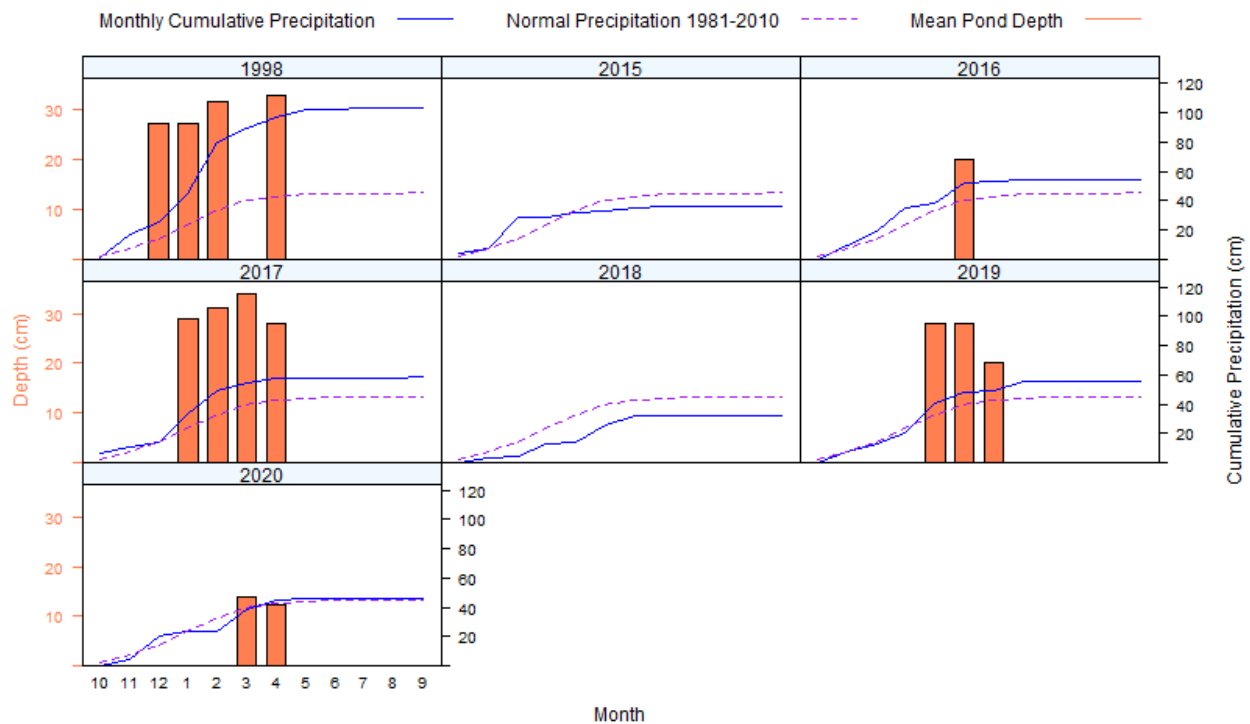
Pond 40 South is situated within a small and shallow basin, surrounded by topographically varied small inundations that in an above normal water year can become inundated and hydrologically connected. Pond 40 South is located in the northern part of the Fort Ord National Monument. Depth and inundation of Pond 40 South have been monitored for seven years (Figure 5-51). 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), or a consecutive drought year (2015).

Pond 40 South was monitored in 2020 as a year 3 post-burn, year 2 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). The 2020 maximum depth of Pond 40 South was 20 cm and maximum measured inundation was 0.024 acres (Table 4-13). The depth and inundation were lower than previously recorded values but within the expected range based on inundation history (Figure 5-52). By size, Pond 40 South is most similar to reference Pond 997.

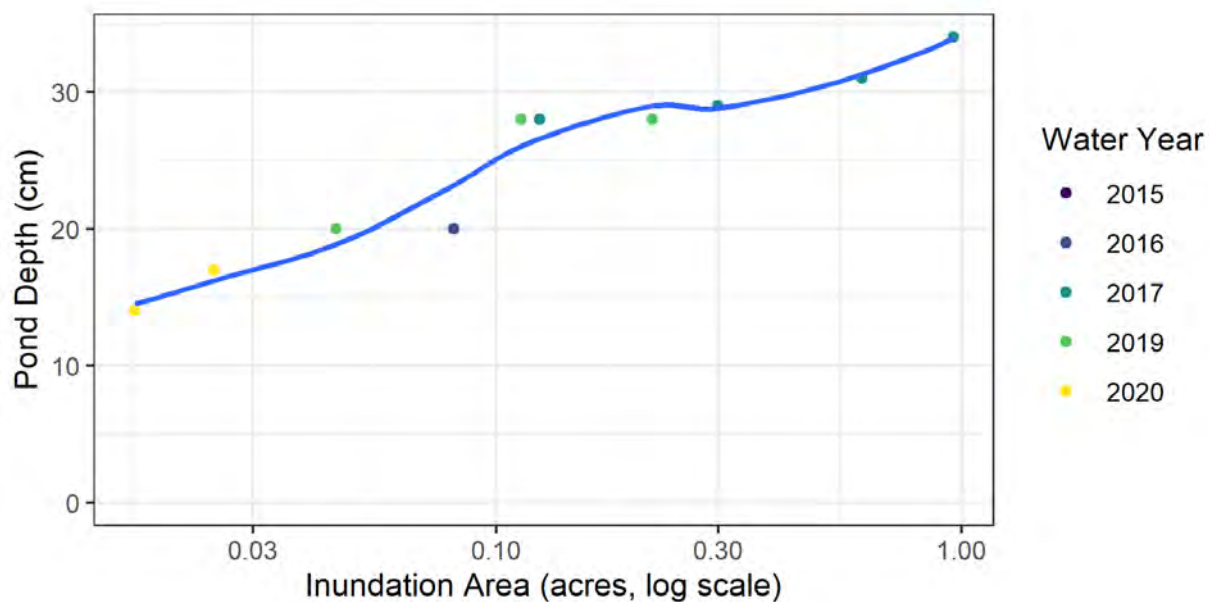
Pond 40 South was inundated from mid-March to mid-April and was dry by April 29. Its hydroperiod in 2020 mostly resembled that of Reference Pond 997. Maximum inundation area was smaller in 2020 than in baseline year 2016, which was an above normal water year (Figure 5-53).



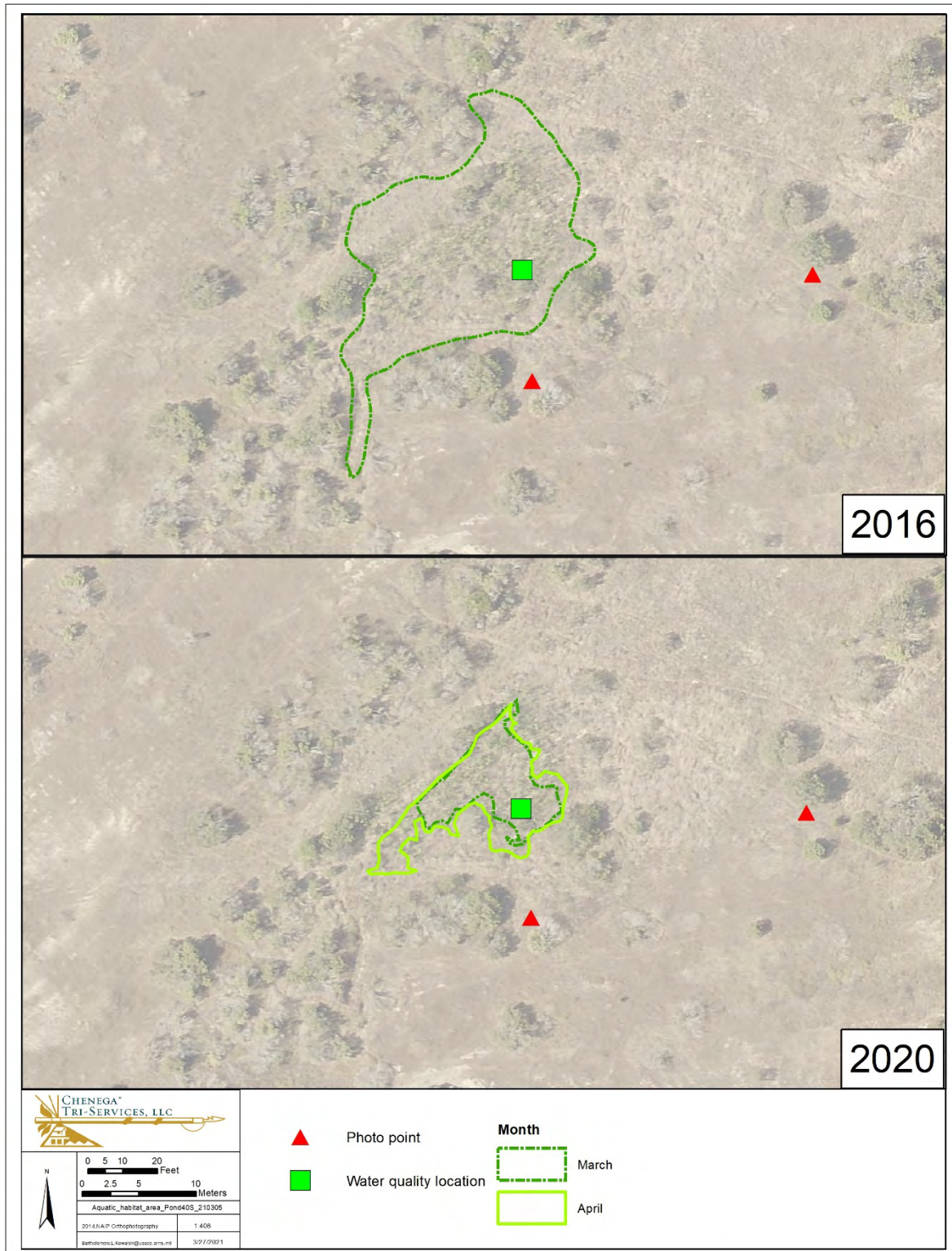
Water quality parameters of Pond 40 South were generally within the historical ranges and similar to other vernal pools (Figure 5-54 and Figures 5-2 to 5-5). Although pH value of pH= 6.04 was the lowest on record at Pond 40 South, it was not out of range when compared to other vernal pools (Figure 5-2).



**Figure 5-51.** Pond 40 South (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)

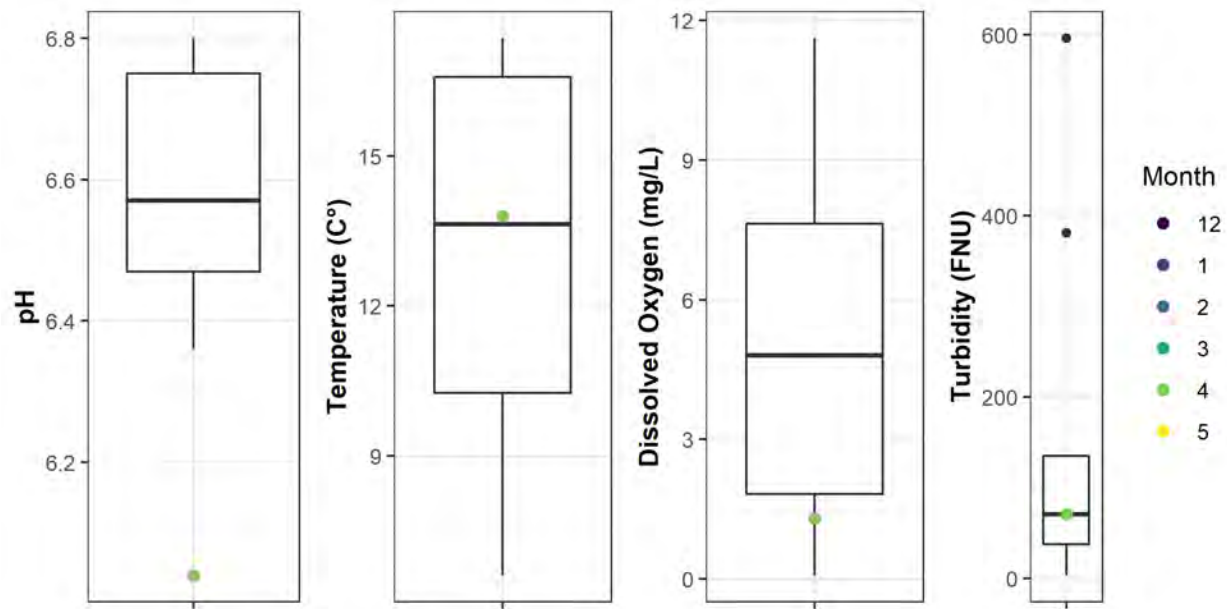


**Figure 5-52.** Pond 40 South (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2015 (Depth Axis is Presented on a Logarithmic Scale).



**Figure 5-53.** Pond 40 South (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Inundations for 2016 (above normal precipitation) and 2020 (close to normal precipitation).





**Figure 5-54.** Pond 40 South (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

#### 5.13.1.1 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, but it did meet the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 40 South did not provide sufficient depth for CTS (2.8 cm through March) but it did provide sufficient depth for fairy shrimp (17 cm from March through April).

#### 5.13.1.2 Data Quality Objective 2

Pond 40 South was briefly inundated from mid-March through mid-April. Pond 40 South depth and inundation metrics reflected the precipitation pattern of 2020 and were within the expected range (Figure 5-52). Maximum inundated area was smaller than in 2016, and above normal water year (Figure 5-53). Its hydroperiod was similar to that of reference Pond 997, both were inundated from March through April and had small inundation areas.

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

Pond 40 South, a post-burn and post-subsurface munitions remediation vernal pool, was partially on track to meet the performance standard for years 3 and 2 in 2020. Pond 40 South partially met DQO 1; it did not provide suitable habitat for CTS, but it did provide suitable habitat for fairy shrimp in 2020. Pond 40 South was similar to itself in previous monitoring years and reference Pond 997. Pond 40 South will continue to be monitored in future years.

#### 5.13.1.4 Data Quality Objective 4

Water quality parameters of Pond 40 South were generally within the historical ranges (Figure 5-54) and were similar to the values at other vernal pools.

#### 5.13.1.5 Performance Standard: Wildlife Usage

Pond 40 South was partially on track to meet this performance standard as it did not have sufficient depth for CTS, but it was sufficient fairy shrimp. Water quality measurements were adequate for wildlife.

### 5.13.2 Conclusion

Pond 40 South, a post-burn and post-subsurface munitions remediation vernal pool, was in years 3 and 2 of monitoring in 2020. The vernal pool was partially on track to meet the performance standards (Table 5-10). Pond 40 South will continue to be monitored in the future.

**Table 5-13. Success at Pond 40 South (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

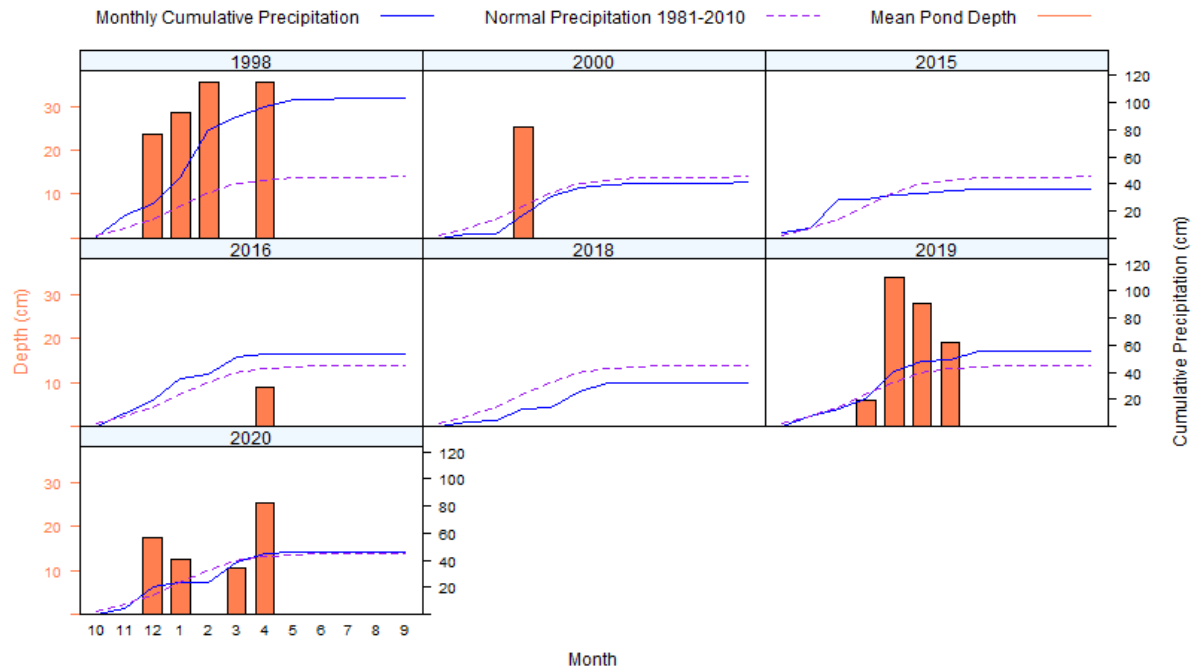
Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Partially on track
	DQO 2	On track
Wildlife Usage	DQO 1	Partially on track
	DQO 4	On track

### 5.14 Pond 43 – Year 3 and Year 2

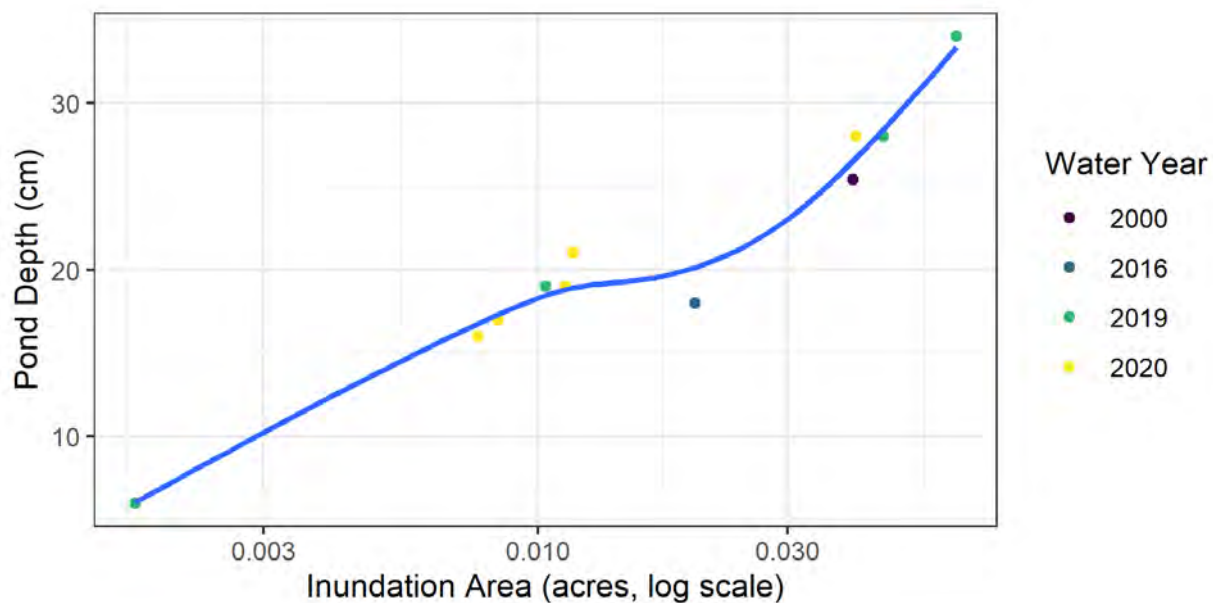
Pond 43 is situated within a small and shallow basin in the northern part of the Fort Ord National Monument. Depth and inundation of Pond 43 have been monitored for seven years (Figure 5-55). Above normal water years were 1998, 2016, and 2019. Years 2000 and 2020 were close to normal water years. All other monitoring was conducted either in a below normal water year (2018), or a consecutive drought year (2015).

Pond 43 was monitored in 2020 as a year 3 post-burn and year 2 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 2018, a below normal water year, and it reached a maximum depth of 34 cm and a maximum inundation of 0.06 acres in 2019, an above normal water year. The 2020 maximum depth of Pond 43 was 31 cm and maximum measured inundation was 0.04 acres (Table 4-14). The depth and inundation values were within range of previously recorded values (Figure 5-56). By size, Pond 43 is most similar to reference Pond 997.

Pond 43 dried out twice during the 2020 water year due to low precipitation in January and a completely dry February 2020; first following initial inundation in February, and second time by the end of June (Table 4-14 and Figure 4-14). Maximum inundation area was greater in 2020 than in baseline year 2016, which was an above normal water year (Figure 5-57). Inundation pattern of Pond 43 was most similar to that of reference Pond 101 East (East). Pond 101 East (East) dried for a brief period following dry February as did Pond 43, and both became inundated again in March.

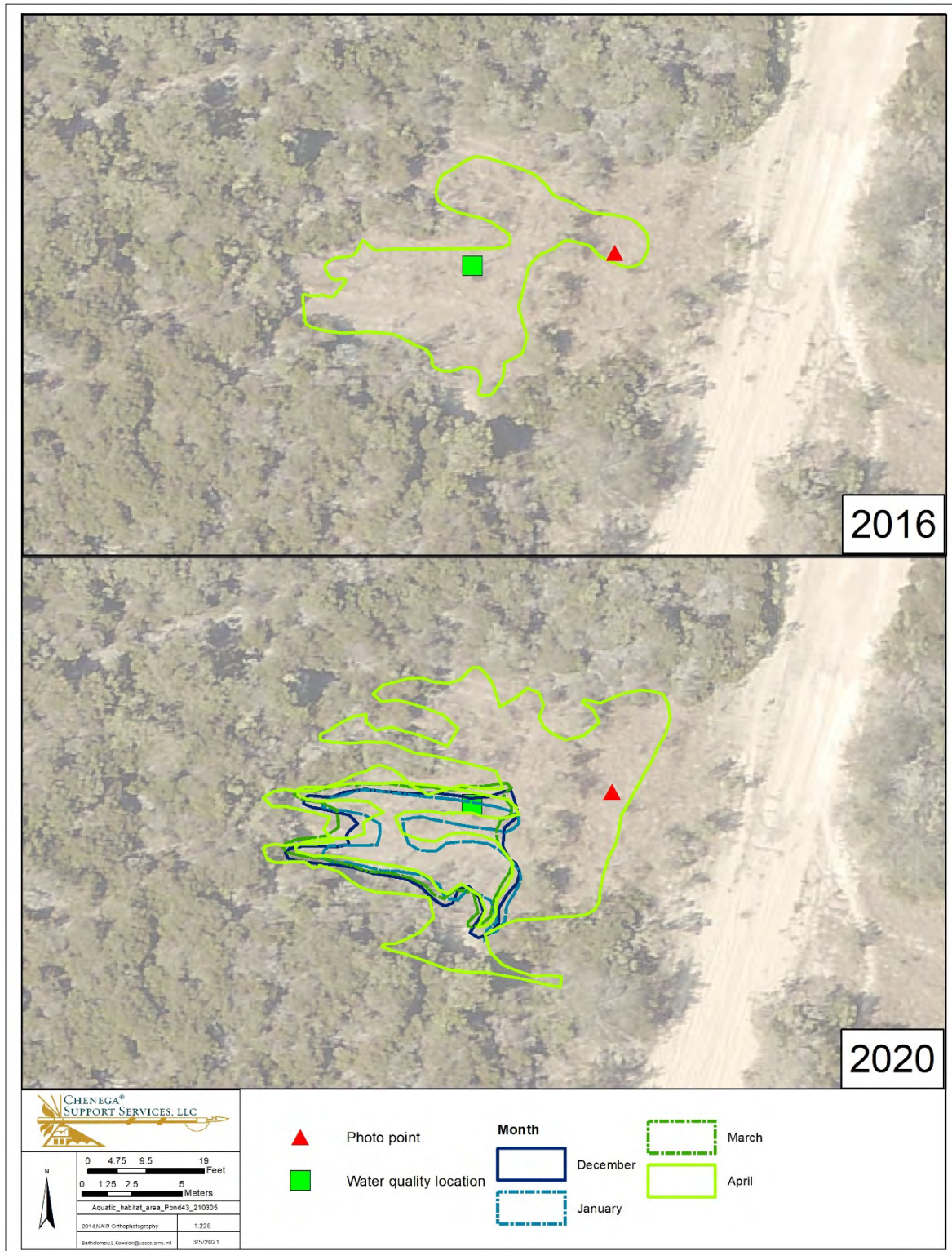


**Figure 5-55.** Pond 43 (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)



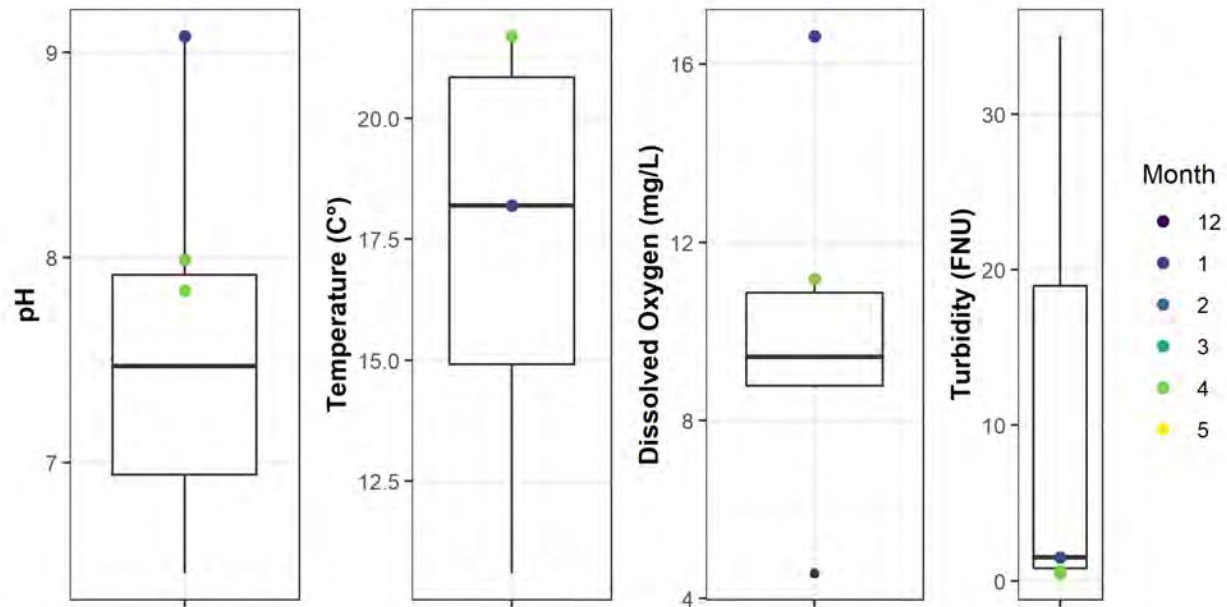
**Figure 5-56.** Pond 43 (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2000 (Depth Axis is Presented on a Logarithmic Scale).

Water quality parameters of Pond 43 were generally within the historical ranges (Figure 5-58). Dissolved oxygen in January was measured at DO = 16.63 mg/L, which was highest on record. However, when compared to measurements of other vernal pools, several of them had highest dissolved oxygen values early in the season as well, and this elevated reading was likely due to environmental factors (Ponds 5, 41, and 101 East (East); Figure 5-5).



**Figure 5-57.** Pond 43 (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Inundations for 2016 (above normal precipitation) and 2020 (close to normal precipitation).





**Figure 5-58.** Pond 43 (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

#### 5.14.1.1 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, but it did meet the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 43 did not provide sufficient depth for CTS (12 cm through March), but it did provide sufficient depth for fairy shrimp (14 cm through May).

#### 5.14.1.2 Data Quality Objective 2

Pond 43 was intermittently inundated from December through May and was dry by May 26, 2020. Pond 43 depth and inundation metrics reflected the precipitation pattern of 2020 and were within the historical range (Figure 5-56). Pond 43 had similar hydroperiod as reference Pond 101 East (East); both were inundated intermittently from early December, dried out in February, and became inundated again from mid-March to the end of May. The maximum inundation area in 2020 was slightly larger than in 2016, and above normal water year (Figure 5-57), and it reached greater depths (Figure 5-55). This may be due to 2016 water year following a several year drought period, while 2020 followed an above normal water year.

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

Pond 43, a post-burn and post-subsurface munitions remediation vernal pool, was partially on track to meet the performance standard for years 3 and 2 in 2020. Pond 43 partially met DQO 1; it did not provide suitable habitat for CTS, but it did provide suitable habitat for fairy shrimp in 2020. Hydroperiod of Pond 43 was similar to reference Pond 101 East (East), thus DQO 2 was met. The vernal pool will continue to be monitored in future years to evaluate its progress to meet this performance standard.

#### 5.14.1.4 Data Quality Objective 4

Water quality parameters of Pond 40 South were generally within the historical ranges (Figure 5-58) and were similar to the values at other vernal pools.

#### 5.14.1.5 Performance Standard: Wildlife Usage

Pond 43 partially met this performance standard in 2020 at Pond 43 due to insufficient inundation depth and duration for CTS, but it provided sufficient depth and inundation for fairy shrimp. Water quality measurements were adequate for wildlife.

### 5.14.2 Conclusion

Pond 43, a post-burn and post-subsurface munitions remediation vernal pool, was in years 3 and 2 of monitoring in 2020. The vernal pool was partially on track to meet hydrological conditions and wildlife usage (Table 5-14). This is due to the vernal pool not providing an average depth appropriate for CTS habitat. Pond 43 will continue to be monitored in the future.

**Table 5-14. Success at Pond 43 (Year 3 Post-Burn, Year 2 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

### 5.15 Pond 56 – Year 3

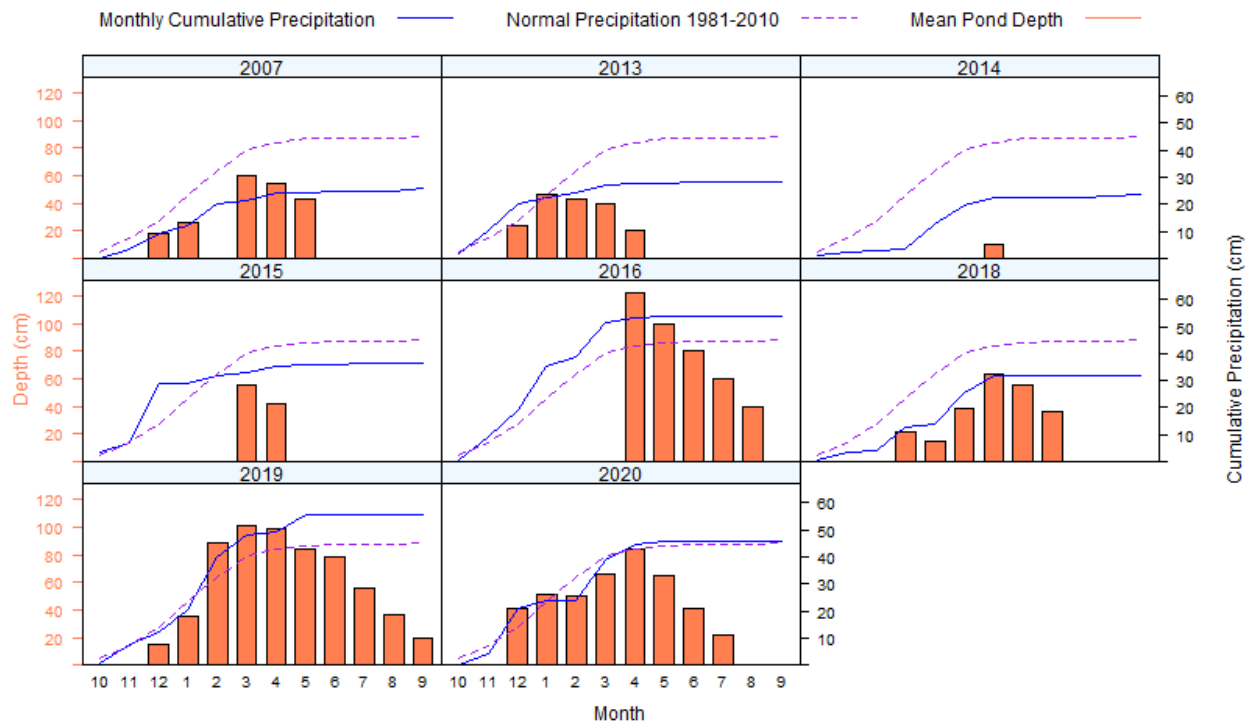
Pond 56 is situated within a large and shallow basin in the northern part of the Fort Ord National Monument. Depth and inundation of Pond 56 have been monitored for eight years (Figure 5-59). Above normal water years were 2016 and 2019. Year 2020 was a close to normal water year. All other monitoring was conducted either in a below normal water years (2007, 2018), or consecutive drought years (2013, 2014, 2015).

Pond 56 was monitored in 2020 as a year 3 post-mastication vernal pool. Pond 56 was monitored for baseline conditions in 2007, 2013, 2014, 2015, and 2016. Vegetation within the watershed of Pond 56 was masticated in 2017 to support MEC remediation activities and prepare areas for a prescribed burn. Prior to the 2017 mastication, Pond 56 was used as a reference vernal pool. No subsurface remediation occurred within the basin of Pond 56. Historically, Pond 56 reached a depth of 10 cm and 0.0005 ac in 2014, a consecutive drought year, and it reached a maximum depth of 125 cm and a maximum inundation of 5.17 acres in 2016, an above normal water year (Figure 5-59). The 2020 maximum depth of Pond 56 reached 84 cm and maximum measured inundation was 3.01 acres (Table 4-15). The depth and inundation values were within range of previously recorded values (Figure 5-60). By size, Pond 56 is most similar to reference Pond 101 East (East), but it has a slightly steeper profile (Figure 5-1).

Due to low precipitation in January and a completely dry February 2020, depth of Pond 56 decreased slightly in February, before rising again in March and reaching maximum depth in April (Table 4-15). This pattern was similar to 2018 when precipitation in February was also very low, and it resulted in a



decrease of pond depth that month (Figure 5-59). Maximum inundation area was much larger in 2020 than in baseline year 2015, which was a below normal water year (Figure 5-61). Hydroperiod of Pond 56 was most similar to that of reference Pond 5; both vernal pools stayed inundated from December, although Pond 5 dried out by the end of May, while Pond 56 stayed inundated through July. Depth at both vernal pools decreased in February, rose again in March, and reached their maximum in April.



**Figure 5-59.** Pond 56 (Year 3 Post-Mastication) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)

Water quality parameters of Pond 56 were within the historical ranges (Figure 5-62).

#### 5.15.1.1 Data Quality Objective 1

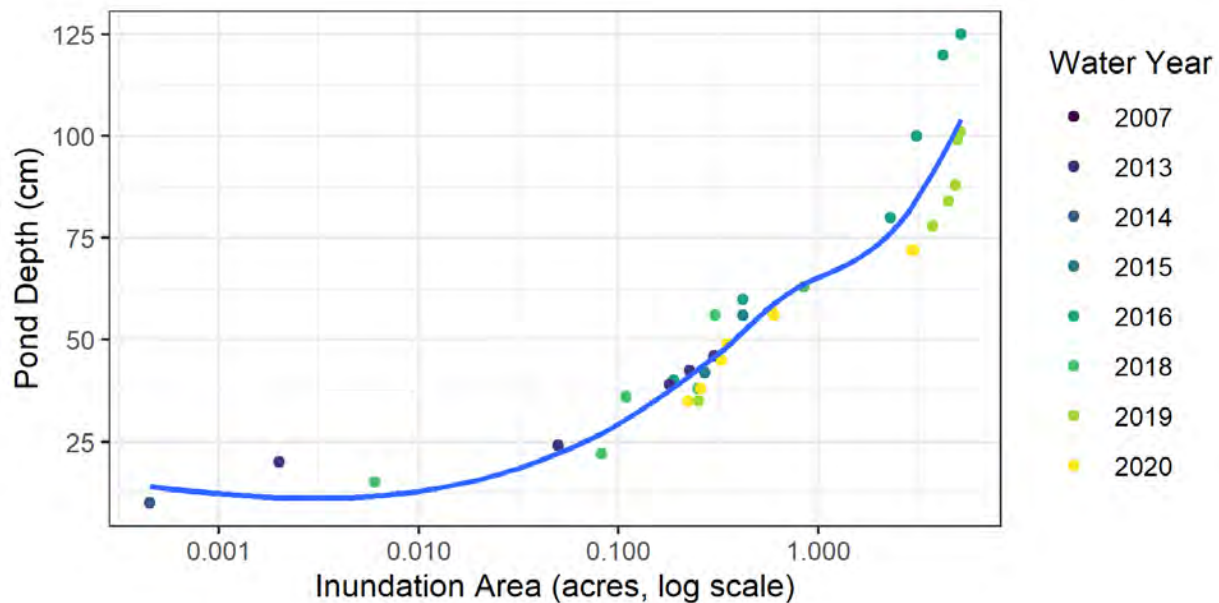
Pond 56 met the required average depths of 25 cm from the first rain event through March for CTS and 10 cm for 18 consecutive days through May for fairy shrimp. Pond 56 provided sufficient depth for CTS (52 cm through March) and fairy shrimp (58 cm through May).

#### 5.15.1.2 Data Quality Objective 2

Pond 56 was inundated from December through July and was dry by August 3, 2020. Pond 56 depth and inundation metrics reflected the precipitation pattern of 2020 and were within the historical range (Figure 5-60). Pond 60 had similar hydroperiod as reference Pond 5; both vernal pools became inundated in early December and decreased in depth in February. As would be expected due to a difference of 9.56 cm of cumulative rainfall, the maximum inundation area in 2020 was greater than in 2015 (Figure 5-61).

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

Pond 56, a post-mastication vernal pool, met the performance standard for year 3 in 2020. Pond 56 met DQOs 1 and 2 indicating that it provided suitable habitat for CTS and fairy shrimp and its hydroperiod was similar to reference Pond 5.



**Figure 5-60.** Pond 56 (Year 3 Post-Mastication) Plot of Depth vs Area Going Back to Water Year 2007 (Depth Axis is Presented on a Logarithmic Scale).

### 5.15.1.4 Data Quality Objective 4

Water quality parameters of Pond 56 were within the historical ranges (Figure 5-62).

### 5.15.1.5 Performance Standard: Wildlife Usage

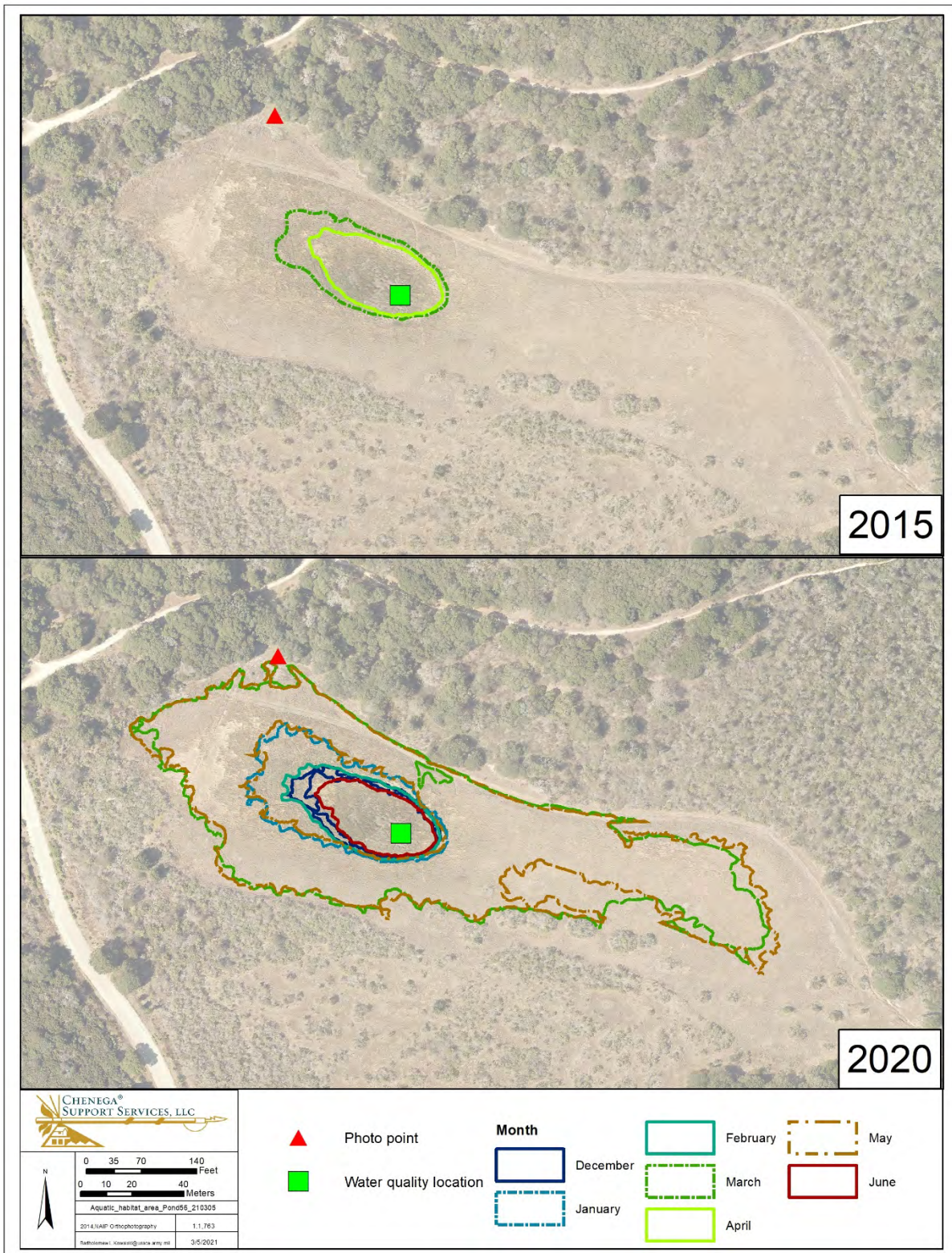
Pond 56 it provided sufficient depth and inundation for CTS and fairy shrimp in 2020 water year. Water quality measurements were adequate for wildlife.

## 5.15.2 Conclusion

Pond 56, a post-mastication vernal pool, was in year 3 of monitoring in 2020. This vernal pool met the performance standards in all three years following a prescribed burn in 2017 (Table 5-9). This was the final year of required monitoring, and no additional monitoring is recommended for Pond 56.

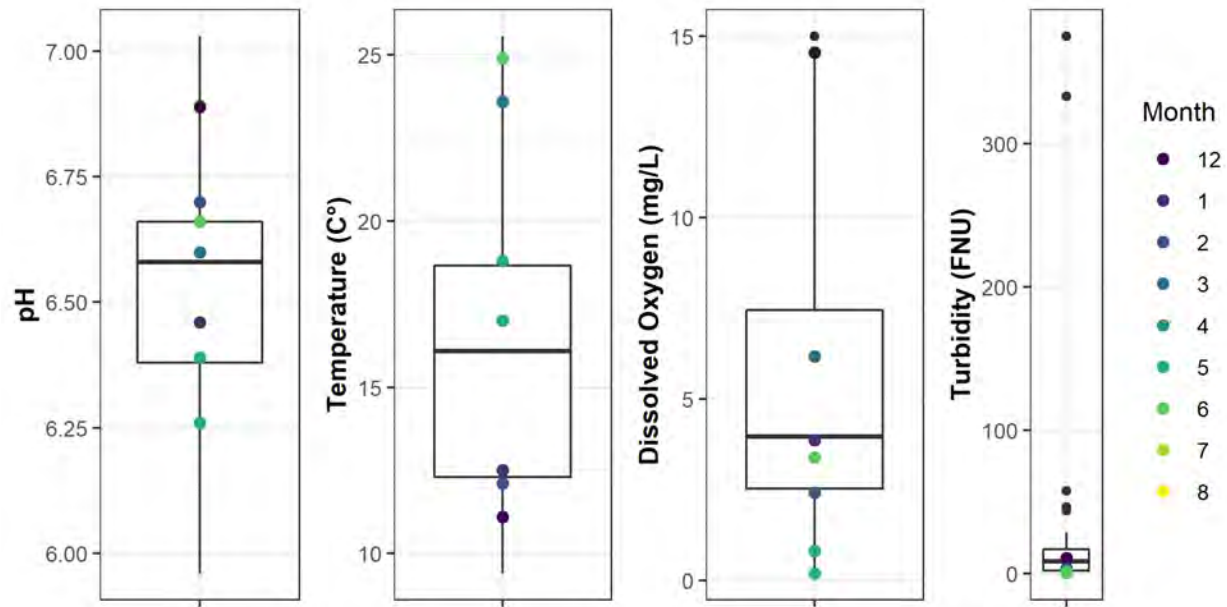
**Table 5-15. Success at Pond 56 (Year 3 Post-Mastication) Based on Performance Standards and Applicable Data Quality Objectives for All Follow up Monitoring Years**

Performance Standard	Applicable DQO	2018	2019	2020
Hydrological Conditions & Inundation Area	DQO 1	On track	On track	Met
	DQO 2	On track	On track	Met
Wildlife Usage	DQO 1	On track	On track	Met
	DQO 4	On track	On track	Met



**Figure 5-61.** Pond 56 (Year 3 Post-Mastication) Inundations for 2016 (above normal precipitation) and 2020 (close to normal precipitation).





**Figure 5-62.** Pond 56 (Year 3 Post-Mastication) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent values outside of those statistics.

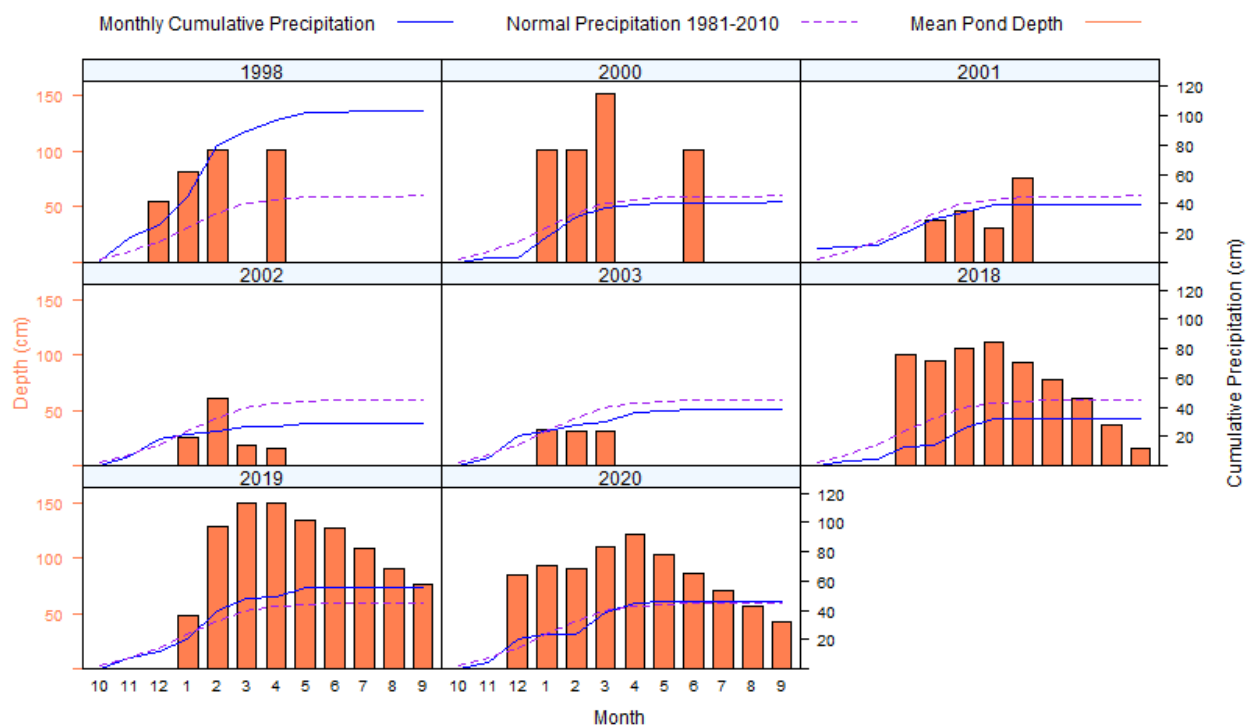
### 5.16 Machine Gun Flats – Year 3

Machine Gun Flats is situated within a large and shallow basin in the northern part of the Fort Ord National Monument and consists of small deep depression on the western side and a large relatively flat marshy area to the east with numerous small depressions. The staff gauge is located in the western depression. During above normal water years most depressions within the basin become hydrologically connected, but in normal or below normal water years they remained as separate small water bodies. Depth and inundation of Machine Gun Flats have been monitored for eight years (Figure 5-63). Above normal water years were an extreme El Niño water year in 1998 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).

Machine Gun Flats was monitored in 2020 as a year 3 post-mastication vernal pool. Machine Gun Flats was first monitored in 1997 for pH and turbidity. Full baseline hydrology survey occurred in 1998. Previous mastication, MEC remediation and subsurface activities, were conducted in 1999 and 2000 with follow-up monitoring in 2000, 2001, 2002, and 2003 (HLA, 2001; Harding, 2002; MACTEC, 2003, MACTEC, 2004). Vegetation within the watershed of Machine Gun Flats was masticated in the summer of 2017 to support MEC remediation in BLM Area B Subunit B-3 East. No vegetation mastication occurred within the basin of the Machine Gun Flats vernal pool. Historically, Machine Gun Flats reached a depth of 111 cm and an area of 8.34 ac in 2018, a below normal water year, and it reached a maximum depth of 152 cm and a maximum inundation of 10.6 acres in 2000, a close to normal water year (Figure 5-63). However, MGF likely reached greatest depth and inundation area in 1998, which was an El Niño year and measurements of depth and area were estimated that year. The 2020 maximum depth of Machine Gun Flats reached 126 cm and maximum measured inundation of the western depression was

0.12 acres (Table 4-16). Figure 5-64 shows depth and inundation values recorded at Machine Gun Flats. The two separate groupings correspond to times when the western depression was hydrologically connected to the large marshy area, and when it was hydrologically separate. By size, Machine Gun Flats is most similar to reference Pond 5 (Figure 5-1).

Due to low precipitation in January and a completely dry February 2020, depth of Machine Gun Flats decreased slightly in February, before rising again in March and reaching maximum depth in April (Table 4-16 and Figure 4-16). Precipitation in February was also very low in 2018, and it resulted in a decrease of pond depth that month (Figure 5-63). Maximum inundation area of the western depression was almost identical to that in 2003, which was also a close to-normal water year (Figure 5-65). Hydroperiod of Machine Gun Flats was most similar to that of reference Pond 5. Both vernal pools were inundated in December, depth at both vernal pools decreased in February and rose again in March and reached their maximum in April.



**Figure 5-63.** Machine Gun Flats (Year 3 Post-Mastication) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)

Water quality parameters of Machine Gun Flats were within the historical ranges (Figure 5-62).

#### 5.16.1.1 Data Quality Objective 1

Machine Gun Flats met the required average depths of 25 cm from the first rain event through March for CTS and 10 cm for 18 consecutive days through May for fairy shrimp. Machine Gun Flats provided sufficient depths for CTS (96 cm through March) and fairy shrimp (102 cm through May).

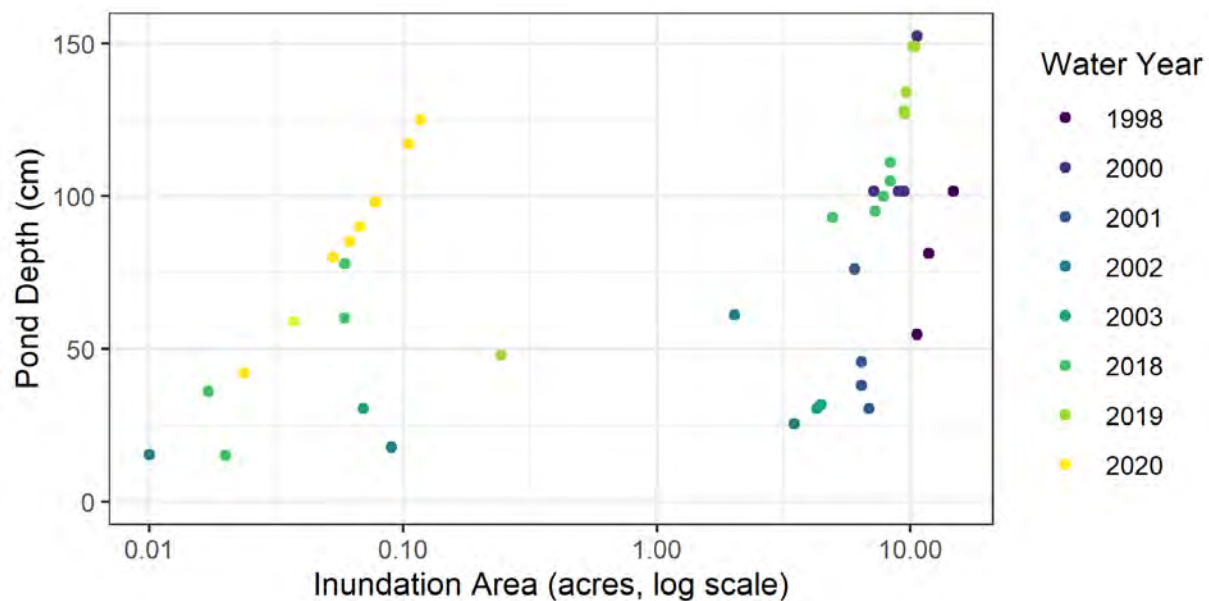


### 5.16.1.2 Data Quality Objective 2

Machine Gun Flats was inundated from December and it did not dry in 2020 water year. Machine Gun Flats depth and inundation metrics reflected the precipitation pattern of 2020 and were within the historical range (Figure 5-64). Machine Gun Flats had similar hydroperiod as reference Pond 5; both vernal pools became inundated in early December, decreased in depth in February, and reached maximum depth in April. The maximum inundation area of the western depression was very similar to that observed in 2003, which was also a close to normal water year (Figure 5-65).

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

Machine Gun Flats, a post-mastication vernal pool, met the performance standard for year 3 in 2020. Machine Gun Flats met DQOs 1 and 2 indicating that it provided suitable habitat for CTS and fairy shrimp and its hydroperiod was similar to itself in previous monitoring years and was similar to reference Pond 5.



**Figure 5-64.** Machine Gun Flats (Year 3 Post-Mastication) Plot of Depth vs Area Since Water Year 2000 (Depth Axis is Presented on a Logarithmic Scale). Only the deepest depression was measured for inundation area in 2020 water year.

### 5.16.1.4 Data Quality Objective 4

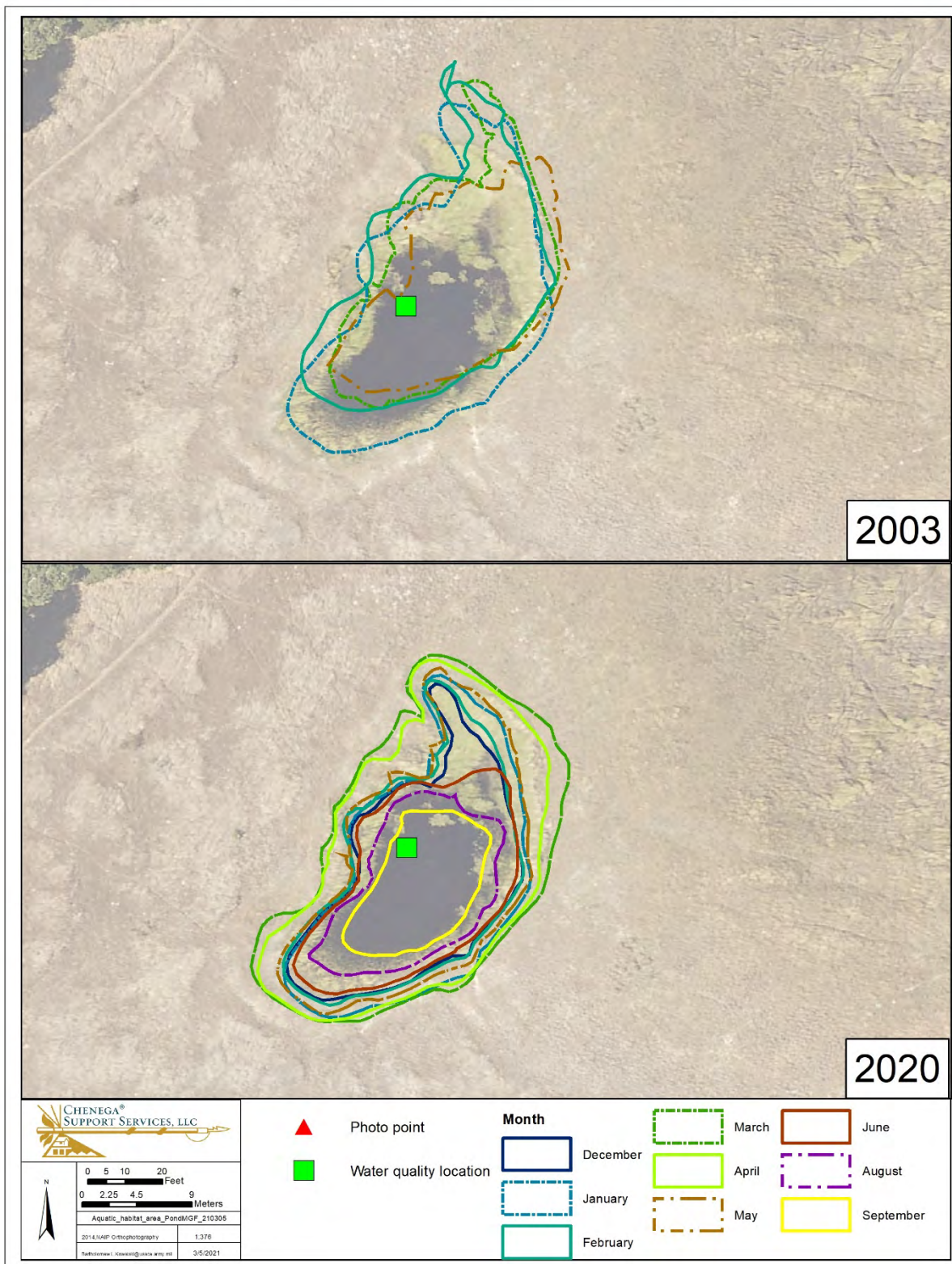
Water quality parameters of Machine Gun Flats were within the historical ranges (Figure 5-66).

### 5.16.1.5 Performance Standard: Wildlife Usage

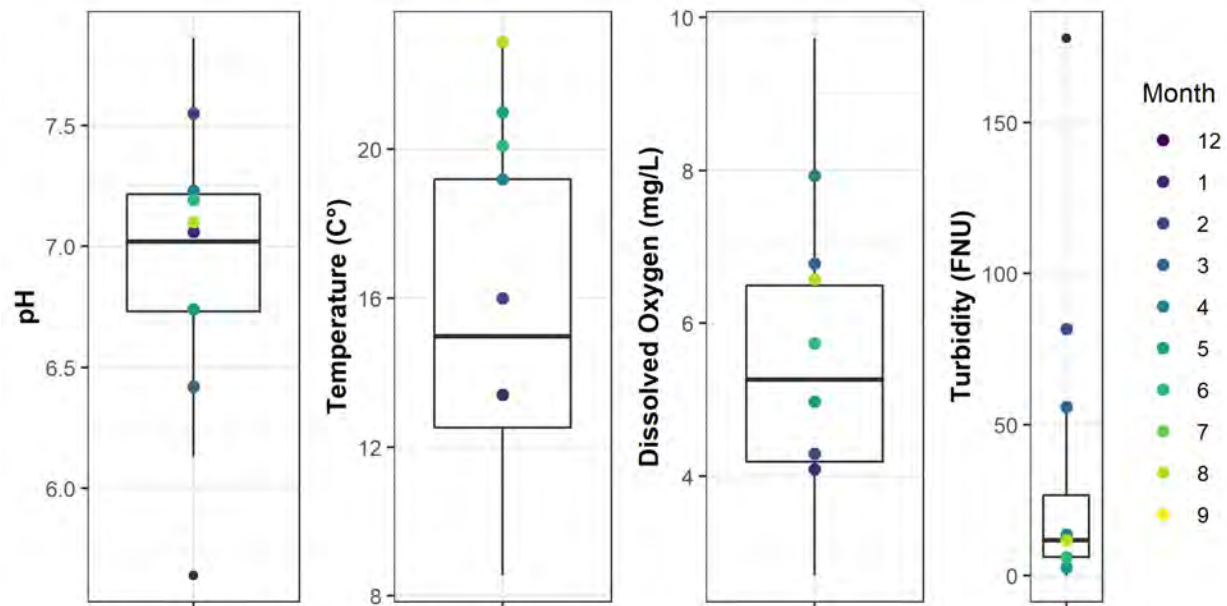
This performance standard was met in 2020 at Machine Gun Flats, it provided sufficient depth and inundation for CTS and fairy shrimp. Water quality measurements were adequate for wildlife.

## 5.16.2 Conclusion

Machine Gun Flats, a post-mastication vernal pool, was in year 3 of monitoring in 2020. This vernal pool met the performance standards in all three years following a mastication within its watershed in 2017 (Table 5-16). This was the final year of required monitoring, and no additional monitoring is recommended for Machine Gun Flats.



**Figure 5-65.** Machine Gun Flats (Year 3 Post-Mastication) Inundations for 2003 (close to normal precipitation) and 2020 (close to normal precipitation).



**Figure 5-66.** Machine Gun Flats (Year 3 Post-Mastication) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

**Table 5-16. Success at Machine Gun Flats (Year 3 Post-Mastication) Based on Performance Standards and Applicable Data Quality Objectives for All Follow up Monitoring Years**

Performance Standard	Applicable DQO	2018	2019	2020
Hydrological Conditions & Inundation Area	DQO 1	On track	On track	Met
	DQO 2	On track	On track	Met
Wildlife Usage	DQO 1	On track	On track	Met
	DQO 4	On track	On track	Met

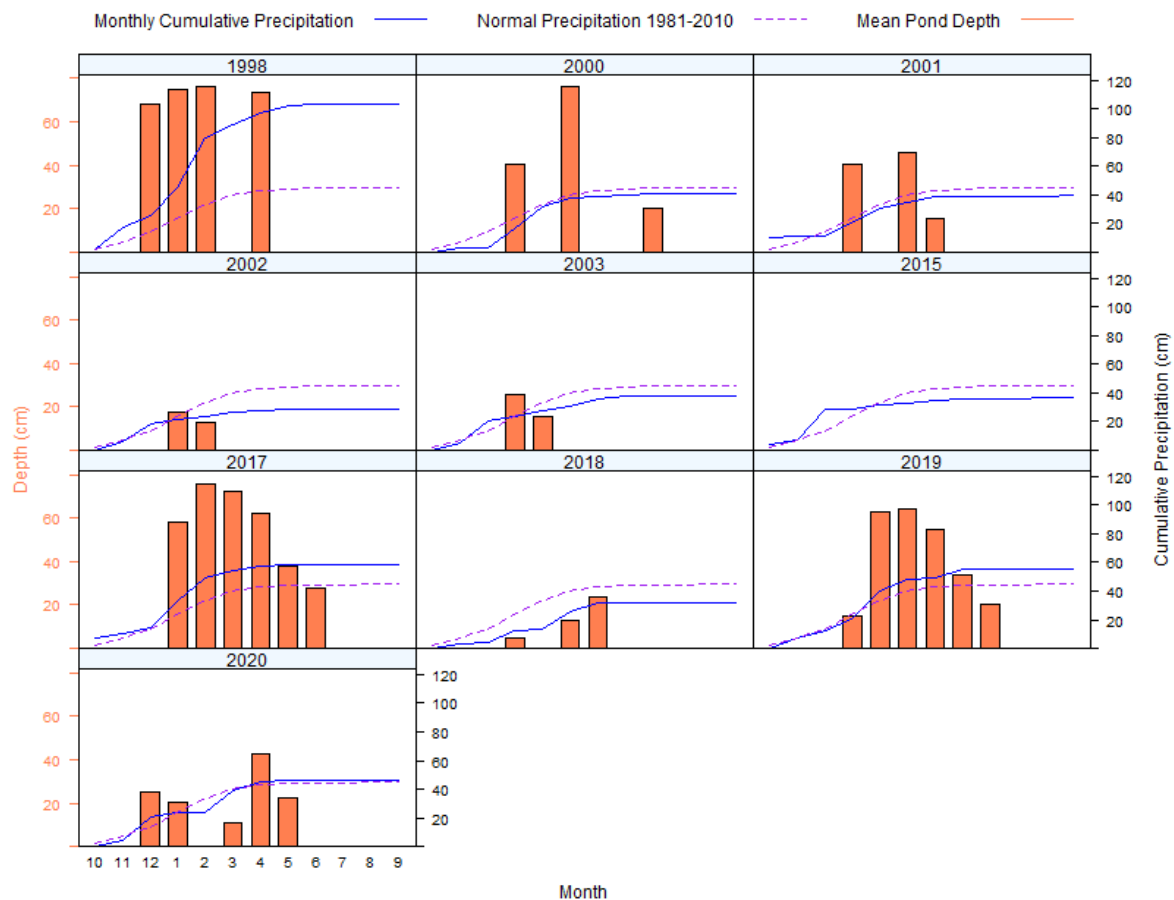
### 5.17 Pond 42 – Year 3 and Year 2

Pond 42 is situated within a small shallow basin in the northern tip of the Fort Ord National Monument. Depth and inundation of Pond 42 have been monitored for ten years (Figure 5-67). 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), or in a consecutive drought year (2015).

Pond 42 was monitored in 2020 as a year 3 post-mastication and post-burn and year 2 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

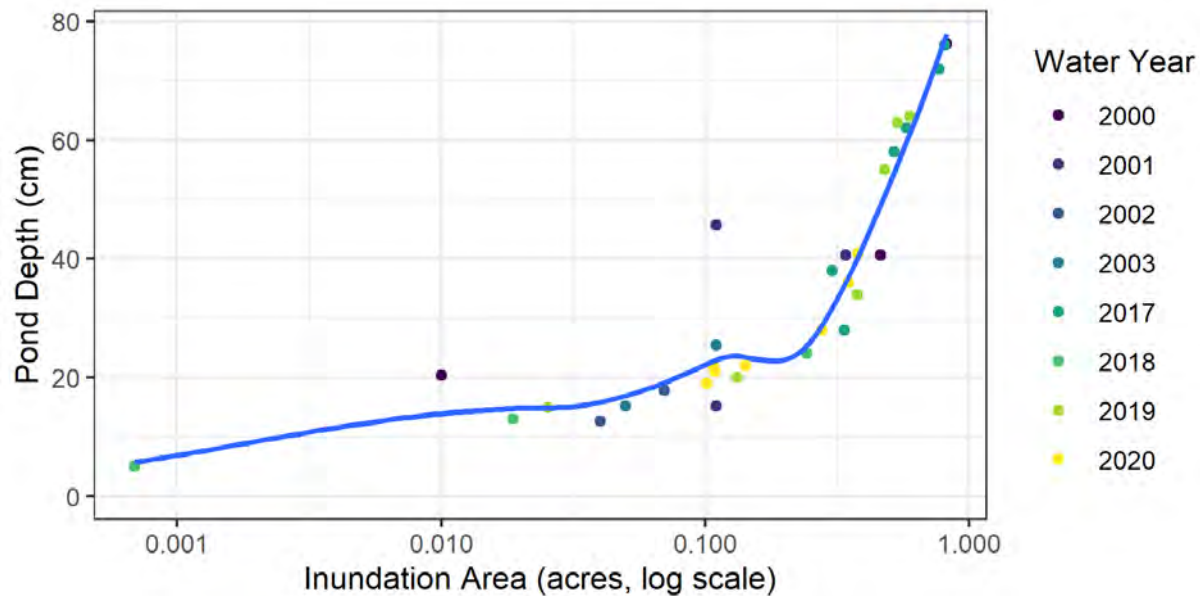
monitored for baseline in 1998. Following MEC remediation activities, Pond 42 was monitored annually from 2000 to 2003 (HLA, 2001; Harding, 2002; MACTEC, 2003). Additional baseline surveys occurred in 2015 and 2017. Historically, Pond 42 remained dry in a consecutive drought year (2015), and it reached a maximum depth of 76 cm and a maximum inundation of 0.81 acres in an above normal water year (2017, Figures 5-67 and 5-68). The 2020 maximum depth of Pond 42 was 51 cm and maximum inundation was 0.38 acres (Table 4-17). The depth and inundation values were within range of previously recorded values (Figure 5-68). By size, Pond 42 is most similar to reference Pond 997.

Pond 42 dried out two times during the 2020 water year; first following initial inundation in February, and second time by the beginning of June (Table 4-17 and Figure 4-17). Insufficient precipitation early in the season and low precipitation in January and a completely dry February 2020 were responsible for this intermittent hydroperiod of Pond 42. This pattern was similar to the one observed in 2018 when following low precipitation in February, Pond 42 also dried out that month (Figure 5-67). Maximum inundation area of Pond 42 was very similar to 2001, which was also a close to normal water year (Figure 5-69). Hydroperiod of Pond 42 was most similar to that of reference Pond 101 East (East). Following initial inundation in December both vernal pools dried out, and both became inundated again in March. Pond 42 was completely dry by June 10.



**Figure 5-67.** Pond 42 (Year 3 Post-Mastication and Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)





**Figure 5-68.** Pond 42 (Year 3 Post-Mastication and Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Data since 2000 Water Year (Depth Axis is Presented on a Logarithmic Scale).

Water quality parameters of Pond 42 were generally within the historical ranges with an exception of pH and temperature values in May (Figure 5-70). May value of pH = 7.95 was second highest on record, and temperature value of Temp = 31.6 °C was the highest on record. However, these values are close to observed ranges when compared to measurements of other vernal pools (Figures 5-2 and 5-3).

#### 5.17.1.1 Data Quality Objective 1

Pond 42 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 42 did not provide sufficient depth for CTS (14 cm through March), but it did provide sufficient depth for fairy shrimp (22 cm through May).

#### 5.17.1.2 Data Quality Objective 2

Pond 42 was intermittently inundated from December through May and was completely dry by June 10, 2020. Pond 42 depth and inundation metrics reflected the precipitation pattern of 2020 and were within the historical range (Figure 5-68). Pond 42 had similar hydroperiod as reference Pond 101 East (East); both were inundated intermittently and became initially inundated in early December, after which both dried out in February, and became inundated again in mid-March. Maximum inundated area was similar to baseline year 2001, which was also a close to normal water year (Figure 5-69).

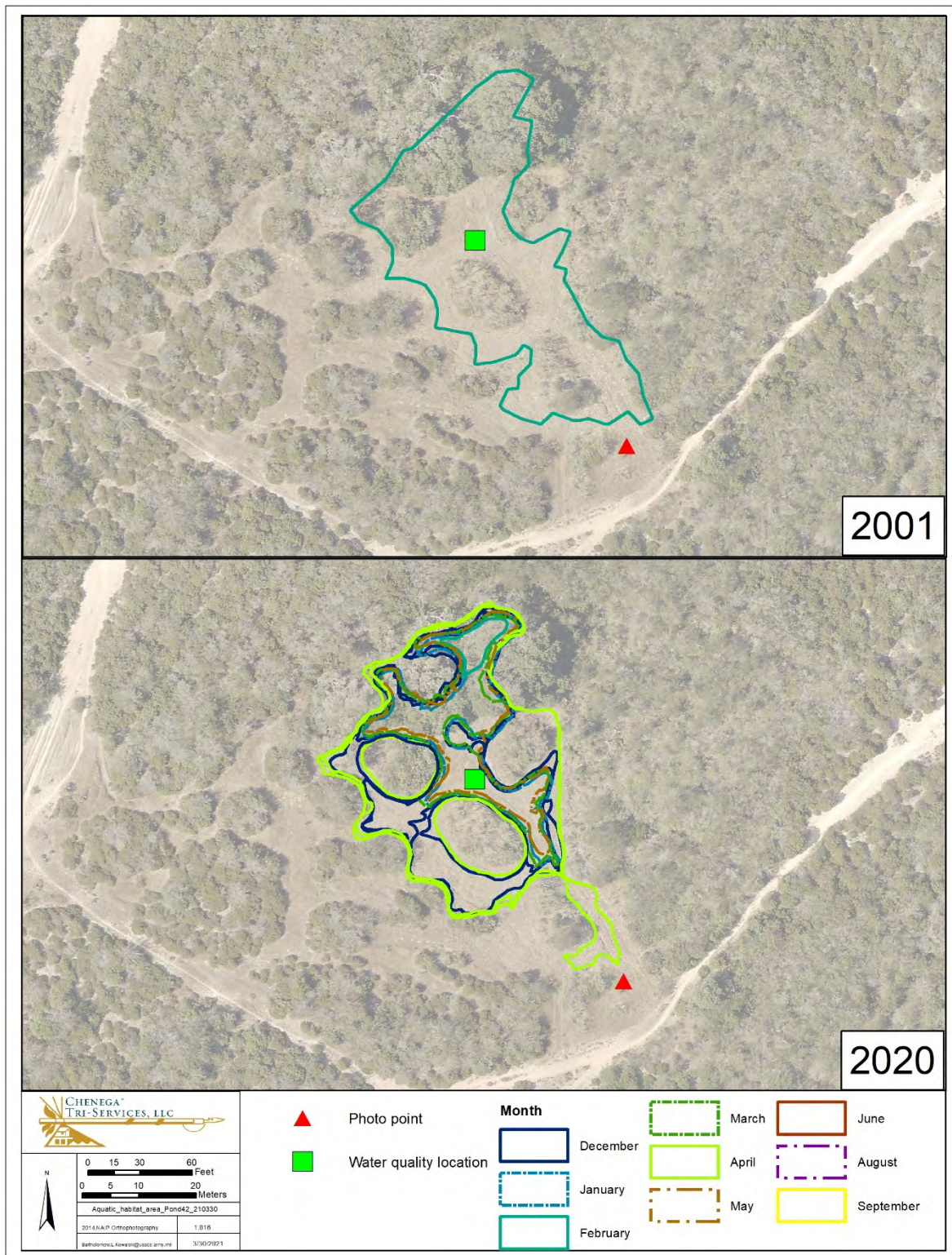
#### 5.17.1.3 Performance Standard: Hydrological Conditions and Inundation Area

This performance standard was partially in 2020 at Pond 42 due to insufficient inundation depth and duration for CTS, but it provided sufficient depth and inundation for fairy shrimp. Water quality measurements were adequate for wildlife.

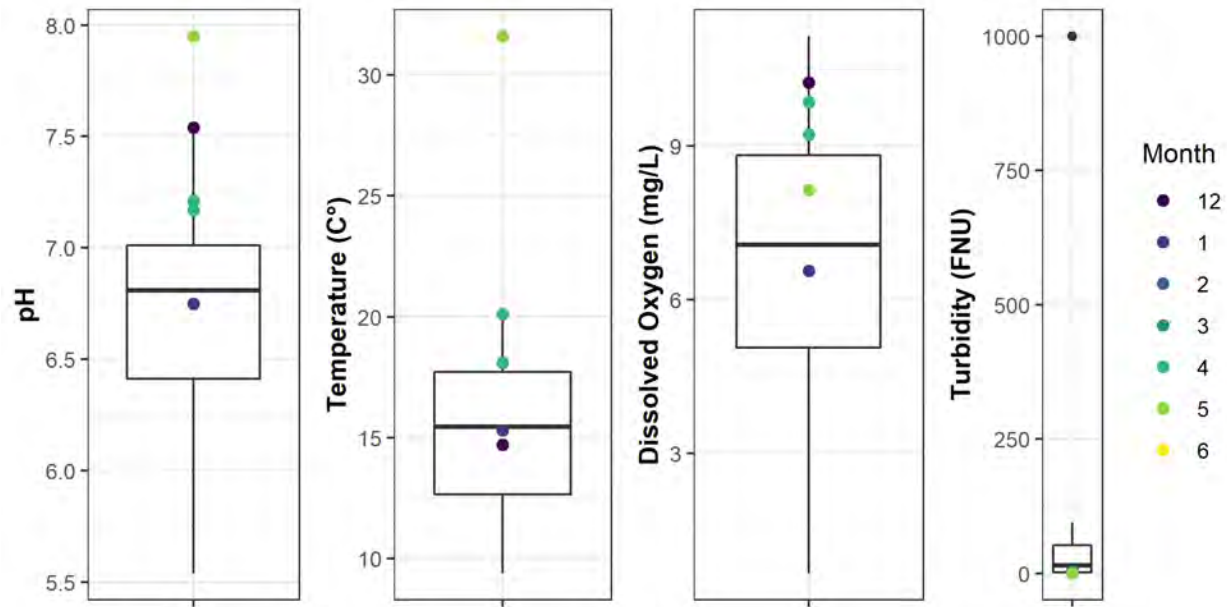
#### 5.17.1.4 Data Quality Objective 4

Water quality parameters of Pond 42 were generally within the historical ranges (Figure 5-70).





**Figure 5-69.** Pond 42 (Year 3 Post-Mastication and Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Inundations for 2001 (close to normal precipitation) and 2020 (close to normal precipitation).



**Figure 5-70.** Pond 42 (Year 3 Post-Mastication and Post-Burn, Year 2 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent values outside of those statistics.

#### 5.17.1.5 Performance Standard: Wildlife Usage

This performance standard was partially met in 2020 at Pond 42 due to insufficient inundation depth and duration for CTS, but it provided sufficient depth and inundation for fairy shrimp. Water quality measurements were adequate for wildlife.

#### 5.17.2 Conclusion

Pond 42, a post-mastication, post-burn, and post-subsurface munitions remediation vernal pool, was in years 3, and 2 of monitoring in 2020. The vernal pool was partially on track to meet performance standards (Table 5-17). Pond 42 will continue to be monitored in the future.

**Table 5-17. Success at Pond 42 (Year 3 Post-Mastication and Post-Burn, Year 2 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

#### 5.18 Pond 35 – Year 3 and Year 2

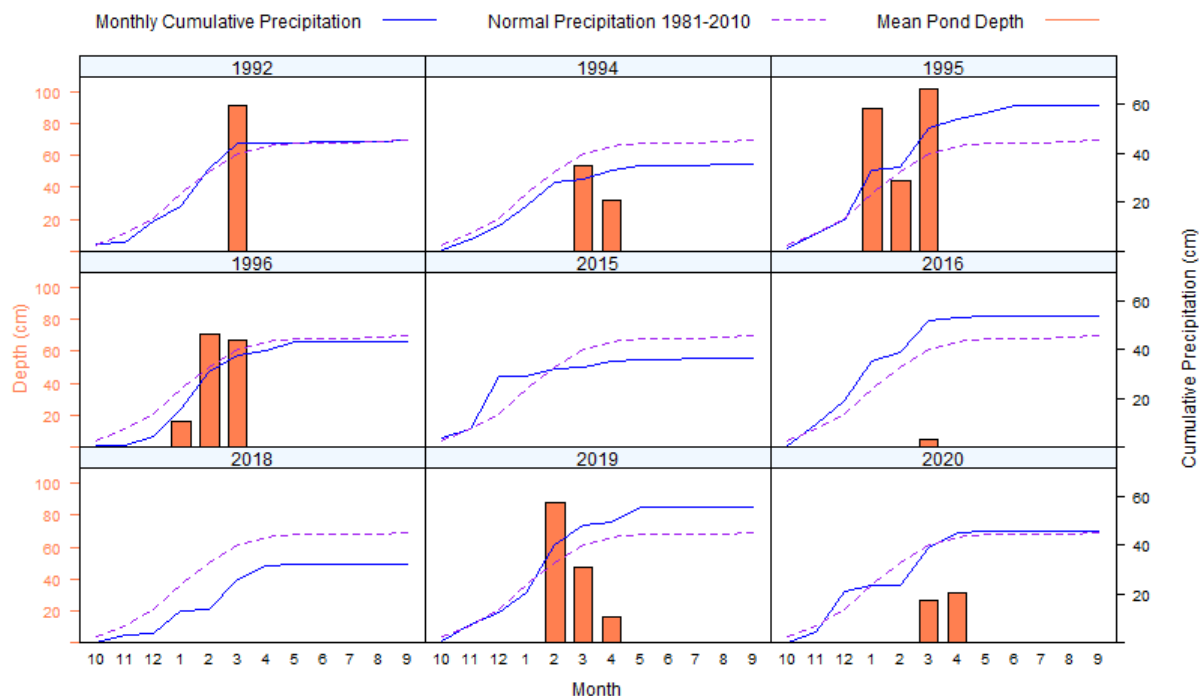
Pond 35 is situated within a small basin with a moderately steep profile in the northern part of the Fort Ord National Monument. Pond 35 was monitored for nine years (Figure 5-71). Above normal water

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) or consecutive drought years (2015).

Pond 35 was monitored for baseline conditions in 1992, 1994, 1995, 1996, 2015, and 2016. 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 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 5-71). The 2020 maximum depth of Pond 35 was 37 cm and maximum recorded inundation area was 0.09 acres (Table 4-18). The depth and inundation values were within range of previously recorded values (Figure 5-72).

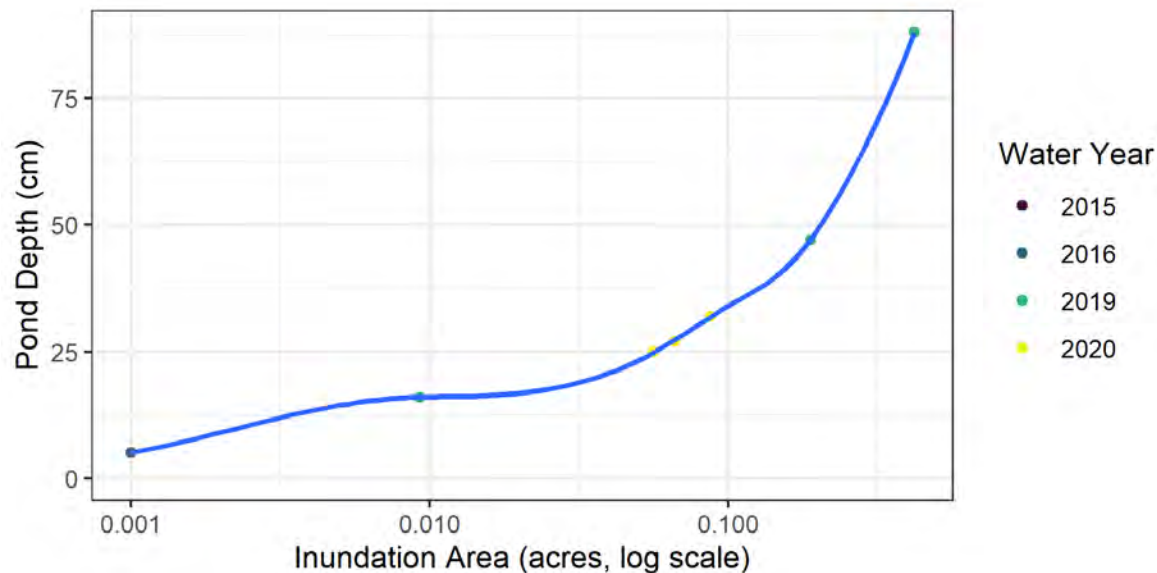
Pond 35 was briefly inundated from mid-March through April and was dry by May 21 (Table 4-18 and Figure 4-18). Its hydroperiod in 2020 mostly resembled that of Reference Pond 997. Maximum inundation area was larger in 2020 than in baseline year 2016, which was an above normal water year (Figure 5-73). This may have been due to 2016 water year following a several year long drought, while 2020 followed an above normal water year.

Water quality parameters of Pond 35 were within the historical ranges with the exception of pH value in April (Figure 5-74). However, the April value of pH = 6.56 was still within the range of values observed at other vernal pools (Figure 5-2).



**Figure 5-71.** Pond 35 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)





**Figure 5-72.** Pond 35 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Plot of Depth vs Area since 2015 Water Year (Depth Axis is Presented on a Logarithmic Scale).

#### 5.18.1.1 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, but it did meet the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 35 did not provide sufficient depth for CTS (3.86 cm through March), but it did provide sufficient depth for fairy shrimp (11 cm through May).

#### 5.18.1.2 Data Quality Objective 2

Pond 35 was briefly inundated from mid-March through April. The vernal pool was dry by May 21, 2020. Pond 35 depth and inundation metrics reflected the precipitation pattern of 2020 water year and were within the historical range (Figure 5-72). Pond 35 had similar hydroperiod as reference Pond 997; both were inundated for a short period between March and April. The maximum inundation area in 2020 was larger than in 2016, an above normal water year (Figure 5-73), and it reached greater depths (Figure 5-71). This may be due to 2016 following a several year drought period, while 2020 followed an above normal water year.

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

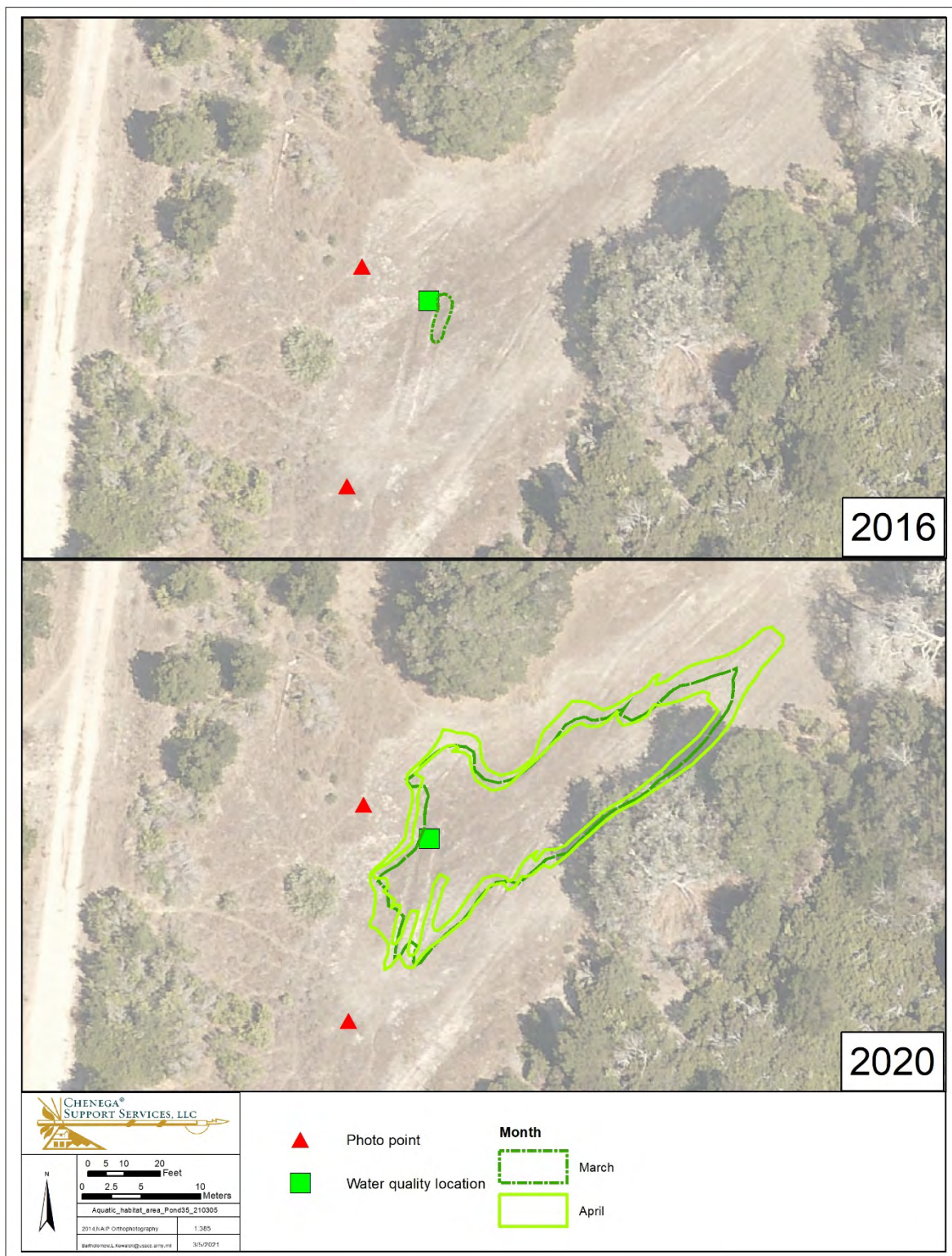
Pond 35, a post-mastication and post-subsurface munitions remediation, vernal pool, was partially on track to meet the performance standard for year 3 and year 2 in 2020. Pond 35 only partially met DQO 1; it provided suitable habitat for fairy shrimp but not CTS. Hydroperiod of Pond 35 was similar to that of reference Pond 997, thus DQO 2 was met.

#### 5.18.1.4 Data Quality Objective 4

Water quality parameters of Pond 35 were generally within the historical ranges (Figure 5-74).

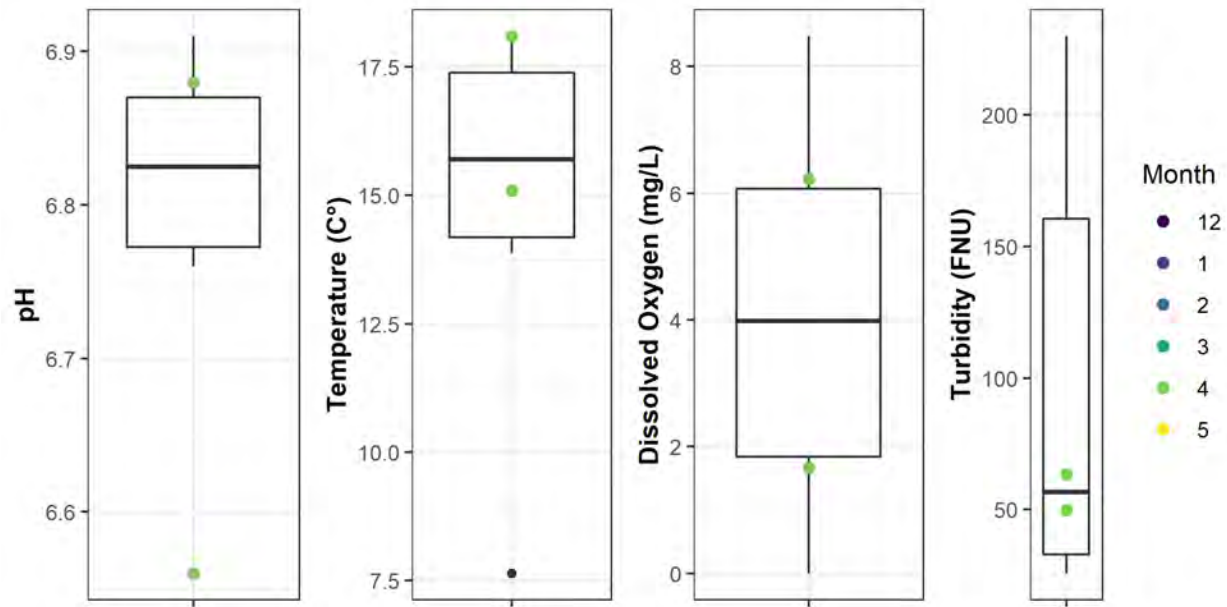
#### 5.18.1.5 Performance Standard: Wildlife Usage

This performance standard was partially met in 2020 at Pond 35 due to insufficient inundation depth and duration for CTS, but Pond 35 provided sufficient depth and inundation for fairy shrimp. Water quality measurements were adequate for wildlife.



**Figure 5-73.** Pond 35 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Inundations for 2016 (above normal precipitation) and 2020 (close to normal precipitation).





**Figure 5-74.** Pond 35 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

### 5.18.2 Conclusion

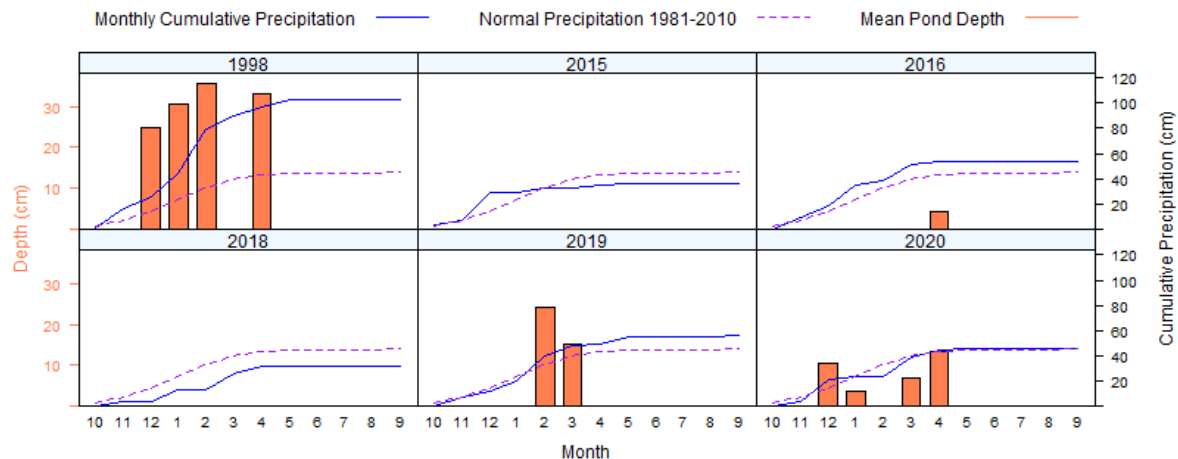
Pond 35, a post-mastication and post-subsurface munitions remediation vernal pool, was in years 3 and 2 of monitoring in 2020. The vernal pool was partially on track to meet the performance standards (Table 5-18). Pond 35 will continue to be monitored in the future.

**Table 5-18. Success at Pond 35 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

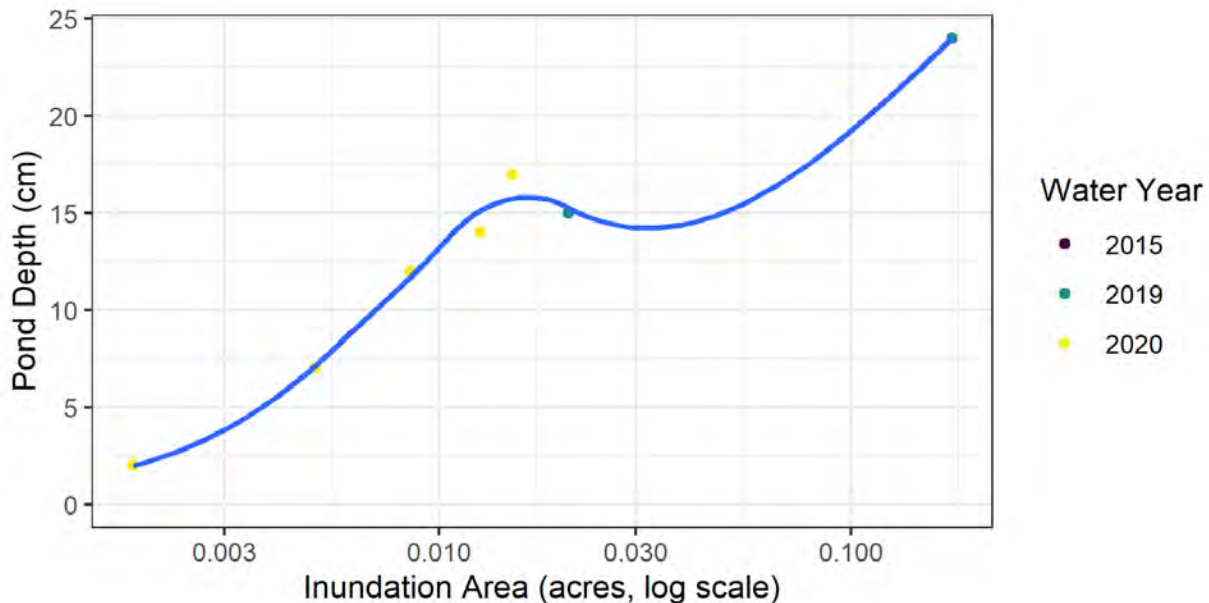
Performance Standard	Applicable DQO	Success
Hydrological Conditions & Inundation Area	DQO 1	Partially on track
	DQO 2	On track
Wildlife Usage	DQO 1	Partially on track
	DQO 4	On track

### 5.19 Pond 44 – Year 3 and Year 2

Pond 44 is situated within a small and shallow basin. Pond 44 is located in the northern part of the Fort Ord National Monument. Depth and inundation of Pond 44 have been monitored for six years (Figure 5-75). 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), or a consecutive drought year (2015).



**Figure 5-75.** Pond 44 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)



**Figure 5-76.** Pond 44 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Data since 2007 Water Year (Depth Axis is Presented on a Logarithmic Scale).

Pond 44 was monitored in 2020 as a year 3 post-mastication, year 2 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 for 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. The 2020 maximum depth of Pond 44 was 21 cm and maximum inundation was 0.02 acres (Figure 4-19). The depth and inundation values were within range of previously recorded values (Figure 5-76). By size, Pond 44 is most similar to reference Pond 997.

Pond 44 dried out three times during the 2020 water year due to low precipitation in January and a completely dry February 2020; first following initial inundation in January, second time in February, and the third time by the end of May (Table 4-19 and Figure 4-19). Maximum inundation area was smaller in 2020 than in baseline year 1998, which was an extreme above normal water year (Figure 5-77). Inundation pattern of Pond 44 was most similar to that of reference Pond 101 East (East) which also dried out three times for a brief period following dry February as did Pond 43, and both became inundated again in March.

Water quality parameters of Pond 44 were generally within the historical ranges (Figure 5-78). Temperature value in April was the highest on record, however it was still within the range observed at other vernal pools (Figure 5-3).

#### 5.19.1.1 *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 or 10 cm for 18 consecutive days through May for fairy shrimp. Pond 44 did not provide sufficient depth for CTS (6 cm through March) or fairy shrimp (7.45 cm through April).

#### 5.19.1.2 *Data Quality Objective 2*

Pond 44 was intermittently inundated from December through April and was dry by May 26, 2020. Pond 44 depth and inundation metrics reflected the precipitation pattern of 2020 water year and were within the historical range (Figure 5-76). Pond 44 had similar hydroperiod as reference Pond 101 East (East); both vernal pools were inundated intermittently from early December and dried out three times. The maximum inundation area in 2020 was smaller than in 1998, an extremely above normal water year (Figure 5-77).

#### 5.19.1.3 *Performance Standard: Hydrological Conditions and Inundation Area*

Pond 44, a post-mastication and post-subsurface munitions remediation vernal pool, was partially on track to meet this performance standard for years 3 and 2 in 2020. Pond 44 did not meet DQO 1; it did not provide suitable habitat for CTS or fairy shrimp in 2020. Hydroperiod of Pond 44 was similar to reference Pond 101 East (East), 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.

#### 5.19.1.4 *Data Quality Objective 4*

Water quality parameters of Pond 44 were generally within the historical ranges (Figure 5-78) and were similar to the values at other vernal pools.

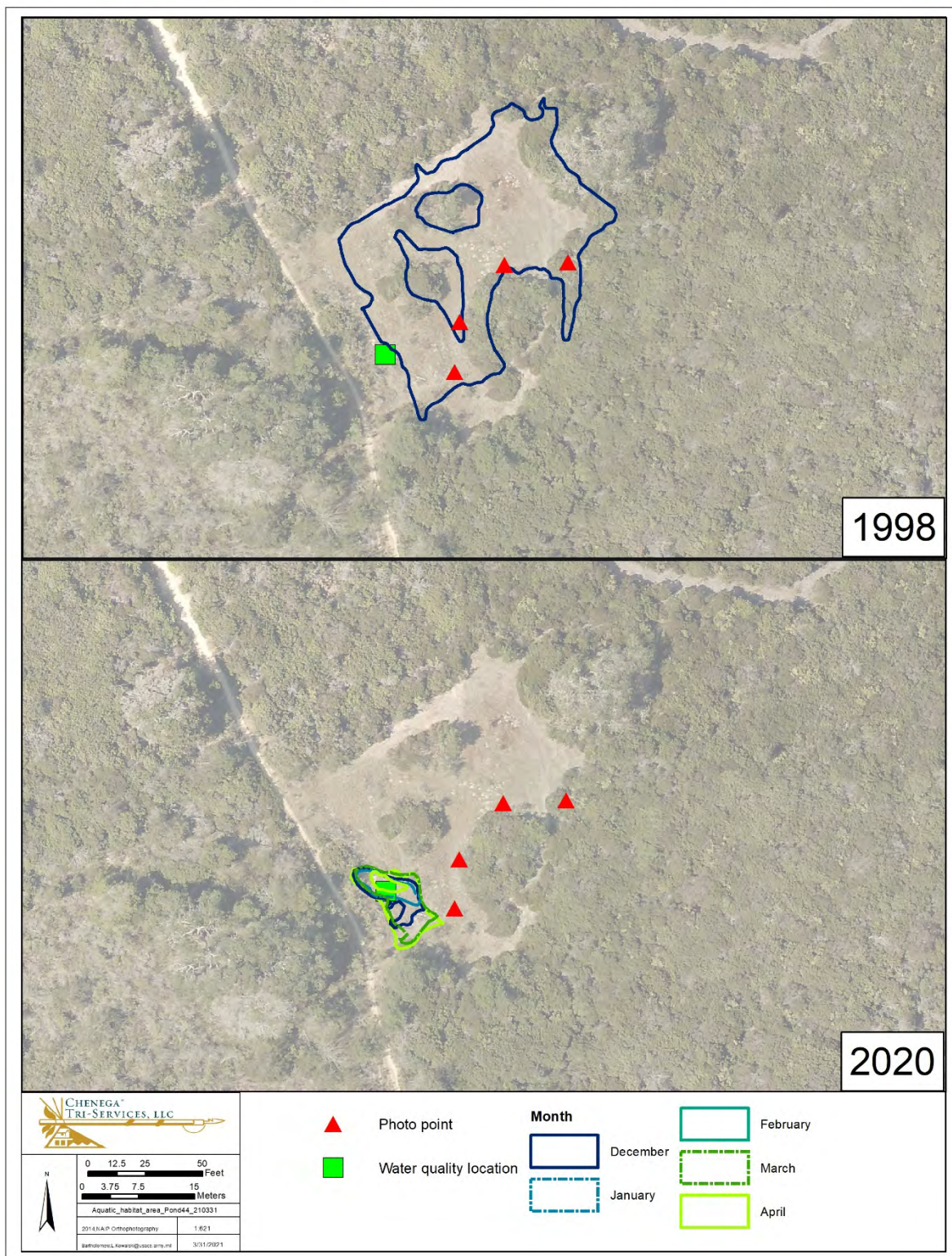
#### 5.19.1.5 *Performance Standard: Wildlife Usage*

Pond 44 was partially met in 2020 at Pond 43 due to insufficient inundation depth and duration for CTS and fairy shrimp. Water quality measurements were adequate for wildlife.

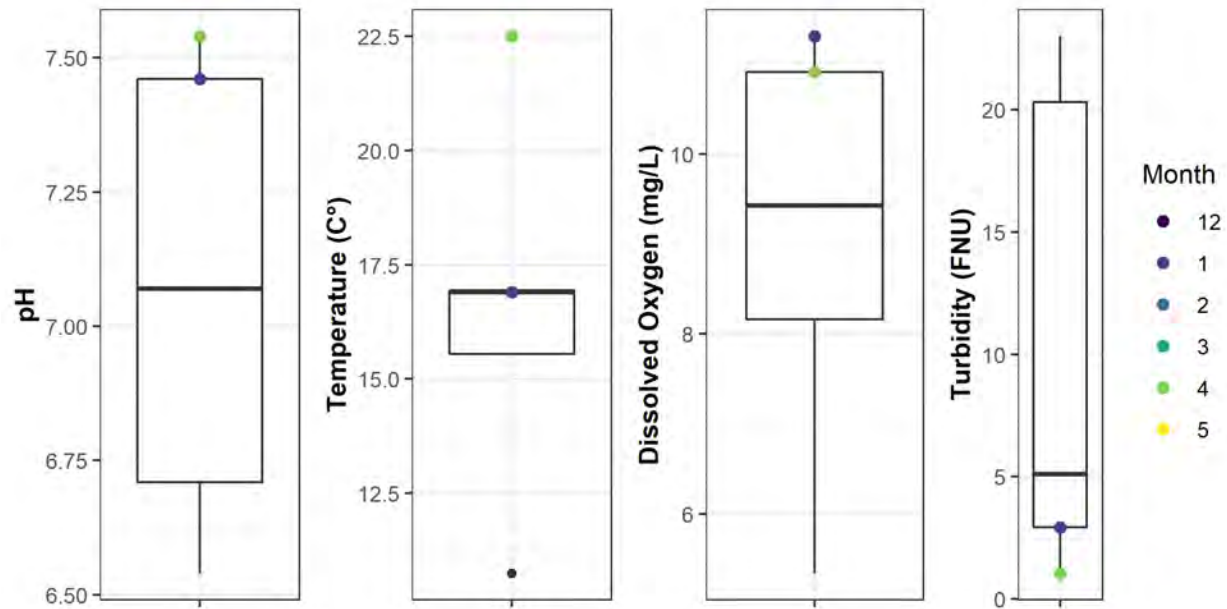
### 5.19.2 **Conclusion**

Pond 44, a post-mastication and post-subsurface munitions remediation vernal pool, was in years 3 and 2 of monitoring in 2020. Pond 44 was partially on track to meet performance standards (Table 5-19). Pond 44 will continue to be monitored in the future.





**Figure 5-77.** Pond 44 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Inundations for 1998 (extreme above normal precipitation) and 2020 (close to normal precipitation).



**Figure 5-78.** Pond 44 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

**Table 5-19. Success at Pond 44 (Year 3 Post-Mastication, Year 2 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

## 5.20 Pond 60 – Year 3 and Year 2

Pond 60 is situated within a medium sized basin with a moderate profile in the northern part of the Fort Ord National Monument. Depth and inundation of Pond 60 have been monitored for five years (Figure 5-79). Above normal water years were 2016 and 2019. 2020 was a close to normal water year. All other monitoring was conducted either in a below normal water year (2018), or consecutive drought year (2015).

Pond 60 was monitored in 2020 as a year 3 post-mastication and year 2 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 prescribe burning. Subsurface anomaly investigations occurred in Pond 60 basin in 2018. Historically, Pond 60 reached a 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 5-79). The 2020 maximum depth of Pond 60 reached 79 cm and maximum measured inundation was 1.67 acres (Table 4-20). The depth and inundation values were within range of previously recorded values (Figure 5-80). By size, Pond 60 is most similar to reference Pond 101 East (East), but it has a slightly steeper profile (Figure 5-1).

Due to low precipitation in January and a completely dry February 2020, depth of Pond 60 decreased slightly in February, before rising again in March and reaching maximum depth in April (Table 4-20 and Figure 4-20). This pattern was similar to 2018 when precipitation in February was also very low, and it resulted in Pond 60 drying out that month following initial inundation (Figure 5-79). Maximum inundation area was slightly larger in 2020 than in baseline year 2015, which was a below normal water year (Figure 5-81). Hydroperiod of Pond 60 was most similar to that of reference Pond 5; both vernal pools became inundated in December, although Pond 5 dried out by the end of May, while Pond 60 stayed inundated through June. Depth at both vernal pools decreased in February, rose again in March, and reached their maximum in April.

Water quality parameters of Pond 60 were generally within the historical ranges. February pH value of pH = 7.76 was highest on record at Pond 60 but it was not out of range observed at other vernal pools (Figure 5-82 and Figure 5-2).

#### 5.20.1.1 *Data Quality Objective 1*

Pond 60 met the required average depths of 25 cm from the first rain event through March for CTS and 10 cm for 18 consecutive days through May for fairy shrimp. Pond 60 provided sufficient depth for CTS (51 cm through March) and for fairy shrimp (56 cm through May).

#### 5.20.1.2 *Data Quality Objective 2*

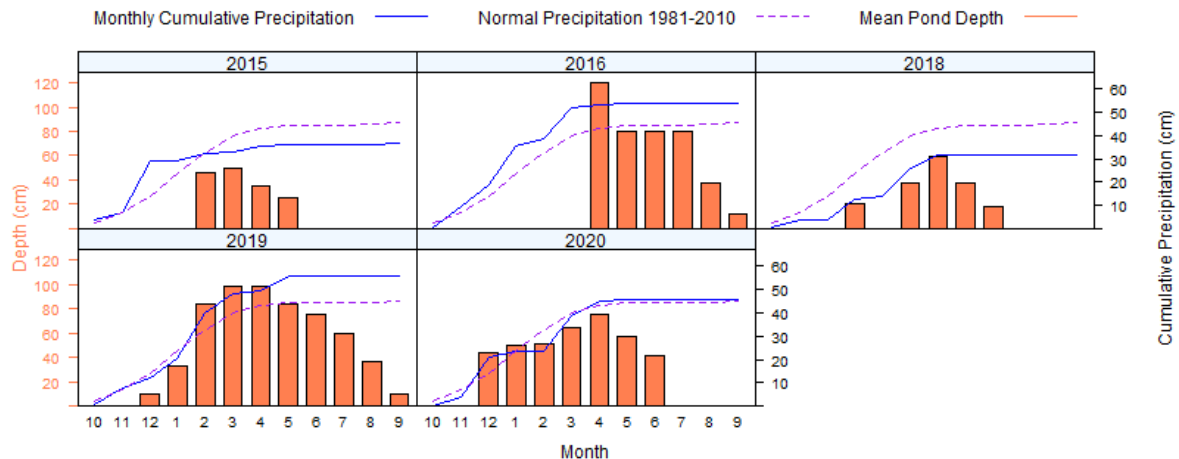
Pond 60 was inundated from December through June, and its hydroperiod was similar to that of reference Pond 5. As would be expected due to a difference of 9.56 cm of cumulative rainfall, the maximum inundation area in 2020 was greater than in 2015 (Figure 5-81).

#### 5.20.1.3 *Performance Standard: Hydrological Conditions and Inundation Area*

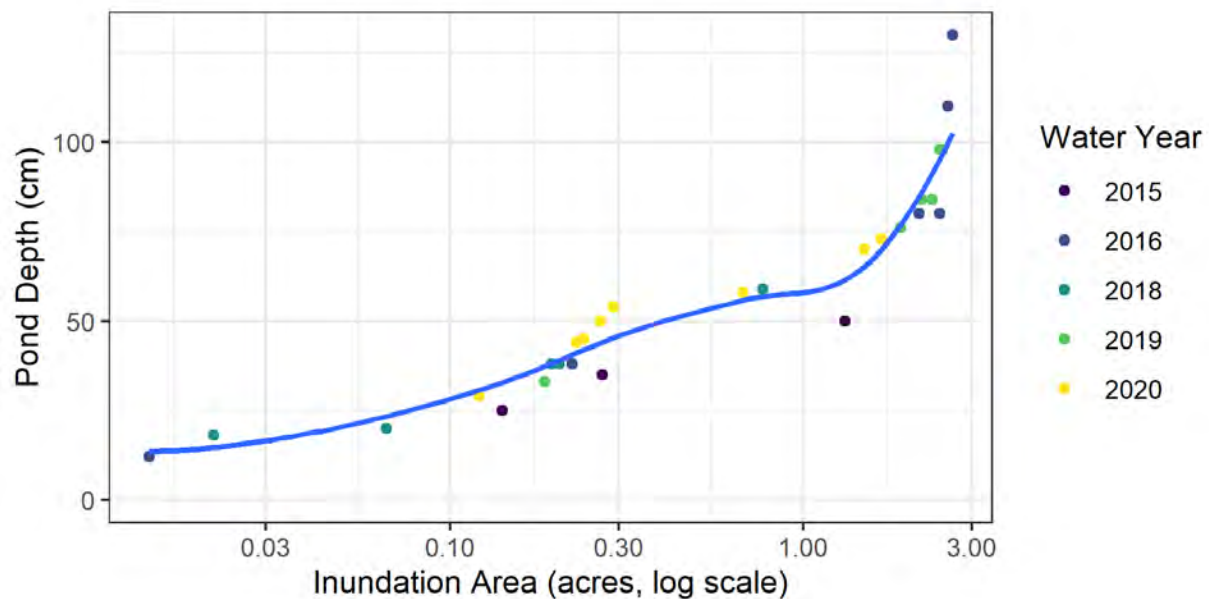
Pond 60, a post-mastication and post-subsurface munitions remediation vernal pool, was on track to meet this performance standard for years 3 and 2 in 2020. Pond 60 met DQO 1 and DQO 2 indicating that it provided suitable habitat for CTS and fairy shrimp and was similar to itself in previous monitoring years and reference Pond 5.

#### 5.20.1.4 *Data Quality Objective 4*

Water quality parameters of Pond 60 were generally within the historical ranges with the exception of pH value in February, although it was still within ranges observed at other vernal pools (Figure 5-82 and Figure 5-2).



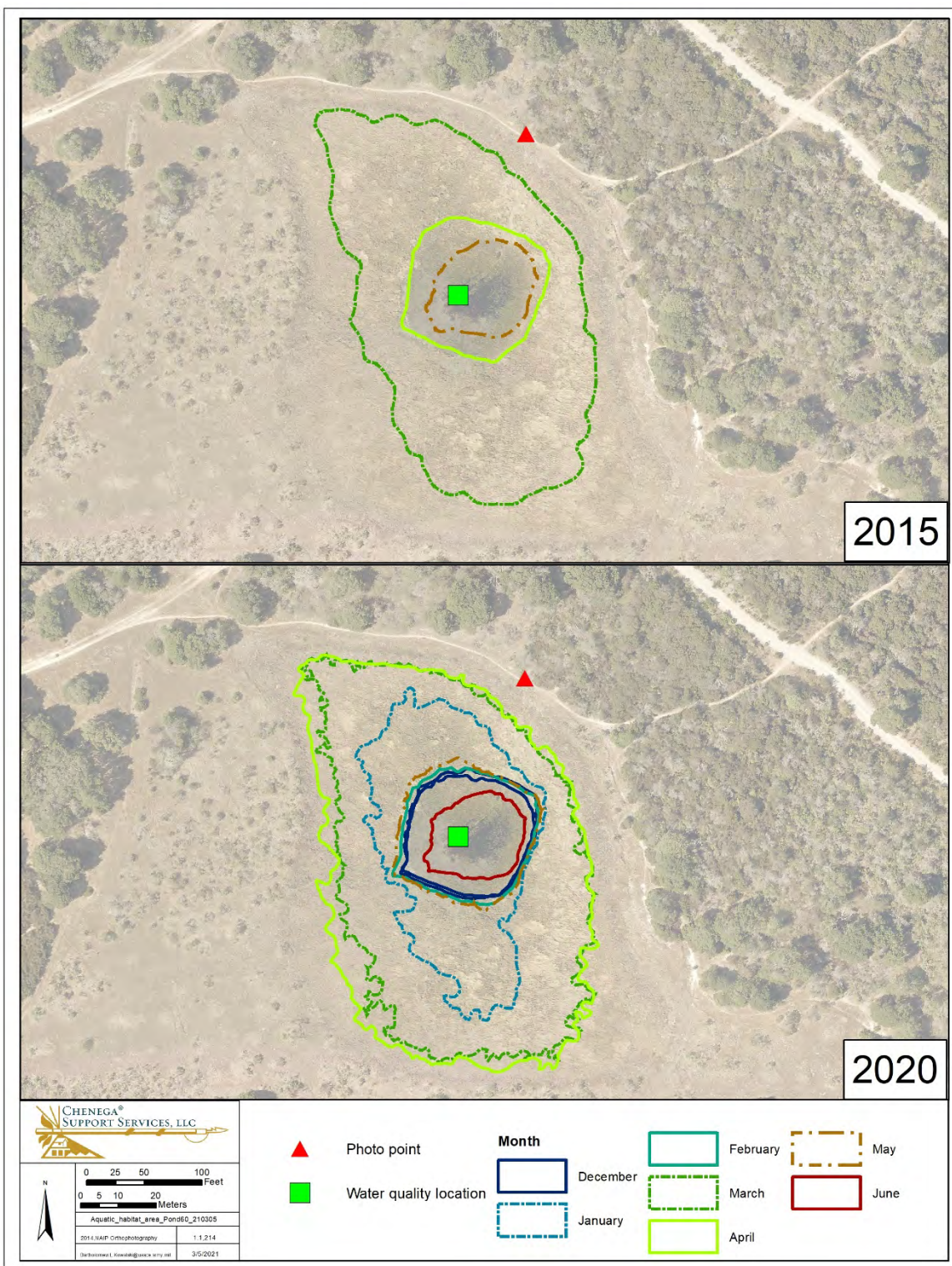
**Figure 5-79.** Pond 60 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)



**Figure 5-80.** Pond 60 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Data since 2007 Water Year (Depth Axis is Presented on a Logarithmic Scale).

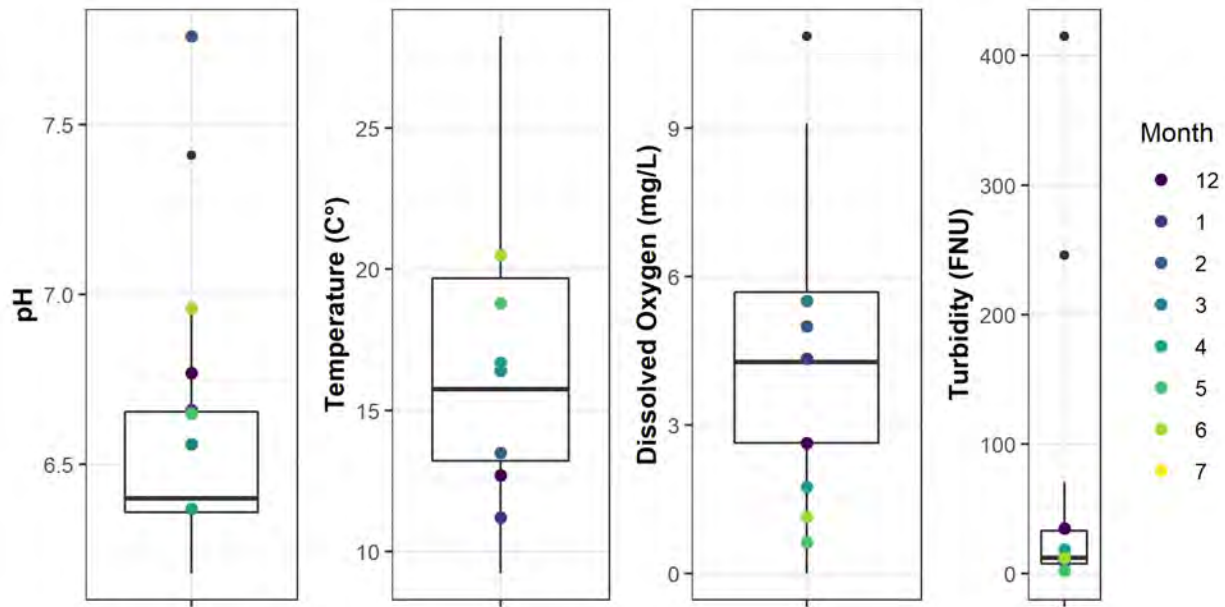
### 5.20.2 Conclusion

Pond 60, a post-mastication and post-subsurface munitions remediation vernal pool, was in years 3 and 2 of monitoring in 2020. The vernal pool was on track to meet the performance standards (Table 5-20). Pond 60 will continue to be monitored in the future.



**Figure 5-81.** Pond 60 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Inundations for 2015 (below normal precipitation) and 2020 (close to normal precipitation).





**Figure 5-82.** Pond 60 (Year 3 Post-Mastication) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

**Table 5-20. Success at Pond 60 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

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

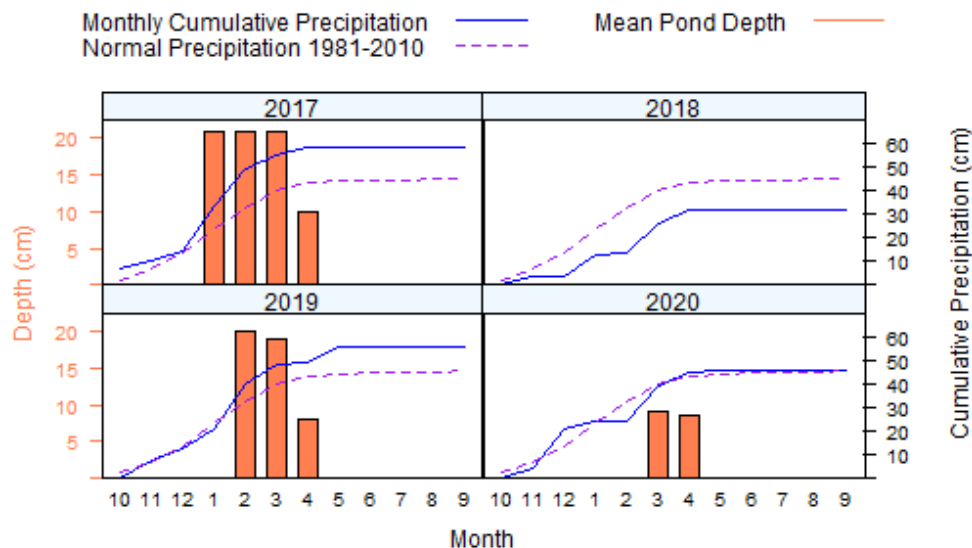
### 5.21 Pond 61 – Year 3 and Year 2

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 two separate depressions, one in the west and one in the east portion of the basin. The western depression requires less precipitation to become inundated, however, the water gauge was installed in the eastern depression. As a result, while some gauge readings had zero values, the western depression was holding water and was recorded as “peripheral inundation present” (Table 4-21). Pond 61 was monitored for four years (Figure 5-83). Above normal water years were 2017, and 2019. Year 2020 was a close to normal water year, while 2018 was a below normal water year.

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 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 an above normal water year (2017; Figure 5-83). The 2020 maximum depth of Pond 61 was 18 cm and maximum inundation area was 0.08 acres (Table 4-21). The depth and inundation values were within range of previously recorded values (Figure 5-84).

Pond 61 was briefly inundated from the end of March through April and was dry on April 29 (Table 4-21 and Figure 4-21). Hydroperiod of Pond 61 in 2020 was most similar to that of Reference Pond 997, both vernal pools became initially inundated in March, and dried out in April. Maximum inundation area was smaller in 2020 than in baseline year 2017, which was an above normal water year (Figure 5-85).

Water quality parameters of Pond 61 were within the historical ranges (Figure 5-86).



**Figure 5-83.** Pond 61 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)

#### 5.21.1.1 Data Quality Objective 1

Pond 61 did not meet the required average depths of 25 cm from the first rain event through March for CTS or 10 cm for 18 consecutive days through May for fairy shrimp. Pond 61 did not provide sufficient depth for CTS (2.6 cm through March) or for fairy shrimp (3.9 cm through April).

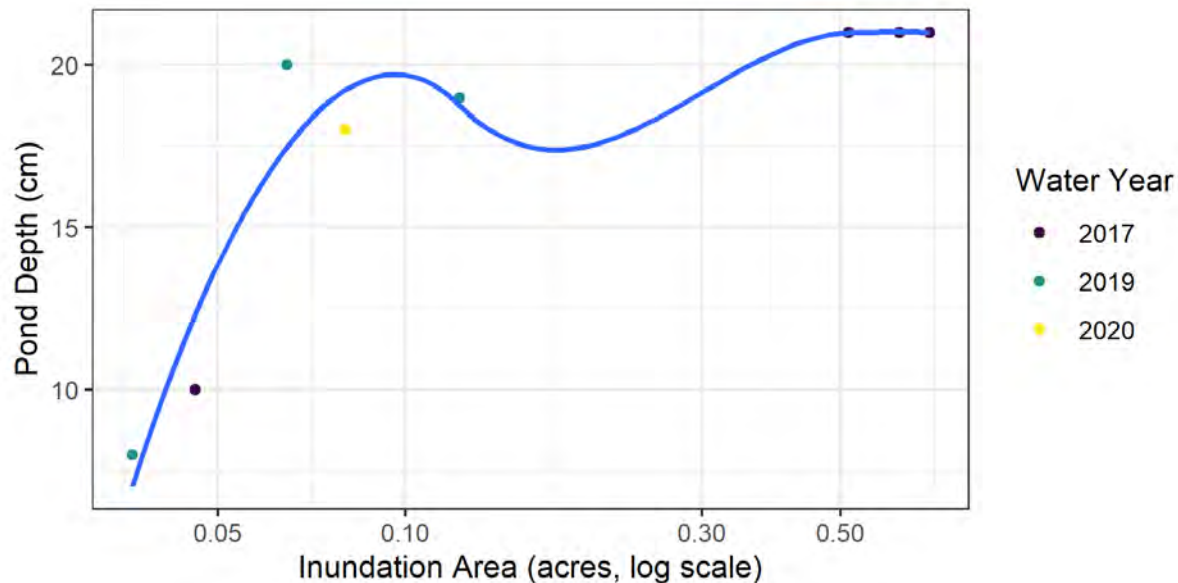
#### 5.21.1.2 Data Quality Objective 2

Pond 61 was briefly inundated from late March through mid-April. The vernal pool was dry by late April. Depth and inundation of Pond 61 reflected the precipitation pattern of 2020 and were within the historical range (Figure 5-84). Maximum inundated area was smaller than in 2017 (Figure 5-85). Pond 61 had a similar hydroperiod as Pond 997, both were inundated from late March through April.



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

Pond 61, a post-mastication and post-subsurface munitions remediation vernal pool, was partially on track to meet the performance standard for years 3 and 2, in 2020. Pond 61 did not meet DQO 1. Hydroperiod of Pond 61 was similar to reference Pond 997, 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.



**Figure 5-84.** Pond 61 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Plot of Depth vs Area since 2007 Water Year (Depth Axis is Presented on a Logarithmic Scale).

### 5.21.1.4 Data Quality Objective 4

Water quality parameters of Pond 61 were within the historical ranges (Figure 5-86).

### 5.21.1.5 Performance Standard: Wildlife Usage

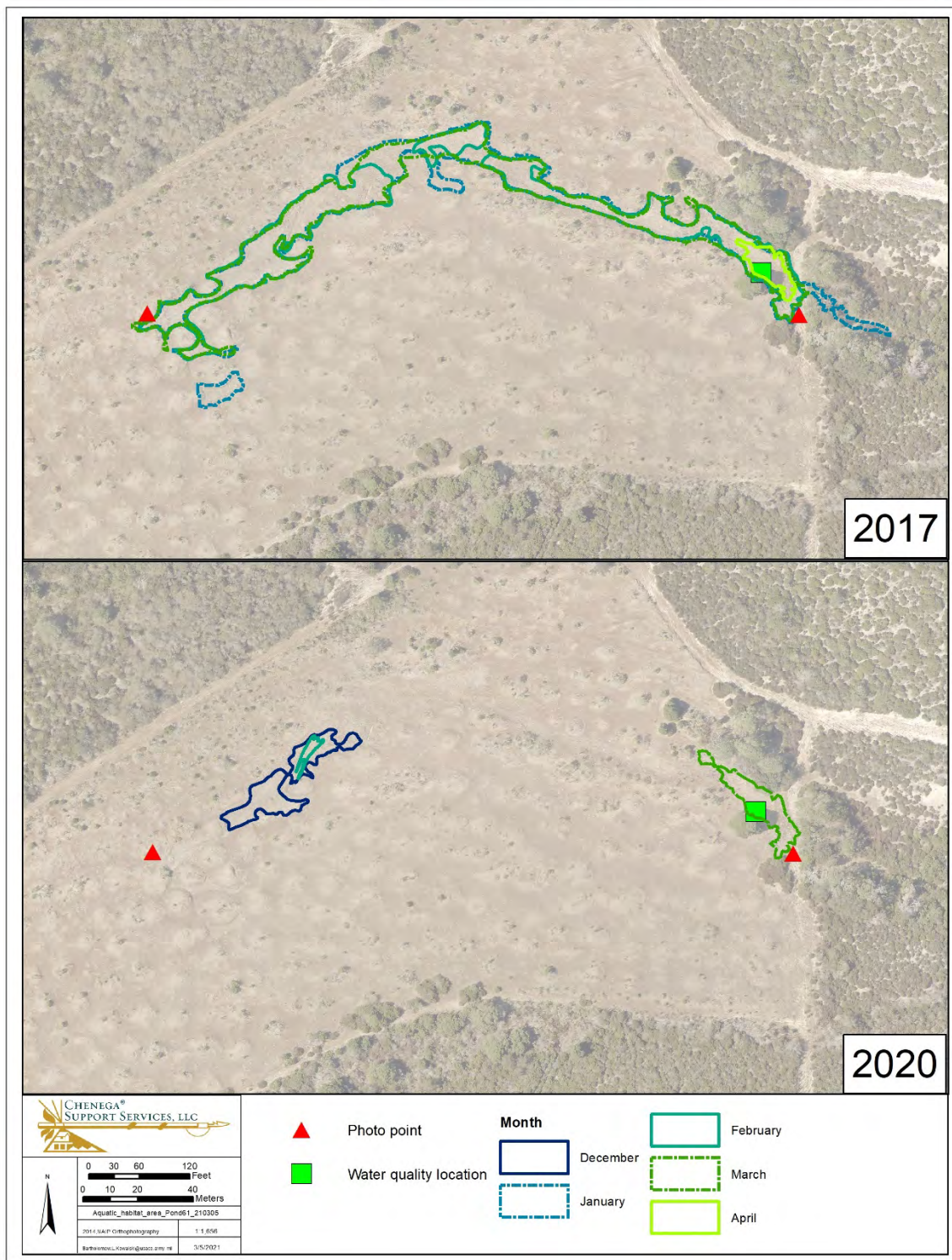
This performance standard was partially on track in 2020 at Pond 61 due to insufficient inundation depth and duration for CTS and fairy shrimp. Water quality measurements were adequate for wildlife.

## 5.21.2 Conclusion

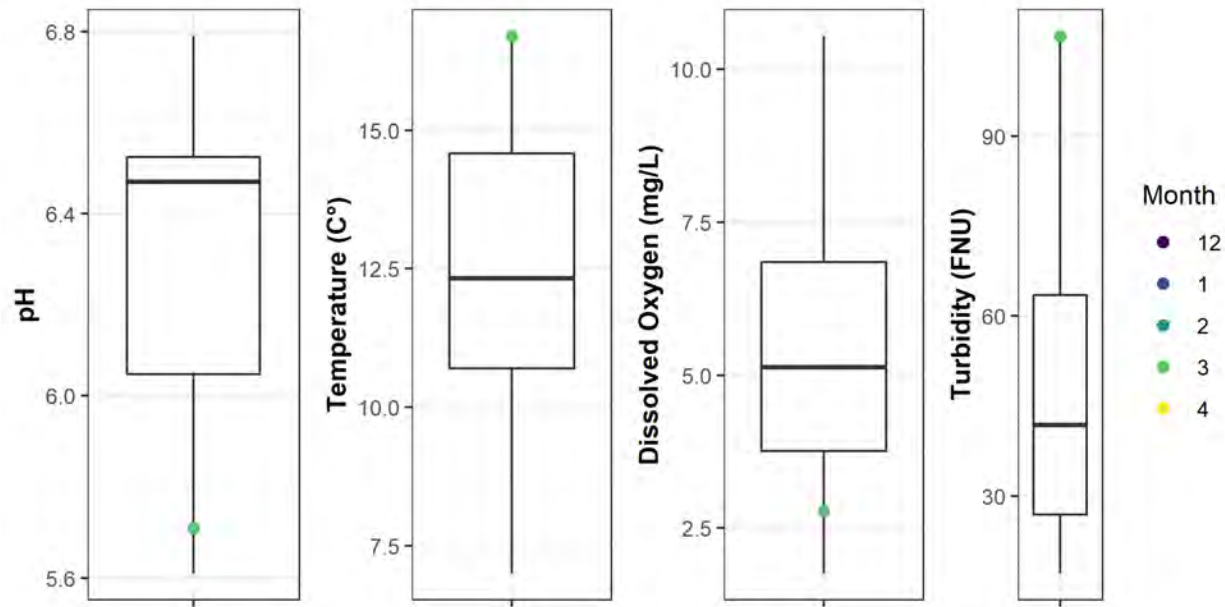
Pond 61, a post-mastication and post-subsurface munitions remediation vernal pool, was in years 3 and 2 of monitoring in 2020. The vernal pool was partially on track to meet the performance standards (Table 5-21). Pond 61 will continue to be monitored in the future.

**Table 5-21. Success at Pond 61 (Year 3 Post-Mastication, Year 2 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



**Figure 5-85.** Pond 61 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Inundations for 2017 (above normal precipitation) and 2020 (close to normal precipitation).



**Figure 5-86.** Pond 61 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

## 5.22 Pond 73 – Year 3 and Year 2

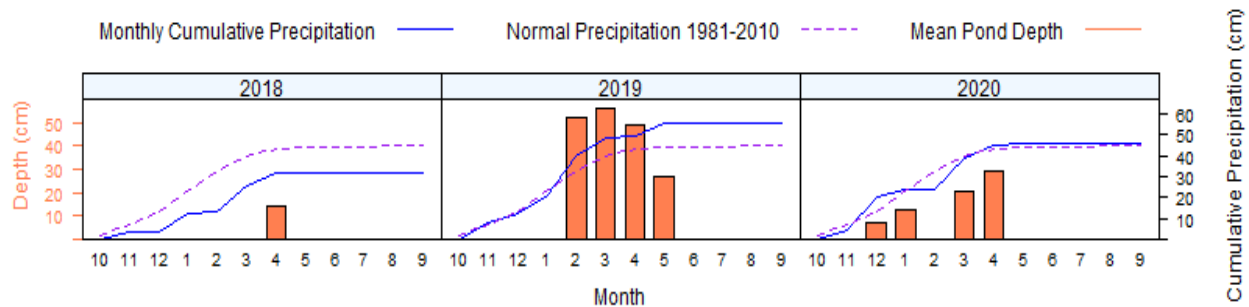
Pond 73 is situated within a medium sized and shallow basin in the northern part of the Fort Ord National Monument. Depth and inundation of Pond 73 have been monitored for three years (Figure 5-87). Baseline inundation was recorded in 2017 but depth and water quality parameters were not measured that year. Years 2017 and 2019 were above normal water years, 2020 was close to normal water year, and 2018 was a below normal water year.

Pond 73 was monitored in 2020 as a year 3 post-mastication and year 2 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 5-87). The 2020 maximum depth of Pond 73 reached 33 cm and maximum measured inundation was 0.42 acres (Table 4-22). The depth and inundation values were within range of previously recorded values (Figure 5-88). By size, Pond 73 can be compared to reference Ponds 101 East (East) and 997 (Figure 5-1).

Pond 73 dried out twice during the 2020 water year due to low precipitation in January and a completely dry February 2020; first following initial inundation in February, and second time by June 4, 2020 (Table 4-22 and Figure 4-22). Maximum inundation area was slightly smaller in 2020 than in baseline year 2017, which was an above normal water year (Figure 5-89). Hydroperiod of Pond 73 was

most similar to that of reference Pond 101 East (East). Both vernal pools dried out for a brief period following dry February, and both became inundated again in March.

Water quality parameters of Pond 73 were generally within the historical ranges except for the temperature value of Temp = 23.1 °C in April. However, this value was not out of range when compared to other vernal pools (Figure 5-90 and Figure 5-3).



**Figure 5-87.** Pond 73 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1981-2010) (NPS, 2021; NCDC NOAA, 2021)

#### 5.22.1.1 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, but it did meet the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 73 did not provide sufficient depths for CTS (10.1 cm through March), but it did provide sufficient depth for fairy shrimp (13.9 cm through May).

#### 5.22.1.2 Data Quality Objective 2

Pond 73 was intermittently inundated from December through May and was dry by June 4, 2020. Pond 73 depth and inundation metrics reflected the precipitation pattern of 2020 and were within the historical range (Figure 5-88). Pond 73 had similar hydroperiod as reference Pond 101 East (East); both were inundated intermittently from early December and dried out in February, after which both became inundated again in mid-March. The maximum inundation area in 2020 was slightly smaller than in 2017, an above normal water year (Figure 5-89).

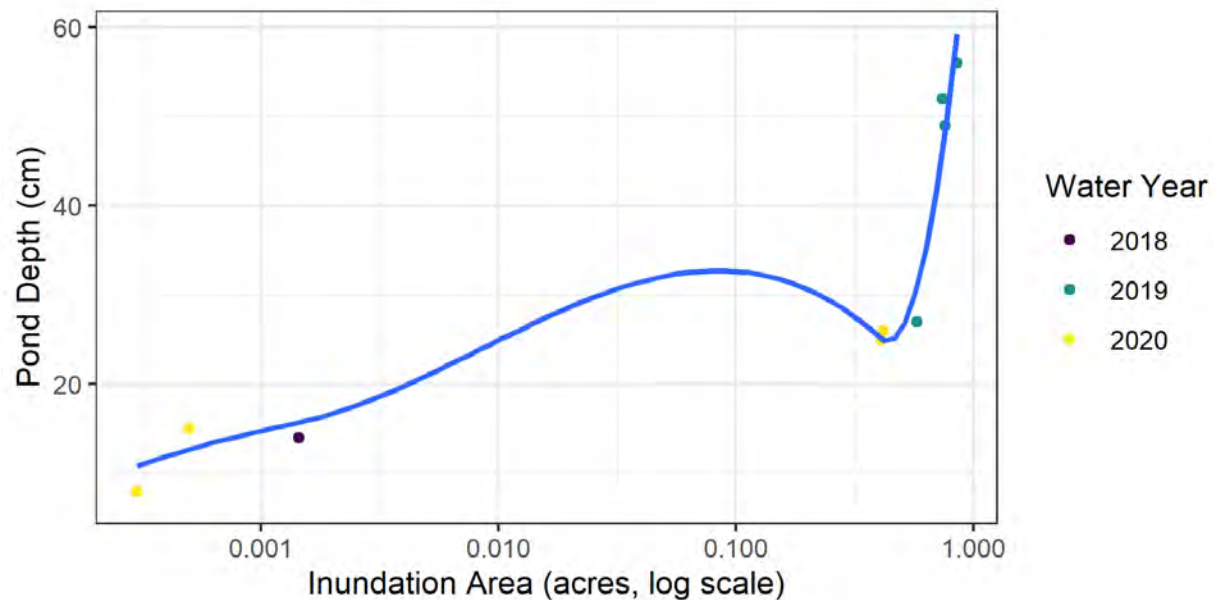
#### 5.22.1.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 73, a post-mastication and post-subsurface munitions remediation vernal pool, was partially on track to meet the performance standard for year 3 and year 2 in 2020. Pond 73 partially met DQO 1; it did not provide suitable habitat for CTS, but it did provide suitable habitat for fairy shrimp in 2020. Hydroperiod of Pond 73 was similar to reference Pond 101 East (East) and congruent with baseline patterns, thus DQO 2 was met.

#### 5.22.1.4 Data Quality Objective 4

Water quality parameters of Pond 73 were within the historical ranges (Figure 5-90).





**Figure 5-88.** Pond 73 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2018 (Depth Axis is Presented on a Logarithmic Scale).

#### 5.22.1.5 Performance Standard: Wildlife Usage

This performance standard was partially met in 2020 at Pond 73 due to insufficient inundation depth and duration for CTS, but it provided sufficient depth and inundation for fairy shrimp. Water quality measurements were adequate for wildlife.

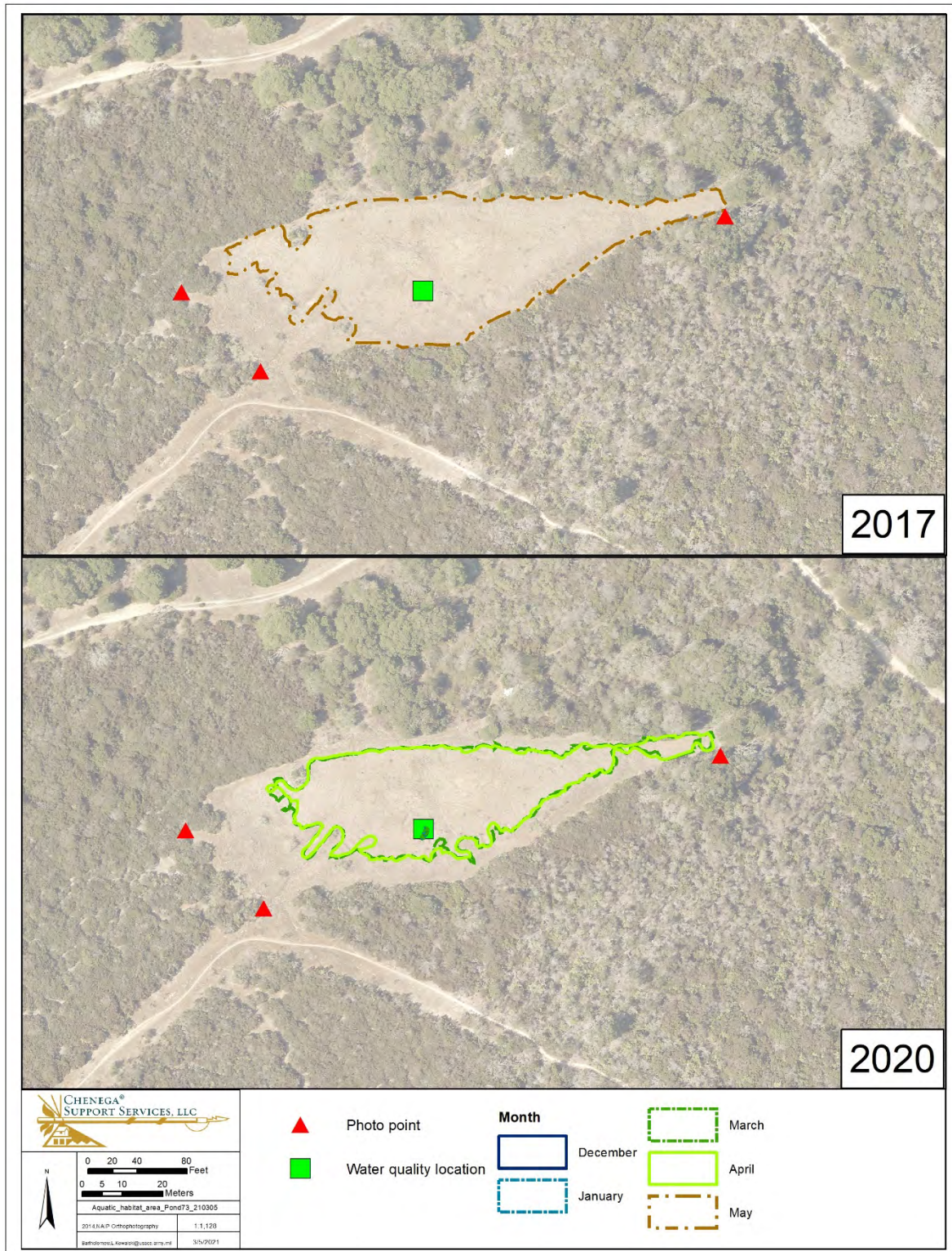
#### 5.22.2 Conclusion

Pond 73, a post-mastication and post-subsurface munitions remediation vernal pool, was in years 3 and 2 of monitoring in 2020. Pond 73 was partially on track to meet the performance standards (Table 5-22). Pond 73 will continue to be monitored in the future.

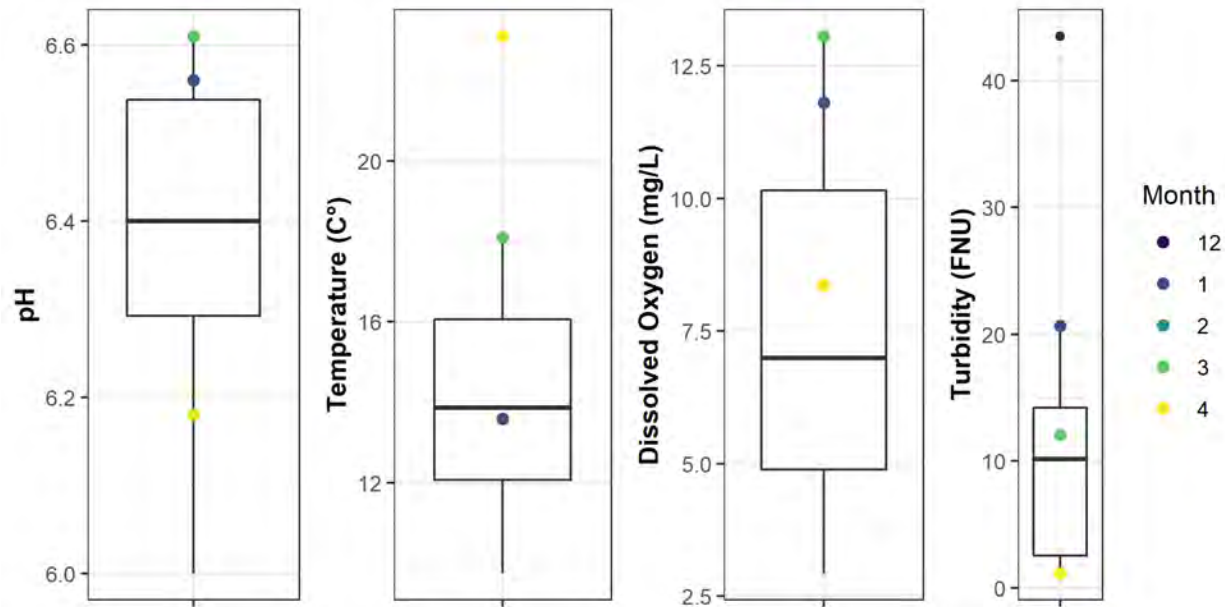
**Table 5-22. Success at Pond 73 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives**

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





**Figure 5-89.** Pond 73 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) Inundations for 2017 (above normal precipitation) and 2020 (close to normal precipitation).



**Figure 5-90.** Pond 73 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU/NTU). The colored dots represent observed values in 2020 water year. The thick grey line in the box represents the median, the top and bottom edges of the central box represent the upper (3<sup>rd</sup>) and lower (1<sup>st</sup>) quartile of all observed values, respectively. The upper and lower whiskers represent largest value within 1.5 times interquartile range above 75th percentile, and smallest value within 1.5 times interquartile range below 25th percentile, respectively. Small black dots represent historical values outside of those statistics.

## 6 CONCLUSION

A close to normal cumulative rainfall but unusual precipitation frequency in 2020 resulted in irregular and sometimes late ponding for several vernal pools, some of which dried out once or twice between larger rain events. Nonetheless, 15 of the 19 remediated vernal pools monitored in 2020 either met, were on track to meet, or were partially on track to meet the performance standards (Table 6-1). While required inundation was met or was on track to meet at all 19 monitored vernal pools, Ponds 74, 40 South, 44, and 61 did not reach the required average depth to support CTS or fairy shrimp in 2020 because their hydroperiods were too short. Ponds 101 East (West), 101 West, 16, 41, 3 South, 43, 42, 35, and 73 were partially on track to meet the hydrology performance standard because they did not reach the required average depth to support CTS, but they did reach the required average depth for fairy shrimp. Hydroperiods of most of those vernal pools exhibited intermittent inundation which was similar to the hydroperiod of reference vernal pool 101 East (East). All of the vernal pools that met the required depth for CTS and fairy shrimp were those that held water continuously from initial inundation to the point when they dried out in spring. Maximum inundation areas of all remediated vernal pools were within the expected ranges based on historical data. This suggests that insufficient depth to support CTS observed at 13 remediated vernal pools was due to short or intermittent hydroperiods caused by low precipitation in January and a completely dry February.

Out of the vernal pools that were not on track or were partially on track to meet the hydrology performance standard, historically CTS were only detected in Ponds 101 East (West), 101 West, and 41,



while fairy shrimp were detected in all of the above vernal pools except for Pond 74 (Pond 74 did not have baseline surveys, and was monitored for wildlife only once in 2019, while Pond 101 West is assumed to have had fairy shrimp detections in 1992 and 2001 because it was collectively referred to as Pond 101 along with Ponds 101 East (West) and 101 East (East)). It is important to note that there have been instances in the past when fairy shrimp were detected in vernal pools that did not reach the required average depth (Burleson 2019). Results of 2020 wildlife surveys are presented in a separate report (Burleson 2021).

Water quality, as assessed by DQO 4, was met or on track to meet at all vernal pools apart from Pond 74, where it could not be assessed due to insufficient depth for taking measurements. There were a few record measurements in several vernal pools, but those were still within general ranges observed across all vernal pools, and there were no unexpected trends. Water quality was adequate to support wildlife in all vernal pools where it was measured.

Three vernal pools were in the third year of monitoring following remedial action (Ponds 40 North, 56 and Machine Gun Flats). During the three years of follow up surveys, hydrological condition and inundation performance standard, as well as water quality DQO 4, were met at all three vernal pools. Prescribed burns and mastication do not seem to have negatively affected the hydrology or water quality of Ponds 40 North, 56, and Machine Gun Flats, and no additional monitoring of these standards is recommended at these vernal pools.

Remaining remediated vernal pools monitored in 2020 were either in year 2 or 3 and will continue to be monitored in the future according to specified requirements in PBO and the wetland plan.

The only recommendation for future surveys is to install additional gauge in the western depression of Pond 61. As described in section 5.21, in close to normal and below normal water years, the western and eastern depressions stay disconnected and act as separate vernal pools with their own hydroperiods. Thus, starting with water year 2021, Pond 61 will be split into Ponds 61 West and 61 East, and hydrological and wildlife monitoring will be conducted independently at these ponds unless they become hydrologically connected.

**Table 6-1. 2020 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 2 Post-Mastication	Not on track	On track	Not on track	Can't assess
Pond 101 East (West)	Year 2 Post-Mastication	Partial	On track	Partial	On track
Pond 101 West	Year 2 Post-Mastication	Partial	On track	Partial	On track
Pond 16	Year 2 Post-Subsurface Munitions Remediation	Partial	On track	Partial	On track
Pond 41	Year 2 Post-Subsurface Munitions Remediation	Partial	On track	Partial	On track
Pond 40 North	Year 3 Post-Burn	Met	Met	Met	Met
Pond 3 North	Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation	On track	On track	On track	On track
Pond 3 South	Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation	Partial	On track	Partial	On track

Vernal Pool	Monitoring Status	Hydrology		Wildlife	
		DQO 1 (depth)	DQO 2 (inundation)	DQO 1 (depth)	DQO 4 (water quality)
Pond 39	Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation	On track	On track	On track	On track
Pond 40 South	Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	On track
Pond 43	Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation	Partial	On track	Partial	On track
Pond 56	Year 3 Post-Mastication	Met	Met	Met	Met
Machine Gun Flats	Year 3 Post-Mastication	Met	Met	Met	Met
Pond 42	Year 3 Post-Mastication and Post-Burn, Year 2 Post-Subsurface Munitions Remediation	Partial	On track	Partial	On track
Pond 35	Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation	Partial	On track	Partial	On track
Pond 44	Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	On track
Pond 60	Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation	On track	On track	On track	On track
Pond 61	Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation	Not on track	On track	Not on track	On track
Pond 73*	Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation	Partial	On track	Partial	On track

\*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**

Table A-1. Hydrology Results for December Monitoring (12/4/2019-12/31/2019)

December									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
5	12/4/2019	1:35 PM	NS	9	NS	NS	NS	NS	NS
60	12/4/2019	1:15 PM	NS	41	NS	NS	NS	NS	NS
997^	12/4/2019	1:23 PM	0	0					
101EW	12/4/2019	1:59 PM	NS	10	NS	NS	NS	NS	NS
101EE	12/4/2019	2:10 PM	NS	13	NS	NS	NS	NS	NS
35	12/6/2019		0	0					
39^	12/6/2019	11:24 PM	0.0079	42	NS	NS	NS	NS	NS
41	12/6/2019	12:38 PM	0	0					
42^	12/6/2019		0.276	28	NS	NS	NS	NS	NS
43^	12/6/2019	1:10 PM	0.0113	19	NS	NS	NS	NS	NS
44^	12/6/2019	12:51 PM	0.0085	12	NS	NS	NS	NS	NS
56	12/6/2019	3:06 PM	0.2573	38	NS	NS	NS	NS	NS
60	12/6/2019	2:46 PM	0.2278	44	NS	NS	NS	NS	NS
61^	12/6/2019		0.1092	0					
73^	12/6/2019	2:36 PM	3e-04	8	NS	NS	NS	NS	NS
3N^	12/6/2019	11:56 AM	0.0563	30	NS	NS	NS	NS	NS
3S^	12/6/2019	12:08 PM	0.0136	14	NS	NS	NS	NS	NS
40N	12/6/2019	11:36 AM	0.0198	40	NS	NS	NS	NS	NS
40S	12/6/2019		0	0					
MGF	12/6/2019	1:51 PM	0.0618	85	NS	NS	NS	NS	NS
16	12/13/2019	1:45 PM	0.1438	15	NS	NS	NS	NS	NS
101EE	12/13/2019	3:45 PM	0	0					

December									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
101EW	12/13/2019	3:30 PM	0	0					
5#	12/20/2019		0.7359	8	6.01	15.3	18.37	7.28	529
41	12/20/2019		0	0					
60	12/20/2019	3:22 PM	0.2388	45	2.64	12.7	34.54	6.77	736
997	12/20/2019		0	0					
101EE	12/20/2019		0	0					
101EW	12/20/2019		0	0					
35	12/23/2019		0	0					
41	12/23/2019		0	0					
61^	12/23/2019		0	0					
73	12/23/2019		NS	7	NS	NS	NS	NS	NS
997	12/23/2019		0	0					
101EE	12/23/2019		0	0					
101EW	12/23/2019		0	0					
10	12/27/2019		NS	57	NS	NS	NS	NS	NS
16	12/27/2019		NS	12	NS	NS	NS	NS	NS
72	12/27/2019		NS	22	NS	NS	NS	NS	NS
35	12/31/2019	3:35 PM	0	0					
41^	12/31/2019	3:24 PM	0	0					
42^	12/31/2019	2:35 PM	0.1418	22	10.24	14.7	2.89	7.54	282
43	12/31/2019	3:08 PM	NS	16	NS	NS	NS	NS	NS
44^	12/31/2019	3:14 PM	NS	9	NS	NS	NS	NS	NS

December									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
56^	12/31/2019	2:05 PM	0.3266	45	14.55	11.1	10.81	6.89	570
101EE	12/31/2019	1:31 PM	0.0715	12	9.98	13.3	5.46	6.84	560
101EW	12/31/2019	1:03 PM	0.0032	14	11.67	13.2	22.86	6.67	447.1

NS = Not Surveyed

^Peripheral inundation present

#Probe not fully submerged

Table A-2. Hydrology Results for January Monitoring (1/6/2020-1/30/2020)

January									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
42^	1/6/2020	11:50 AM	NS	20	NS	NS	NS	NS	NS
60	1/6/2020	11:12 AM	NS	42	NS	NS	NS	NS	NS
73^	1/6/2020	11:06 AM	NS	10	NS	NS	NS	NS	NS
997	1/6/2020	10:57 AM	0	0					
101EE	1/6/2020	10:43 AM	NS	11	NS	NS	NS	NS	NS
101EW	1/6/2020	10:35 AM	NS	5	NS	NS	NS	NS	NS
3N^	1/6/2020	12:00 PM	NS	26	NS	NS	NS	NS	NS
3S^	1/6/2020	11:58 AM	NS	11	NS	NS	NS	NS	NS
5	1/8/2020	3:52 PM	NS	11	NS	NS	NS	NS	NS
16	1/8/2020	1:48 PM	NS	12	NS	NS	NS	NS	NS
35	1/8/2020	2:09 PM	0	0					
39	1/8/2020	2:14 PM	NS	37	NS	NS	NS	NS	NS
43^	1/8/2020	2:49 PM	NS	9	NS	NS	NS	NS	NS



January									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
44	1/8/2020	2:41 PM	0	0					
56	1/8/2020	3:30 PM	NS	46	NS	NS	NS	NS	NS
61^	1/8/2020	3:02 PM	0	0					
101W	1/8/2020	3:37 PM	0	0					
40N	1/8/2020	2:20 PM	NS	10	NS	NS	NS	NS	NS
40S	1/8/2020	2:18 PM	0	0					
MGF	1/8/2020	3:21 PM	NS	89	NS	NS	NS	NS	NS
30B	1/10/2020	3:31 PM	0	0					
30C	1/10/2020	3:30 PM	NS	5	NS	NS	NS	NS	NS
16^#	1/29/2020	10:58 AM	0.097	12	11.38	13.2	43.8	6.81	1666
35	1/29/2020	3:40 PM	0	0					
39	1/29/2020	3:47 PM	0.0055	38	2.35	11.2	74.97	6.25	94.5
41^#	1/29/2020	12:48 PM	0.0011	15	17.16	11.9	1.46	7.08	258.7
42^	1/29/2020	2:38 PM	0.1088	21	6.56	15.3	4.87	6.75	276.4
43^	1/29/2020	3:08 PM	0.0077	16	16.63	18.2	1.51	9.08	176.2
44^#	1/29/2020	11:45 AM	0.005	7	11.31	16.9	2.93	7.46	147.7
3N^#	1/29/2020	1:35 PM	0.0513	29	12.79	19.5	8.76	7.54	473.2
3S^	1/29/2020	1:52 PM	0.0141	16	4.38	11	1.12	6.83	200.2
40N	1/29/2020	4:12 PM	0.002	9	NS	NS	NS	NS	NS
40S	1/29/2020	4:00 PM	0	0					
5	1/30/2020	12:30 PM	1.9979	14	20.16	14.6	16.54	7.41	631
56	1/30/2020	3:45 PM	0.6023	56	3.87	12.5	3.37	6.46	447.7
60	1/30/2020	1:53 PM	0.6746	58	4.34	11.2	8.74	6.66	721
61^	1/30/2020	2:58 PM	0	0					

January									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
73 <sup>#</sup>	1/30/2020	1:35 PM	5e-04	15	11.81	13.6	20.69	6.56	194.8
74	1/30/2020	2:36 PM	0	0					
997	1/30/2020	1:13 PM	0	0					
101EW <sup>#</sup>	1/30/2020	11:51 AM	0.0031	19	9.47	11.4	16.82	6.67	480.1
101EE <sup>#</sup>	1/30/2020	11:58 AM	0.1752	12	23.33	14.6	28.16	6.68	446.4
101W <sup>#</sup>	1/30/2020	10:56 AM	0.0019	10	9.96	12.5	6.27	6.46	319.7
MGF <sup>^</sup>	1/30/2020	3:16 PM	0.0776	98	4.09	13.4	81.68	7.06	454.7

NS = Not Surveyed

<sup>^</sup>Peripheral inundation present<sup>#</sup>Probe not fully submerged

Table A-3. Hydrology Results for February Monitoring (2/19/2020-2/27/2020)

February									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
41	2/19/2020	3:22 PM	0	0					
42 <sup>^</sup>	2/19/2020	2:42 PM	0	0					
43	2/19/2020	2:56 PM	0	0					
44	2/19/2020	3:05 PM	0	0					
60	2/19/2020	2:22 PM	NS	53	NS	NS	NS	NS	NS
73 <sup>^</sup>	2/19/2020	2:18 PM	0	0					
101EE	2/19/2020	1:59 PM	NS	8	NS	NS	NS	NS	NS
101EW	2/19/2020	1:53 PM	0	0					
101W	2/19/2020	1:51 PM	0	0					

February									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
MGF <sup>^</sup>	2/19/2020	2:36 PM	NS	92	NS	NS	NS	NS	NS
5	2/21/2020	4:08 PM	NS	8	NS	NS	NS	NS	NS
16	2/21/2020	3:31 PM	0	0					
35	2/21/2020	3:07 PM	0	0					
39	2/21/2020	2:39 PM	NS	20	NS	NS	NS	NS	NS
56	2/21/2020	3:50 PM	NS	51	NS	NS	NS	NS	NS
3N	2/21/2020	2:53 PM	NS	17	NS	NS	NS	NS	NS
3S	2/21/2020	2:57 PM	0	0					
40N	2/21/2020	2:43 PM	0	0					
40S	2/21/2020	2:41 PM	0	0					
5	2/27/2020	11:41 AM	0.751	6	6.87	16.5	91.61	6.52	533
39 <sup>#</sup>	2/27/2020	3:47 PM	8e-04	15	7.65	16.7	34.17	6.42	113.4
42 <sup>^</sup>	2/27/2020	3:05 PM	0.012	0					
56	2/27/2020	2:35 PM	0.3487	49	2.43	12.1	1.75	6.7	513
60	2/27/2020	12:09 PM	0.2661	50	5	13.5	11.18	7.76	856
61 <sup>^</sup>	2/27/2020	12:59 PM	0.009	0					
73	2/27/2020	12:41 PM	0	0					
101EE	2/27/2020	11:03 AM	0.0032	1	NS	NS	NS	NS	NS
3N	2/27/2020	4:05 PM	0.0163	15	7.2	19.6	12.71	7.06	271.9
MGF <sup>^</sup>	2/27/2020	1:31 PM	0.0675	90	4.29	16	81.64	7.55	506

NS = Not Surveyed

<sup>^</sup>Peripheral inundation present<sup>#</sup>Probe not fully submerged

Table A-4. Hydrology Results for February Monitoring (2/19/2020-2/27/2020)

March									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
41	3/11/2020	1:08 PM	0	0					
42	3/11/2020	12:34 PM	0	0					
43	3/11/2020	12:41 PM	0	0					
44	3/11/2020	12:50 PM	0	0					
101EE	3/11/2020	1:29 PM	0	0					
101EW	3/11/2020	1:22 PM	0	0					
101W	3/11/2020	1:21 PM	0	0					
39	3/12/2020		0	0					
3N	3/12/2020		NS	5	NS	NS	NS	NS	NS
56	3/16/2020		NS	59	NS	NS	NS	NS	NS
60	3/16/2020		NS	60	NS	NS	NS	NS	NS
MGF	3/16/2020		NS	95	NS	NS	NS	NS	NS
5	3/17/2020		NS	15	NS	NS	NS	NS	NS
39	3/17/2020		NS	44	NS	NS	NS	NS	NS
3N	3/17/2020		NS	30	NS	NS	NS	NS	NS
16	3/19/2020	12:45 PM	0.1734	16	NS	NS	NS	NS	NS
35	3/19/2020	4:08 PM	0.0666	27	NS	NS	NS	NS	NS
39 <sup>^</sup>	3/19/2020	4:17 PM	0.0075	43	NS	NS	NS	NS	NS
41 <sup>^</sup>	3/19/2020	3:29 PM	0.1503	44	NS	NS	NS	NS	NS
42 <sup>^</sup>	3/19/2020	1:59 PM	0.1075	22	NS	NS	NS	NS	NS
43 <sup>^</sup>	3/19/2020	2:32 PM	0.0117	21	NS	NS	NS	NS	NS

March									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
44 <sup>^</sup>	3/19/2020	2:52 PM	0.0126	14	NS	NS	NS	NS	NS
3S <sup>^</sup>	3/19/2020	1:20 PM	0.0285	20	NS	NS	NS	NS	NS
40N <sup>^</sup>	3/19/2020	3:43 PM	0.0058	20	NS	NS	NS	NS	NS
40S <sup>^</sup>	3/19/2020	3:40 PM	0.0167	14	NS	NS	NS	NS	NS
61 <sup>^</sup>	3/20/2020	1:16 PM	0	0					
73 <sup>^</sup>	3/20/2020	12:40 PM	5e-04	15	NS	NS	NS	NS	NS
74	3/20/2020	12:59 PM	0	0					
997	3/20/2020	12:20 PM	0	0					
101EE <sup>^</sup>	3/20/2020	11:43 AM	0.6504	26	NS	NS	NS	NS	NS
101EW	3/20/2020	11:23 AM	0.0825	26	NS	NS	NS	NS	NS
101W <sup>^</sup>	3/20/2020	11:07 AM	0.0271	25	NS	NS	NS	NS	NS
3N <sup>^</sup>	3/20/2020	1:34 PM	NS	30	NS	NS	NS	NS	NS
5	3/27/2020	2:40 PM	3.0472	23	8.89	15.2	7.82	6.33	558
60	3/27/2020	4:14 PM	1.4878	70	5.51	16.4	13.3	6.56	547
73	3/27/2020	4:37 PM	0.4167	26	13.06	18.1	12.06	6.61	108.1
997 <sup>^</sup> #	3/27/2020	2:30 PM	0.0507	7	8.44	19.6	49.45	6.06	95.9
61	3/30/2020	3:38 PM	0.0801	18	2.78	16.7	106.68	5.71	176.2
74	3/30/2020	3:02 PM	0.0116	5	NS	NS	NS	NS	NS
101EE	3/30/2020	1:55 PM	1.6103	34	3.28	16.2	3.31	6.36	275.5
101EW	3/30/2020	1:24 PM	0.4425	49	8.86	14.7	12.68	5.99	154
101W	3/30/2020	1:04 PM	0.0958	50	3.34	15.9	7.93	6.03	127.3
3N <sup>^</sup>	3/31/2020	4:13 PM	0.1568	52	8.11	23.6	22.2	6.91	159
3S <sup>^</sup>	3/31/2020	4:41 PM	0.3869	29	10.34	20.7	16.8	6.74	442.1
MGF	3/30/2020	4:26 PM	0.1168	125	6.78	19.2	55.84	6.42	116.5



March									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
16	3/31/2020	1:20 PM	0.3271	44	4.38	18.8	156	6.28	384.3
56	3/31/2020	2:20 PM	3.0134	72	6.18	23.6	1.22	6.6	311.4

NS = Not Surveyed

\*taken during Burleson surveys

^Peripheral inundation present

#Probe not fully submerged

Table A-5. Hydrology Results for April Monitoring (4/3/2020-4/29/2020)

April									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
35	4/3/2020	1:30 PM	0.0872	32	6.23	15.1	63.53	6.56	96.8
39^	4/3/2020	1:07 PM	0.0089	43	6.22	14.1	43.27	6.37	86.4
41^	4/3/2020	4:13 PM	0.4961	49	1.58	12.9	151.21	6.26	157.6
42^	4/3/2020	2:22 PM	0.3487	36	9.86	20.1	1.62	7.21	131.2
43	4/3/2020	2:54 PM	0.0404	28	11.17	21.7	0.49	7.99	172
44^	4/3/2020	3:16 PM	0.0151	17	10.91	22.5	1.05	7.54	106.6
40N^	4/3/2020	12:30 PM	0.009	30	7.6	13.2	112.67	6.51	137.7
40S^	4/3/2020	12:45 PM	0.0247	17	1.31	13.8	70.47	6.04	300.4
56	4/13/2020		NS	84	NS	NS	NS	NS	NS
60	4/14/2020		NS	79	NS	NS	NS	NS	NS
61	4/14/2020		NS	17	NS	NS	NS	NS	NS
MGF	4/14/2020		NS	126	NS	NS	NS	NS	NS
5	4/15/2020		NS	33	NS	NS	NS	NS	NS

April									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
42	4/15/2020		NS	51	NS	NS	NS	NS	NS
43	4/15/2020		NS	31	NS	NS	NS	NS	NS
44	4/15/2020		NS	21	NS	NS	NS	NS	NS
35	4/16/2020		NS	37	NS	NS	NS	NS	NS
39	4/16/2020		NS	45	NS	NS	NS	NS	NS
41	4/16/2020		NS	56	NS	NS	NS	NS	NS
3N	4/16/2020		NS	55	NS	NS	NS	NS	NS
3S	4/16/2020		NS	29	NS	NS	NS	NS	NS
40N	4/16/2020		NS	75	NS	NS	NS	NS	NS
40S	4/16/2020		NS	20	NS	NS	NS	NS	NS
997	4/17/2020		NS	6	NS	NS	NS	NS	NS
101EE	4/17/2020		NS	37	NS	NS	NS	NS	NS
101EW	4/17/2020		NS	60	NS	NS	NS	NS	NS
101W	4/17/2020		NS	49	NS	NS	NS	NS	NS
16	4/20/2020		NS	101	NS	NS	NS	NS	NS
73	4/20/2020		NS	33	NS	NS	NS	NS	NS
5	4/28/2020	1:56 PM	3.1494	26	2.9	24.2	1.63	6.57	619
997	4/28/2020	2:45 AM	0	0					
60	4/28/2020	3:38 PM	1.6664	73	1.75	16.7	18.65	6.37	497.6
73	4/28/2020	3:03 PM	0.4074	25	8.36	23.1	1.15	6.18	211
101EE	4/28/2020	12:58 PM	1.0074	29	2.24	23.1	4.72	6.56	330.7
101EW	4/28/2020	12:24 PM	0.469	50	0.73	15.8	5.31	6.04	190.8

April									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
101W	4/28/2020	11:34 AM	0.0633	38	3.43	17.9	3.54	6.45	218.8
35	4/29/2020	11:07 AM	0.0561	25	1.67	18.1	49.77	6.88	265.3
39 <sup>^</sup>	4/29/2020	10:15 AM	0.005	34	4.86	17.4	3.32	6.38	134.3
41 <sup>^</sup>	4/29/2020	2:25 PM	0.4152	47	0.01	17.6	7.62	6.26	192.8
42 <sup>^</sup>	4/29/2020	12:45 PM	0.3787	41	9.23	18.1	0.74	7.17	136.5
43	4/29/2020	1:37 PM	0.0084	17	11.05	21.7	0.62	7.84	261
44 <sup>^</sup>	4/29/2020	1:45 PM	0.0018	2	NS	NS	NS	NS	NS
61	4/29/2020	3:19 PM	0	0					
74	4/29/2020	3:39 PM	0	0					
3N <sup>^</sup>	4/29/2020	11:50 AM	0.1086	46	2.4	19	1.51	6.36	324.1
3S <sup>^</sup>	4/29/2020	12:08 PM	0.0168	18	10.28	20.8	1.76	7.28	358.3
40N	4/29/2020	10:42 AM	0.0246	47	0.88	15.3	101.99	6.56	244.1
40S	4/29/2020	10:42 AM	0	0					
MGF <sup>^</sup>	4/29/2020	4:08 PM	0.105	117	7.93	19.2	13.49	7.23	155.1

NS = Not Surveyed

\*taken during Burleson surveys

^Peripheral inundation present

Table A-6. Hydrology Results for May Monitoring (5/4/2020-5/27/2020)

May									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
16	5/4/2020	3:20 PM	0.5172	88	0.06	15.3	122.01	6.21	300
56	5/4/2020	4:03 PM	2.9339	72	0.82	17	1.97	6.26	307.9

May									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
5	5/18/2020		NS	15	NS	NS	NS	NS	NS
60	5/18/2020		NS	61	NS	NS	NS	NS	NS
MGF	5/18/2020		NS	106	NS	NS	NS	NS	NS
42	5/19/2020		NS	26	NS	NS	NS	NS	NS
56	5/19/2020		NS	64	NS	NS	NS	NS	NS
101EE	5/19/2020		NS	4	NS	NS	NS	NS	NS
101EW	5/19/2020		NS	27	NS	NS	NS	NS	NS
101W	5/19/2020		NS	7	NS	NS	NS	NS	NS
40N	5/19/2020		NS	27	NS	NS	NS	NS	NS
39	5/20/2020		0	0	NS	NS	NS	NS	NS
3N	5/20/2020		NS	31	NS	NS	NS	NS	NS
35	5/21/2020		0	0					
MGF	5/22/2020	2:36 PM	NS	104	NS	NS	NS	NS	NS
5	5/26/2020	1:51 PM	0.7328	8	3.51	28.7	74.48	6.71	11.9
35	5/26/2020	11:00 AM	0	0					
39	5/26/2020	11:05 AM	0	0					
42	5/26/2020	3:00 PM	0.1015	19	8.15	31.6	0.05	7.95	200.8
43	5/26/2020	12:35 PM	0	0					
44	5/26/2020	12:30 PM	0	0					
60	5/26/2020	2:34 PM	NS	55	NS	NS	NS	NS	NS
101EE	5/26/2020	1:30 PM	0	0					
101EW	5/26/2020	1:19 PM	0	0					

May									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
101W	5/26/2020	1:15 PM	0	0					
3N	5/26/2020	12:13 PM	0.04	26	4.29	28	0.94	6.59	253.1
3S	5/26/2020		0	0					
40N	5/26/2020	11:32 AM	0.006	21	3.09	20.8	89.21	6.71	369.2
41	5/26/2020		0	0					
40S	5/26/2020	11:15 AM	0	0					
16	5/27/2020	10:25 AM	0.4311	69	1.34	18.7	85.23	6.66	392.1
56	5/27/2020	11:50 AM	0.5845	57	0.2	18.8	0.27	6.39	415.9
60	5/27/2020	12:55 PM	0.2889	54	0.63	18.8	2.01	6.65	752
MGF	5/27/2020	2:26 PM	0.0783	98	4.97	21	2.59	6.74	197.9

NS = Not Surveyed

\*taken during Burleson surveys

^Peripheral inundation present

Table A-7. Hydrology Results for June Monitoring (6/10/2020-6/30/2020)

June									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
5	6/10/2020		0	0					
42 <sup>^</sup>	6/10/2020	10:20 AM	0	0					
56	6/10/2020	10:38 AM	NS	48	NS	NS	NS	NS	NS
60	6/10/2020	11:03 AM	NS	54	NS	NS	NS	NS	NS
3N	6/10/2020	11:39 AM	NS	11	NS	NS	NS	NS	NS



June									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
MGF	6/10/2020	11:14 AM	NS	92	NS	NS	NS	NS	NS
41	6/16/2020		0	0					
MGF	6/25/2020		NS	85	NS	NS	NS	NS	NS
42	6/26/2020		0	0					
16	6/30/2020	3:18 PM	0.3156	41	7.19	25.1	18.31	7.09	703
42	6/30/2020	12:20 PM	0	0					
56	6/30/2020	12:27 PM	0.223	35	3.4	24.9	0.31	6.66	761
60	6/30/2020	1:54 PM	0.1207	29	1.14	20.5	11.78	6.96	1586
3N	6/25/2020		0	0					
3N	6/30/2020	12:00 PM	0	0					
MGF	6/30/2020	2:36 PM	0.0532	80	5.74	20.1	6.03	7.19	267.5

NS = Not Surveyed

\*taken during Burleson surveys

^Peripheral inundation present

Table A-8. Hydrology Results for July Monitoring (7/14/2020-7/14/2020)

July									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
16	7/14/2020	1:54 PM	NS	29	NS	NS	NS	NS	NS
56	7/14/2020	2:24 PM	NS	22	NS	NS	NS	NS	NS
60	7/14/2020	2:40 PM	0	0					
MGF^	7/14/2020	3:00 PM	NS	70	NS	NS	NS	NS	NS

NS = Not Surveyed, ^Peripheral inundation present

Table A-9. Hydrology Results for August Monitoring (8/3/2020-8/14/2020)

August									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
16 <sup>^</sup>	8/3/2020	3:06 PM	0.031	11	NS	NS	NS	NS	NS
56	8/3/2020	3:45 PM	0	0					
MGF	8/3/2020	4:11 PM	0.037	59	6.58	22.9	11.55	7.1	352.1
16	8/11/2020		0	0					
16	8/14/2020	12:50 PM	0	0					
MGF	8/14/2020	1:30 PM	NS	53	NS	NS	NS	NS	NS

NS = Not Surveyed

\*taken during Burleson surveys

^Peripheral inundation present

Table A-10. Hydrology Results for September Monitoring (9/4/2020-9/4/2020)

September									
Pond	Date	Time	Inundated Surface Area (acres)	Max Depth (cm)	Dissolved Oxygen (mg/L)	Temperature (C)	Turbidity (FNU)	pH	Conductivity (µs/cm)
MGF	9/4/2020	2:46 PM	0.0237	42					

## **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 1994-2020**

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
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

§Depth approximately 10 cm in two small puddles immediately west of staff gauge.

**Table B-1. Pond 5 (Reference) Historical Hydrology Results on Former Fort Ord 1994-2020**

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>



**Table B-1. Pond 5 (Reference) Historical Hydrology Results on Former Fort Ord 1994-2020**

Water Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2019	1/14/2019	6.70	11.09	10.16	4.7	4	0.47 <sup>‡</sup>
	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
	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

‡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 eleven years between 1994 and 2020 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
- 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 0, 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
  - 0 though the entire monitoring season
- 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
  - 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 Historicalal 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 Historicalal range. Turbidity values were somewhat elevated in February and May, but not outside of Historicalal 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

**Table B-2. Pond 101 East (East) (Reference) Historical Hydrology Results on  
Former Fort Ord 2001-2020**

Water Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2001	Feb	-	-	-	-	36 <sup>y</sup>	1.47
	Mar	6.30	-	-	-	>46 <sup>y</sup>	1.26
	Apr	6.81	-	-	-	>5 <sup>y</sup>	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 <sup>§</sup>	0.00
	12/19/2012	-	-	-	-	0 <sup>§</sup>	0.00
	1/22/2013	-	-	-	-	11 <sup>§</sup>	0.08
	2/25/2013	-	-	-	-	0 <sup>§</sup>	0.00
	3/15/2013	-	-	-	-	0 <sup>§</sup>	0.00
	4/12/2013	-	-	-	-	0 <sup>§</sup>	0.00
	5/10/2013	-	-	-	-	0 <sup>§</sup>	0.00
2014	12/11/2014	-	-	-	-	0 <sup>§</sup>	0.00
	2/18/2014	-	-	-	-	0 <sup>§</sup>	0.00
	3/17/2014	-	-	-	-	0 <sup>§</sup>	0.00
	4/7/2014	-	-	-	-	0 <sup>§</sup>	0.00
	5/6/2014	-	-	-	-	0 <sup>§</sup>	0.00
	6/3/2014	-	-	-	-	0 <sup>§</sup>	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

<sup>y</sup>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.

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



**Table B-2. Pond 101 East (East) (Reference) Historical Hydrology Results on  
Former Fort Ord 2001-2020**

Water Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
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
	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	12/04/19	-	-	-	-	13	-
	12/13/2020	-	-	-	-	0	0
	12/20/19	-	-	-	-	0	0
	12/23/19	-	-	-	-	0	0
	12/31/19	6.84	13.3	9.98	5.46	12	0.0715
	01/06/20	-	-	-	-	11	-

**Table B-2. Pond 101 East (East) (Reference) Historical Hydrology Results on Former Fort Ord 2001-2020**

Water Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2020	1/30/2020 <sup>#</sup>	6.68	14.6	23.33	28.16	12	0.1752
	02/19/20	-	-	-	-	8	-
	02/27/20	-	-	-	-	1	0.0032
	03/11/20	-	-	-	-	0	0
	03/20/20 <sup>^</sup>	-	-	-	-	26	0.6504
	03/30/20	6.36	16.2	3.28	3.31	34	1.6103
	04/17/20 <sup>*</sup>	-	-	-	-	37	-
	04/28/20	6.56	23.1	2.24	4.72	29	1.0074
	05/19/20 <sup>*</sup>	-	-	-	-	4	-
	05/26/20	-	-	-	-	0	0

#Probe not fully submerged

\*taken during Burleson surveys

<sup>^</sup>Peripheral inundation present

Pond 101 East (East) was monitored ten years between 2001 and 2020 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
  - 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 Historicalal 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 Historicalal range. Turbidity values were within the Historicalal 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



**Table B-3. Pond 997 (Reference) Historical Hydrology Results on Former Fort Ord 2017-2020**

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

<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
  - 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 Historicalal 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

**Table B-4. Pond 74 (Year 2 Post-Mastication) Historical Hydrology Results on Former Fort Ord 2019-2020**

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

Pond 74 was monitored two years between 2019 and 2020 water years. Pond 74 is a Year 2 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 2020, 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 (Burleson, 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
  - 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

**Table B-4. Pond 101 East (West) (Year 2 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	-	-	-	- <sup>y</sup>	-	-
	2/12/2001-2/13/2001	-	-	-	-	36 <sup>y</sup>	0.11
	3/26/2001	-	-	-	-	>46 <sup>y</sup>	0.14
	4/18/2001-4/19/2001	-	-	-	-	>5 <sup>y</sup>	-
	5/23/2001-5/24/2001	-	-	-	-	- <sup>y</sup>	-
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

**Table B-4. Pond 101 East (West) (Year 2 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)
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>
	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

<sup>\*</sup> In 1992, turbidity was measured qualitatively.

<sup>\*\*</sup> The 1992 acreage includes Ponds 101 East (East) and 101 East (West).

<sup>†</sup> 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.

<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>Peripheral inundation present

Pond 101 East (West) was monitored nine years between 1992 and 2020. Mastication activities occurred in 2018. Pond 101 East (West) is a post-mastication vernal pool and was in year 2 of monitoring in 2020. 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 Historicalal 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 Historicalal range. Turbidity values were within the Historicalal 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

**Table B-5. Pond 101 West (Year 2 Post-Mastication) Historical Hydrology Results on Former Fort Ord 2001-2020**

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 <sup>y</sup>	0.05
	3/26/2001	-	-	-	-	>46 <sup>y</sup>	0.06
	4/18/2001-4/19/2001	-	-	-	-	>5 <sup>y</sup>	-
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 <sup>‡</sup>
	3/5/2019	6.53	13.58	5.13	100.0	51	0.11 <sup>‡</sup>
	4/4/2019	6.68	14.69	4.77	90.8	47	0.09
	5/8/2019	6.69 <sup>†</sup>	24.35 <sup>†</sup>	5.40 <sup>†</sup>	202.0 <sup>†</sup>	10	0.01 <sup>‡</sup>
	6/2019	-	-	-	-	0	0.00
2020	1/8/2020					0	0
	1/30/2020 <sup>#</sup>	6.46	12.5	9.96	6.27	10	0.0019
	2/19/2020					0	0
	3/11/2020					0	0
	3/20/2020 <sup>^</sup>					25	0.0271
	3/30/2020	6.03	15.9	3.34	7.93	50	0.0958
	4/17/2020 <sup>*</sup>	-	-	-	-	49	-
	4/28/2020	6.45	17.9	3.43	3.54	38	0.0633
	5/19/2020 <sup>*</sup>	-	-	-	-	7	-
	5/26/2020					0	0

<sup>y</sup>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

<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 101 West was monitored five years between 2001 and 2020 water years. Mastication activities occurred in 2018. Pond 101 West is a post-mastication vernal pool and was in year 2 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
  - 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 Historicalal 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 Historicalal range. Turbidity values were within the Historicalal 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

**Table B-6. Pond 16 (Year 2 Post-Subsurface Munitions Remediation)**  
**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	3/26/1992	-	20	-	extreme*	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	-
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	-
	4/25/1996	-	-	-	-	>91	-
2009	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	-
	9/6/2017	-	-	-	-	28	-
2018	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

**Table B-6. Pond 16 (Year 2 Post-Subsurface Munitions Remediation)  
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)
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	-
	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 <sup>^</sup>	-	-	-	-	11	0.031

\* 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

<sup>^</sup>Peripheral inundation present

Pond 16 was monitored ten years between 1992 and 2020 water years. Mastication activities occurred in 2016 and Munitions remediation activities occurred in 2018. In 2019, Pond 16 was in year 2 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 (Burlison, 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 (Burlison, 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
  - 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 Historicalal 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 Historicalal 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

**Table B-7. Pond 41 (Year 2 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1997-2020**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2003	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

<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 five years between 1997 and 2020 water years. Munitions remediation activities occurred in 2018. Pond 41 is a post-subsurface Munitions remediation vernal pool and was in year 2 of monitoring in 2020. 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
  - 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 Historicalal 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 Historicalal 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

**Table B-8. Pond 40 North (Year 3 Post-Burn) Historical Hydrology Results on Former Fort Ord 2015-2020**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2015	3/18/2015	-	-	-	-	10-15§	0.01
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2018	1/16/2018	-	-	-	-	0	0.00
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018	6.18	6.67	9.12	141.0	8	0.01
	4/16/2018	6.36	11.72	7.62	64.2	9	0.01
	5/21/2018	-	-	-	-	0	0.00
2019	1/16/2019	6.55 <sup>†</sup>	11.57 <sup>†</sup>	10.89 <sup>†</sup>	112.0 <sup>†</sup>	8	0.003 <sup>‡</sup>
	2/11/2019	6.69	7.18	7.99	69.9	82	0.08 <sup>‡</sup>
	3/6/2019	6.77	14.05	6.91	16.8	81	0.04 <sup>‡</sup>
	4/3/2019	6.99	14.80	6.20	6.2	64	0.03
	5/7/2019	6.60	17.33	5.40	450.0	26	0.008 <sup>‡</sup>
	6/10/2019	-	-	-	-	8	0.003
	7/9/2019	-	-	-	-	0	0.00
2020	12/6/2019	-	-	-	-	40	0.0198
	1/8/2020	-	-	-	-	10	-
	1/29/2020	-	-	-	-	9	0.002
	2/21/2020	-	-	-	-	0	0
	3/19/2020 <sup>^</sup>	-	-	-	-	20	0.0058
	4/3/2020 <sup>^</sup>	6.51	13.2	7.6	112.67	30	0.009
	4/16/2020 <sup>†</sup>	-	-	-	-	75	-
	4/29/2020	6.56	15.3	0.88	101.99	47	0.0246
	5/19/2020 <sup>†</sup>	-	-	-	-	27	-
	5/26/2020	6.71	20.8	3.09	89.21	21	0.006

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

<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.

\*taken during Burleson surveys

<sup>^</sup>Peripheral inundation present

Pond 40 North was monitored four years between 2015 and 2020. Burn activities occurred in 2017. Pond 40 North is a post-burn vernal pool and was in year 3 of monitoring in 2020. The Historical data and precipitation are summarized below:

- 2015 (Burleson, 2016)
  - In a 0, consecutive drought year with cumulative precipitation below normal, Pond 40 North only held water in March and was 0 by April. It is likely that Pond 40 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. No water quality data were collected.
  - Consecutive drought year with yearly cumulative precipitation 14.35 inches
  - Data collected March-May, three monitoring events
  - Depth 10-15 cm in March (no staff gauge because of limited access to ponds)
  - No water quality data collected
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 40 North was inundated in March and April. The maximum inundation area was 0.01 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages. Dissolved oxygen had a small range. Turbidity had moderate levels, with a high reading in March.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - May, five monitoring events
  - Inundated March and April
  - Inundation range 0.005-0.007 acres, mean 0.006 acres
  - depth range 8-9 cm, mean 9 cm
  - pH range 6.18-6.36, mean 6.27
  - temperature range 6.67°-11.72° C, mean 9.20° C
  - dissolved oxygen range 7.62-9.12 mg/L, mean 8.37 mg/L
  - turbidity range 64.2-141.0 FNU, mean 102.6 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 40 North was inundated from the first monitoring event in January through June. The maximum inundation area was 0.08 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages. Dissolved oxygen had a small range, with low levels. Turbidity had moderate levels, with high readings in January and May.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - July, seven monitoring events
  - Inundated January through June
  - Inundation range 0.003-0.08 acres, mean 0.03 acres
  - depth range 8-82 cm, mean 45 cm
  - pH range 6.55-6.99, mean 6.72
  - temperature range 7.18°-17.33° C, mean 12.99° C
  - dissolved oxygen range 5.40-10.89 mg/L, mean 7.48 mg/L
  - turbidity range 6.2-450.0 FNU, mean 131.0 FNU
- 2020
  - In a close to normal water year, Pond 40 North was inundated intermittently from the first recorded monitoring in December through May. The maximum inundation area was 0.03 acres. Water quality was generally within Historicalal ranges. Slightly acidic pH values were observed. Temperature reached a record value of 20.8 °C in May, but otherwise was within normal averages for Fort Ord. Dissolved oxygen was lowest on record at the end of April. Turbidity values were within the Historicalal ranges.
  - Yearly cumulative precipitation 18.08 inches



- Data collected December - June, 11 monitoring events
- Inundated intermittently from December through June, dried out two times
- Inundation range 0-0.03 acres, mean 0.01 acres
- Depth range 0-75 cm, mean 27.9 cm
- pH range 6.51-6.71, mean 6.59
- temperature range 13.2°-20.8° C, mean 16.43° C
- dissolved oxygen range 0.88-7.60 mg/L, mean 3.86 mg/L
- turbidity range 89.21-112.67 FNU, mean 101.29 FNU

**Table B-9. Pond 3 North (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1997-2020**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2003	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 <sup>§</sup>	-	-	-	-	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

§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

^Peripheral inundation present

Pond 3 North was monitored six years between 1997 and 2020. Burn activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2020, Pond 3 North 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:

- 2003 (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 Historicalal ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature, dissolved oxygen, and turbidity were within the Historicalal 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

**Table B-10. Pond 3 South (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation)  
Historical Hydrology Results on Former Fort Ord 1997-2020**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2003	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

<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 3 South was monitored six years between 1997 and 2020. Burn activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2020, Pond 3 South 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 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
  - 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 Historicalal ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historicalal 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 17.5 mg/L
  - turbidity range 1.12-16.8 FNU, mean 6.56 FNU

**Table B-11. Pond 39 (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1997-2020**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2003	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
	5/20/2020 <sup>*</sup>	-	-	-	-	0	0
	5/26/2020					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

<sup>^</sup>Peripheral inundation present

Pond 39 was monitored six years between 1997 and 2020. Burn activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2020, 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 Historicalal ranges. Slightly acidic pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historicalal 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

**Table B-12. Pond 40 South (Year 3 Post-Burn, Year 2 Post-Subsurface Munitions Remediation)**  
**Historical Hydrology Results on Former Fort Ord 1997-2020**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2003	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

<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 six years between 1997 and 2020. Burn activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2020, Pond 40 South 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 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
  - 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 Historicalal ranges. Slightly acidic pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historicalal 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

**Table B-13. Pond 43 (Year 3 Post-Burn, Year 2 Post-Subsurface Munition Remediation) Historical Hydrology Results on Former Fort Ord 1997-2020**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2003	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

<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 2020. Burn activities occurred in 2017 and munition remediation activities occurred in 2018. In 2020, Pond 43 was in year 3 of monitoring for post-burn and

year 2 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
  - 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 Historicalal ranges. Slightly alkaline pH values were observed. Dissolved oxygen value in January was highest on record. Temperature and turbidity values were within the Historicalal 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

**Table B-14. Pond 56 (Year 3 Post-Mastication) Historical Hydrology Results on Former Fort Ord 2006-2020**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2007	12/1/2006	-	-	-	-	18	-
	1/23/2007	-	-	-	-	26	-
	3/6/2007	6.78	-	-	9.8 (NTU)	60	0.46
	4/9/2007	-	-	-	-	54	-
	5/7/2007	-	-	-	-	43	-
2013	11/26/2012	-	-	-	-	0	0.00
	12/19/2012	-	-	-	-	24	0.05
	1/22/2013	-	-	-	-	46	0.30
	2/25/2013	6.60	10.30	11.34	11.6 (NTU)	43	0.23
	3/15/2013	6.31	12.90	12.48	22.7 (NTU)	39	0.18
	4/12/2013	-	-	-	-	20	0.002
	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	-	-	-	-	10	0.00045
	5/6/2014	-	-	-	-	0	0.00
	6/3/2014	-	-	-	-	0	0.00
2015	3/18/2015	-	-	-	-	56	0.42
	4/16/2015	6.20	21.10	5.80	153.0 (NTU)	42	0.27
	5/28/2015	-	-	-	-	0	0.00
2016	4/4/2016	6.54	16.27	0.50	28.6	125	5.17
	4/19/2016	6.67	18.90	2.23	375.0	120	4.21
	5/9/2016	6.63	16.09	3.24	16.9	100	3.11
	6/7/2016	6.16	20.76	3.55	57.4	80	2.29
	7/8/2016	6.23	18.04	6.27	44.0	60	0.42
	8/10/2016	6.64	16.03	10.56	16.3	40	0.19
	9/12/2016	-	-	-	-	0	0.00
2018	11/20/2017	-	-	-	-	0	0.00
	1/16/2018	5.96	12.02	3.22	46.2	22	0.08
	2/20/2018	6.95	13.2	15.00	333.0	15	0.01
	3/19/2018	7.03	10.79	9.75	8.3	38	0.25
	4/17/2018	6.65	12.94	2.15	12.0	63	0.85
	5/21/2018	6.38	14.75	2.56	1.5	56	0.31
	6/19/2018	6.58	25.56	4.08	0.0	36	0.11
	7/19/2018	-	-	-	-	0	0.00



**Table B-14. Pond 56 (Year 3 Post-Mastication) Historical Hydrology Results on Former Fort Ord 2006-2020**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2019	12/13/2018	-	-	-	-	15	-
	1/15/2019	6.55	9.40	8.22	11.4	35	0.25 <sup>‡</sup>
	2/14/2019	6.39	11.80	7.66	7.1	88	4.86 <sup>‡</sup>
	3/5/2019	6.20	14.26	7.38	2.6	101	5.13 <sup>‡</sup>
	4/9/2019	6.63	16.72	6.47	1.5	99	4.99 <sup>‡</sup>
	5/8/2019	6.55	17.24	3.01	2.8	84	4.49 <sup>‡</sup>
	6/6/2019	6.92	18.53	5.40	10.2	78	3.73 <sup>‡</sup>
	7/9/2019	-	-	-	-	56	-
	8/15/2019	-	-	-	-	36	-
	9/9/2019	-	-	-	-	20	-
2020	12/6/2019	-	-	-	-	38	0.2573
	12/31/2019 <sup>^</sup>	6.89	11.1	14.55	10.81	45	0.3266
	1/8/2020	-	-	-	-	46	-
	1/30/2020	6.46	12.5	3.87	3.37	56	0.6023
	2/21/2020	-	-	-	-	51	-
	2/27/2020	6.7	12.1	2.43	1.75	49	0.3487
	3/16/2020 <sup>*</sup>	-	-	-	-	59	-
	3/31/2020	6.6	23.6	6.18	1.22	72	3.0134
	4/13/2020 <sup>*</sup>	-	-	-	-	84	-
	5/4/2020	6.26	17	0.82	1.97	72	2.9339
	5/19/2020 <sup>*</sup>	-	-	-	-	64	-
	5/27/2020	6.39	18.8	0.2	0.27	57	0.5845
	6/10/2020	-	-	-	-	48	-
	6/30/2020	6.66	24.9	3.4	0.31	35	0.223
	7/14/2020	-	-	-	-	22	-
	8/3/2020					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 56 was monitored eight years between 2006 and 2020. Mastication activities occurred in 2017. Pond 56 is a post-mastication vernal pool and was in year 3 of monitoring in 2020. The Historical data and precipitation are summarized below:

- 2007 (Shaw, 2008)
  - In a below normal rain year, Pond 56 was inundated to 0.46 acres. The pH was neutral and the turbidity was relatively low.
  - Yearly cumulative precipitation 10.13 inches

- Data collected December-May, five monitoring events
  - Inundation only measured in March, 0.46 acres
  - depth range 18-60 cm, mean 40 cm
  - pH 6.78
  - turbidity 9.8 NTU
- 2013 (Tetra Tech, 2014)
  - In a drought year with below normal precipitation, Pond 56 was inundated December through April with a maximum inundation of 0.30 acres.
  - Drought year with yearly cumulative precipitation of 11.17 inches
  - Data collected November-May, seven monitoring events
  - Inundated in December through April
  - Inundation range 0.002-0.30 acres, mean 0.10 acres
  - depth range 20-46 cm, mean 34 cm
  - Water quality data were collected in March
  - pH 6.31
  - temperature 11.9° C
  - dissolved oxygen 2.43 mg/L
  - turbidity 22.7 NTU
- 2014 (Tetra Tech, 2015)
  - In a 0, consecutive drought year Pond 56 only held water in April. No water quality data were collected.
  - Consecutive drought year with yearly cumulative precipitation 9.33 inches
  - Data collected December-June, six monitoring events
  - Inundated only in April
  - Inundation 0.00045 acres
  - depth 10 cm
  - No water quality data collected
- 2015 (Burleson, 2016)
  - In a 0 consecutive drought year with below normal precipitation, Pond 56 was inundated March and April. 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 March - May, three monitoring events
  - Inundated March to April
  - Inundation range 0.27-0.42 acres, mean 0.35 acres
  - depth range 42-56 cm, mean 49 cm
  - Water quality data were collected only in April
  - pH 6.20
  - temperature 21.10° C
  - dissolved oxygen 5.80 mg/L
  - turbidity 153 NTU
- 2016 (Burleson, 2017)
  - In a consecutive drought with precipitation above normal, Pond 56 was inundated from the first recorded monitoring in April through August. The maximum inundation area was 2.20 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 moderate range. Turbidity was low on average with a high reading in February. It is likely that Pond 56 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 0.19-5.17 acres, mean 2.56 acres
- depth range 40-125 cm, mean 88 cm
- pH range 6.16-6.67, mean 6.48
- temperature range 16.03°-20.76° C, mean 17.68° C
- dissolved oxygen range 0.50-10.56 mg/L, mean 4.39 mg/L
- turbidity range 16.3-375 FNU, mean 89.7 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 56 was inundated from the first recorded monitoring in January through July. The maximum inundation area was 0.85 acres. Water quality was within normal ranges. Neutral to moderately acidic pH values were observed. Temperature was within normal averages for Fort Ord with one relatively high reading in June. Dissolved oxygen had a large range, with moderate levels. Turbidity had low levels, with a moderate high reading in February.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected November, January - July, eight monitoring events
  - Inundated January through June
  - Inundation range 0.01-0.85 acres, mean 0.27 acres
  - Depth range 15-63 cm, mean 38 cm
  - pH range 5.96-7.03, mean 6.59
  - temperature range 10.79°-25.56° C, mean 14.88° C
  - dissolved oxygen range 2.15-15 mg/L, mean 6.13 mg/L
  - turbidity range 0.0-333 FNU, mean 66.8 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 56 was inundated from the first recorded monitoring in December through September. The maximum inundation area was 5.13 acres. Water quality was within normal ranges. Moderately acidic pH values were observed. Temperature was within normal averages for Fort Ord with one relatively high reading in June. Dissolved oxygen had a small range, with low levels. Turbidity had low levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected December – September, ten monitoring events
  - Inundated January through September
  - Inundation range 0.25-5.13 acres, mean 3.91 acres
  - Depth range 15-101 cm, mean 61 cm
  - pH range 6.20-6.92, mean 6.54
  - temperature range 9.40°-18.53° C, mean 14.66° C
  - dissolved oxygen range 3.01-8.22 mg/L, mean 6.36 mg/L
  - turbidity range 1.5-11.4 FNU, mean 5.9 FNU
- 2020
  - In a close to normal water year, Pond 56 was inundated intermittently from the first recorded monitoring in December through July. The maximum inundation area was 3.01 acres. Water quality was generally within Historicalal ranges. Slightly acidic pH

values were observed. Dissolved oxygen value in January was highest on record.

Temperature and turbidity values were within the Historicalal ranges.

- Yearly cumulative precipitation 18.08 inches
- Data collected December - May, 16 monitoring events
- Inundated from December through July
- Inundation range 0-3.01 acres, mean 0.92 acres
- Depth range 0-84 cm, mean 49.88 cm
- pH range 6.26-6.89, mean 6.57
- temperature range 11.1°-24.9° C, mean 17.14° C
- dissolved oxygen range 0.20-14.55 mg/L, mean 4.49 mg/L
- turbidity range 0.27-10.87 FNU, mean 2.82 FNU

**Table B-15. Machine Gun Flats (Year 3 Post-Mastication) Historical Hydrology Results on Former Fort Ord 1997-2020**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1996-1997	June	7.38	-	-	7 inches (Secchi disk reading)	-	-
2003	Dec	7.48-7.98	-	-	44.0-87.0 (NTU)	55	10.62
	Jan	-	-	-	13.5 (NTU)	81	11.80
	Feb	7.25-7.50	-	-	15.1 (NTU)	102	14.75
	Apr	-	-	-	-	102	14.75
2000	1/26/2000	-	-	-	-	>102	7.16
	2/23/2000	-	-	-	-	>102	9.42
	3/13/2000	5.64	-	-	28.1 (NTU)	>152	10.65
	6/15/2000	-	-	-	-	>102	9.00
2001	2/12/2001- 2/13/2001	-	-	-	-	38	6.40
	3/26/2001	6.70	-	-	-	>46	6.85
	4/18/2001- 4/19/2001	7.50	-	-	-	30	6.01
	5/23/2001- 5/24/2001	7.86	-	-	-	>76	0.093
2002	1/23/2002	-	-	-	57.2 (NTU)	-	3.49
	2/25/2002	-	-	-	71.0 (NTU)	>91	2.03
	3/27/2002	6.88	-	-	150.0 (NTU)	>91	0.09
	4/17/2002	7.20	-	-	180.0 (NTU)	-	0.01
2003	1/29/2003	6.13	-	-	11.8 (NTU)	>91	4.44
	2/24/2003	-	-	-	-	>91	4.27
	3/29/2003	6.89	-	-	126.0 (NTU)	>91	0.07
	5/1/2003	-	-	-	0.0	0	0.00
2018	11/20/2017	-	-	-	-	98	-
	1/15/2018	7.02	11.14	3.40	18.5	100	7.84*
	2/23/2018	7.33	8.55	4.65	6.2	95	7.26*
	3/21/2018	7.17	11.83	6.20	18.7	105	8.33*
	4/18/2018	6.84	13.80	3.56	7.8	111	8.34*
	5/24/2018	6.84	14.98	5.26	4.8	93	4.93*
	6/19/2018	7.06	22.99	2.70	0.0	78	0.06
	7/19/2018	-	-	-	-	60	0.04
	8/20/2018	-	-	-	-	36	0.02
	9/19/2018	-	-	-	-	15	0.01

**Table B-15. Machine Gun Flats (Year 3 Post-Mastication) Historical Hydrology Results on Former Fort Ord 1997-2020**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2019	1/15/2019	7.24	9.69	7.90	178.0	48	0.24*
	2/13/2019	6.77	8.60	9.73	34.5	128	9.42*
	3/7/2019	6.72	13.20	6.40	10.2	149	10.45*
	4/3/2019	6.62	14.97	2.78	2.8	149	10.20*
	5/8/2019	6.62	17.30	4.51	17.5	134	9.59*
	6/6/2019	7.29	18.13	6.03	10.4	127	9.52*
	7/9/2019	-	-	-	-	109	-
	8/13/2019	-	-	-	-	90	-
	9/9/2019	-	-	-	-	76	-
2020	12/6/2019	-	-	-	-	85	0.0618
	1/8/2020	-	-	-	-	89	-
	1/30/2020^	7.06	13.4	4.09	81.68	98	0.0776
	2/19/2020^	-	-	-	-	92	-
	2/27/2020^	7.55	16	4.29	81.64	90	0.0675
	3/16/2020+	-	-	-	-	95	-
	3/30/2020	6.42	19.2	6.78	55.84	125	0.1168
	4/14/2020+	-	-	-	-	126	-
	4/29/2020^	7.23	19.2	7.93	13.49	117	0.105
	5/18/2020+	-	-	-	-	106	-
	5/22/2020	-	-	-	-	104	-
	5/27/2020	6.74	21	4.97	2.59	98	0.0783
	6/10/2020	-	-	-	-	92	-
	6/25/2020+	-	-	-	-	85	-
	6/30/2020	7.19	20.1	5.74	6.03	80	0.0532
	7/14/2020^	-	-	-	-	70	-
	8/3/2020	7.1	22.9	6.58	11.55	59	0.037
	8/14/2020	-	-	-	-	53	-
	9/4/2020	-	-	-	-	42	0.0237

\*No hydrological connectivity between pools. However, both inundation areas were mapped in order to compare to baseline data.

#Probe not fully submerged

+taken during Burleson surveys

^Peripheral inundation present

Machine Gun Flats was monitored nine years between 1997 and 2020. Mastication activities occurred in 2017. The water-years 1996-1997 and 2003 are baseline, while all other years are post-remediation. Machine Gun Flats is a post-mastication vernal pool and was in year 3 of monitoring in 2020. The Historical data and precipitation are summarized below:



- 1997 (HLA, 1997)
  - The water-year was above normal prior to February but fell to approximately normal by the end of the season. Machine Gun Flats was only monitored for pH and turbidity in June. No depths or inundation areas were recorded.
  - Yearly cumulative precipitation 17.45 inches (0.4 in below normal)
  - Data collected in June, one monitoring event
  - pH 7.38 in June
  - turbidity was 7 inches, based on Secchi disk reading in June
- 1998 (HLA, 1998)
  - In an El Niño year with yearly cumulative precipitation significantly above normal, Machine Gun Flats held water December 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 10.62-14.75 acres, mean 12.98 acres
  - Depth range 54.61-101.6 cm, mean 84.77 cm
  - pH range 7.25-7.98, mean 7.55
  - turbidity range 13.5-87 NTU, mean 39.9 NTU
- 2000 (Harding Lawson Associates, 2001)
  - In a precipitation year below normal, Machine Gun Flats held water from January through June with a maximum recorded inundation of 10.65 acres. Water quality data were only collected once, in March.
  - Yearly cumulative precipitation 16.13 inches
  - Data collected January-March and June, four monitoring events
  - Inundated January through June
  - Inundation range 7.16-10.65 acres, mean 9.06 acres
  - Depth range >101.6 - >152.4 cm, mean 114.3 cm
  - pH 5.74 in March
  - turbidity 28.1 NTU in March
- 2001 (Harding ESE, 2002)
  - In a precipitation year below normal, Machine Gun Flats held water from February through May with a maximum recorded inundation of 6.85 acres. pH was the only water quality data parameter measured. Slightly acidic pH values were observed. It is likely that Machine Gun Flats 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.
  - Yearly cumulative precipitation 15.52 inches
  - Data collected February- May, four monitoring events
  - Inundated February through May
  - Inundation range 0.09-6.85 acres, mean 4.84 acres
  - Depth range 30- >76 cm, mean 48 cm
  - pH range 6.70-7.86, mean 7.35
- 2002 (Mactec, 2003)
  - In a precipitation year below normal, Machine Gun Flats held water from January through April with a maximum recorded inundation of 3.49 acres. Turbidity and pH were the only water quality parameters measured.
  - Yearly cumulative precipitation 11.42 inches

- Data collected January-April, four monitoring events
  - Inundated January through April
  - Inundation range 0.10-3.49 acres, mean 1.41 acres
  - Depth range 15-61 cm, mean 30 cm
  - pH range 6.88-7.20, mean 7.04
  - Turbidity range 57.2-180.0 NTU, mean 114.6 NTU
- 2003 (Mactec, 2004)
  - In a precipitation year below normal, Machine Gun Flats held water from January through March with a maximum recorded inundation of 4.44 acres. Turbidity and pH were the only water quality parameters measured in January and March. It should be noted that depth data were not collected in April and it is possible that the vernal pool was still inundated before drying in May.
  - Yearly cumulative precipitation 15.02 inches
  - Data collected January-May, four monitoring events
  - Inundated January through March
  - Inundation range 0.07-4.44 acres, mean 2.93 acres
  - Depth 91 cm
  - pH range 6.13-6.89, mean 6.51
  - turbidity range 11.8-126.0 NTU, mean 45.9 NTU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Machine Gun Flats was inundated from the first recorded monitoring in January through September. The maximum inundation area was 8.34 acres. Water quality was within normal ranges. Neutral pH values were observed. Temperature was within normal averages for Fort Ord, with a higher reading in June. Dissolved oxygen had a small range, with moderate levels. Turbidity had low levels.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected November, January - August, nine monitoring events
  - Inundated January through September
  - Inundation range 0.01-8.34 acres, mean 4.60 acres
  - Depth range 15-111 cm, mean 86 cm
  - pH range 6.84-7.33, mean 7.04
  - temperature range 8.55°-22.99° C, mean 13.88° C
  - dissolved oxygen range 2.70-6.20 mg/L, mean 4.30 mg/L
  - turbidity range 0.0-18.7 FNU, mean 9.33 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Machine Gun Flats was inundated from the first recorded monitoring in January through September. The maximum inundation area was 10.45 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord, with higher readings in May and June. Dissolved oxygen had a small range, with low levels. Turbidity had a large range, with moderate levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - September, nine monitoring events
  - Inundated January through September
  - Inundation range 0.24-10.45 acres, mean 8.24 acres
  - Depth range 48-149 cm, mean 112 cm
  - pH range 6.62-7.29 mean 6.88
  - temperature range 8.60°-18.13° C, mean 13.65° C

- dissolved oxygen range 2.78-9.73 mg/L, mean 6.23 mg/L
  - turbidity range 2.8-178.0 FNU, mean 42.2 FNU
- 2020
  - In a close to normal water year, Machine Gun Flats was inundated from the first recorded monitoring in December through the last survey in September. The maximum inundation area was 0.11 acres. The western depression was not hydrologically connected to the eastern marshy area during the water year. Water quality was within Historicalal ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historicalal ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - September, 18 monitoring events
  - Inundated from December through September
  - Inundation range 0-0.12 acres, mean 0.07 acres
  - Depth range 42-126 cm, mean 89.79 cm
  - pH range 6.42-7.55, mean 7.04
  - temperature range 13.4° - 22.9° C, mean 18.83° C
  - dissolved oxygen range 4.09-7.93 mg/L, mean 5.77 mg/L
  - turbidity range 2.59-81.68 FNU, mean 36.12 FNU

**Table B-16. Pond 42 (Year 3 Post-Mastication and Post-Burn, Year 2 Post-Subsurface Munitions Remediation)**  
**Historical Hydrology Results on Former Fort Ord 1997-2020**

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2003	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 <sup>†</sup>	0.34
	7/7/2017	-	-	-	-	0	0.00

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

**Table B-16. Pond 42 (Year 3 Post-Mastication and Post-Burn, Year 2 Post-Subsurface Munitions Remediation)**  
**Historical Hydrology Results on Former Fort Ord 1997-2020**

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

\*taken during Burleson surveys

^Peripheral inundation present

Pond 42 was monitored ten years between 1997 and 2020. Burn activities occurred in October 2017 and mastication and Munitions remediation activities occurred in the summer of 2018. In 2020, Pond 42 was in year 3 of monitoring for post-mastication and post-burn and year 2 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
    - 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 Historicalal 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 Historicalal 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

**Table B-17. Pond 35 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation)**  
**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	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
2020	12/6/2019	-	-	-	-	0	0
	12/23/2019	-	-	-	-	0	0
	12/31/2019	-	-	-	-	0	0
	1/8/2020	-	-	-	-	0	0
	1/29/2020	-	-	-	-	0	0
	2/21/2020	-	-	-	-	0	0

**Table B-17. Pond 35 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation)  
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)
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

\* In 1992, turbidity was measured qualitatively.

\*taken during Burleson surveys

Pond 35 was monitored nine years between 1992 and 2020. Mastication activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2020, Pond 35 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:

- 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
  - 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 Historicalal ranges. Slightly acidic pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historicalal 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



**Table B-18. Pond 44 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation)**  
**Historical Hydrology Results on Former Fort Ord 1997-2020**

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

<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 six years between 1997 and 2020. Mastication activities occurred in 2017 and Munitions remediation occurred in 2018. In 2020, Pond 44 was in year 3 for post-mastication and year 2 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 that were not hydrologically connected 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
    - 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 Historicalal ranges. Slightly alkaline pH values were observed. Temperature value in April was highest on record. Dissolved oxygen, and turbidity values were within the Historicalal 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

**Table B-19. Pond 60 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation)  
Historical Hydrology Results on Former Fort Ord 2015-2020**

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 <sup>+</sup>	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

§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 five years between 2015 and 2020. Mastication activities occurred in 2017. Pond 60 was in year 3 of monitoring for post-mastication and year 2 for post-subsurface Munitions remediation in 2020. The Historical data and precipitation are summarized below:

- 2015 (Burleson, 2016)
  - In a 0 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
  - 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 Historicalal ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historicalal 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

**Table B-20. Pond 61 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation)  
Historical Hydrology Results on Former Fort Ord 2017-2020**

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 <sup>†</sup>	14.15 <sup>†</sup>	6.01 <sup>†</sup>	17.1 <sup>†</sup>	8	0.04‡
	5/8/2019	-	-	-	-	0	0.00
2020	12/6/2019 <sup>^</sup>	-	-	-	-	0	0.1092
	12/23/2019 <sup>^</sup>	-	-	-	-	0	0
	1/8/2020 <sup>^</sup>	-	-	-	-	0	0
	1/30/2020 <sup>^</sup>	-	-	-	-	0	0
	2/27/2020 <sup>^</sup>	-	-	-	-	0	0.009
	3/20/2020 <sup>^</sup>	-	-	-	-	0	0
	3/30/2020	5.71	16.7	2.78	106.68	18	0.0801
	4/14/2020 <sup>*</sup>	-	-	-	-	17	-
	4/29/2020	-	-	-	-	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>taken during Burleson surveys

<sup>^</sup>Peripheral inundation present

Pond 61 was monitored three years between 2016 and 2020. Mastication activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2020, Pond 61 was in year 3 of monitoring for post-mastication and year 2 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
    - 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 Historicalal ranges. Slightly acidic pH value was observed. Temperature, dissolved oxygen, and turbidity values were within the Historicalal 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

**Table B-21. Pond 73 (Year 3 Post-Mastication, Year 2 Post-Subsurface Munitions Remediation)  
Historical Hydrology Results on Former Fort Ord 2017-2020**

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

‡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 four years between 2017 and 2020. Mastication activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2020, Pond 73 was in year 3 of monitoring for post-mastication and year 2 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
  - 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 Historicalal ranges. Slightly acidic pH values were observed. Temperature value in April was highest on record. Dissolved oxygen, and turbidity values were within the Historicalal 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

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## **APPENDIX C**

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### **Site Photos**



**Figure C-1.** Pond 5 (Reference): Hydrology Photo Point on 3/27/2020





**Figure C-2.** Pond 101 East (East) (Reference): Hydrology Photo Point 1 on 3/20/2020



**Figure C-3.** Pond 101 East (East) (Reference): Hydrology Photo Point 2 on 3/20/2020





**Figure C-4.** Pond 997 (Reference): Hydrology Photo Point 1 on 3/27/2020





**Figure C-5.** Pond 74 (Year 2 Post Mastication) Hydrology Photo Point 1 on 3/30/2020



**Figure C-6.** Pond 74 (Year 2 Post Mastication) Hydrology Photo Point 2 on 3/30/2020





**Figure C-7.** Pond 101 East (West) (Year 2 Post Mastication) Hydrology Photo Point 1 on 3/20/2020





**Figure C-8.** Pond 101 West (Year 2 Post Mastication) Hydrology Photo Point 1 on 4/28/2020





**Figure C-9.** Pond 16 (Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 5/04/2020



**Figure C-10.** Pond 16 (Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 5/04/2020





**Figure C-11.** Pond 41 (Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 4/29/2020



**Figure C-12.** Pond 41 (Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 4/29/2020





**Figure C-13.** Pond 40 North (Year 3 Post Burn) Hydrology Photo Point 1 on 4/29/2020





**Figure C-14.** Pond 3 North (Year 3 Post Burn, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 3/31/2020



**Figure C-15.** Pond 3 North (Year 3 Post Burn, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 3/31/2020





**Figure C-16.** Pond 3 South (Year 3 Post Burn, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 3/31/2020



**Figure C-17.** Pond 3 South (Year 3 Post Burn, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 3/31/2020





**Figure C-18.** Pond 39 (Year 3 Post Burn, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 3/19/2020





**Figure C-19.** Pond 40 South (Year 3 Post Burn, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 3/19/2020



**Figure C-20.** Pond 40 South (Year 3 Post Burn, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 3/19/2020





**Figure C-21.** Pond 43 (Year 3 Post Burn, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point on 3/19/2020



**Figure C-22.** Pond 56 (Year 3 Post Mastication) Hydrology Photo Point on 3/31/2020





**Figure C-23.** Machine Gun Flats (Year 3 Post Mastication) Hydrology Photo Point 1 on 4/29/2020



**Figure C-24.** Pond 42 (Year 3 Post Mastication, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point on 4/03/2020





**Figure C-25.** Pond 35 (Year 3 Post Mastication, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 3/19/2020



**Figure C-26.** Pond 35 (Year 3 Post Mastication, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 3/19/2020





**Figure C-27.** Pond 44 (Year 3 Post Mastication, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 3/19/2020



**Figure C-28.** Pond 44 (Year 3 Post Mastication, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 3/19/2020





**Figure C-29.** Pond 60 (Year 3 Post Mastication, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point on 4/28/2020





**Figure C-30.** Pond 61 (Year 3 Post Mastication, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 3/20/2020



**Figure C-31.** Pond 61 (Year 3 Post Mastication, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 3/20/2020





**Figure C-32.** Pond 73 (Year 3 Post Mastication, Year 2 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 3/27/2020