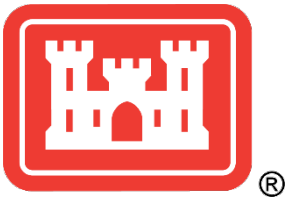
2023 ANNUAL REPORT
WETLAND HYDROLOGY AND WATER QUALITY MONITORING
FORMER FORT ORD, CALIFORNIA

Prepared for:



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ACRONYMS AND ABBREVIATIONS

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 2023 water year and this report describes the methods and results of those efforts. Vegetation and wildlife monitoring were performed by another contractor and will be reported elsewhere.

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). It states that reestablishment of these species will be considered successful if, at the end of monitoring, wetland function, wildlife usage, wetland plant cover, diversity and dominance, and CCG abundance are directly comparable to the conditions before remediation. These assessments are conducted using performance standards which are evaluated for vernal pool depth, inundation, vegetation, water quality, and wildlife using Data Quality Objectives (DQO) described in the Wetland Plan. This report provides assessment of performance standards of hydrological conditions and inundation area (DQOs 1 and 2), and partial assessment of wildlife usage (DQOs 1 and 4), while assessment of performance standards for plant cover and species diversity (DQO 3) and wildlife usage (DQO 5) will be presented in a separate report. DQOs are summarized in Section 3.2 below.

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 2023 water year included three reference ponds: 5, 101 East (East), 997; one baseline pond 75; and 16 remediated ponds: 3 North, 3 South, 16, 21, 35, 39, 40 South, 41, 42, 43, 44, 54, 60, 61, 73, and 76 (Table 1-1). Ponds 3 North, 3 South, 16, 35, 39, 40 South, 41, 42, 43, 44, 54, 60, 61 and, 73 were in their fifth and final year of required follow up monitoring, and assessment of their performance standards is based on results from all the years the ponds were monitored. The remaining remediated Ponds 21 and 76, which are in Year 1 of follow up monitoring, will continue to be monitored in the future.

Table 1-1. 2022-2023 Monitoring Status of Vernal Pools on Former Fort Ord

Index	Vernal Pool	Monitoring Status
1	Pond 5	Reference
2	Pond 997	Reference
3	Pond 101 East (East)	Reference
4	Pond 75	Baseline
5	Pond 76	Year 1 Post Mastication
6	Pond 21	Year 1 Post Mastication and Post Subsurface munitions remediation
7	Pond 3 North	Year 5 Post Subsurface munitions remediation
8	Pond 3 South	Year 5 Post Subsurface munitions remediation
9	Pond 16	Year 5 Post Subsurface munitions remediation
10	Pond 35	Year 5 Post Subsurface munitions remediation
11	Pond 39	Year 5 Post Subsurface munitions remediation
12	Pond 40 South	Year 5 Post Subsurface munitions remediation
13	Pond 41	Year 5 Post Subsurface munitions remediation
14	Pond 42	Year 5 Post Subsurface munitions remediation
15	Pond 43	Year 5 Post Subsurface munitions remediation
16	Pond 44	Year 5 Post Subsurface munitions remediation
17	Pond 54	Year 5 Post Subsurface munitions remediation
18	Pond 60	Year 5 Post Subsurface munitions remediation
19	Pond 61	Year 5 Post Subsurface munitions remediation
20	Pond 73	Year 5 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 part of 2023 water year spanning from October 2022 to June 2023, the Monterey area received 159% of normal cumulative precipitation which was the third largest in the past 30 years (NDC NOAA, 2023; Figure 2-2). Monthly precipitation during the 2023 water year was well above normal between November and March, with the largest amount of precipitation falling in December (Figure 2-3). Overall, the amount of cumulative precipitation in 2023 water year was the third largest in the last 30 years (after 1998 and 1993), which was a stark contrast to the previous two water years of well below normal precipitation.

Vernal pools are internally drained basins in low-lying 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 five of the vernal pools monitored in 2023 water year are located in the northern portion of FONM, while Ponds 16, 21, 54, 75 and 76 are located in the southern section inside the Impact Area (Figure 2-4).

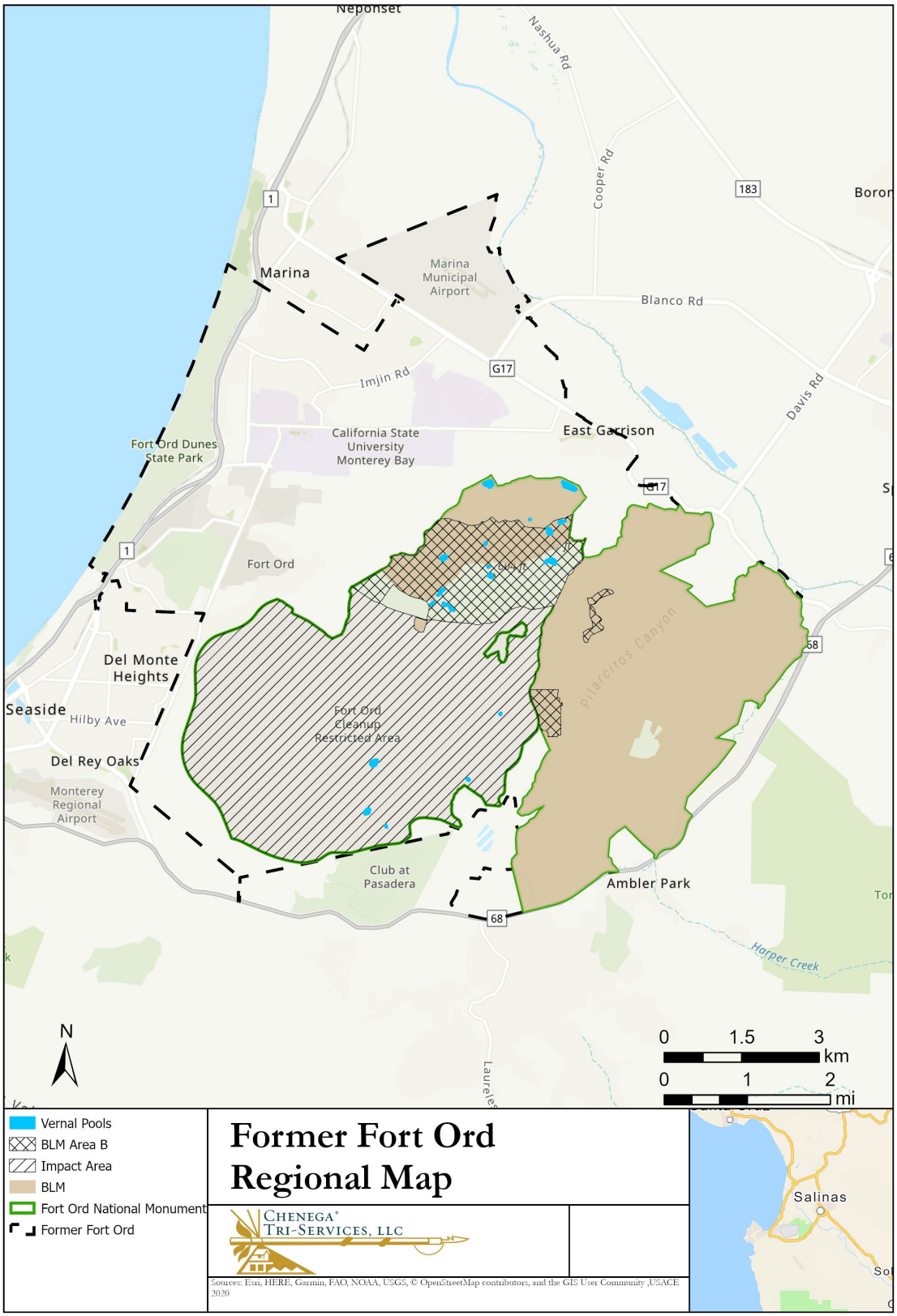

Figure 2-1. Location Map of Vernal Pools on Former Fort Ord

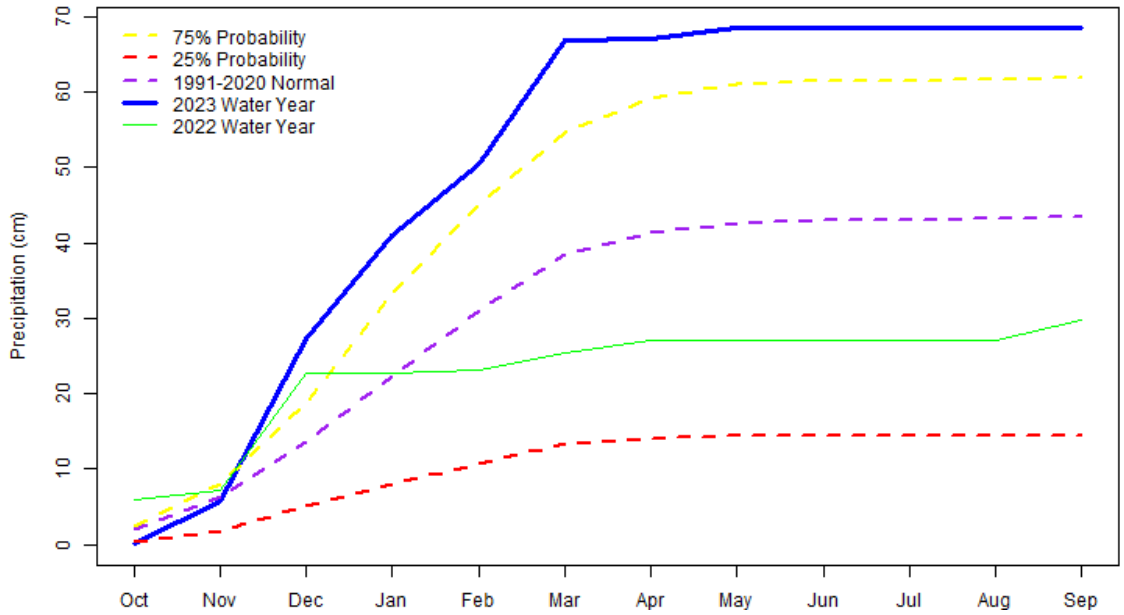

Figure 2-2. Cumulative Monthly Precipitation for the 2023 Water Year through June compared to the 30-Year Normal (mean 1991-2020), the 2022 Water Year, and the 25% and 75% Probabilities (NPS, 2023; National Climatic Data Center [NCDC] and National Oceanic and Atmospheric Administration [NOAA], 2023)

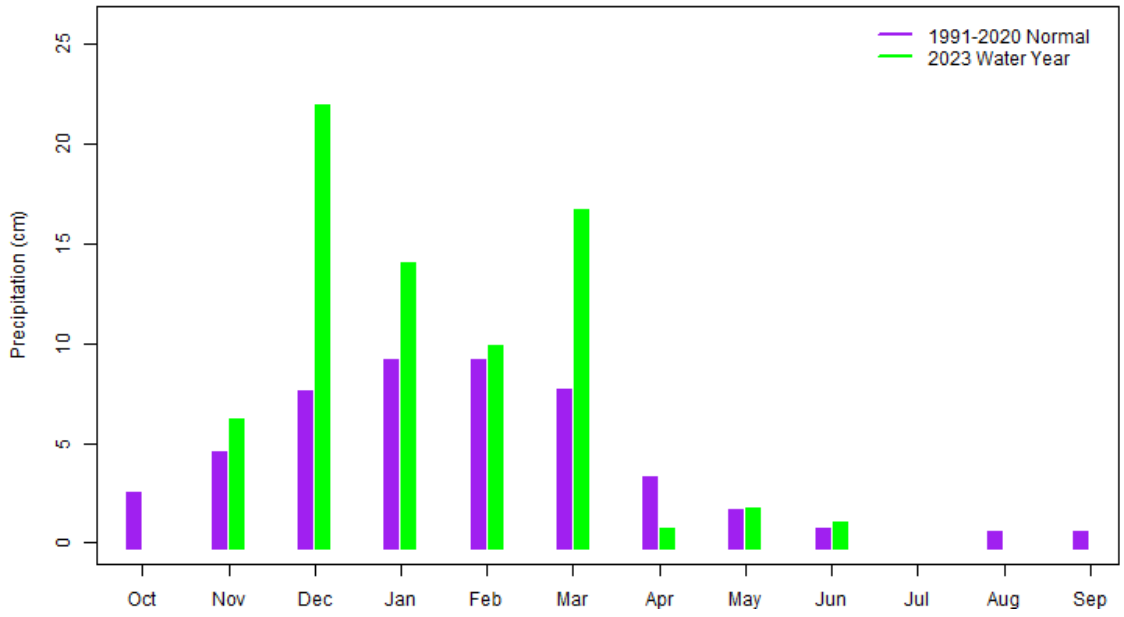

Figure 2-3. Monthly Precipitation for the 2023 Water-Year through May, and Normal Monthly Precipitation (NPS, 2023; National Climatic Data Center [NCDC] and National Oceanic and Atmospheric Administration [NOAA], 2023)

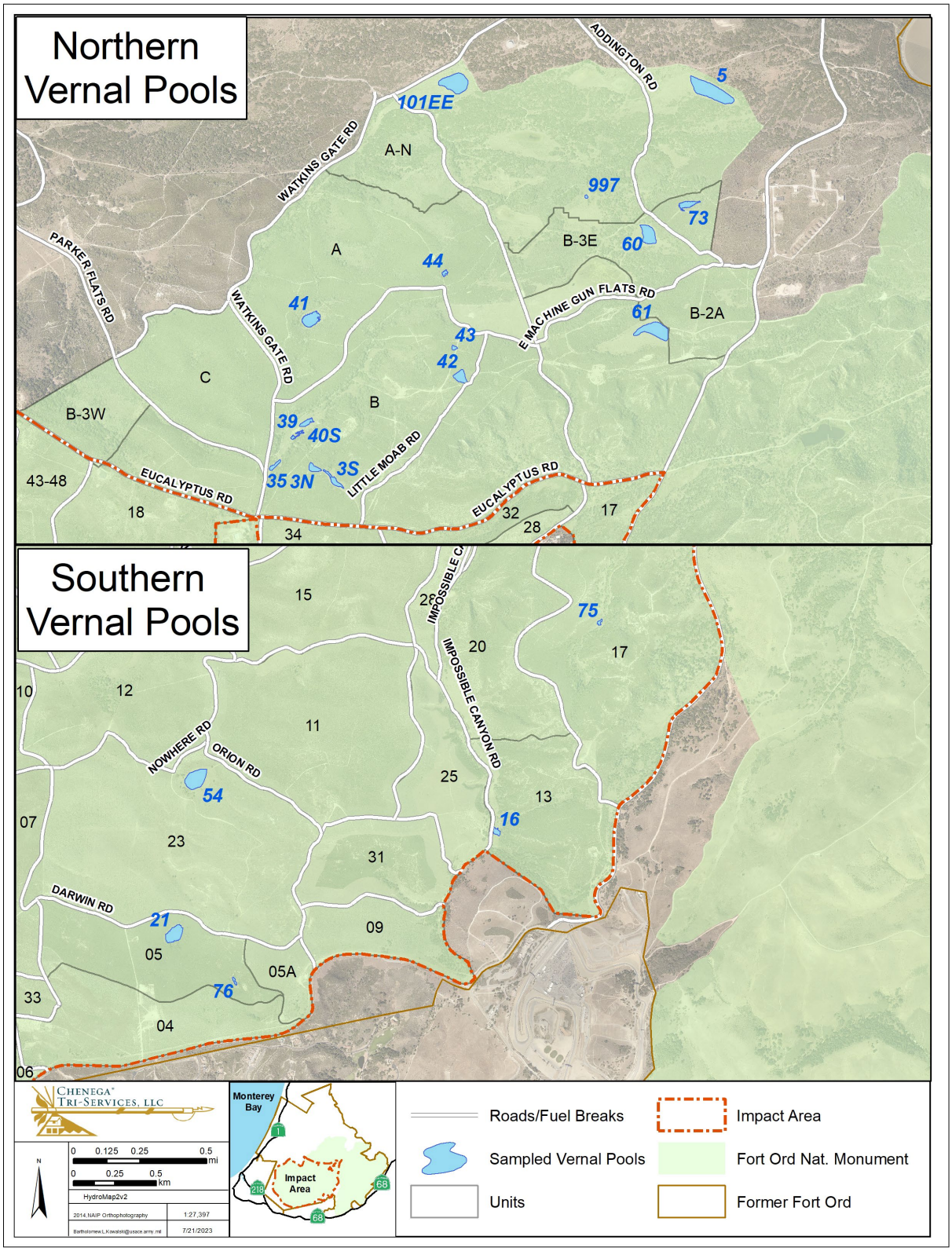

Figure 2-4. Location Map of Ponds 5, 101 East (East), 997, 75, 21, 76, 3 North, 3 South, 16, 35, 39, 40 South, 41, 42, 43, 44, 54, 60, 61, 73.

3 METHODS

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

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

In 2015, vegetation within watershed of Pond 54 was masticated. In 2016, vegetation within watershed and basin of Pond 16 was masticated. In 2017, vegetation within watersheds of Ponds 35, 42, 44, 60, 61, and 73 was masticated. In the same year, vegetation within watersheds of Ponds 3 North, 3 South, 39, 40 South, 42, and 43 was burned. In 2018, Ponds 3 North, 3 South, 16, 35, 39, 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 (Kemron, 2020a). Subsurface munitions remediation was also conducted in Pond 54 in early 2019 as part of subsurface investigation of large anomalies in Unit 23 (Kemron, 2020b). In late 2021, vegetation within watersheds of Ponds 21 and 76 was masticated as part of Unit 5 munitions remediation, and in 2022 subsurface munitions remediation was conducted within the basin of Pond 21 (Kemron, 2023). Due to its small size, Pond 76 was identified after mastication of Unit 5, and baseline data were not collected at that vernal pool. Pond 76 will be investigated for presence of potential munitions items using digital geophysical mapping, and based on the results of the investigation a decision will be made whether subsurface munitions remediation is necessary at that vernal pool.

In 2023 water year, Pond 75 was monitored for baseline, Pond 21 was monitored for Year 1 post-mastication, Pond 21 was monitored for Year 1 post-mastication and post-subsurface munitions remediation, and ponds 3 North, 3 South, 16, 35, 39, 40 South, 41, 42, 43 , 44, 54, 60, 61 West, 61 East, and 73 were monitored for Year 5 post-subsurface munitions remediation. A summary of monitored ponds and their monitoring status is presented in Table 1-1.

3.1 Hydrology Monitoring

Vernal pools were surveyed approximately once a month and in some instances additional monitoring was conducted. Depth measurements at some of the vernal pools were also recorded opportunistically

while conducting other field activities. Gauge depth readings were taken during all visits, while area of inundation was measured approximately once per month. When vernal pools were deep enough, water quality metrics of pH, turbidity, temperature, dissolved oxygen, and conductivity were measured at the same time as inundation area. Although conductivity is not a required water quality parameter per wetland plan and PBO, it was recorded since it was one of the default metrics measured by the water quality probe, but data available for comparison is from 2020 water year only. Water quality data were collected using a YSI Pro-DSS Multi-parameter Meter. The meter was calibrated once a month prior to each data collection event. Monitoring ceased at the beginning of June or when vernal pools became completely dry, whichever came first. These sampling methods are consistent with the PBO (USFWS, 2017) and the Wetland Plan (Burleson, 2006). Water quality data were collected at mid-pool and mid-depth in all vernal pools with the exception of Ponds 54, 75, and 76, where measurements were taken from the edge of the pond due to MEC safety concerns. 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 2023 were deemed safe to enter by the Base Realignment and Closure (BRAC) office except for ponds 21, 54, 75, and 76, which were accessed with a UXO escort (Kemron, 2020).

During water quality surveys care was taken to ensure the probe was completely submerged in water, and when that wasn't possible due to insufficient depth of water in the vernal pool, this was noted. The pH, temperature, turbidity, dissolved oxygen, and conductivity were logged and recorded on the field data sheet. Temperature, turbidity, dissolved oxygen, and conductivity were recorded in degrees Celsius (°C), formazin nephelometric units (FNU), milligrams per liter (mg/L), and Microsiemens per centimeter (µS/cm), respectively. 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. Turbidity measures the amount of suspended sediment in the water column by measuring the degree of scattered light by suspended particles. Three turbidity readings prior to 2016 had been recorded in nephelometric turbidity units (NTU), which are collected with a probe with a white light source, while turbidity measurements made with probes with an infrared light are recorded with formazin nephelometric units (FNU). These units are nor directly comparable since suspended particles scatter light of different wavelengths with varying efficiency (USGS, 2023), thus historical turbidity measurements recorded in NTU units were excluded from comparison analysis.

Inundated surface area was recorded with a Trimble® Geoexplorer 6000 ® GPS unit. The perimeter only included ponded areas that had surface hydrological connectivity to the ponded area at the staff gauge. Peripheral ponding was observed and documented but was not mapped. Areas were calculated from the resultant shape files using ArcGIS (Esri, 2018) in acres (ac). Depths of vernal pools were recorded from the installed staff gauges in centimeters (cm). 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 Monterey Peninsula Regional Airport (MPRA) meteorological tower, approximately 2 miles southwest of Site 39 on former Fort Ord, through the National Centers for Environmental Information portal (NDC NOAA, 2023). Normal rainfall was based on a 30-year average that at the end of each decade is moved forward another 10 years. Normal for the MPRA tower is defined as the mean precipitation from years 1991-2020.

3.2 Evaluation for Data Quality Objectives and Success Criteria

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

- DQO 1: depth – average of 25 cm through March for CTS and average of at least 10 cm through May for fairy shrimp
- DQO 2: inundation – consistent with baseline and similar to reference vernal pool trends
- DQO 3: vegetation – similar hydrophytic vegetation as reference control wetlands
- DQO 4: water quality – adequate for the presence of CTS and/or fairy shrimp
- DQO 5: wildlife – consistent with baseline and similar to reference control wetland trends

This report focuses on hydrological conditions and inundation area performance standard, which was assessed using DQO 1 and DQO 2. The performance standard was assessed by evaluating if the vernal pools held a sufficient average depth of water appropriate for CTS and fairy shrimp for the duration of the breeding season, and if inundation of the vernal pools was consistent with observed inundation trends during baseline years and at reference vernal pools, given the precipitation volume and frequency. DQO 1 was also used to assess wildlife usage performance standard. Suitable CTS habitat was defined at a vernal pool if it retains an average depth of at least 25 cm from the first rain event through March (Burleson, 2006). Suitable fairy shrimp habitat was defined at a vernal pool if it 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 will be analyzed in a separate report.

The following nomenclature was used to evaluate DQOs at specific vernal pools:

- Suitable for comparison – used only for reference vernal pools or vernal pools in baseline monitoring year, this term indicates that the data collected is adequate and sufficient for comparison and evaluation of the data from the remediated vernal pools for a specific DQO
- On track – the data collected satisfied the DQO requirements in the monitoring year
- Partially on track - the data collected partially satisfied the DQO requirements in the monitoring year. This term is used in cases where a specific DQO was satisfied for just one species (CTS or fairy shrimp).
- Not on track - the data collected did not satisfy the DQO requirements in the monitoring year
- Cannot assess – this indicates the data was not collected or was insufficient to make a determination whether DQO requirements were satisfied
- Met – used to indicate the vernal pool met the DQO requirements upon evaluation of all required monitoring data against baseline data and/or data from reference vernal pools. It is not necessary that a vernal pool is “on track” in every monitoring year for it to have “met” the DQO at the end of the monitoring period. Used only after completions of the final year of monitoring.
- Partially met - used after the final year of monitoring to indicate the vernal pool met some of the DQO requirements when all monitoring data were evaluated against baseline data and/or

data from reference vernal pools. This term is used in cases where a spefic DQO was met for just one species (CTS or fairy shrimp).

- Not met - used after the final year of monitoring to indicate a vernal pool did not meet the DQO requirements when all monitoring data were evaluated against baseline data and/or data from reference vernal pools

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

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

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

For Ponds 3 North, 3 South, 16, 35, 39, 40 South, 41, 42, 43, 44, 54, 60, 61, and 73, which were in their last required year of monitoring following subsurface munitions remediation, assessment of performance standards was made across all the post-remediation monitoring years and by comparison to baseline data and the reference vernal pools. In a few cases (Ponds 35, 43, 44, and 61) interpretation of successful meeting of performance standars for fairy shrimp was changed from those reported for the 2019 water year (Burleson, 2020). Even though the requirement for average pond depth of 10 cm for 18 consecutive days was met for Ponds 35, 43, 44, and 61 in 2019 water year, the vernal pools dried out by May of that year and were interpreted as not meeting DQO 1 for fairy shrimp. The difference stems from literal interpretation of text in Table 2 of the Wetland Plan which references Sutter and Francisco (1998): “If (the vernal pool) doesn’t hold at least 10 cm of water through May it is not good linderiella habitat”. However, the text in the body of the Wetland Plan later states: California linderiella can survive in shallower ponds with an average depth of 10 cm and duration of 18 days”, and the Figure 2 in Sutter and Francisco (1998) also points to 18 days as an average duration of ponding. Thus, the suitable habitat for fairy shrimp was intended to mean 18 consecutive days of inundation, which can occur anytime from initial inundation trough May, but does not require the vernal pool to stay inundated through May. While shorter than the minimum reported period of reproduction, this interpretation is more representative of the short maturation periods of fairy shrimp (Helm, 1998).

Historical 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. Water quality results and inundarion area are presented by month in Appendix A. A historic outline of inundation and water quality compared to the precipitation year is provided in Appendix B. Site photos of each vernal pool collected at the established photo points are presented in Appendix C.

4 RESULTS

Hydrology surveys were conducted approximately once per month from December through June when water was present. Measurable ponding was observed in all vernal pools monitored in 2023 water year. As a result of well above normal cumulative precipitation in 2023 water year (Figure 2-2), several vernal pools still held water at a time of the last monitoring event in June (Ponds 5, 101 East East, 3 North, 16, 21, 41, 54, and 60). Remaining vernal pools were inundated between December and June.

Observed water quality measurements were similar to previous years. Typically, pH of vernal pools on former Fort Ord tends to be slightly acidic but can range to slightly alkaline. The mean pH value for all vernal pools was 6.72. 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. Mean value for temperature across all vernal pools was 14.04 °C. Turbidity can be highly variable with amount and frequency of precipitation likely having a large effect, and its mean value for all vernal pools was 33.46 FNU. 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, and its mean value for all vernal pools was 6.61 milligrams per liter (mg/L). Mean conductivity for all vernal pools was 586.87 (µs/cm).

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 six times during the 2023 water year and water quality parameters were measured five times. Pond 5 was inundated from mid-December to May 11th when the last monitoring event occured (Table 4-1 and Figure 4-1).

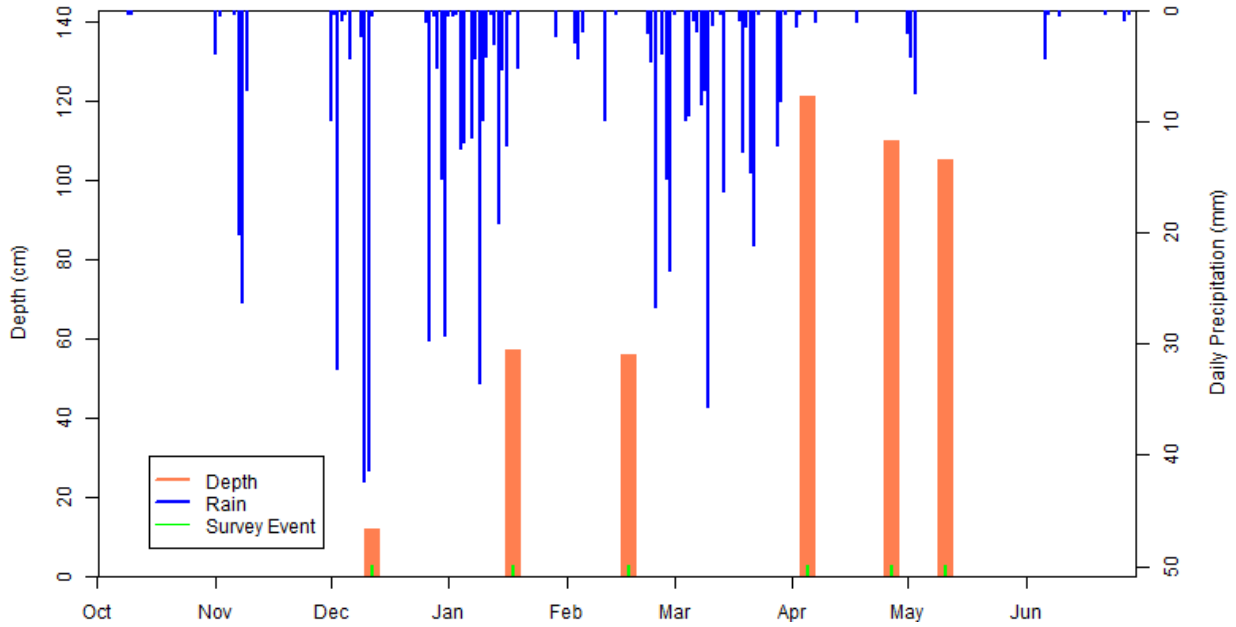

Figure 4-1. Pond 5 (Reference) Depth and Precipitation on Former Fort Ord, 2023

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)**
2022-12-12^	NS	10	NS	NS	NS	NS	NS
2023-01-18	4.8949	55	5.36	11.9	3.48	6.40	169.7
2023-02-17	4.6222	54	6.48	8.5	2.08	6.69	201.8
2023-04-05	7.3529	119	6.38	14.3	2.26	6.91	167.3
2023-04-27	6.3024	108	5.01	18.5	1.00	6.99	195.5
2023-05-11	6.1122	103	4.80	17.9	2.96	7.08	209.4

NS = Not Surveyed

^Peripheral inundation present

4.2 Pond 101 East (East)

Pond 101 East (East) is a reference vernal pool that was monitored as a control for comparison to the remediated vernal pools. Depth of Pond 101 East (East) was monitored seven times during the 2023 water year and water quality parameters were measured five times. Pond 101 East (East) was inundated from mid-December to June 16th when the last monitoring event occurred (Figure 4-2 and Table 4-2).

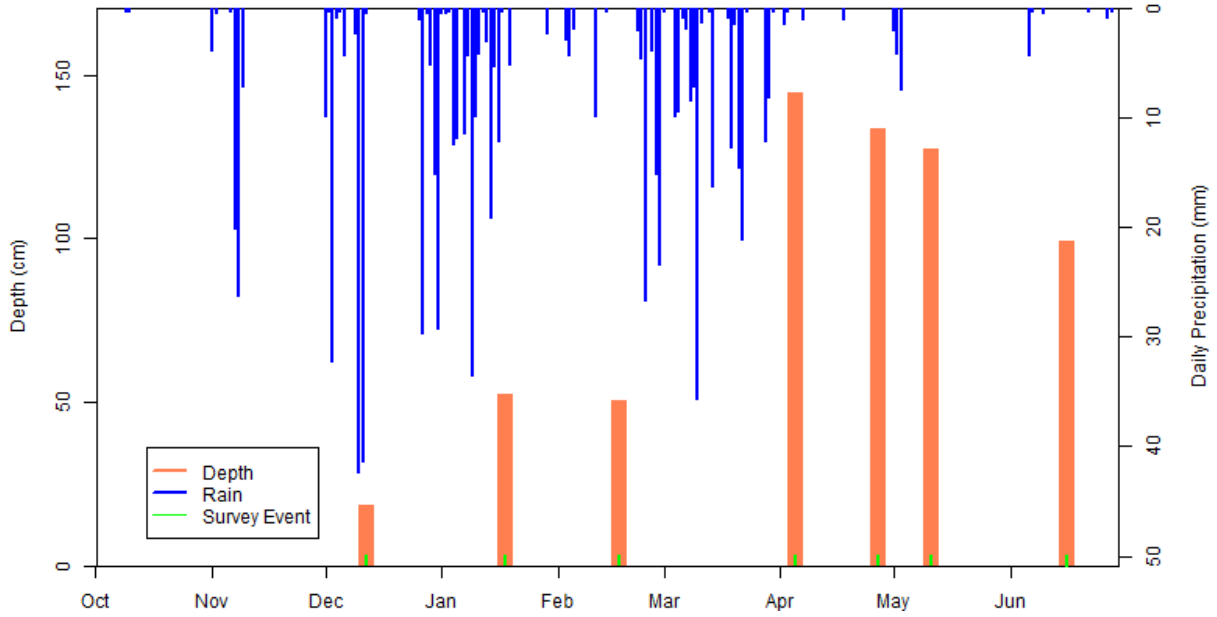

Figure 4-2. Pond 101 East (East) (Reference) Depth and Precipitation on Former Fort Ord, 2023

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

Pond 101EE							
Date	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
2022-12-12^	NS	16	NS	NS	NS	NS	NS
2023-01-18	2.8555	50	7.17	10.06	3.91	6.68	167.6
2023-02-17	2.6451	48	4.61	6.5	2.8	6.52	191.5
2023-04-05~	8.2233	142	4.05	14.3	2.83	6.76	174.6
2023-04-27	5.9252	131	3.08	18.2	3.59	6.95	204.9
2023-05-11	5.6507	125	2.12	16.9	5.23	6.74	218.6
2023-06-16	NS	97	NS	NS	NS	NS	NS

NS = Not Surveyed

^Peripheral inundation present, ~ Hydrologically connected to Pond 101 East (West)

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 five times during the 2023 water year, and water quality parameters were measured three times. Pond 997 was inundated from mid-January, although peripheral inundation was present in December, and it was dry on April 27th (Table 4-3 and Figure 4-3).

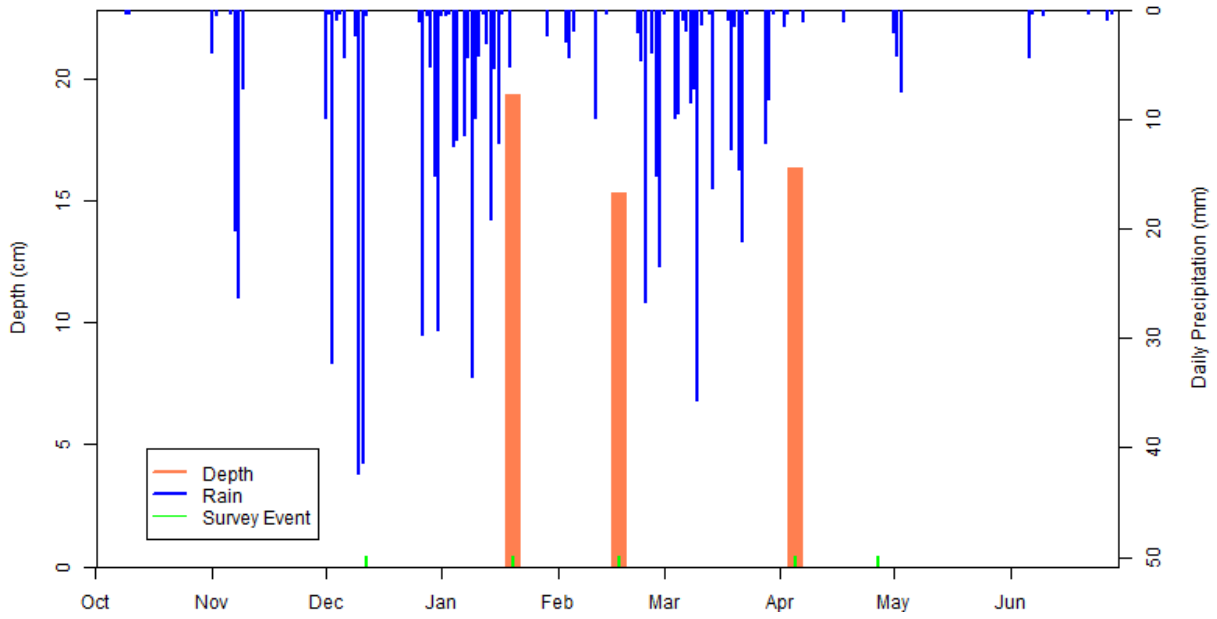

Figure 4-3. Pond 997 (Reference) Depth and Precipitation on Former Fort Ord, 2023

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)**
2022-12-12^	0	0					
2023-01-20	0.4414	19	10.56	9.2	3.03	6.16	140.0
2023-02-17§	0.1101	15	12.58	13.4	5.30	6.60	277.8
2023-04-05	0.5843	16	12.25	22.8	7.63	6.57	176.6
2023-04-27^	0	0					

^Peripheral inundation present

§Probe not fully submerged

4.4 Pond 75

Pond 75 was in baseline monitoring in 2023. While only two years of baseline monitoring are required, previous monitoring efforts took place during below normal water years and the vernal pool was dry in both years (Chenega 2021, 2022). Depth of Pond 75 was monitored once during the 2023 water year as were water quality parameters. (Figure 4-4 and Table 4-4).

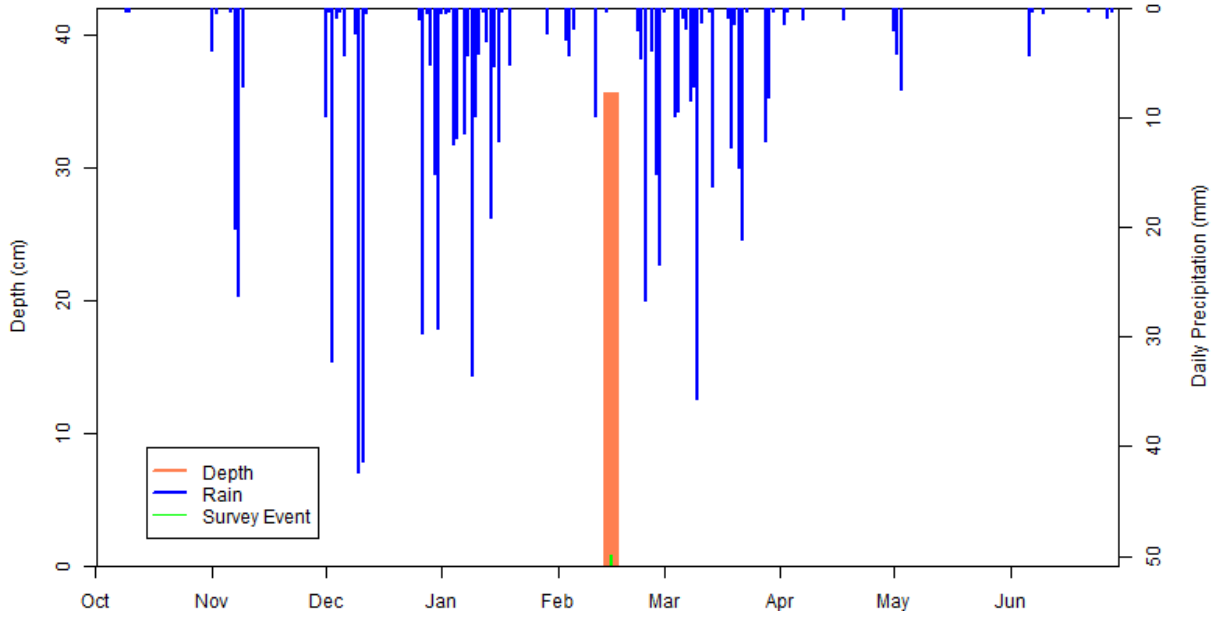

Figure 4-4. Pond 75 (Baseline) Depth and Precipitation on Former Fort Ord, 2023

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

Pond 75							
Date	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
2023-02-15[§]	0.1998	35	1.83	8	217.22	6.44	411.5

[§]Probe not fully submerged, readings taken from the edge of pond

4.5 Pond 76

Pond 76, a post-mastication remediation vernal pool, was in Year 1 of monitoring in 2023. Depth of Pond 76 was approximated as no gauge was installed in the vernal pool due to ongoing munitions cleanup activities. It was monitored five times during the 2023 water year and water quality parameters were measured four times. Pond 76 was inundated from mid-January through April and it was dry on June 9th when the last monitoring event occured (Figure 4-5 and Table 4-5).

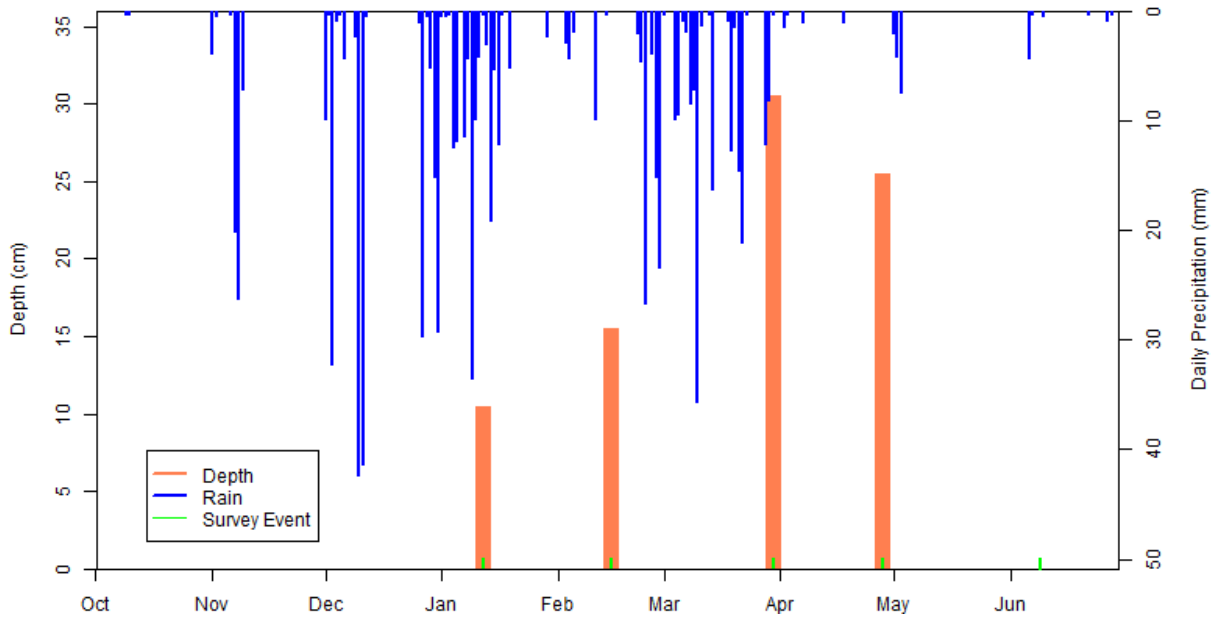

Figure 4-5. Pond 76 (Year 5 Post-mastication) Depth and Precipitation on Former Fort Ord, 2023

Table 4-5. Pond 76 (Year 5 Post-mastication) Hydrology Monitoring Results

Pond 76							
Date	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
2023-01-12§	NS	10	7.51	12.2	86.45	5.95	99.0
2023-02-15^	0.1049	15	9.96	6.9	27.09	7.13	147.0
2023-03-30	0.221	30	4.37	9.9	71.39	6.67	175.6
2023-04-28§	0.1807	25	6.70	18.0	22.16	6.77	234.5
2023-06-09	0	0					

NS = Not Surveyed

^Peripheral inundation present

§Probe not fully submerged

4.6 Pond 21

Pond 21, a post-mastication remediation vernal pool, was in Year 1 of monitoring in 2023. Depth of Pond 21 was monitored seven times during the 2023 water year. Pond 21 was inundated from mid-January to beginning of June when the last monitoring event occurred. Water quality parameters were measured five times (Figure 4-6 and Table 4-6).

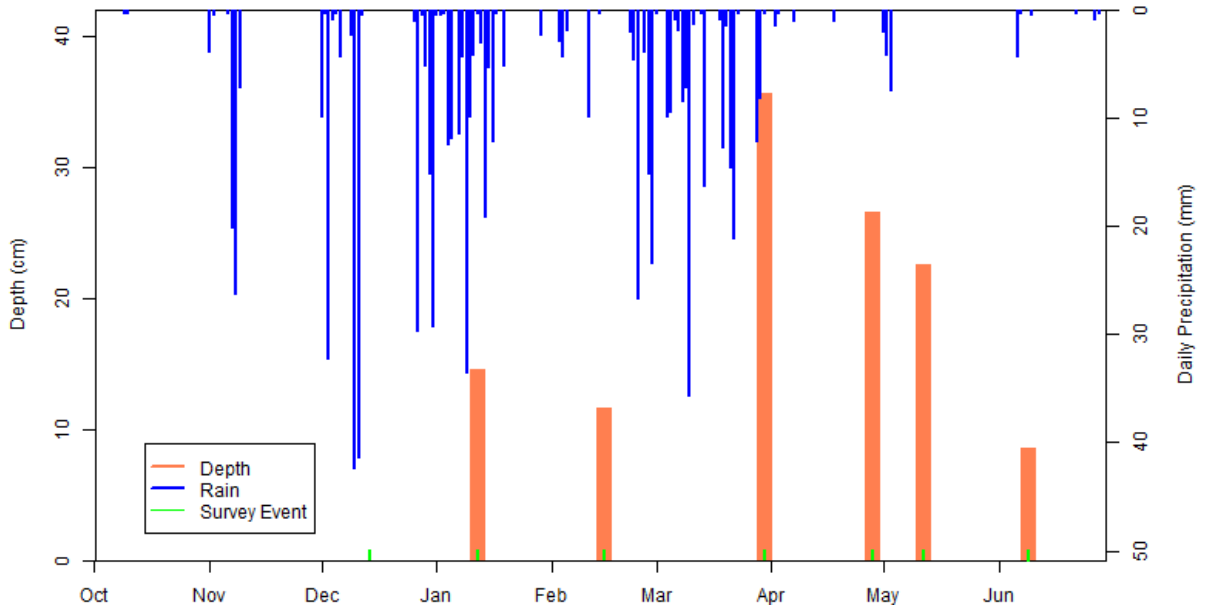

Figure 4-6. Pond 21 (Year 5 Post-mastication) Depth and Precipitation on Former Fort Ord, 202

Table 4-6. Pond 21 (Year 1 Post-mastication and Post-subsurface remediation) Hydrology Monitoring Results

Pond 21							
Date	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
2022-12-14	0	0					
2023-01-12	0.8313	14	6.44	12.8	8.48	6.44	95.4
2023-02-15^	0.8153	11	11.34	10.7	36.23	6.56	157.3
2023-03-30	0.9961	35	8.21	10.8	62.26	6.22	308.5
2023-04-28	0.9342	26	10.24	22.4	101.53	6.63	363.4
2023-05-12	0.8935	22	7.06	15.5	55.06	5.93	357.9
2023-06-09	0.7156	8	NS	NS	NS	NS	NS

NS = Not Surveyed

^Peripheral inundation present

4.7 Pond 3 North

Pond 3 North was in Year 5 for post-subsurface munitions remediation in 2023. Depth of Pond 3 North was monitored seven times and water quality parameters were measured five times. Pond 3 North was inundated from mid-December to June 16th when the last monitoring event occured (Figure 4-7 and Table 4-7). In March, Pond 3 North was hydrologically connected to Pond 3 South.

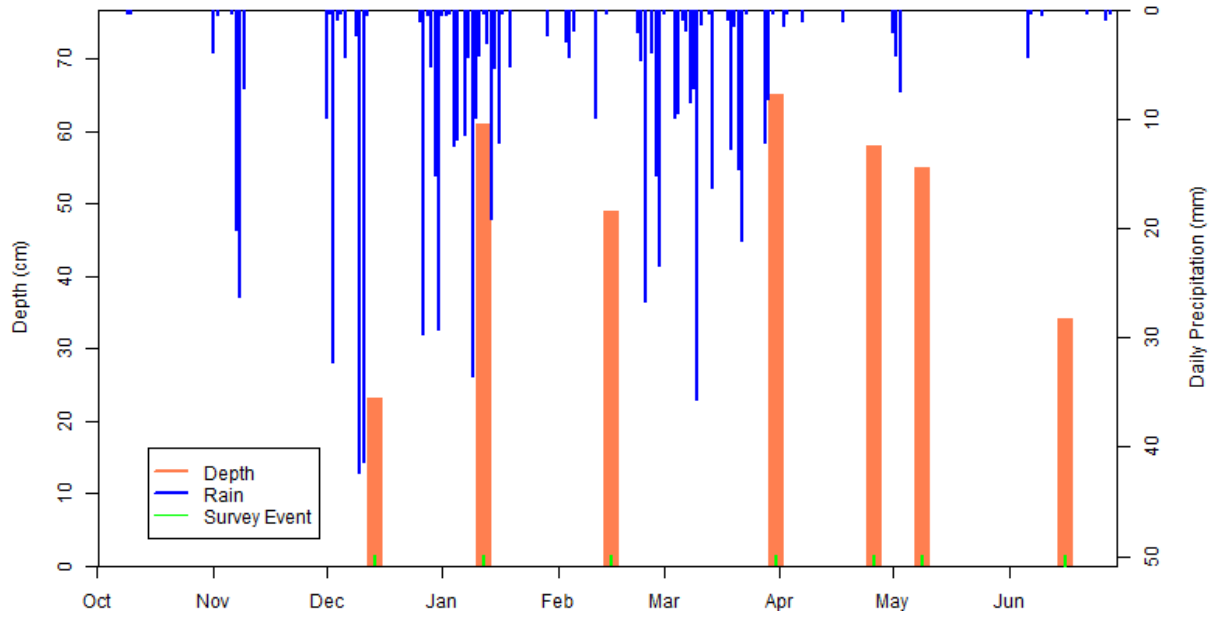

Figure 4-7. Pond 3 North (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2023

Table 4-7. Pond 3 North (Year 5 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)**
2022-12-14^	NS	22	NS	NS	NS	NS	NS
2023-01-12^	0.4097	60	5.71	13.4	40.99	6.57	137.7
2023-02-15^	0.1275	48	9.17	10.4	7.1	6.97	188.4
2023-03-31~	1.3397	64	6.17	11.9	32.95	6.72	317.8
2023-04-26	0.2683	57	4.8	16.5	5.29	6.58	463.1
2023-05-09	0.1596	54	4.39	16.5	2.39	6.41	497.9
2023-06-16	0.0616	33	NS	NS	NS	NS	NS

NS = Not Surveyed

^Peripheral inundation present, ~ Hydrologically connected to Pond 3 South

4.8 Pond 3 South

Pond 3 South was in Year 5 for post-subsurface munitions remediation in 2023. Depth of Pond 3 South was monitored seven times and water quality parameters were measured five times. Pond 3 South was inundated from to mid-December through May, and it was dry on June 16th (Figure 4-8 and Table 4-8). In March, Pond 3 South was hydrologically connected to Pond 3 North.

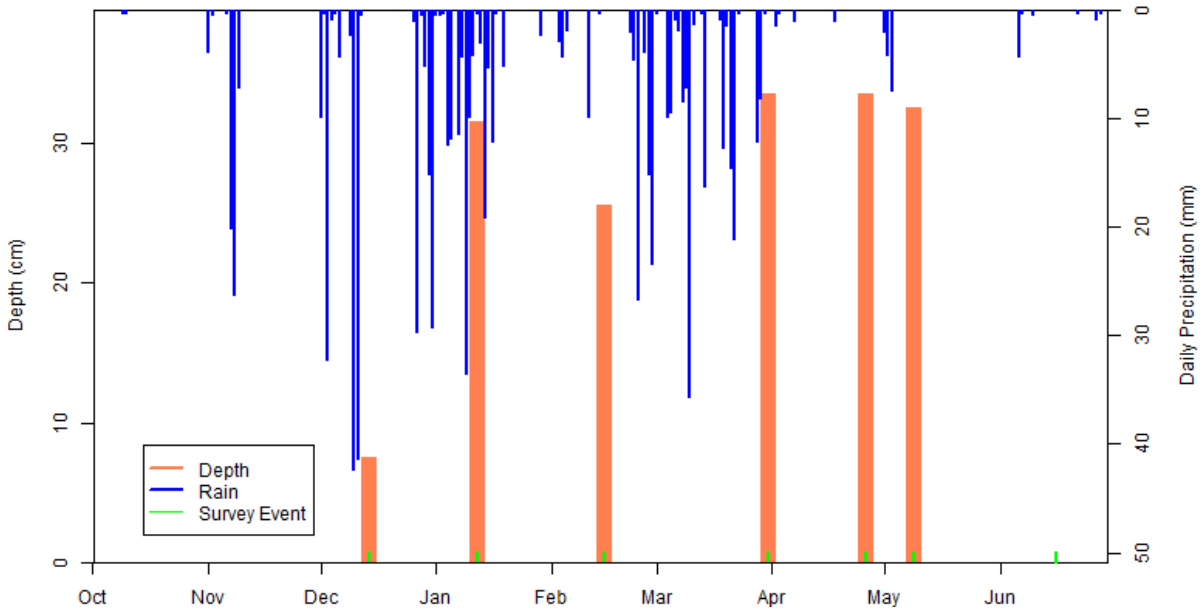

Figure 4-8. Pond 3 South (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation Former Fort Ord, 2023

Table 4-8. Pond 3 South (Year 5 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)**
2022-12-14^	NS	7	NS	NS	NS	NS	NS
2023-01-12^	0.5273	31	7.14	13.5	51.11	6.34	272.4
2023-02-15^	0.4164	25	14.18	12.6	12.38	7.69	371.9
2023-03-31~	1.3397	33	10.31	11.2	4.75	6.44	341.1
2023-04-26	0.6463	33	8.52	17.1	34.17	6.73	472.5
2023-05-09	0.5418	32	9.66	17.4	17.38	6.6	488.9
2023-06-16	0	0					

NS = Not Surveyed

^Peripheral inundation present, ~ Hydrologically connected to Pond 3 North

4.9 Pond 16

Pond 16 was in Year 5 for post-subsurface munitions remediation in 2023. Depth of Pond 16 was monitored seven times and water quality parameters were measured five times. Pond 16 was inundated from mid-January to mid-June when the last monitoring event occurred (Figure 4-9 and Table 4-9).

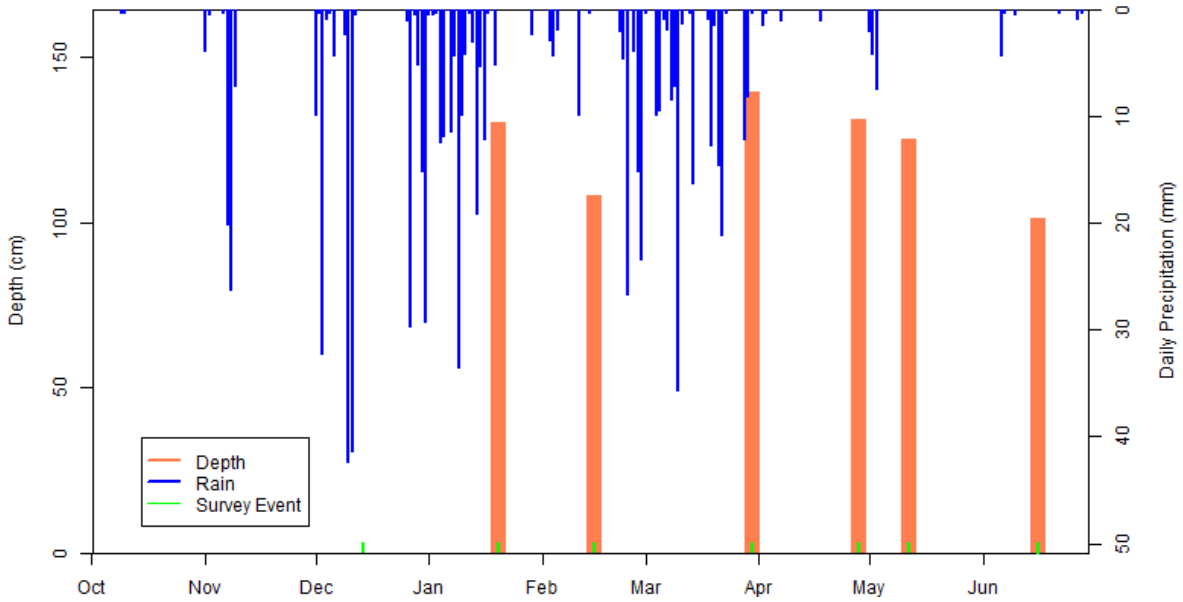

Figure 4-9. Pond 16 (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2023

Table 4-9. Pond 16 (Year 5 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)**
2022-12-14^	0	0					
2023-01-20	0.7186	128	2.42	7.2	326.7	6.21	249.3
2023-02-15	0.6183	106	1.21	6.7	187.4	6.53	303.6
2023-03-30	0.8795	137	2.81	9.2	387.74	6.64	250
2023-04-28	0.728	129	0.28	12.6	130.16	6.77	356.6
2023-05-12	0.7035	123	0.69	14.3	94.23	6.78	395.4
2023-06-16	0.5949	99	NS	NS	NS	NS	NS

NS = Not Surveyed

^Peripheral inundation present

4.10 Pond 35

Pond 35 was in Year 5 of monitoring for post-subsurface munitions remediation in 2023. Depth of Pond 35 was monitored nine times and measurements of the water quality parameters were taken twice. Pond 35 was briefly inundated in January, dried out, and became inundated again from beginning of March to beginning of April (Figure 4-10 and Table 4-10). In March, Pond 35 was hydrologically connected to Pond 39.

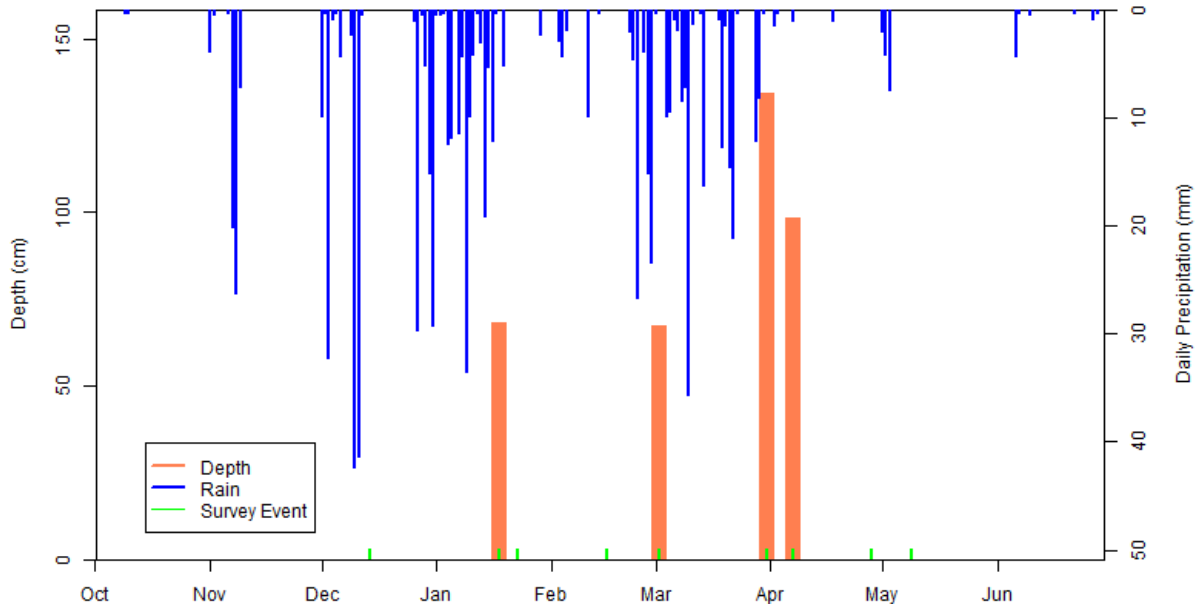

Figure 4-10. Pond 35 (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2023.

Table 4-10. Pond 35 (Year 5 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)**
2022-12-14	0	0					
2023-01-18	0.3802	66	8.39	6.6	37.94	6.86	142.2
2023-01-23	0	0					
2023-02-16	0	0					
2023-03-02	NS	65	NS	NS	NS	NS	NS
2023-03-31*~	2.9714	132	5.08	11.5	11.48	6.91	219.4
2023-04-07	NS	96	NS	NS	NS	NS	NS
2023-04-28	0	0					
2023-05-09	0	0					

NS = Not Surveyed, * Depth greater than specifed, water level above gauge, ~ Hydrologically connected to Pond 39

4.11 Pond 39

Pond 39 was in Year 5 of post-subsurface munitions remediation in 2023. Depth of Pond 39 was monitored six times and water quality parameters were measured five times. Pond 39 was inundated from mid-December to May 9th when the last monitoring event occurred (Figure 4-11 and Table 4-11). In March, Pond 39 was hydrologically connected to Ponds 35 and 40 South.

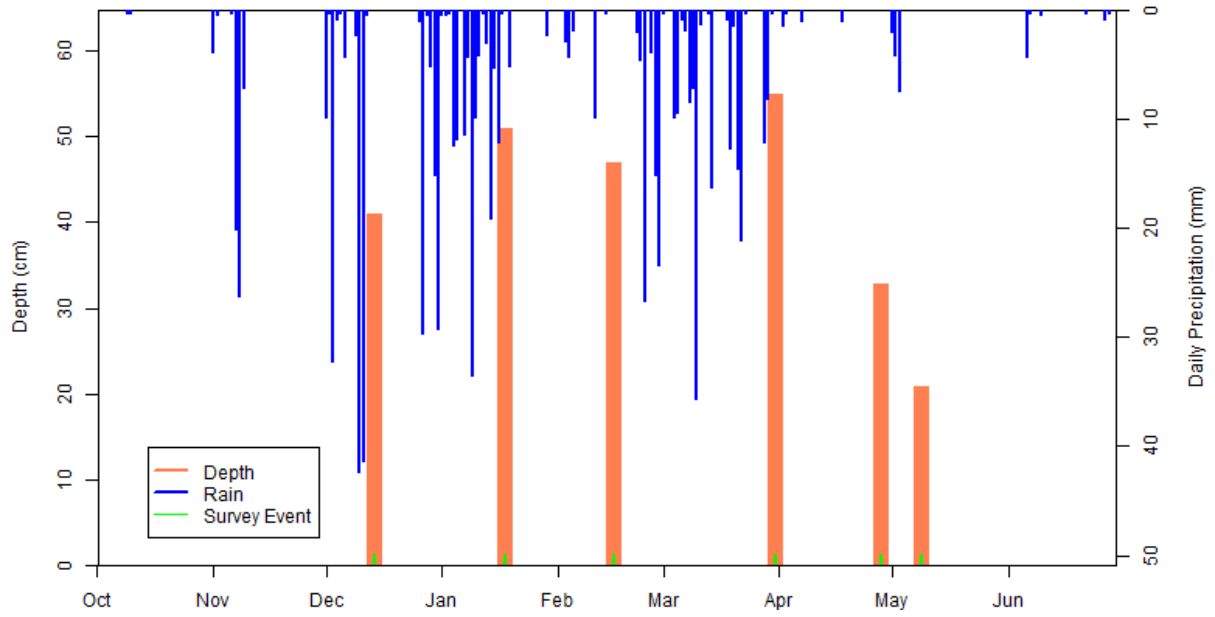

Figure 4-11. Pond 39 (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2023

Table 4-11. Pond 39 (Year 5 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)**
2022-12-14^	NS	40	NS	NS	NS	NS	NS
2023-01-18^	0.6305	50	5.53	7	33.18	6.43	113
2023-02-16^	0.0694	46	7.61	7.6	47.18	6.7	110.2
2023-03-31~	2.9714	54	9.28	12.2	18.19	6.87	238
2023-04-28	0.005	32	9.02	21.7	13.43	6.81	325.1
2023-05-09	0.002	20	3.45	17.2	8.65	6.55	333.5

NS = Not Surveyed

^Peripheral inundation present, ~ Hydrologically connected to Pond 35 and Pond 40 South

4.12 Pond 40 South

Pond 40 South was in Year 5 of post-subsurface munitions remediation in 2023. Depth of Pond 40 South was monitored seven times and measurements of the water quality parameters were taken three times. Pond 40 South was inundated from mid-January through April (Figure 4-12 and Table 4-12). In March, Pond 40 South was hydrologically connected to Pond 39.

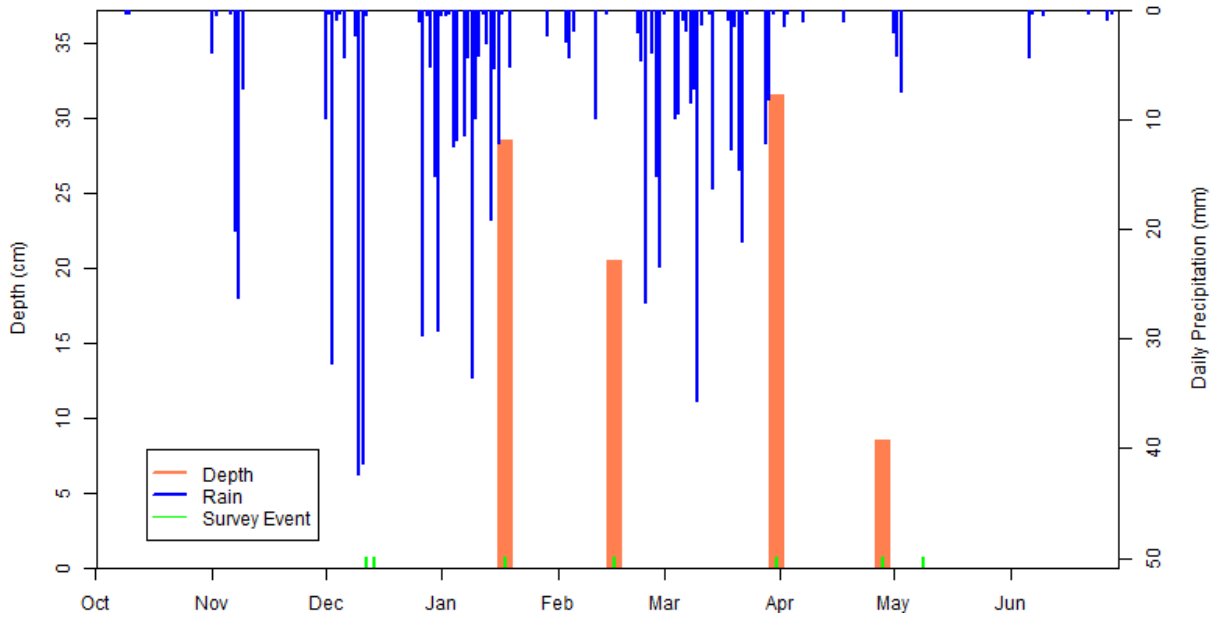

Figure 4-12. Pond 40 South (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2023

Table 4-12. Pond 40 South (Year 5 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)**
2022-12-12	0	0					
2022-12-14^	0	0					
2023-01-18^	NS	28	2.94	7.7	51.93	6.11	168.5
2023-02-16^	0.0651	20	6.1	7.8	4.51	7.02	272.4
2023-03-31~	2.9714	31	11.48	11.6	9.32	7.05	261.1
2023-04-28#	0.0069	8	NS	NS	NS	NS	NS
2023-05-09	0	0					

NS = Not Surveyed

^Peripheral inundation present, ~ Hydrologically connected to Pond 39

#Pond too shallow for water quality probe

4.13 Pond 41

Pond 41, a post-subsurface munitions remediation vernal pool, was in Year 5 of monitoring in 2023. Depth of Pond 41 was monitored seven times during the 2023 water year, and measurements of the water quality parameters were taken five times. Pond 41 was inundated from mid-January to June 16th when the last monitoring event occurred (Figure 4-13 and Tabe 4-13).

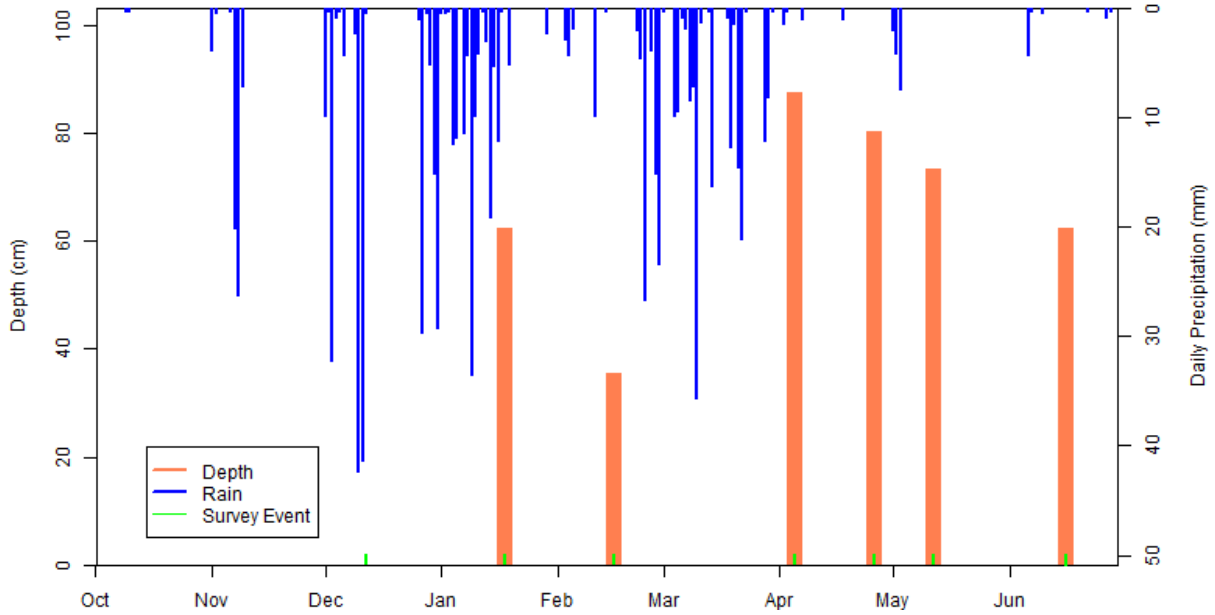

Figure 4-13. Pond 41 (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2023

Tabe 4-13. Pond 41 (Year 5 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)
2022-12-12^	0	0					
2023-01-18	1.3925	61	7.52	9.7	3.04	6.65	97.9
2023-02-16^	1.3806	34	12.5	11.8	9.98	6.83	115.4
2023-04-05	1.73	86	7.62	12.1	2.86	6.49	113.3
2023-04-26	1.6331	79	6.47	17.0	1.42	6.48	126.5
2023-05-12	1.5176	72	5.16	16.7	2.76	6.33	131.7
2023-06-16	1.2444	61	NS	NS	NS	NS	NS

NS = Not Surveyed

^Peripheral inundation present

4.14 Pond 42

Pond 42 was in Year 5 for post-subsurface munitions remediation in 2023. Depth of Pond 42 was monitored five times and water quality parameters were measured four times. Pond 42 was inundated from mid-December through April 26th, when the last monitoring event occured (Figure 4-14 and Table 4-14).

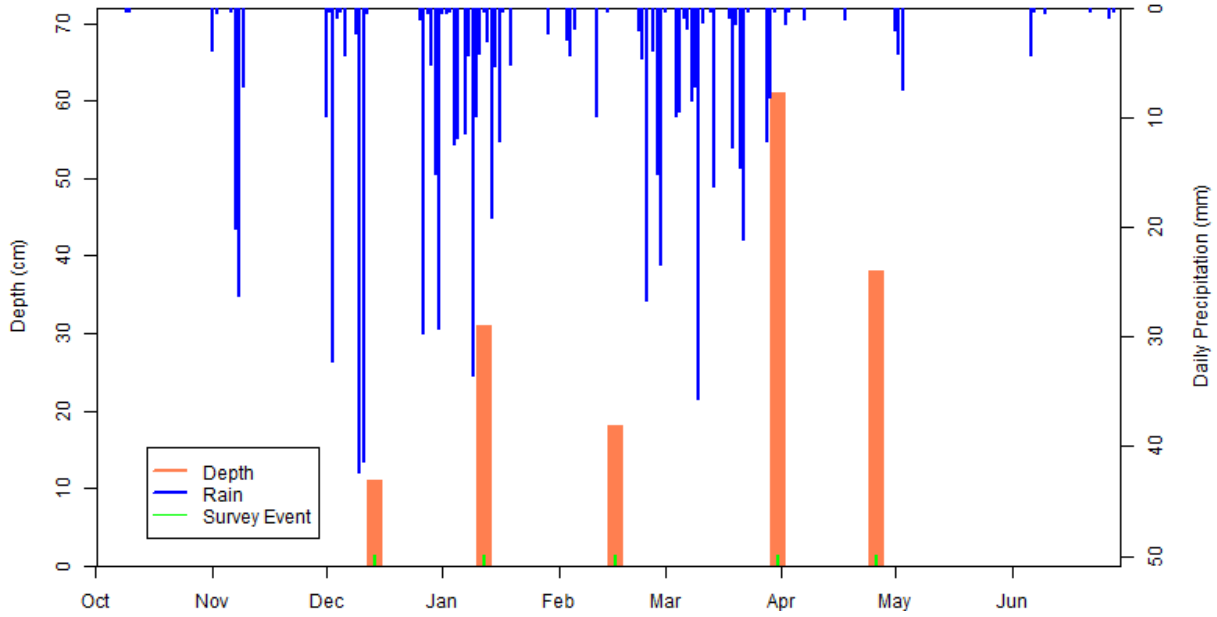

Figure 4-14. Pond 42 (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2023

Table 4-14. Pond 42 (Year 5 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)**
2022-12-14^	NS	10	NS	NS	NS	NS	NS
2023-01-12^	0.3035	30	11.07	14	10.15	6.85	85.8
2023-02-16^§	0.099	17	14.73	11.4	31.32	6.95	90.5
2023-03-31	0.5312	60	10.59	13.5	1.98	7.35	100.2
2023-04-26	0.3632	37	9.01	18.5	1.95	6.98	130.9

NS = Not Surveyed

^Peripheral inundation present

§Probe not fully submerged

4.15 Pond 43

Pond 43 was in Year 5 of post-subsurface munitions remediation in 2023. Depth of Pond 43 was monitored five times and measurements of the water quality parameters were taken three times. Pond 43 was inundated from mid-January through March, and it was dry by April 26th (Figure 4-15 and Table 4-15).

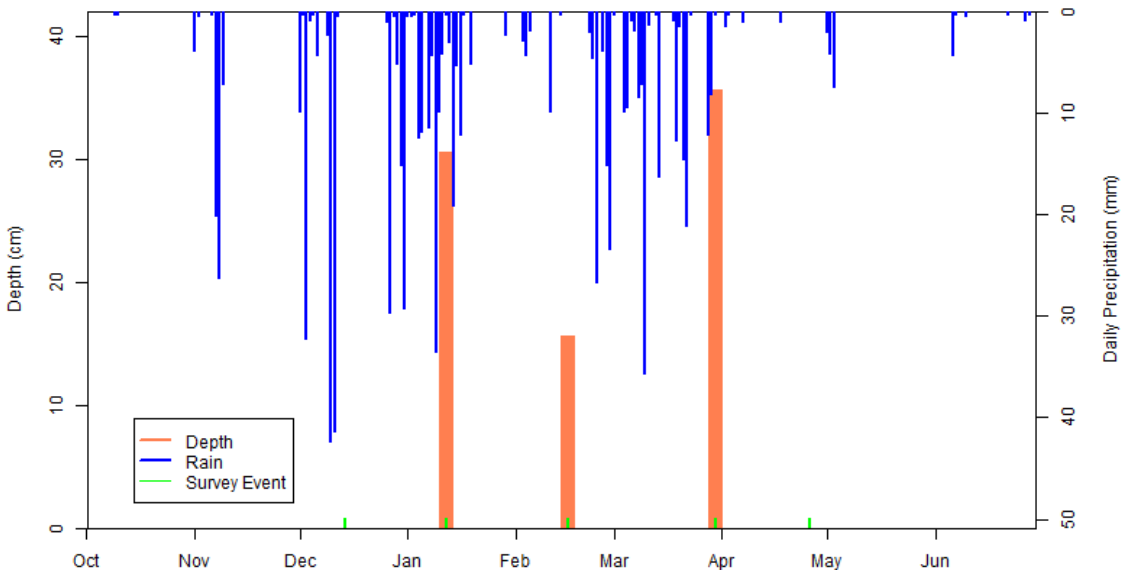

Figure 4-15. Pond 43 (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2023

Table 4-15. Pond 43 (Year 5 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)**
2022-12-14	0	0					
2023-01-12	0.0544	30	8.71	15	10.99	7.48	123.3
2023-02-16^§	0.0109	15	14.61	13.3	156.26	8.34	137.6
2023-03-30	0.0881	35	11.18	19.9	2.27	7.99	158.9
2023-04-26	0	0					

^Peripheral inundation present

§Probe not fully submerged

4.16 Pond 44

Pond 44 was in Year 5 of monitoring for post-subsurface munitions remediation in 2023. Depth of Pond 44 was monitored five times and measurements of the water quality parameters were taken three times. Pond 44 was inundated from mid-December through March, and it was dry by the end of April (Figure 4-16 and Table 4-16).

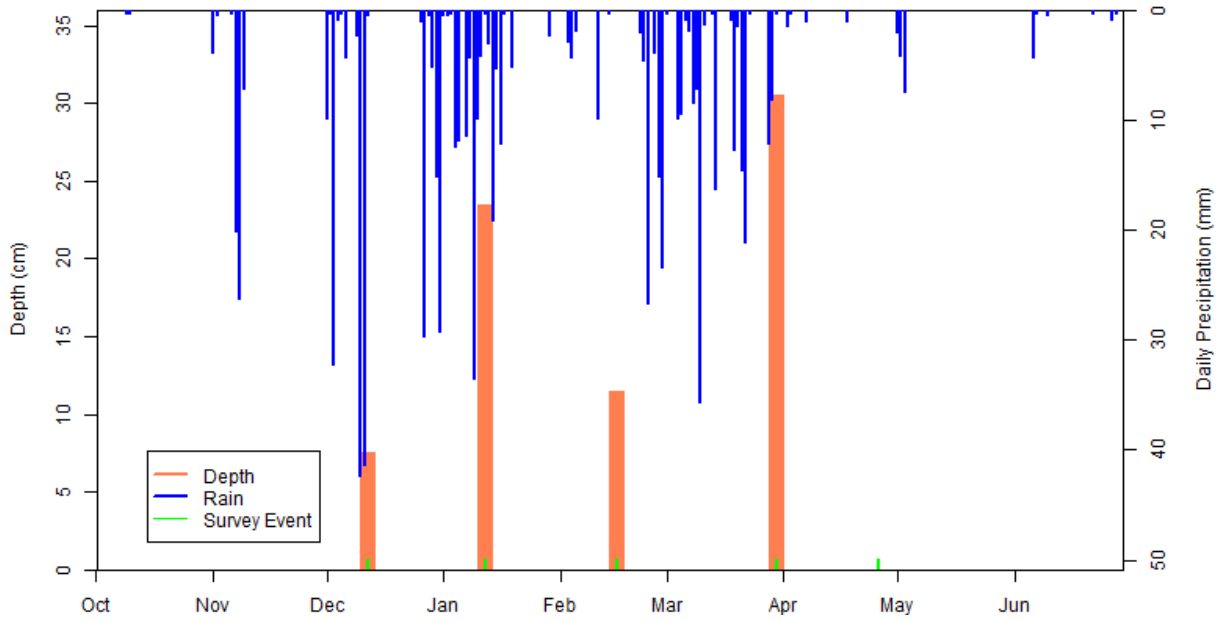

Figure 4-16. Pond 44 (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2023

Table 4-16. Pond 44 (Year 5 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)**
2022-12-12^	NS	7	NS	NS	NS	NS	NS
2023-01-12	0.1705	23	8.06	15.1	4.08	7.01	127.9
2023-02-16^§	0.0124	11	12.16	14.5	5.11	7.47	113.6
2023-03-30	0.208	30	10.43	16.1	2.07	7.29	96.3
2023-04-26	0	0					

NS = Not Surveyed

^Peripheral inundation present

§Probe not fully submerged

4.17 Pond 54

Pond 54 was in Year 5 of post-subsurface munitions remediation in 2023. Depth of Pond 54 was monitored seven times and measurements of the water quality parameters were taken five times. Pond 54 was inundated from mid-December to June 9th, when the last monitoring event occurred (Table 4-17 and Figure 4-17).

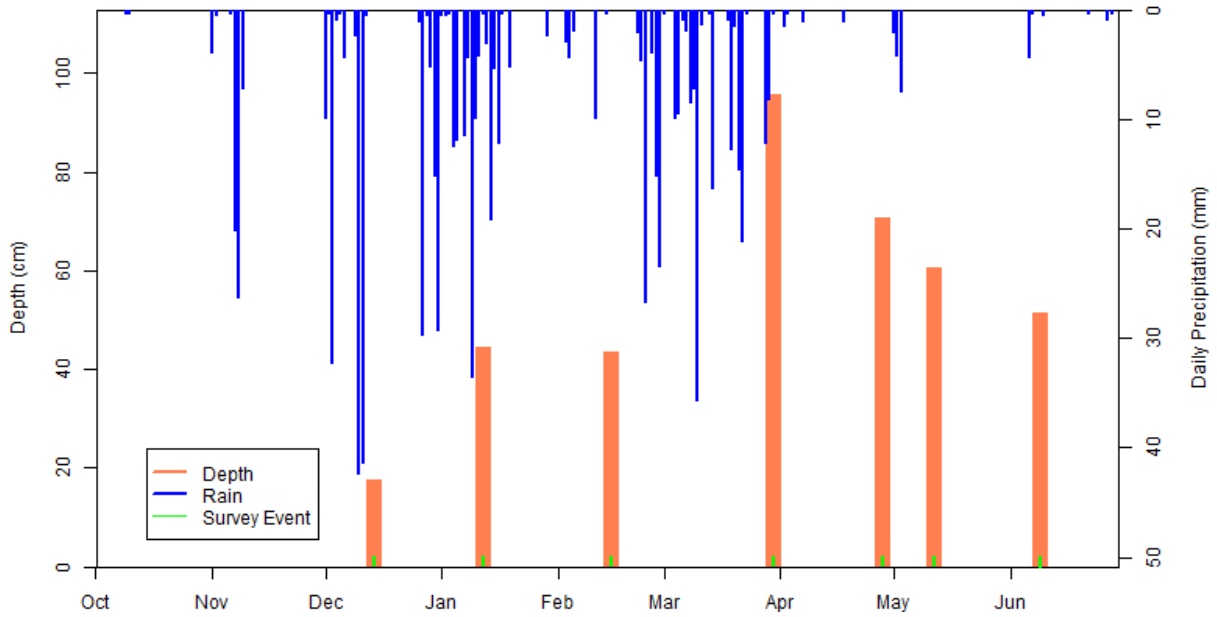

Figure 4-17. Pond 54 (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2023

Table 4-17. Pond 54 (Year 5 Post-Subsurface Munitions Remediation) Hydrology Monitoring Results

Pond 54							
Date	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
2022-12-14^	NS	16	NS	NS	NS	NS	NS
2023-01-12	1.5578	43	4.45	10.9	7.96	6.3	138.7
2023-02-15	1.5863	42	9.42	6	2.22	6.73	136.2
2023-03-30	3.0029	94	3.53	11.4	4.7	6.68	173
2023-04-28	2.1345	69	9	16.8	21.58	7.1	208.6
2023-05-12	1.9998	59	5.17	15.5	58.06	6.41	197.9
2023-06-09	1.6187	50	NS	NS	NS	NS	NS

NS = Not Surveyed

^Peripheral inundation present

4.18 Pond 60

Pond 60 was in Year 5 Post-Subsurface Munitions Remediation in 2023. Pond 60 was monitored seven times and water quality parameters were measured five times. Pond 60 was inundated from mid-December to June 9th, when the last monitoring event occurred (Table 4-18 and Figure 4-18).

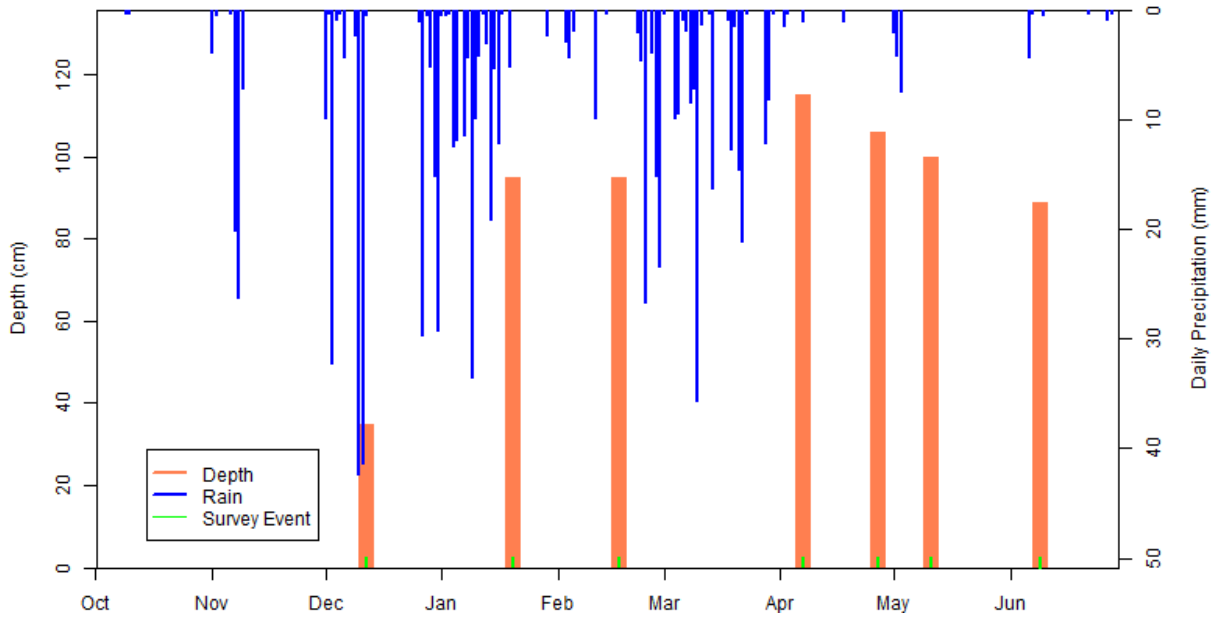

Figure 4-18. Pond 60 (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2023

Table 4-18. Pond 60 (Year 5 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)**
2022-12-12^	NS	33	NS	NS	NS	NS	NS
2023-01-20^	2.5282	93	5.02	9.6	4.5	6.31	210
2023-02-17	2.432	93	5.5	10.3	2.33	6.54	253.2
2023-04-07	2.8424	113	5.88	14	0.82	6.73	194
2023-04-27	2.5525	104	5.54	17	0.76	6.81	227.4
2023-05-11	2.4838	98	4.57	16.7	4.63	6.67	250.8
2023-06-09	2.318	87	NS	NS	NS	NS	NS

NS = Not Surveyed

^Peripheral inundation present

4.19 Pond 61

Pond 61 was in Year 5 of monitoring for post-subsurface munitions remediation in 2023. Pond 61 consists of several depressions that fill with rain water at different rates. Per recommendations in the 2020 hydrology report (Chenega, 2021) a staff gauge was installed in the western portion of Pond 61 and readings for the eastern and western portions were recorded separately. Pond 61 West was inundated from mid-December through April (Figure 4-19 and Table 4-19), while Pond 61 East was inundated from mid-January through April (Figure 4-20 and Table 4-19). Water quality parameters were measured four times at Pond 61 West and three times at Pond 61 East. Ponds 61 East and West hydrologically connected in January and April.

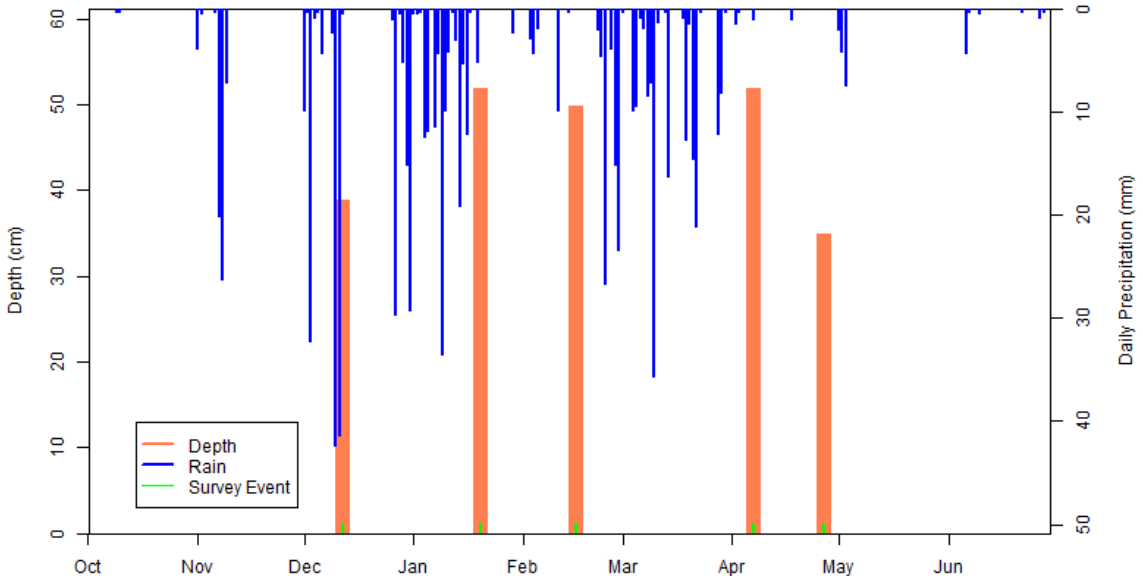

Figure 4-19. Pond 61 West (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2023

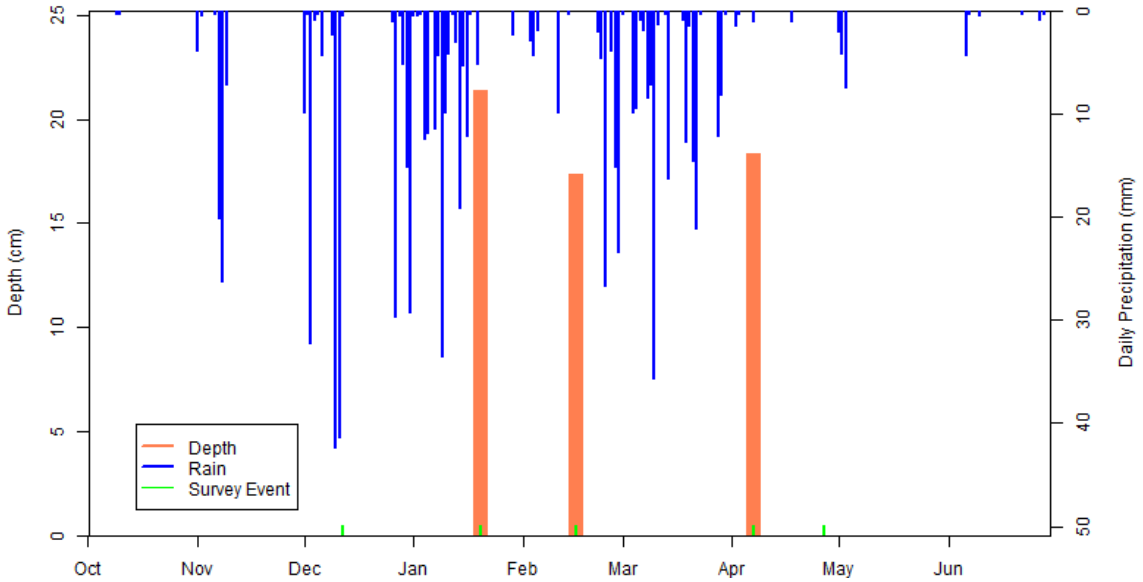

Figure 4-20. Pond 61 East (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2023

Table 4-19. Pond 61 (Year 5 Post-Subsurface Munitions Remediation) Hydrology Monitoring Results

Pond 61 West							
Date	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
2022-12-12^	NS	38	NS	NS	NS	NS	NS
2023-01-20^~	0.6445	51	12.88	10.6	11.5	6.66	115.9
2023-02-16^	0.2836	49	12.21	10.5	5.91	7.56	143.4
2023-04-07~	0.6196	51	9.81	14.5	11.09	7.95	158.2
2023-04-27^	0.0139	34	9.4	27.6	2.89	8.16	249.4
Pond 61 East							
2022-12-12^	0	0					
2023-01-20~	0.6445	21	10.66	11.4	16.29	6.33	124.7
2023-02-16^	0.2287	17	11.19	8.6	12.98	6.63	149.8
2023-04-07~	0.6196	18	8.76	14.1	14.08	6.71	166.2
2023-04-27	0	0					

NS = Not Surveyed

^Peripheral inundation present, ~ Ponds 61 East and West hydrologically connected

4.20 Pond 73

Pond 73 was in Year 5 of monitoring for post-subsurface munitions remediation in 2023. Depth of Pond 73 was monitored six times. Pond 73 was inundated from mid-January through April, and measurements of the water quality parameters were taken four times (Figure 4-21 and Table 4-20).

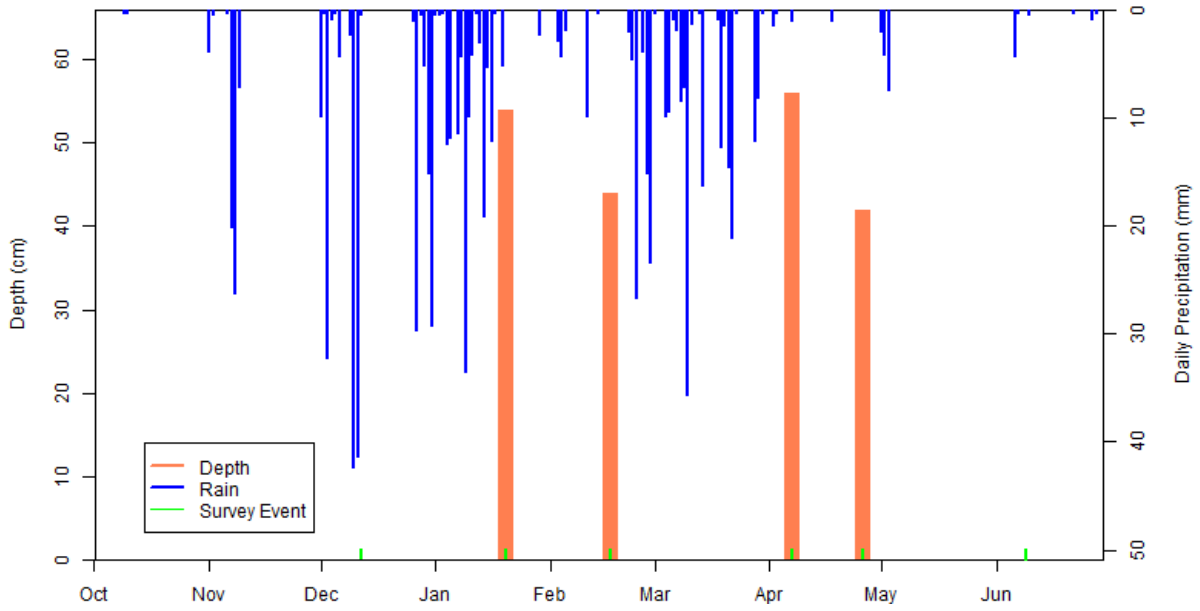

Figure 4-21. Pond 73 (Year 5 Post-Subsurface Munitions Remediation) Depth and Precipitation on Former Fort Ord, 2023

Table 4-20. Pond 73 (Year 5 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)**
2022-12-12^	0	0					
2023-01-20	0.8443	53	6.39	10.5	16.28	6.29	136.8
2023-02-17	0.7267	43	10.37	8.6	14.04	6.92	177.7
2023-04-07	0.8452	55	7.86	13.7	0.92	7.11	141.8
2023-04-26	0.6893	41	9.88	23.6	5.56	7.83	185.1
2023-06-09^	0	0					

^Peripheral inundation present

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 (Burleson, 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 for 18 consecutive days 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 2023 water year with the exception of Pond 75, which only has one measurement and thus no curve could be drawn.

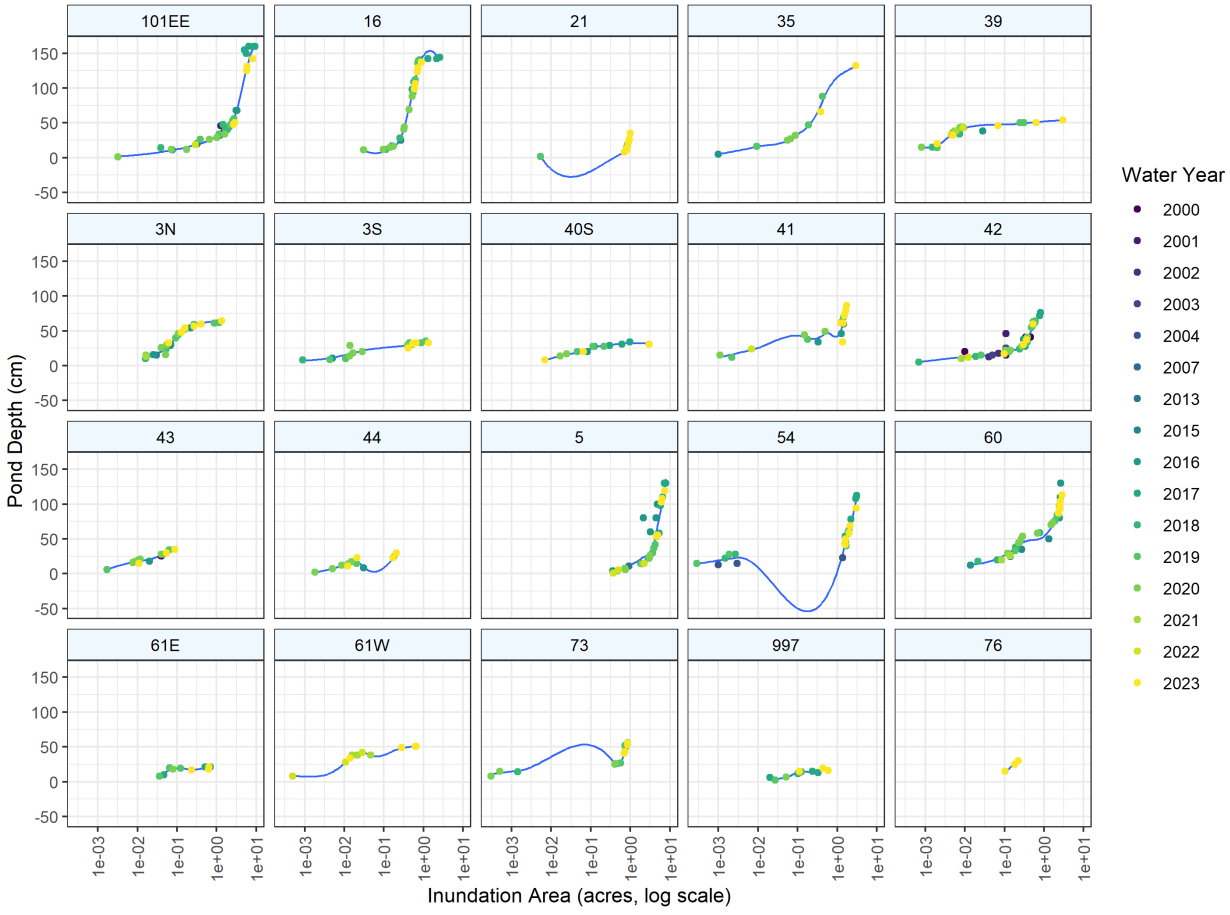

Figure 5-1. Plot of Historical Depth vs Inundation Area data going back to 2000 water year for all ponds surveyed in the 2023 water year except for pond 75, which only had one measurement and thus no curve could be drawn.

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

Since water quality parameters can be variable, their assessment was conducted for each vernal pool by comparing them to their historic values, reference vernal pools, and other vernal pools with an objective of spotting any anomalous trends. Single measurements of water quality parameters that were out of range were noted, but occasional discrepancies are to be expected due to a variety of variables noted above. This was the first year water quality parameters were measured in Pond 76 (Figures 5-2 to 5-5). Since no baseline data was collected at that pond, assessment for DQOs will be made by comparison to the reference and other remediated vernal pools.

During the 2023 water year, measured pH values were within historical range. No strong trends in pH values have been spotted across the vernal pools in 2023. Some vernal pools showed an increase in pH values as the the season progressed (Ponds 5, 16, 42, 61 West, and 73), while others showed a decline in pH values (Ponds 3 North and 21). April values of pH in Pond 61 West and 73 were higher than the historical values but not outside of range observed in the past at other remediated vernal pools (Figure 5-2). Water temperature measurements were mostly within historical ranges (Figure 5-3). Turbidity values were also within historical ranges (Figure 5-4). Dissolved oxygen was within historical ranges in all vernal pools, although Pond 16 showed lower than the average historical values (Figure 5-5).

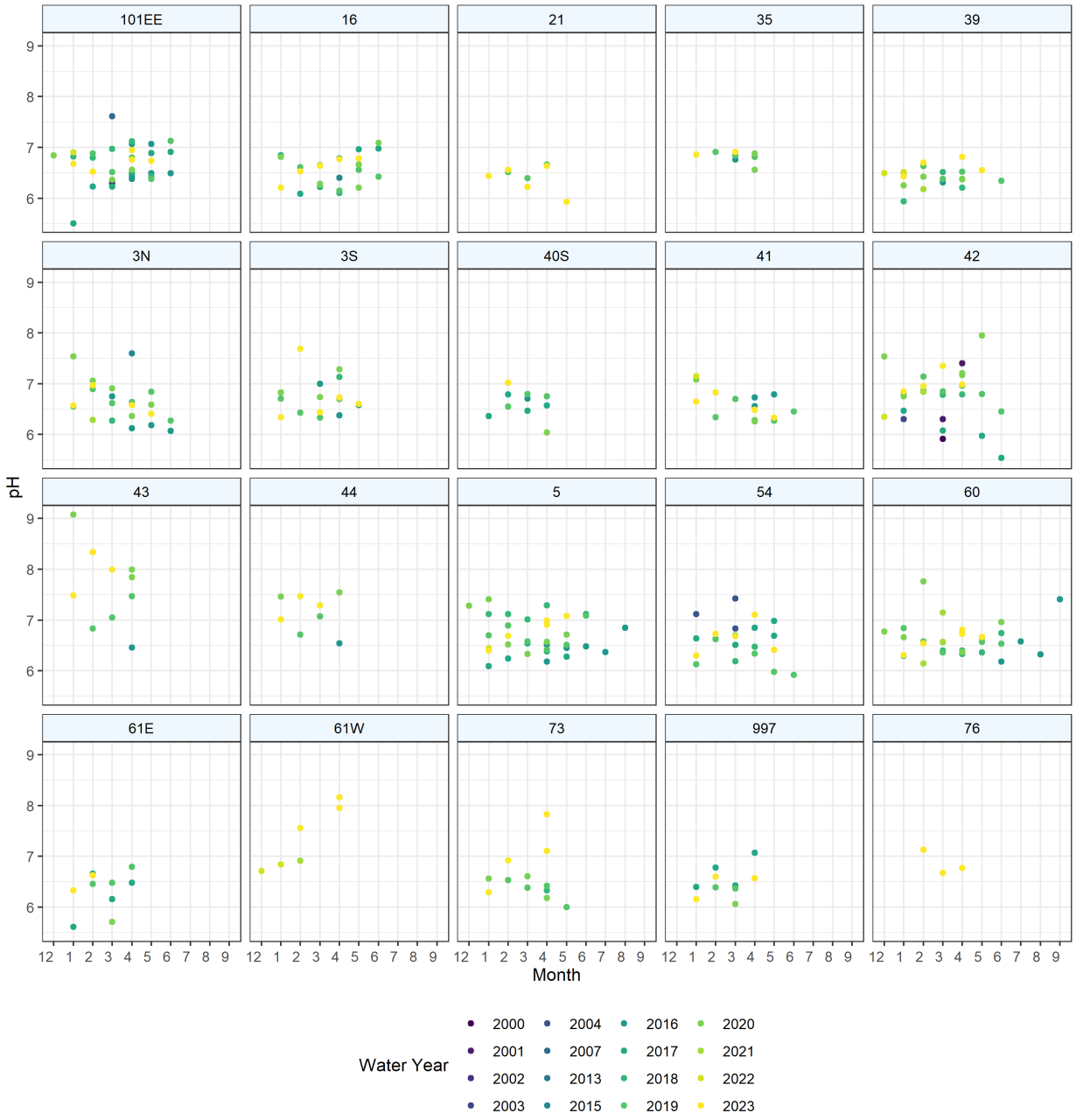

Figure 5-2. Plot of historical pH values going back to water year 1992 for reference and remediated ponds surveyed in the 2023 water year.

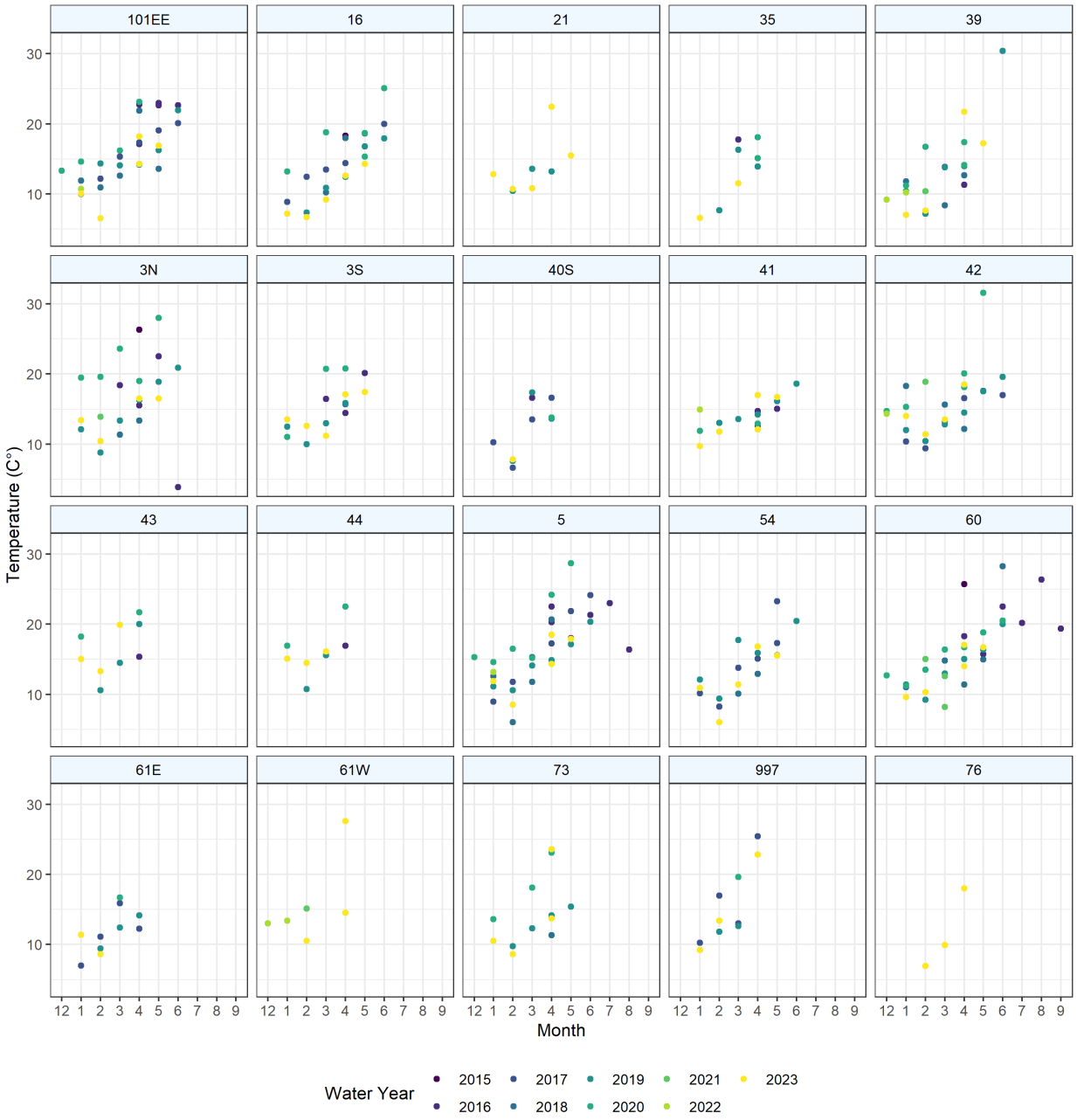

Figure 5-3. Plot of historical temperature values going back to water year 1992 reference and remediated ponds surveyed in the 2023 water year.

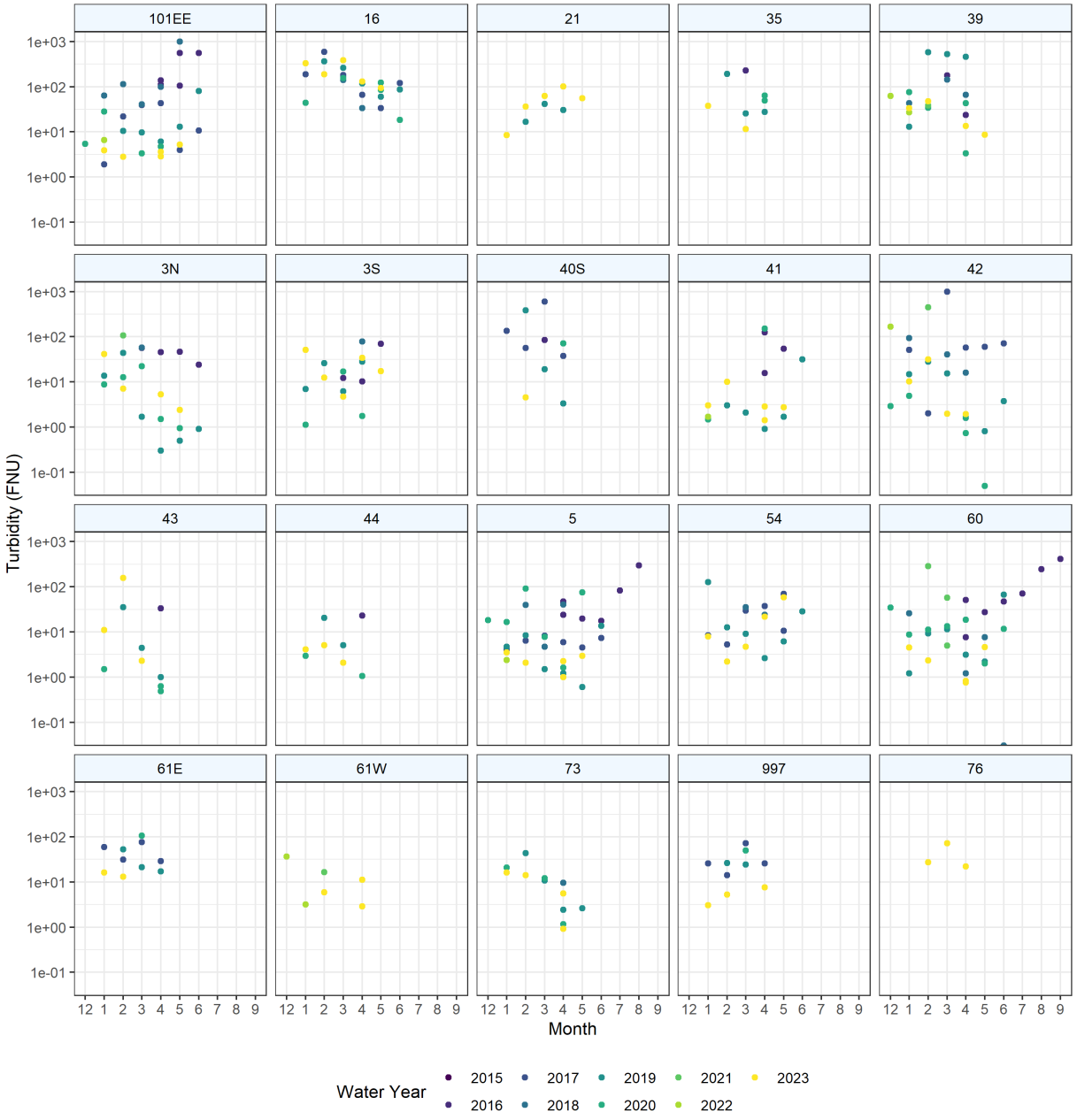

Figure 5-4. Plot of historical turbidity values going back to water year 2015 for reference and remediated ponds surveyed in the 2023 water year.

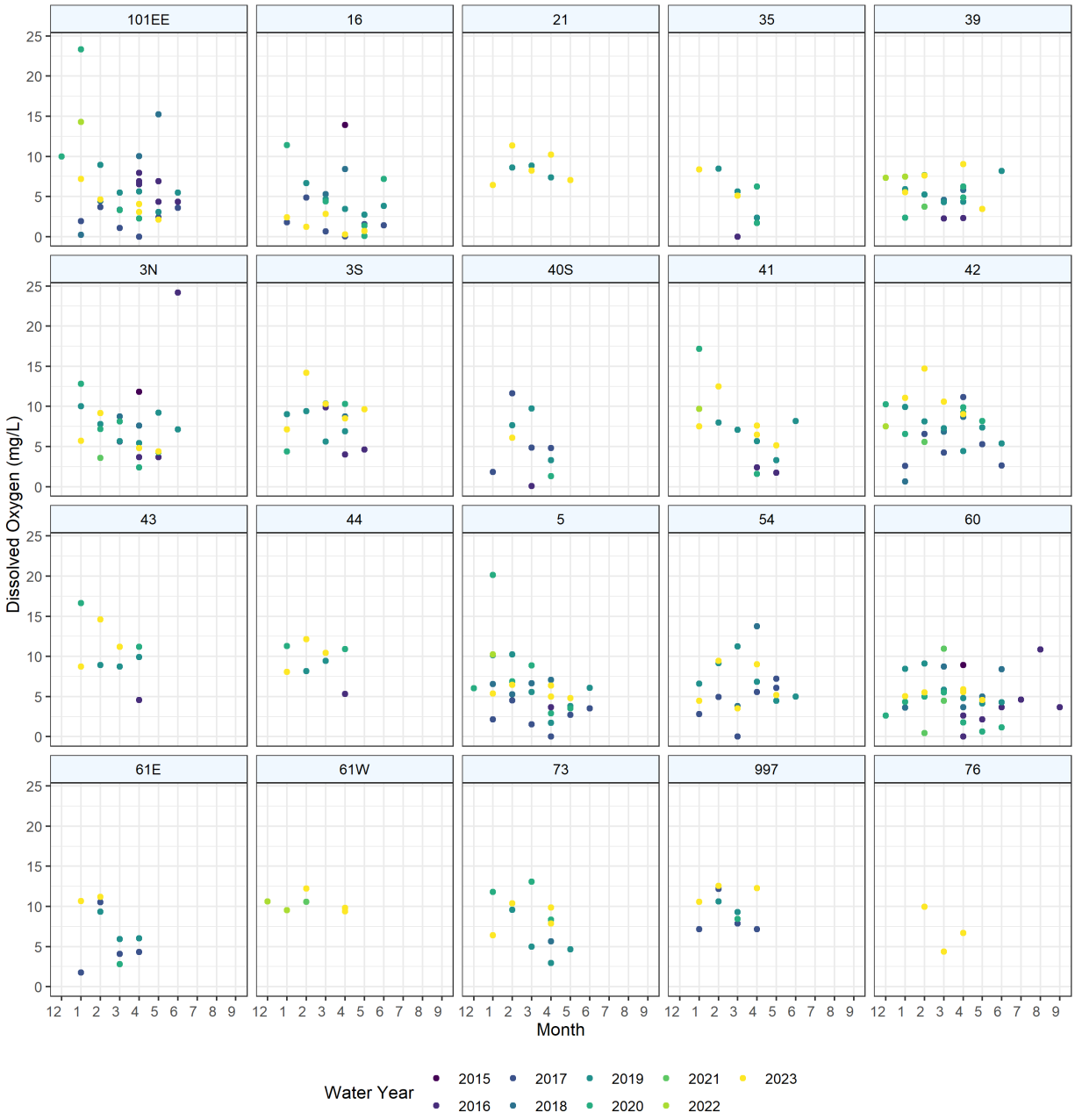

Figure 5-5. Plot of historical dissolved oxygen values going back to water year 2015 for reference and remediated ponds surveyed in the 2023 water year.

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 fifteen years (Figure 5-6). Above normal water-years were 1995, 2016, 2017, 2019, and 2023. Close to normal water years were 1996 and 2020. All other monitoring was conducted either in a below normal water year, drought year, or a consecutive drought year.

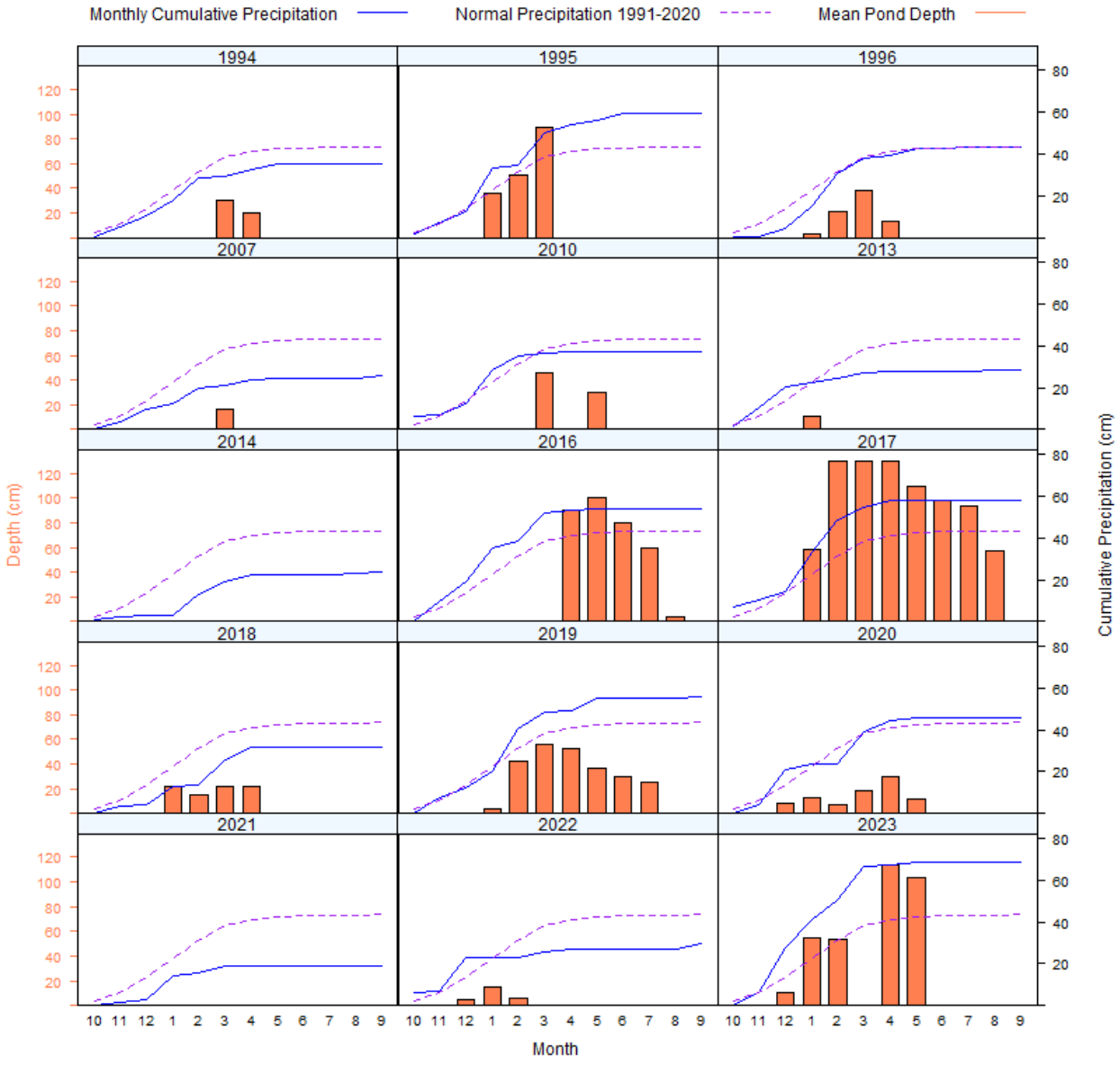

Figure 5-6. Pond 5 (Reference) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

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 5-7). Pond 5 reached a maximum depth of 119 cm and a maximum inundation area of

7.35 ac in 2023 water year (Table 4-1). Historical and 2023 water year values of inundation extent, depth, and water quality measurements are presented in Figures 5-6 through 5-9.

It is important to note that during the fifteen years of monitoring of Pond 5 the cumulative precipitation in 2023 was the highest, yet Pond 5 reached maximum inundation area and depth in 2017 water year. That may be due to 2021 and 2022 water years receiving well below normal precipitation, while 2016 water year was an above normal water year. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. This suggests that the dry conditions present prior to the 2023 water year dried out the underlying clay layer which required more water to saturate it completely before Pond 5 could become inundated. Even though the 2023 water year had record cumulative precipitation, 2016 was an above normal water year, which likely caused the underlaying clay layer to retain some moisture going into the 2017 water year, and thus requiring less precipitation to saturate it.

5.1.1 Data Quality Objective 1

Pond 5 maintaned the required average depths of 25 cm from the first rain event through March for CTS, and the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 5 sustained sufficient depth for CTS (59.5 cm through April 5th), and for fairy shrimp (74.8 cm through May 11th).

5.1.2 Data Quality Objective 2

Pond 5 showed a similar inundation extent in 2023 water year to 2017 water year which also had well above normal cumulative precipitation (Figure 5-9).

5.1.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 5 sustained suitable habitat for CTS and for fairy shrimp in 2023 water year. Pond 5 is a reference vernal pool and was not required to meet the performance standards. Instead, the vernal pool was used as a control for comparison to the remediated vernal pools.

5.1.4 Data Quality Objective 4

Water quality parameters at Pond 5 were within historical ranges in 2023 (Figure 5-8).

5.1.5 Performance Standard: Wildlife Usage

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

5.1.6 Conclusion

All 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

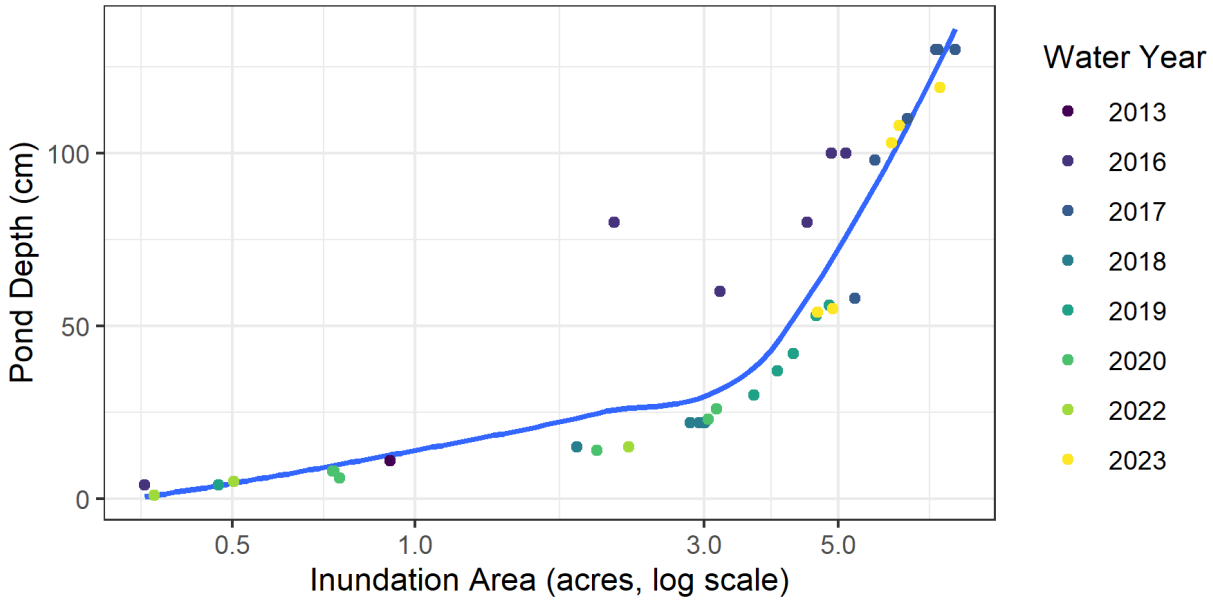

Figure 5-7. Pond 5 (Reference) Plot of Depth vs Inundation Area since 2013 Water Year

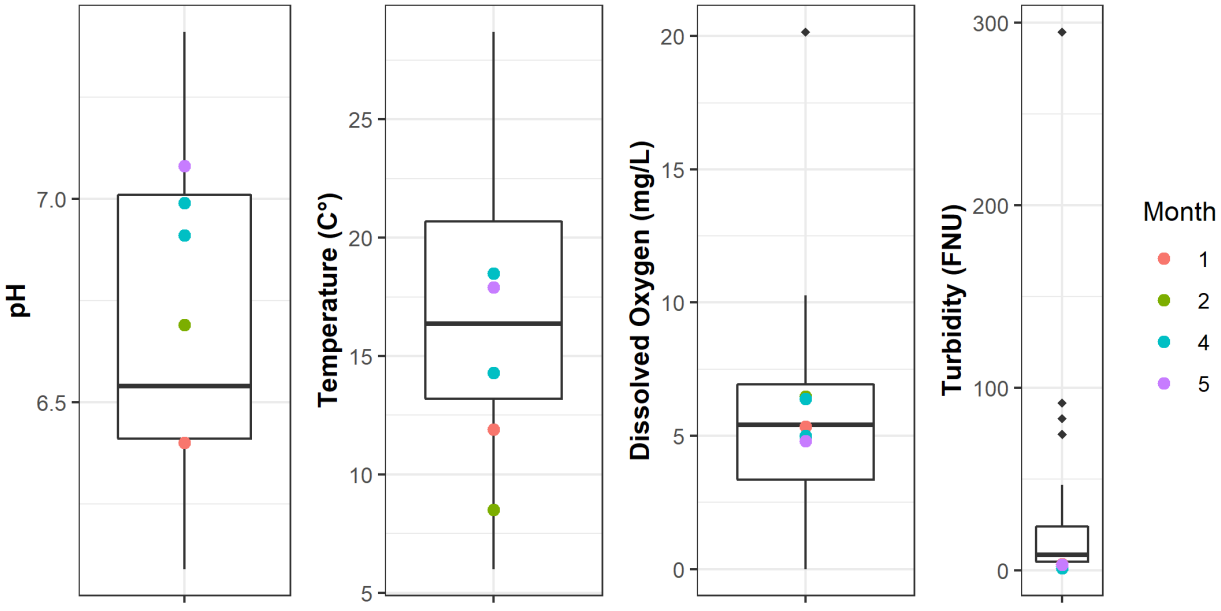

Figure 5-8. Pond 5 (Reference) historical and 2023 water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles of historical values respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics. Colored dots represent 2023 water year values.

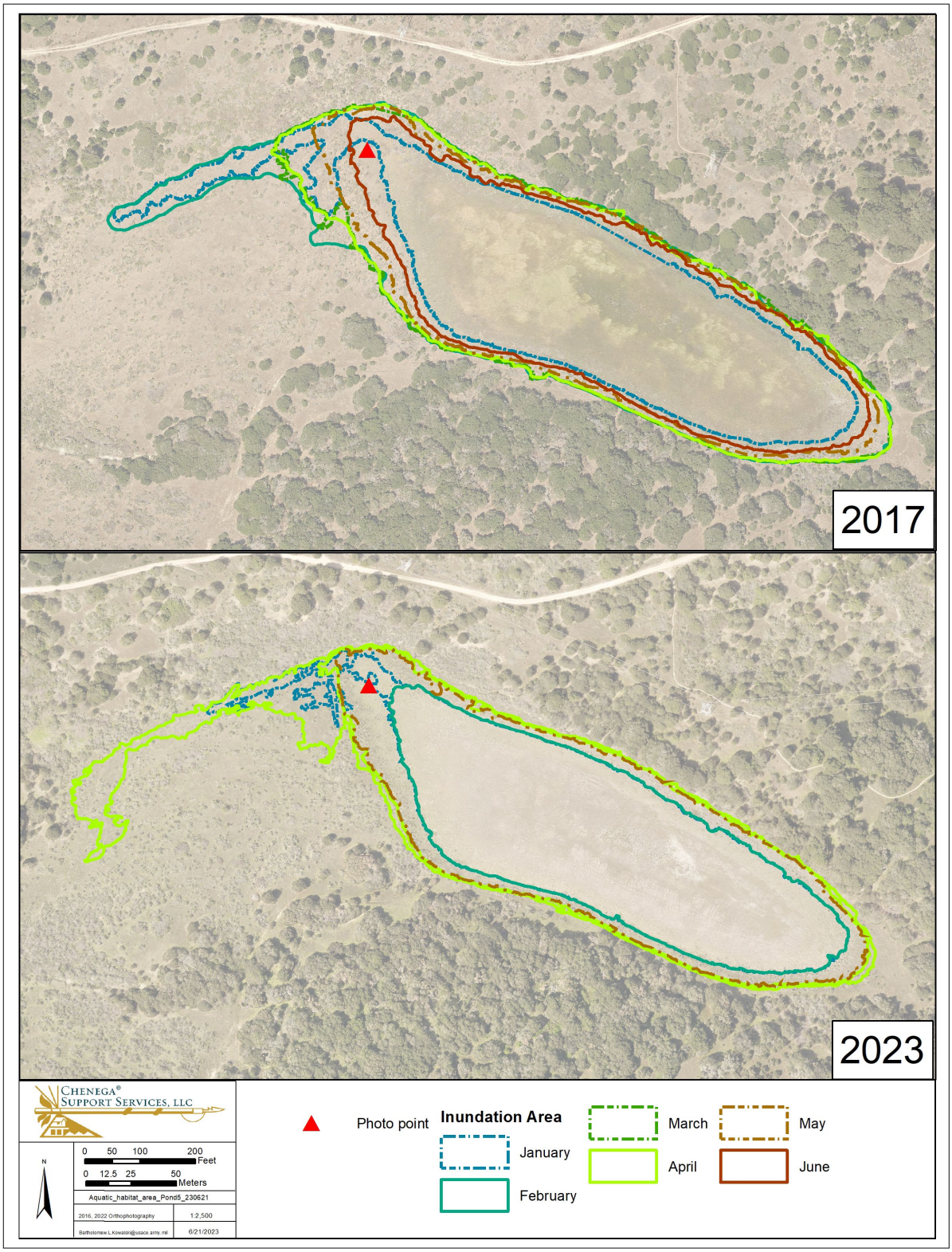

Figure 5-9. Pond 5 (Reference) inundation areas in 2017 and 2023 (both years had well above normal precipitation).

5.2 Pond 101 East (East) – Reference

Pond 101 East (East) is situated within a large and shallow basin in the northern tip of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 101 East (East) have been monitored for thirteen years (Figure 5-10). Above normal water years were 2016, 2017, 2019, and 2023. 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 well 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.

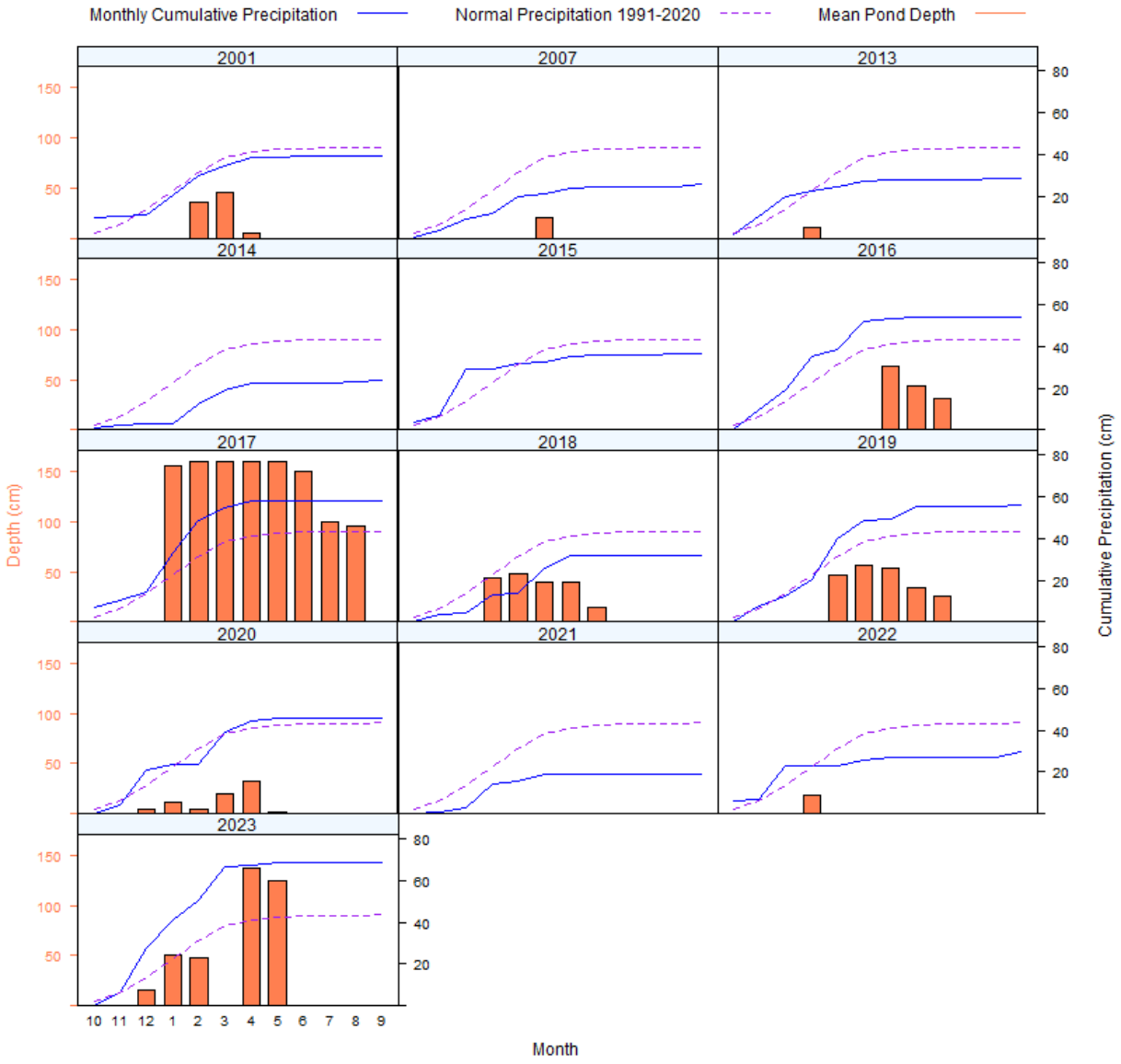

Figure 5-10. Pond 101 East (East) (Reference) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

Historically, Pond 101 East (East) remained completely dry in a consecutive drought year (2014, 2015), and it reached a maximum depth of 160 cm and a maximum inundation of 9.38 acres in a consecutive above normal water year (2017, when it became hydrologically connected to Pond 101 East (West),

Figure 5-10). Pond 101 East (East) reached a maximum depth of 142 cm and a maximum inundation area of 8.22 ac in 2023 water year, when it was hydrologically connected to Pond 101 East (West). Historical and 2023 water year values of inundation extent, depth, and water quality measurements are presented in Figures 5-10 to 5-13.

It is important to note that during the thirteen years of monitoring of Pond 101 East (East) the cumulative precipitation in 2023 was the highest yet Pond East (East) reached maximum inundation area and depth in 2017 water year (Figure 5-11). That may be due to 2021 and 2022 water years receiving well below normal precipitation, while 2016 water year was an above normal water year. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. This suggests that the dry conditions present prior to the 2023 water year dried out the underlying clay layer which required more water to saturate it completely before Pond 101 East (East) could become inundated. Even though the 2023 water year had the highest cumulative precipitation on record, 2016 was an above normal water year which likely caused the underlaying clay layer to retain some moisture going into the 2017 water year, and thus requiring less precipitation to saturate it.

5.2.1 Data Quality Objective 1

Pond 101 East (East) maintained the required average depths of 25 cm from the first rain event through March for CTS, and the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 101 East (East) sustained sufficient depth for CTS (64 cm through April 5th) and for fairy shrimp (85.3 cm through May 11th).

5.2.2 Data Quality Objective 2

Pond 101 East (East) showed a similar inundation extent in 2023 water year to 2017 water year which also had well above normal cumulative precipitation (Figure 5-13).

5.2.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 101 East (East) sustained suitable habitat for CTS and for fairy shrimp in 2023 water year. Pond 101 East (East) is a reference vernal pool and was not required to meet the performance standards. Instead, the vernal pool was used as a control for comparison to the remediated vernal pools.

5.2.4 Data Quality Objective 4

Water quality parameters at 101 Pond East (East) were within historical ranges in 2023 (Figure 5-12).

5.2.5 Performance Standard: Wildlife Usage

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.

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

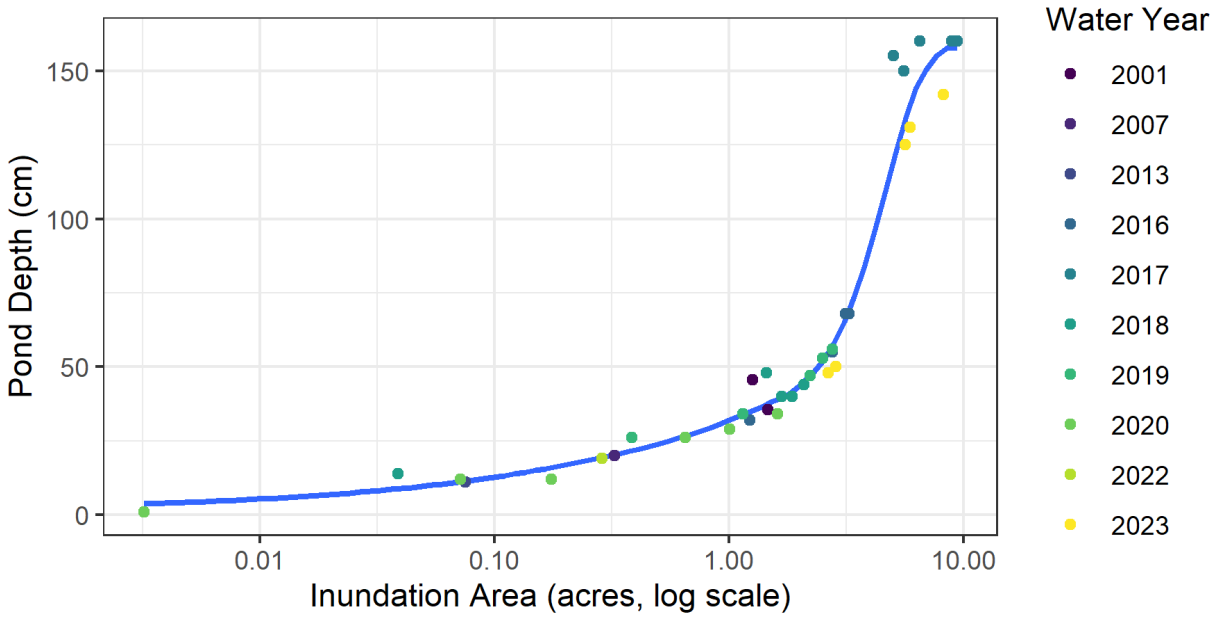

Figure 5-11. Pond 101 East (East) Plot of Depth vs Area since 2001 Water Year

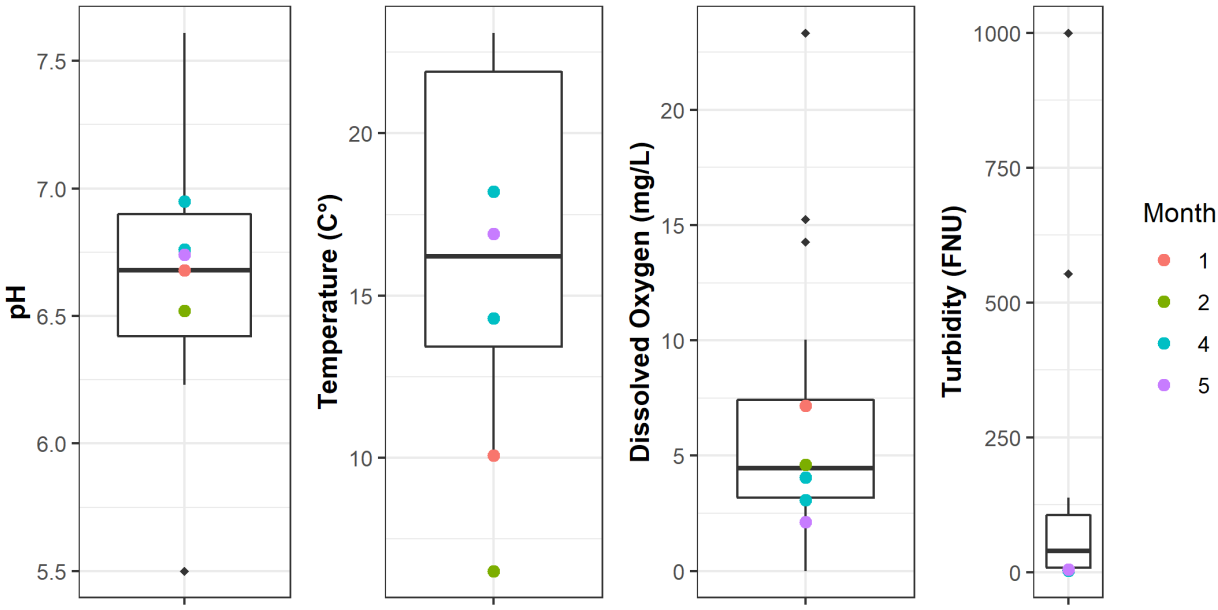

Figure 5-12. Pond 101 East (East) (Reference) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics.

5.2.6 Conclusion

All Pond 101 East (East) metrics were suitable for comparison to the remediated vernal pools (Table 5-2).

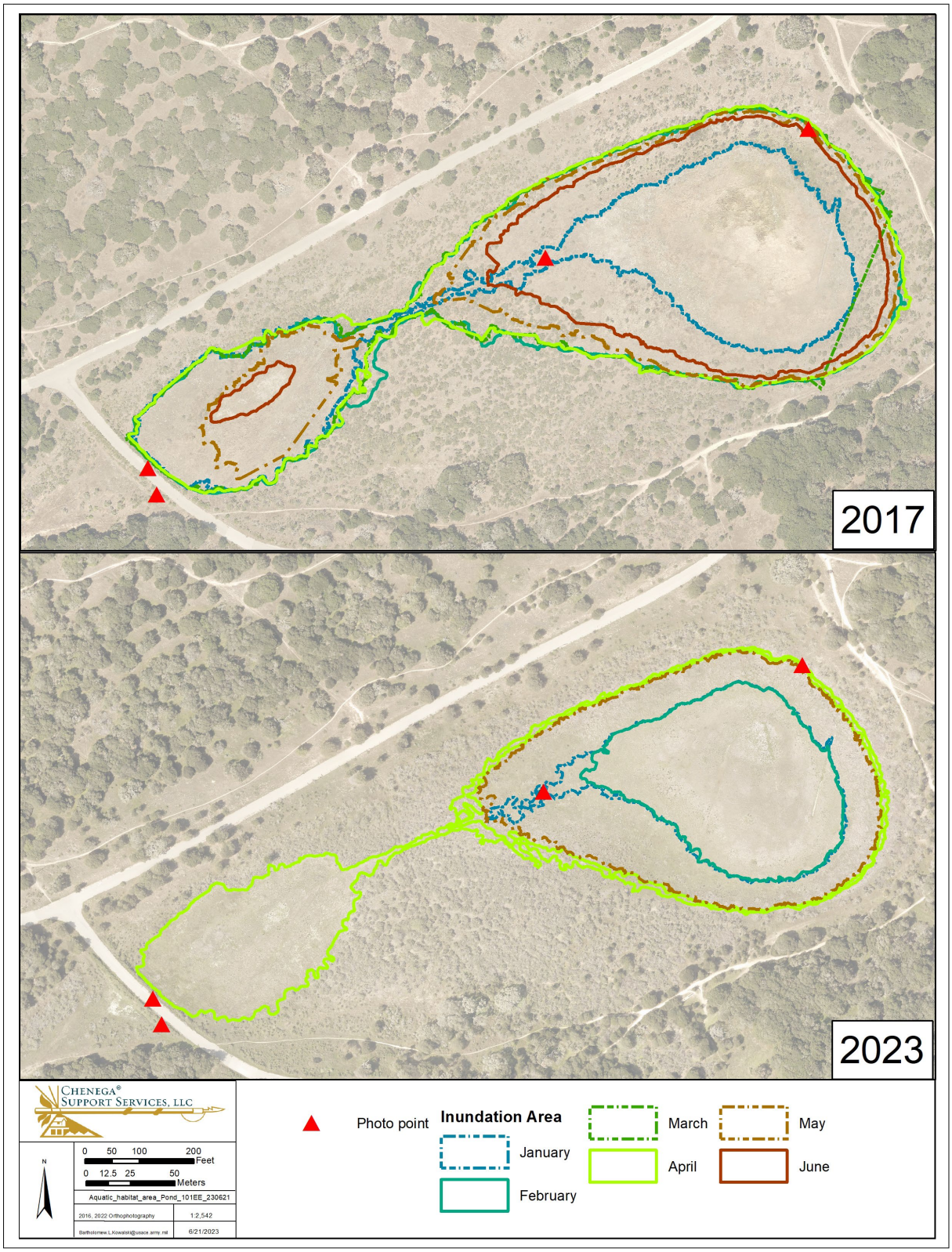

Figure 5-13. Pond 101 East (East) (Reference) inundations. It remained dry in 2017 and 2023 (both years had well above normal precipitation)

5.3 Pond 997 – Reference

Pond 997 is situated within a small and shallow basin in the northern part of the Fort Ord National Monument (Figure 2-4). Although approximately 13% of vegetation within the Pond 997 watershed was masticated in 2017, pond 997 was monitored for seven years as a reference vernal pool (Figure 5-14). The 2017, 2019, and 2023 water-years were above-normal, 2020 was close-to-normal, whereas 2018, 2021, and 2022 water years were below normal.

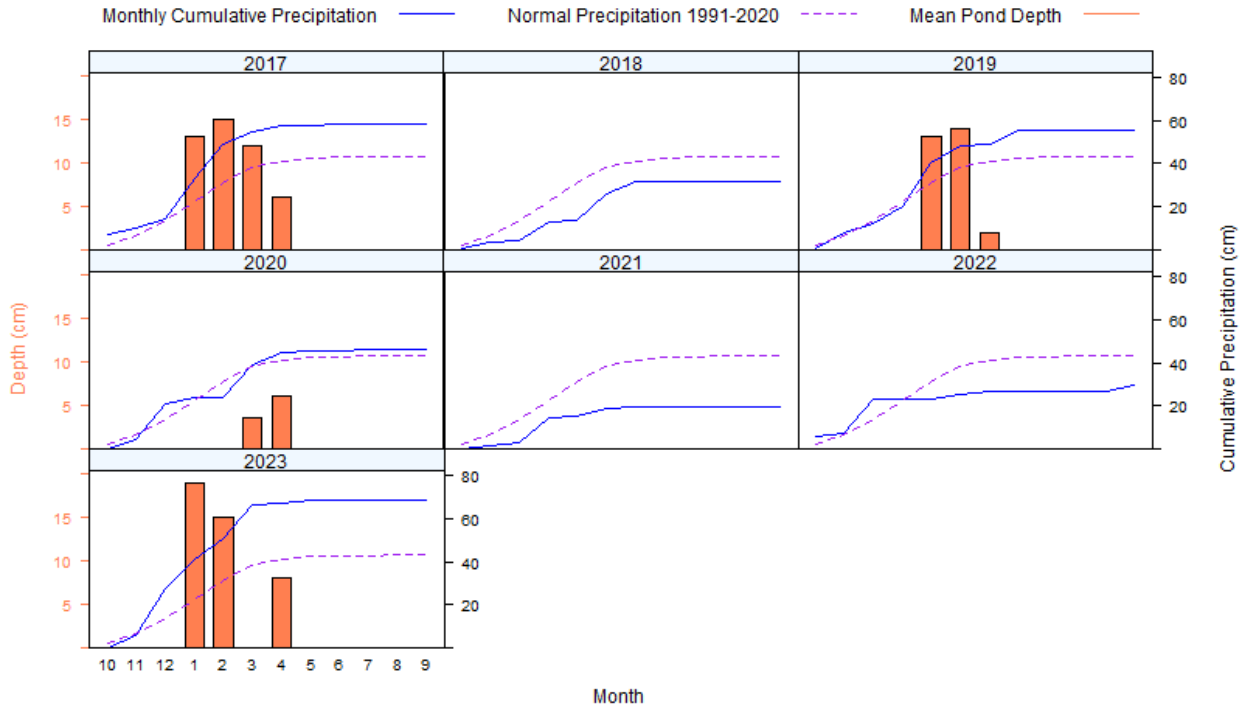

Figure 5-14. Pond 997 (Reference) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

Historically, Pond 997 remained completely dry in a below normal water years (2018, 2021, 2022). Pond 997 reached a maximum depth of 19 cm and a maximum inundation of 0.58 acres in 2023 water year, higher than in 2017, also an above normal water year (Figure 5-15). Historical and 2023 water year values of inundation extent, depth, and water quality measurements are presented in Figures 5-14 to 5-17.

5.3.1 Data Quality Objective 1

Pond 997 did not maintain the required average depths of 25 cm from the first rain event through March for CTS, but it did maintain the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 997 did not sustain sufficient depth for CTS (12.5 cm through April 27th) but it did for fairy shrimp (10 cm through April 27th).

5.3.2 Data Quality Objective 2

Pond 997 showed a larger inundation extent in 2023 water year than in 2017 water year which also had well above normal cumulative precipitation (Figure 5-16).

5.3.3 Performance Standard: Hydrological Conditions and Inundation Area

In 2023 water year, Pond 997 did not sustain suitable habitat for CTS, but it did for fairy shrimp. 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.

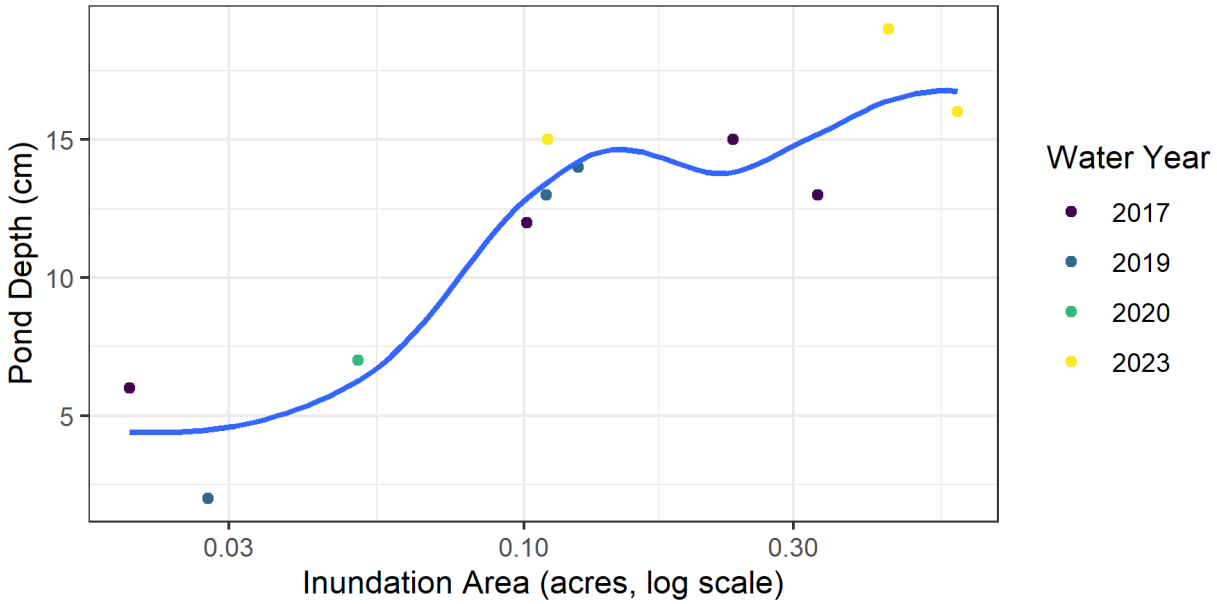

Figure 5-15. Pond 997 (Reference) Plot of Depth vs Area since 2017 Water Year

5.3.4 Data Quality Objective 4

Water quality parameters at Pond 997 were within historical ranges in 2023, with the exception for turbidity values which were lower than the historical values (Figure 5-16).

5.3.5 Performance Standard: Wildlife Usage

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

5.3.6 Conclusion

All 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

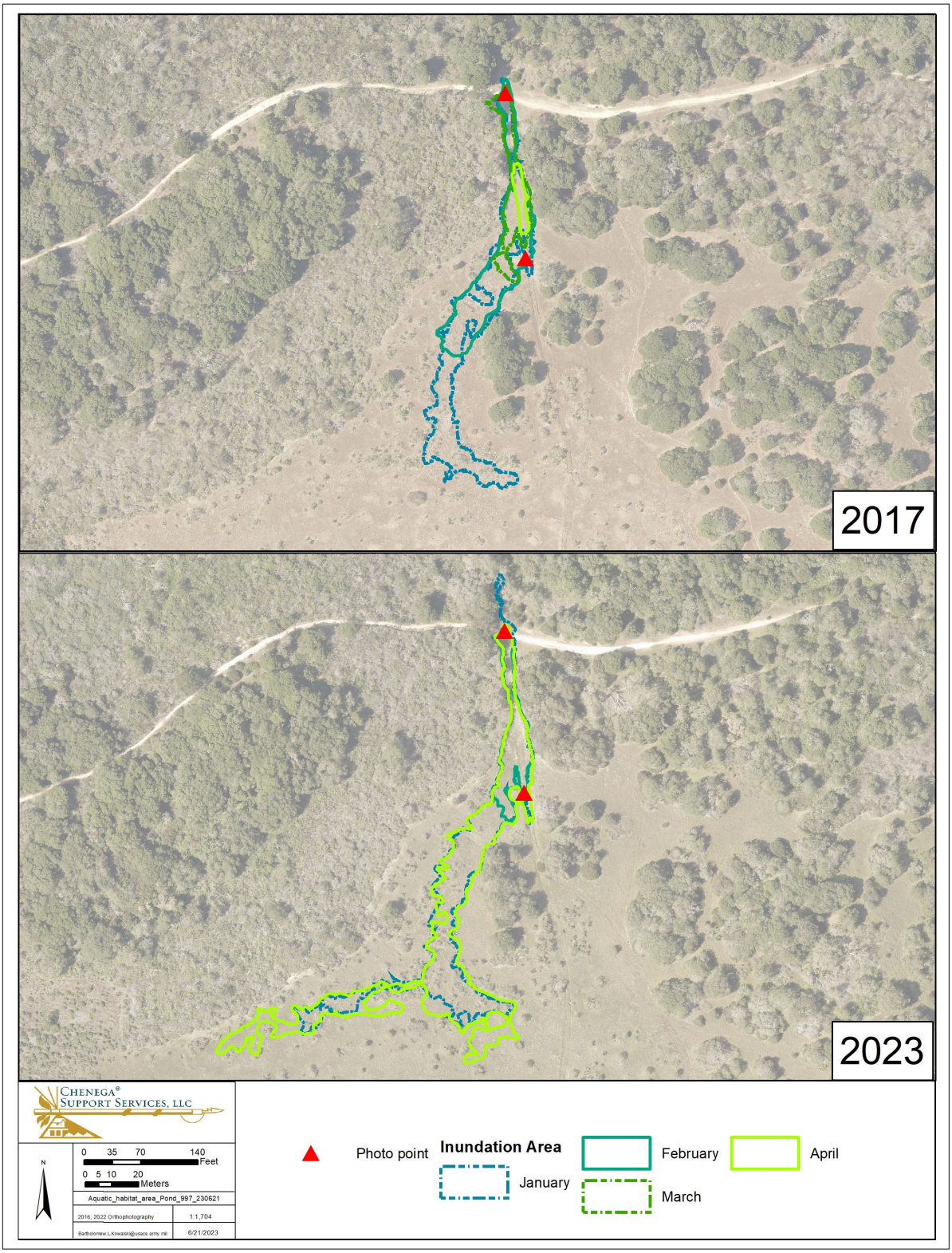

Figure 5-17. Pond 997 (Reference) inundations in 2018 and 2023 (both years had above normal precipitation)

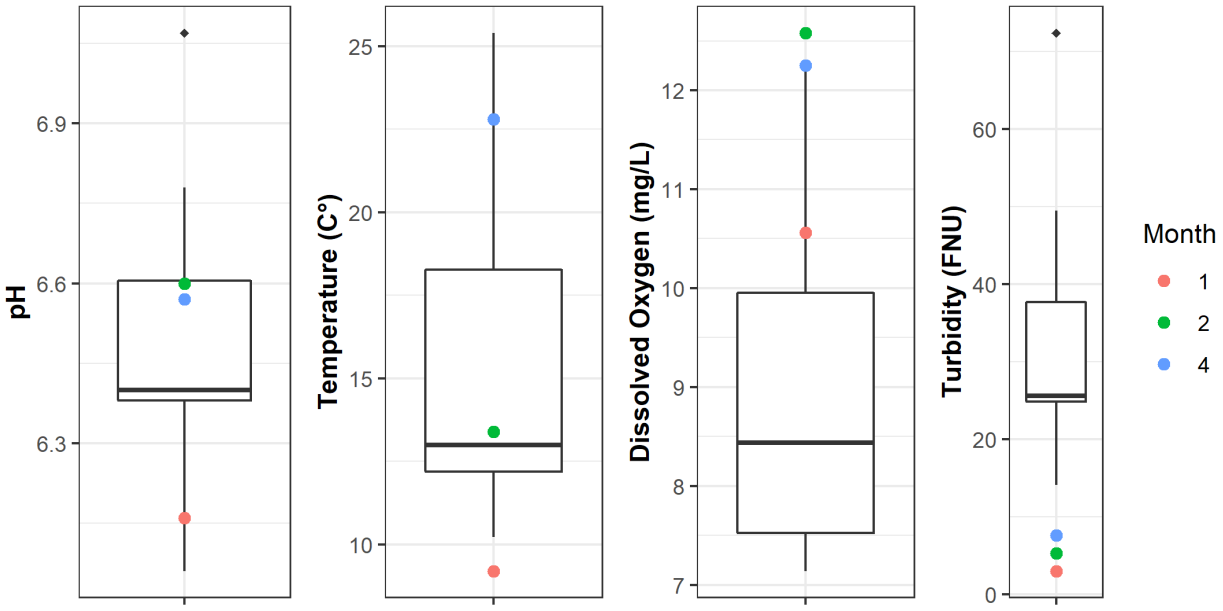

Figure 5-18. Pond 997 (Reference) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics.

5.4 Pond 75 – Baseline

Pond 75 is situated within a small and very shallow basin within a narrow valley in the southern part of the Fort Ord National Monument within Unit 17 inside the Impact Area (Figure 2-4). The valley slopes gently from south to north and thus it precludes Pond 75 from ever reaching deep inundations. Pond 75 was surveyed for baseline in 2021 and 2022, but it remained dry in both years. Although only two years of baseline monitoring are required, data were collected in 2023 to assess the depth, inundation area, and water quality metrics of the Pond 75 when it was inundated. These data will be compared to data from future surveys. Due to its small size and shallow profile, the most similar reference vernal pool is Pond 997. Pond 75 was monitored only once in February in 2023 water year. Its depth was estimated at 35 cm and and inundation area was 0.2 acres. Water quality measurements are shown in Table 5-4.

5.4.1 Data Quality Objective 1

It cannot be assessed if Pond 75 maintained the required average depths of 25 cm from the first rain event through March for CTS since it was monitored only once, but it is likely that it maintained the required 10 cm for 18 consecutive days through May for fairy shrimp.

5.4.2 Data Quality Objective 2

Pond 75 was monitored for baseline in 2023. Pond 75 became inundated in 2023 water year.

5.4.3 Performance Standard: Hydrological Conditions and Inundation Area

It is unknown if Pond 75 sustained suitable habitat for CTS or fairy shrimp in 2023 because only a single observation was taken. Pond 75 is in a baseline year and was not required to meet the performance

standard. Instead, data collected will be used to assess impact after MEC cleanup operations take place in the future years.

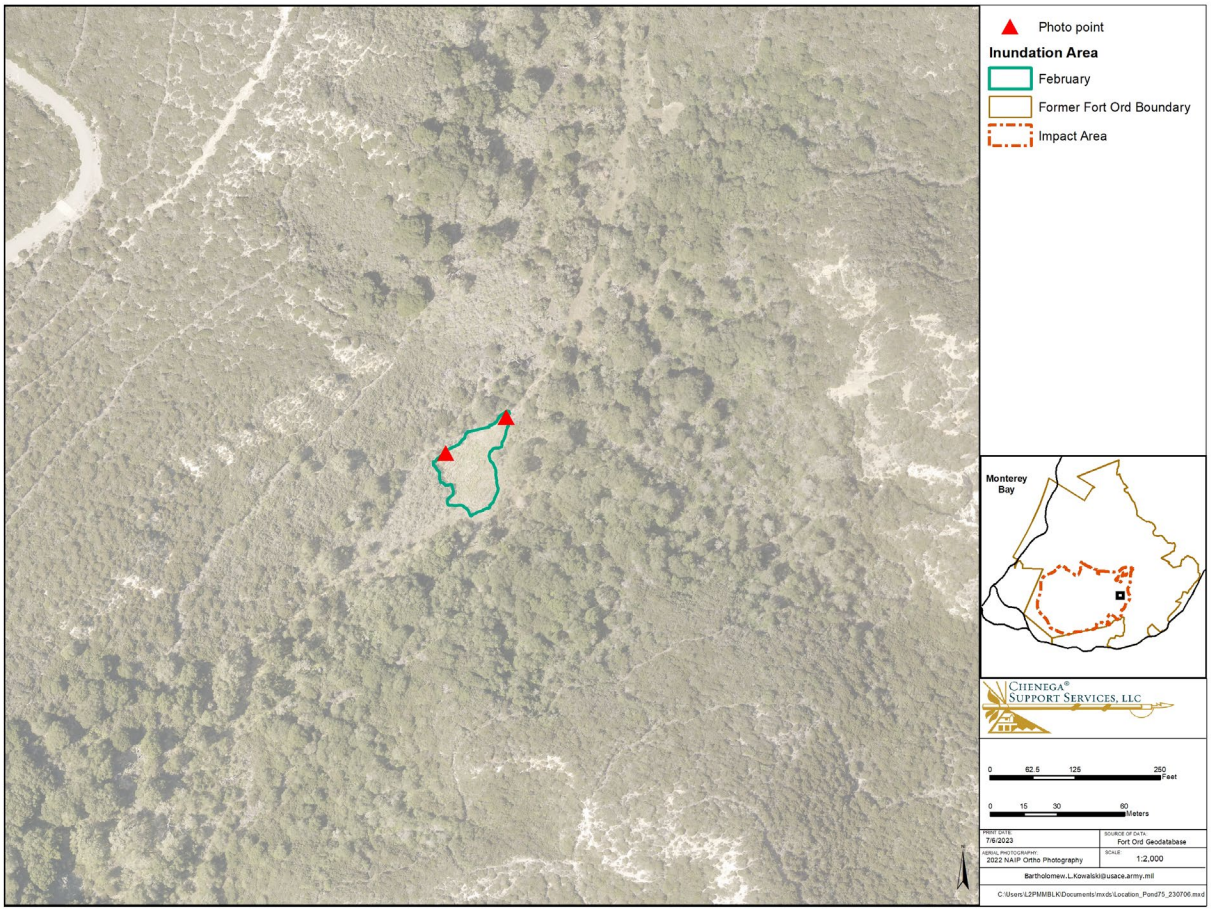

Figure 5-19. Pond 75 (Baseline) Inundation for 2023 (above normal precipitation). This is the first record of Pond 75 inundation.

5.4.4 Data Quality Objective 4

Water quality parameters of Pond 75 were taken for the first time in 2023 water year. They were within ranges of values observed at reference vernal pools.

5.4.5 Performance Standard: Wildlife Usage

Water quality was suitable for wildlife use. Pond 75 was a baseline vernal pool in 2023 and was not required to meet the performance standard. Instead, data collected will be used to assess impact after MEC cleanup operations take place in future years.

5.4.6 Conclusion

Pond 75 was not compared to DQOs in 2023 because it was in baseline condition. With the exception of DQO 1, data for Pond 75 collected in 2023 is suitable for comparison to future monitoring events (Table 5-4).

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

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

5.5 Pond 76 – Year 1 Post-mastication

Pond 76 is situated within a small and shallow basin in the northern part of the Fort Ord National Monument (Figure 2-4). Due to its small size, Pond 76 wasn't discovered until vegetation in Unit 5 was masticated in 2021, and thus no baseline data exists. No subsurface remediation occurred within the basin of Pond 76. Pond 76 inundation area was recorded with a GPS unit, but depth was estimated as there is no staff gauge. Given the limited data on Pond 76, comparison of hydrologic conditions and assessment of DQOs can only be made to reference vernal pools. Due to its small size and shallow profile, the most similar reference vernal pool is Pond 997. Pond 76 inundated from mid-January through April in 2023 water year. Values of inundation extent, depth, and water quality measurements are presented in Figures 5-20 through 5-22.

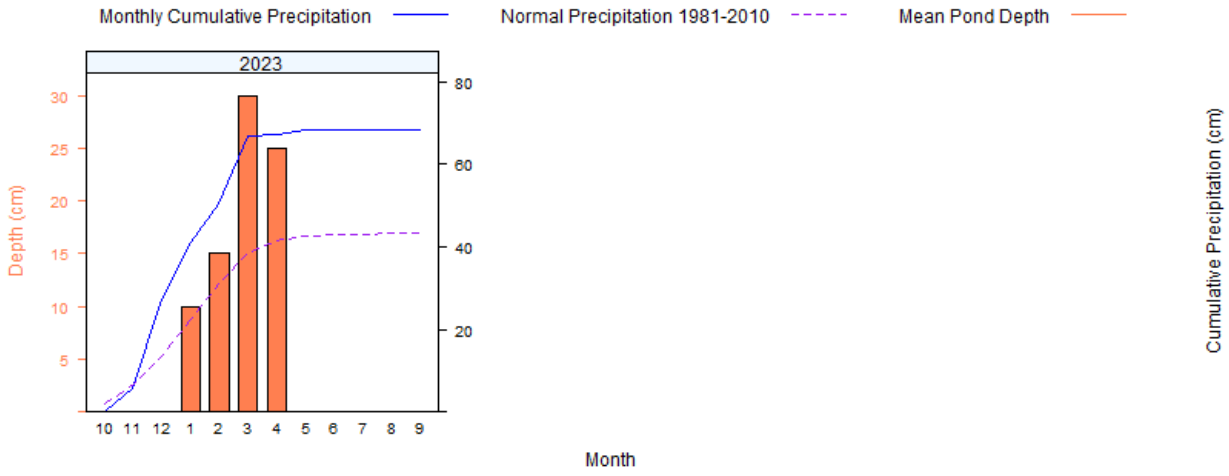

Figure 5-21. Pond 76 (Year 1 Post-mastication) Historic Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

5.5.1 Data Quality Objective 1

Pond 76 did not maintain the required average depths of 25 cm from the first rain event through March for CTS, but it did maintain the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 76 did not sustain sufficient depth for CTS (18 cm through March), but it did sustain sufficient depth for fairy shrimp (20 cm through April).

5.5.2 Data Quality Objective 2

Just like the reference Pond 997, Pond 76 was inundated frim January to April in 2023 water year. There is no baseline data for Pond 76.

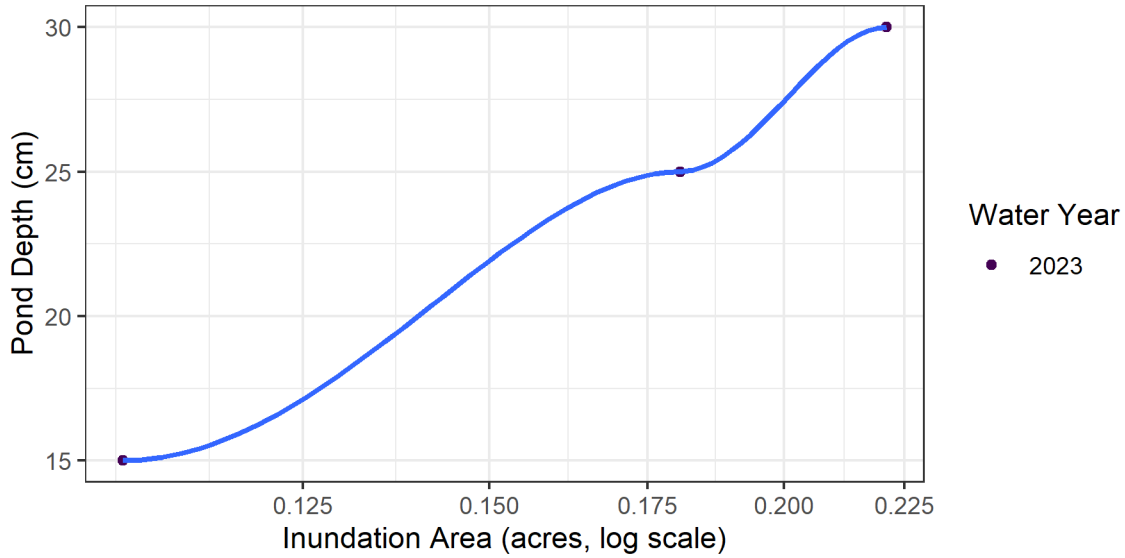

Figure 5-22. Pond 76 (Year 1 Post-mastication) Plot of Depth vs Area for 2023 Water Year

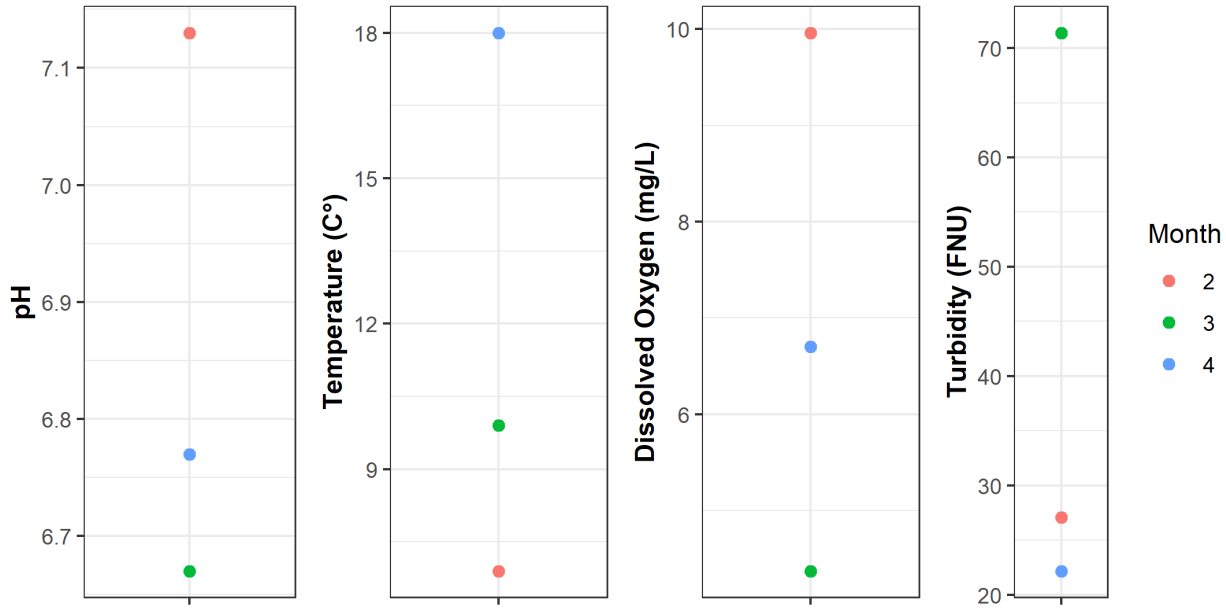

Figure 5-23. Pond 76 (Year 1 Post-mastication) 2023 water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU).

5.5.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 76, a post-mastication vernal pool, was partially on track for this performance standard for Year 1 in 2023. Pond 76 partially satisfied DQO 1 indicating that it did not sustain suitable habitat for CTS, but it did sustain suitable habitat for fairy shrimp in 2023. Pond 76 was inundated in 2023 water year just as reference Pond 997, and DQO 2 was on track.

5.5.4 Data Quality Objective 4

Water quality parameters at Pond 76 were within ranges observed at reference vernal pools in 2023 (Figures 5-2 to 5-5).

5.5.5 Performance Standard: Wildlife Usage

Pond 76 was partially on track to for this performance standard for Year 1 in 2023 because it did not sustain suitable depth for CTS, but it did sustain suitable depth for fairy shrimp. Pond 76 was partially on track for DQO 1. Water quality was suitable for wildlife use and DQO 4 was on track in 2023 water year.

5.5.6 Conclusion

Pond 76, a post-mastication vernal pool, was in Year 1 of monitoring in 2023. DQO 1 was partially on track and DQOs 2 and 4 were on track (Table 5-5). Pond 76 will continue to be monitored in the future.

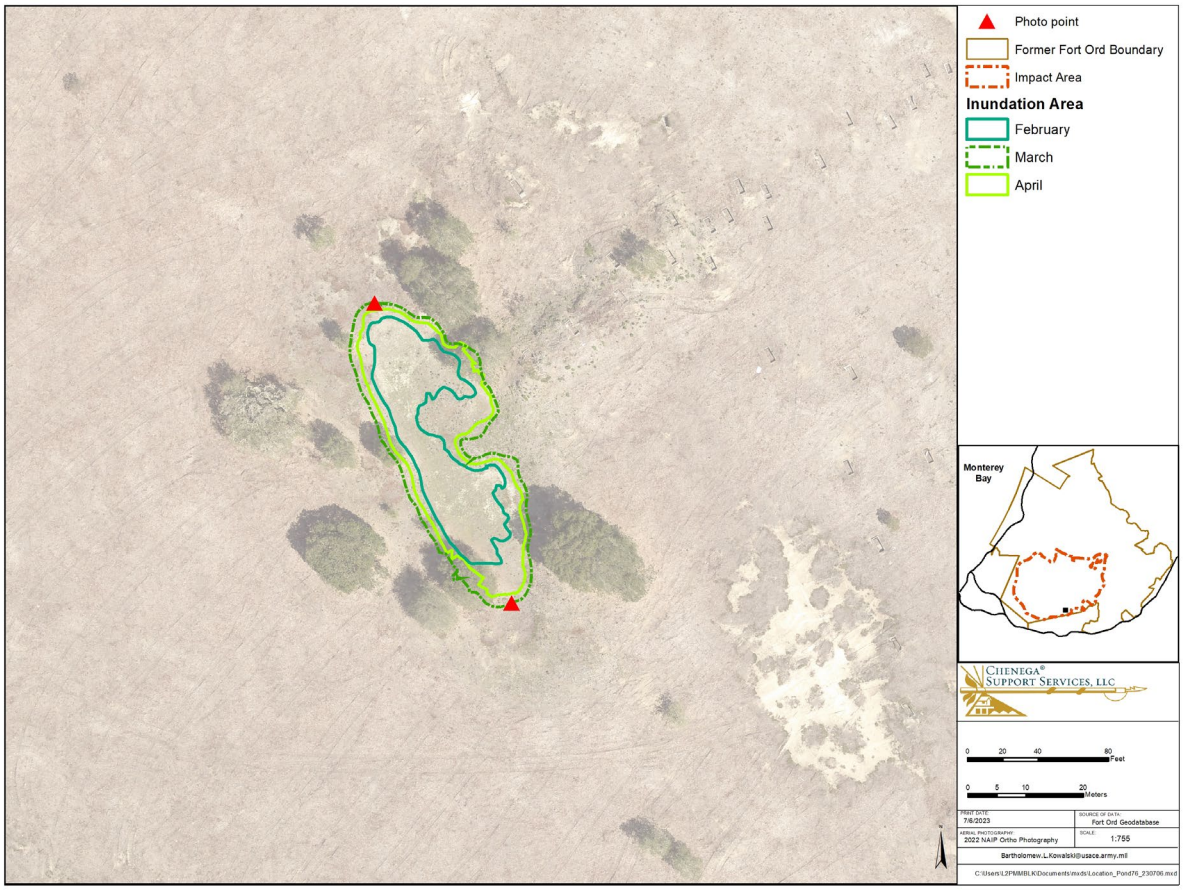

Figure 5-24. Pond 76 (Year 1 Post-mastication) Inundations for 2023 (well above normal precipitation). This is the first record of Pond 76 inundation.

Table 5-5. Success at Pond 76 (Year 1 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*

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

5.6 Pond 21 – Year 1 Post-mastication and Post-Subsurface Munitions Remediation

Pond 21 is situated within a basin with a medium steep profile in the southern part of the Fort Ord National Monument inside the Impact Area (Figure 2-4). Depth and inundation of Pond 21 have been monitored for six years (Figure 5-23). Above normal water years were 2019 and 2023. Year 1999 was a close to normal water year. Years 2007 and 2009 were below normal water years, and 2022 was a consecutive drought year. Pond 21 is most similar to reference Pond 101 East (East), although it has a smaller basin (Figure 5-1).

Pond 21 was monitored in 2023 as a Year 1 Post-mastication and Post-Subsurface Munitions Remediation vernal pool. Vegetation within its watershed was masticated in late 2021 to prepare Unit 5 for surface munitions removal. In the fall of 2022, subsurface munitions remediation occurred within the basin of Pond 21, resulting in five excavations ranging in depth from 1-inch to 22-inches, and a total disturbed area of less than 5 ft^2 (Kemron 2023). Historically, Pond 21 reached a maximum depth of 35.5 cm in the 1999 water year but inundation area was not measured that year. In 2023, Pond 21 reached a maximum depth of 35 cm and a maximum inundation of 1 acre (Figure 5-24). Pond 21 inundation extent, depth, and water quality measurements are presented in Figures 5-23 to 5-26. During the six years of monitoring of Pond 21 the cumulative precipitation in 2023 was the highest which resulted in a longest hydroperiod on record for that vernal pool (Figure 5-23).

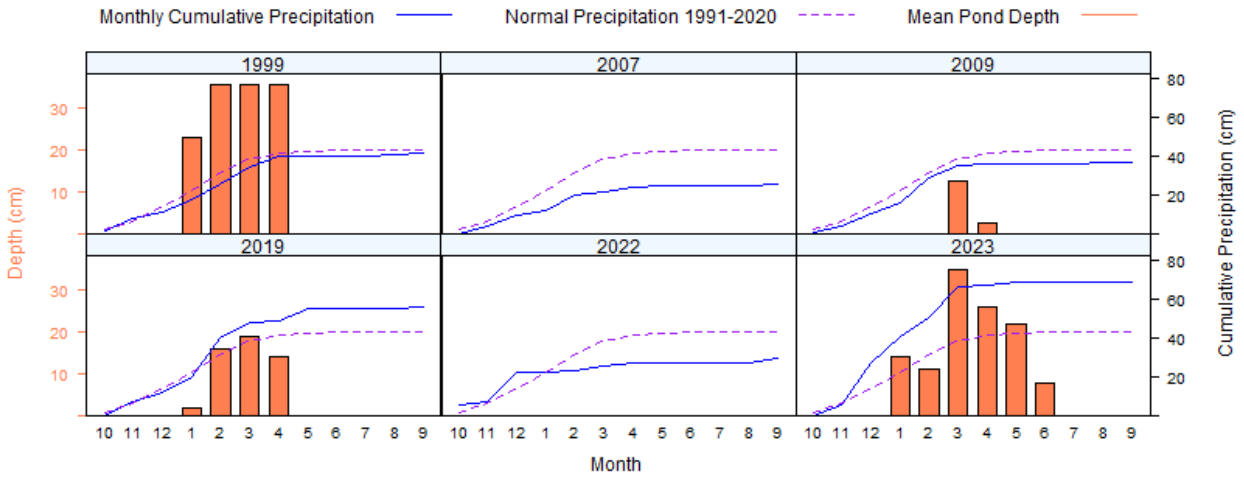

Figure 5-25. Pond 21 (Year 5 Post-mastication) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

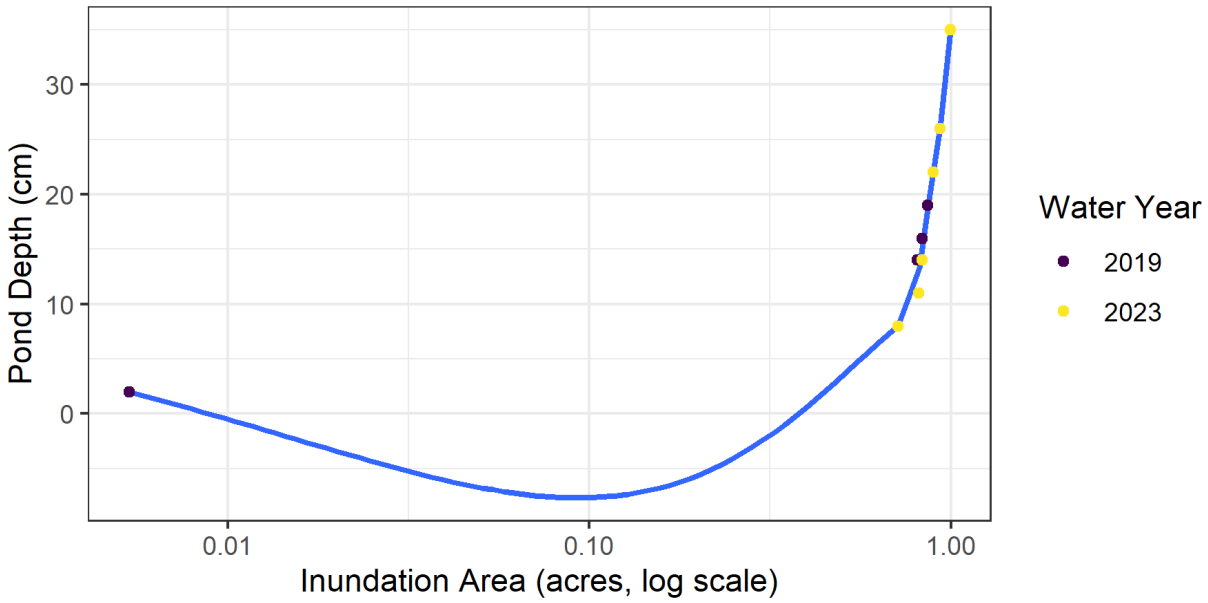

Figure 5-26. Pond 21 (Year 5 Post-mastication) Plot of Depth vs Area since 2015 Water Year.

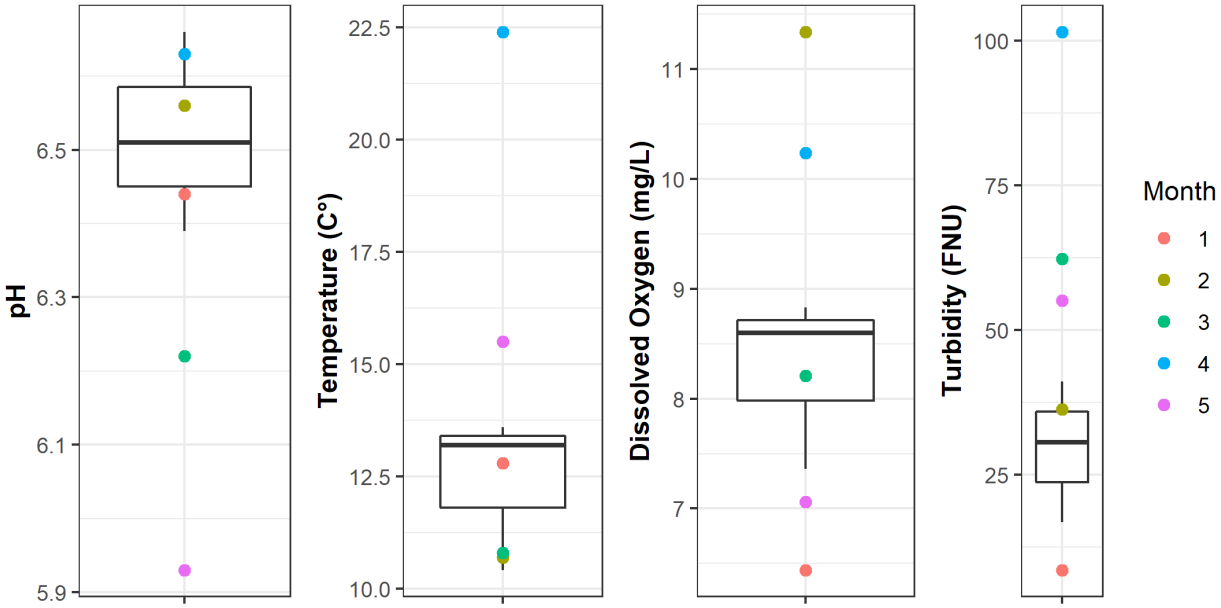

Figure 5-27. Pond 21 (Year 1 Post-mastication) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively.

5.6.1 Data Quality Objective 1

Pond 21 did not maintain the required average depths of 25 cm from the first rain event through March for CTS, but it did maintain the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 21 did not sustain sufficient depth for CTS (15 cm through March), but it did for fairy shrimp (21.6 cm through May).

5.6.2 Data Quality Objective 2

Pond 21 showed a similar inundation extent in 2023 water year to 2019 water year which also had well above normal cumulative precipitation and was a baseline year (Figure 5-26).

5.6.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 21, a post-mastication and post-subsurface munitions remediation vernal pool, was partially on track for this performance standard for Year 1 in 2023. Pond 21 partially satisfied DQO 1 indicating that it did not sustain suitable habitat for CTS, but it did sustain suitable habitat for fairy shrimp in 2023. Pond 21 had similar inundation extent in 2023 water year as in baseline and DQO 2 was met.

5.6.4 Data Quality Objective 4

Water quality parameters at Pond 21 were within ranges observed at reference vernal pools in 2023 (Figures 5-2 to 5-5).

5.6.5 Performance Standard: Wildlife Usage

Pond 21 was partially on track for this performance standard for Year 1 in 2023 because it did not sustain suitable depth for CTS, but it did sustain suitable depth for fairy shrimp. Pond 21 was partially on track for DQO 1. Water quality was suitable for wildlife use and DQO 4 was on track in the 2023 water year.

5.6.6 Conclusion

Pond 21, a post-mastication and pos-subsurface munitions remediation vernal pool, was in Year 1 of monitoring in 2023. DQO 1 was partially on track and DQOs 2 and 4 were on track (Table 5-6). Pond 21 will continue to be monitored in the future.

Table 5-6. Success at Pond 21 (Year 1 Post-mastication and Post-Subsurface 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

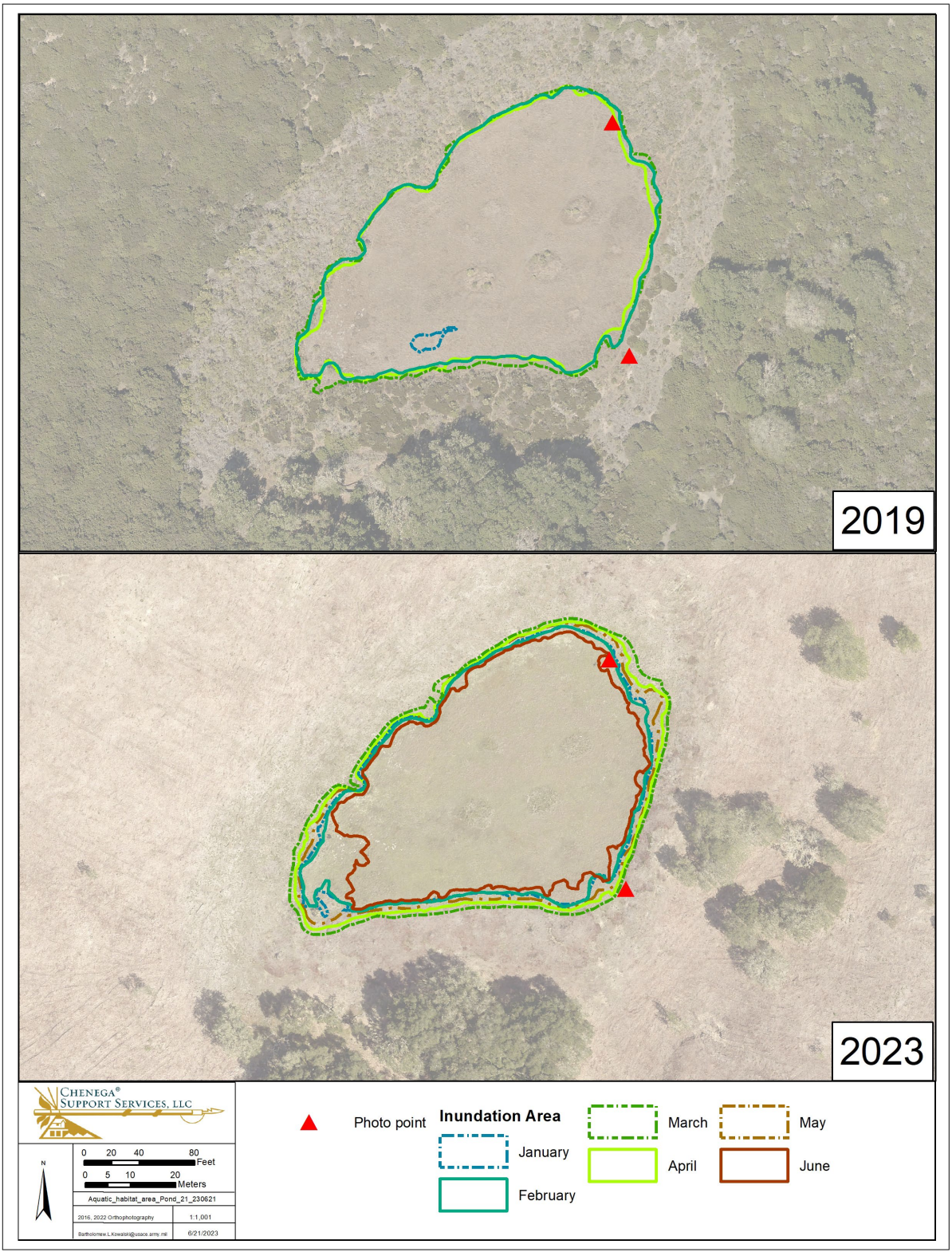

Figure 5-28. Pond 21 (Year 1 Post-mastication and Post-subsurface remediation) Inundations for 2019 and 2023 (both years had above normal precipitation)

5.7 Pond 3 North – Year 5 Post-Subsurface Munitions Remediation

Pond 3 North is situated within a medium size basin in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 3 North have been monitored for eight years (Figure 5-29). Above normal water years were 1998, 2016, 2019, and 2023. Year 2020 was a close to normal water year. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015). In well above normal water years Pond 3 North can become hydrologically connected to Pond 3 South, which last time occurred in 2019. By size, Pond 3 North is between reference Ponds 101 East (East) and 997.

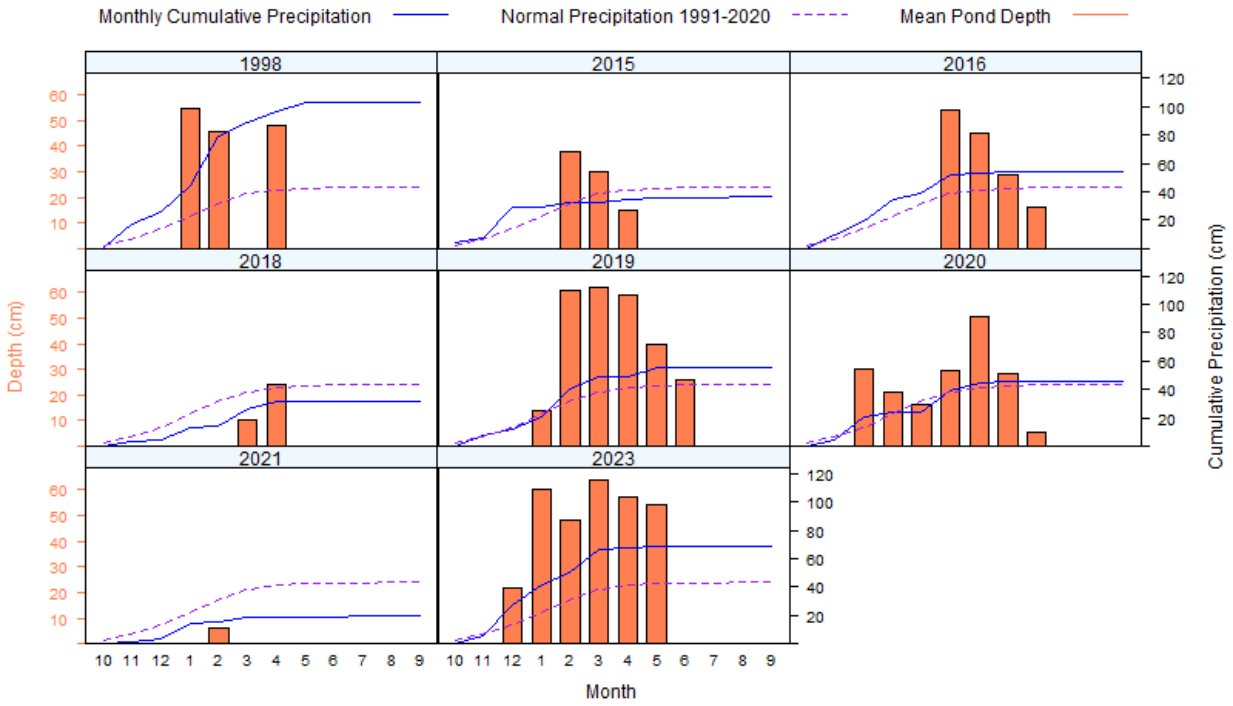

Figure 5-29. Pond 3 North (Year 5 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

Pond 3 North was monitored in 2023 as a Year 5 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 2019, an above normal water year, when it became hydrologically connected to Pond 3 South. In 2023 water year Pond 3 North became hydrologically connected to Pond 3 South again, and it reached a maximum depth of 64 cm and maximum measured inundation of 1.34 acres (Table 4-8). The depth and inundation values were the highest on record for Pond 3 North (Figure 5-30).

Pond 3 North was inundated from December to June when the last monitoring even occurred. Its hydroperiod in 2023 mostly resembled that of 2019 water year (Figure 5-29). Maximum inundation area was greater in 2023 than in baseline water year 2016, which was also an above normal water year (Figure 5-32).

Water quality parameters of Pond 3 North were mostly similar to reference vernal pools with the exception of turbidity, which was higher in January but within the historical range (Figure 5-31 and Figure 5-4).

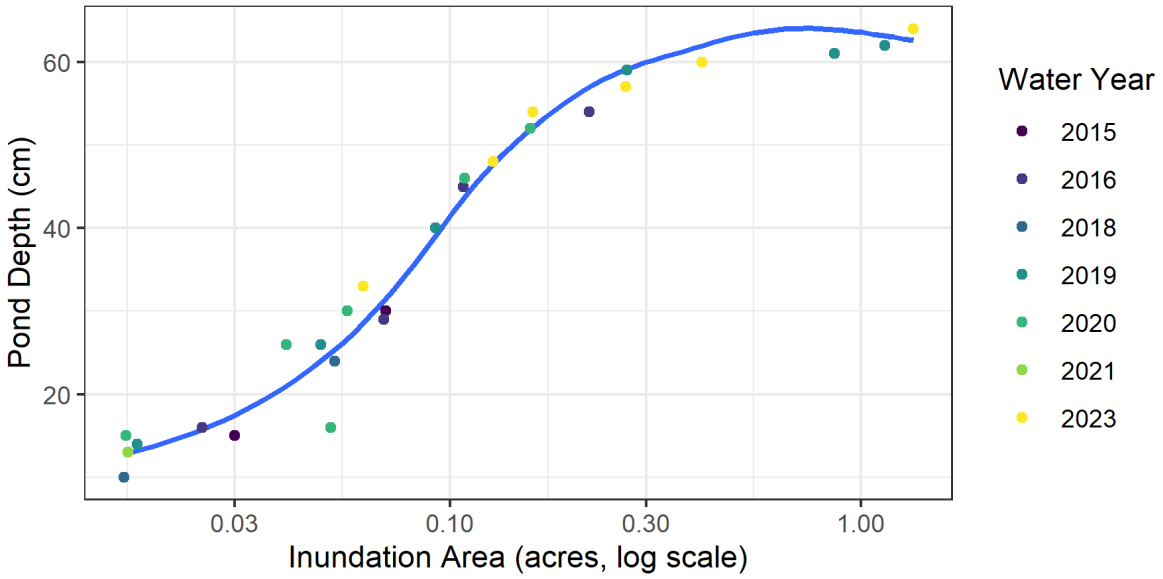

Figure 5-30. Pond 3 North (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2015.

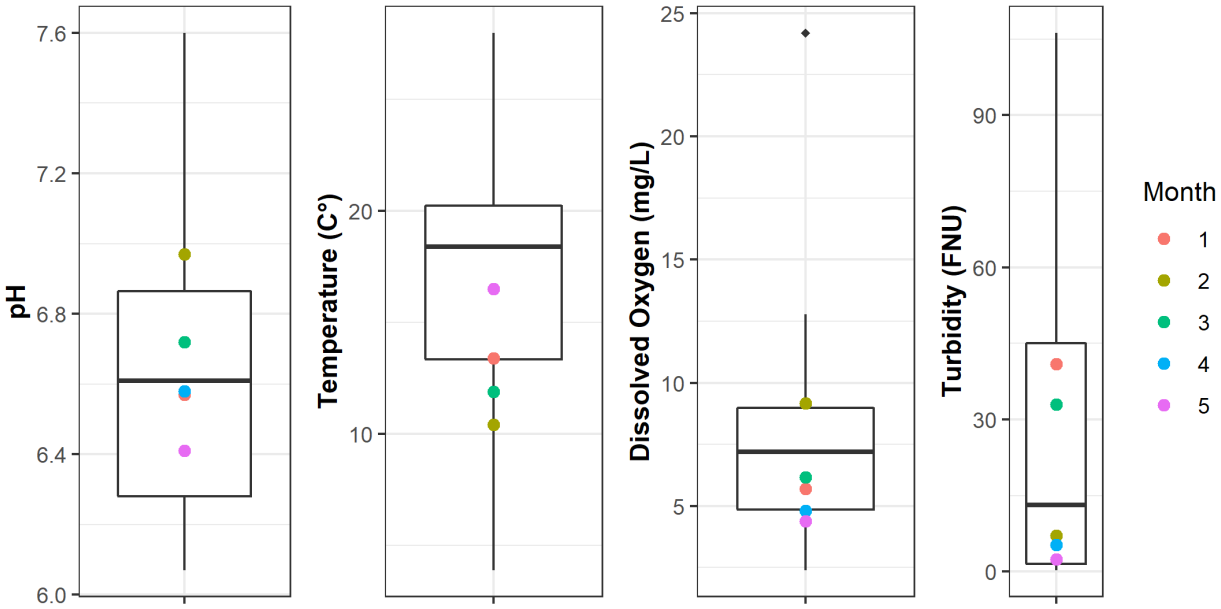

Figure 5-31. Pond 3 North (Year 5 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The colored dots represent observed values in 2023 water year. The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics.

5.7.1 Data Quality Objective 1

Pond 3 North maintained the required average depths of 25 cm from the first rain event through March for CTS and the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 3 North sustained sufficient depth for CTS (48.5 cm through March), and for fairy shrimp (50.8 cm through May).

5.7.2 Data Quality Objective 2

Maximum inundation area in 2023 water year was greater than in baseline year 2016, an above normal water year (Figure 5-30).

5.7.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 3 North, a post-subsurface munitions remediation vernal pool, was on track for this performance standard for Year 5 in 2023. Pond 3 North was on track for DQO 1 indicating that it sustained suitable habitat for CTS and fairy shrimp in 2023. Inundation at Pond 3 North reached the biggest area on record and DQO 2 was on track.

5.7.4 Data Quality Objective 4

Water quality parameters of Pond 3 North were within the ranges of historical values and those observed at reference vernal pools and DQO 4 was on track (Figure 5-31 and Figures 5-2 through 5-5).

5.7.5 Performance Standard: Wildlife Usage

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

5.7.6 Conclusion

Pond 3 North, a post-subsurface munitions remediation vernal pool, was in a final Year 5 of required monitoring and was on track to meet the performance standards (Table 5-7). During the five years of post-prescribed burn and post-subsurface remediation monitoring, Pond 3 North was on track to meet the Hydrological Conditions and Inundation Area Performance Standard in 2019, 2020, and 2023, all normal or above normal water years. The two years when the Performance Standard was not on track was in 2018 and 2021, both below normal water years (Figure 5-32). Similarly, the two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were on track in the normal, and above normal water years. The data collected following MEC cleanup activities demonstrate that hydrological functioning, suitable wildlife habitat, and water quality have not been negatively affected by the cleanup activities at Pond 3 North, and no additional monitoring is recommended.

Table 5-7. Success at Pond 3 North (Year 5 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives

Performance Standard	Applicable DQO	2018	2019	2020	2021	2023
Hydrological Conditions & Inundation Area	DQO 1	Not on track	On track	On track	Not on track	On track
	DQO 2	On track	On track	On track	On track	On track
Wildlife Usage	DQO 1	Not on track	On track	On track	Not on track	On track
	DQO 4	On track	On track	On track	On track	On track

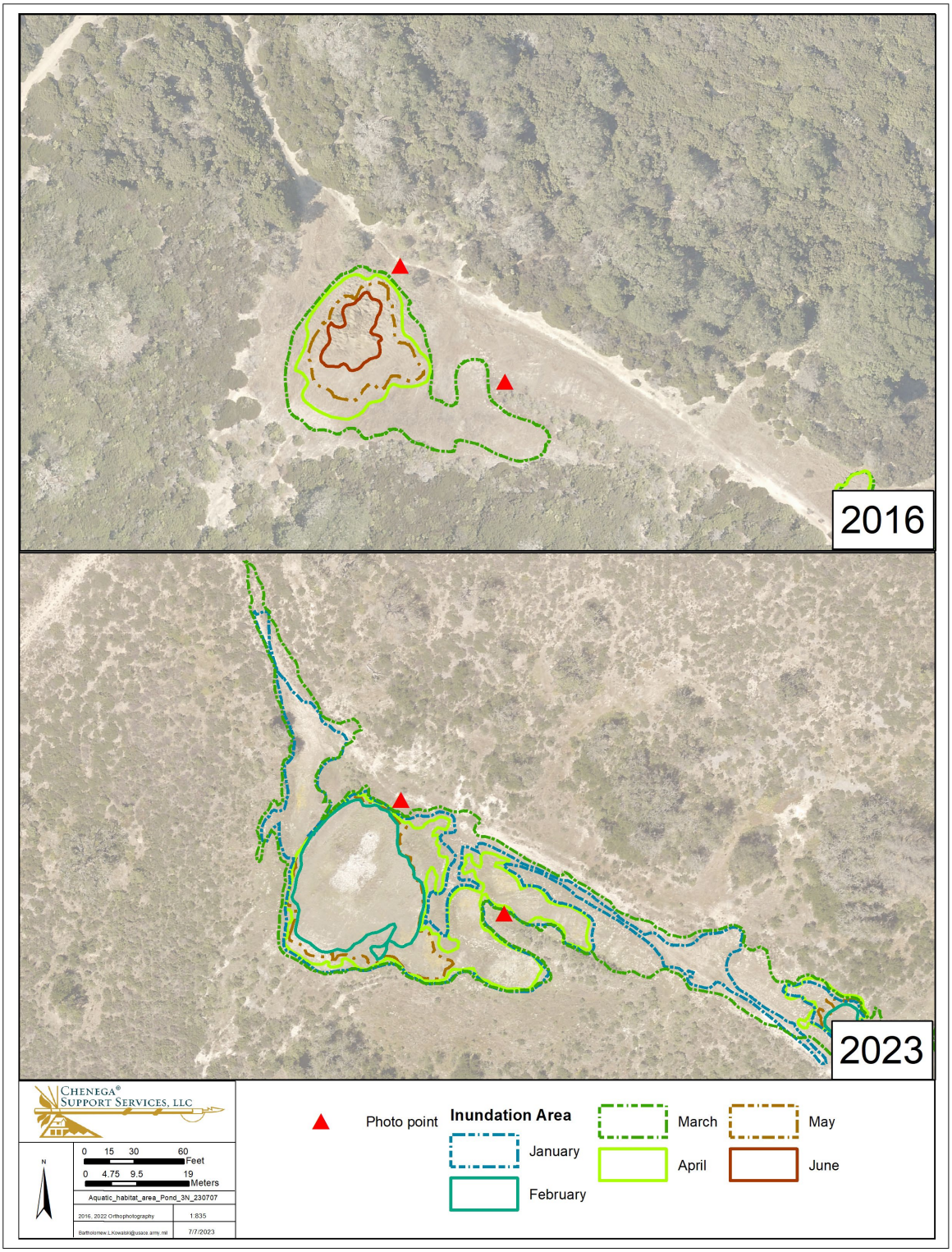

Figure 5-33. Pond 3 North (Year 5 Post-Subsurface Munitions Remediation) Inundations for 2016 and 2023 (both above normal precipitation water years).

5.8 Pond 3 South – Year 5 Post-Subsurface Munitions Remediation

Pond 3 South is situated within a medium size basin in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 3 South have been monitored for eight years (Figure 5-33). Above normal water years were 1998, 2016, 2019, and 2023. Year 2020 was a close to normal water year. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015). In extremely above normal water years Pond 3 South can become hydrologically connected to Pond 3 North, which last time occurred in 2019. By size, Pond 3 South is between reference Ponds 101 East (East) and 997.

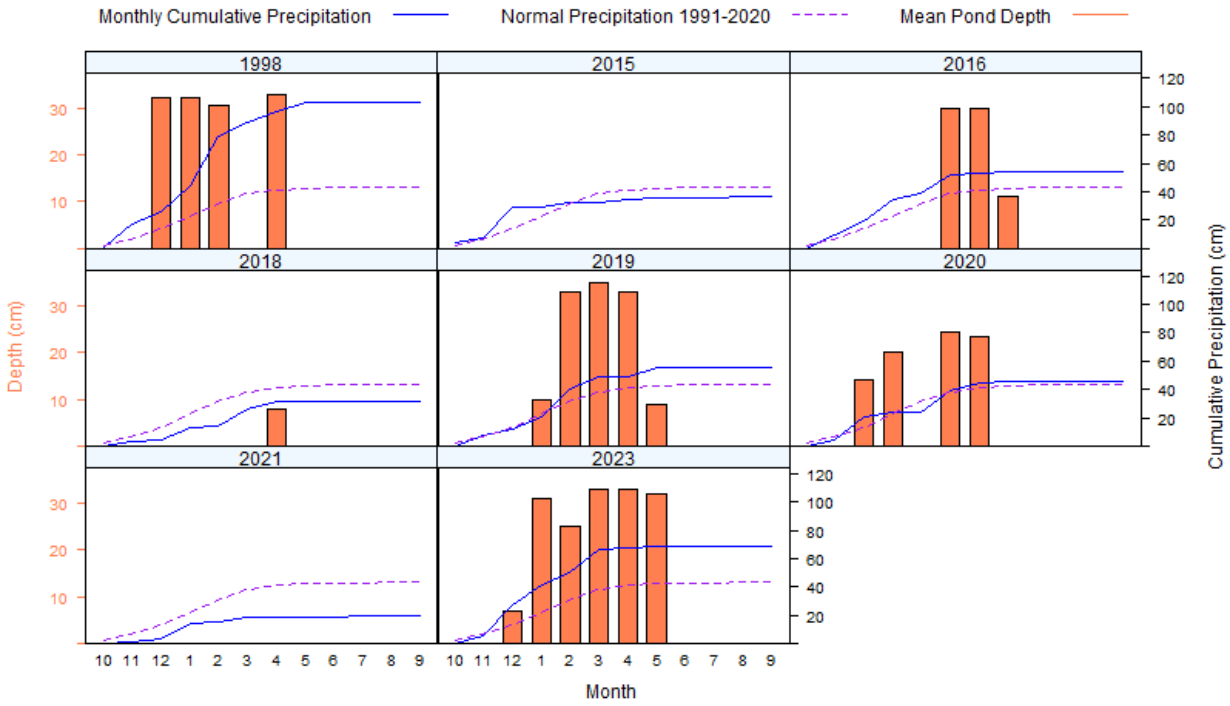

Figure 5-34. Pond 3 South (Year 5 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

Pond 3 South was monitored in 2023 as a Year 5 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 2019, an above normal water year when it became hydrologically connected to Pond 3 North. Pond 3 South reached a maximum depth of 33 cm in 2023 water year and a maximum inundation area of 1.34 acres which was the highest on record (Figure 5-34). Inundation extent, depth, and water quality measurements were not taken. Historical values are presented in Figures 5-33 to 5-36.

During the eight years of monitoring of Pond 3 South the cumulative precipitation in 2023 was the second highest (Figure 5-33). Pond 3 South was inundated from January to May and its hydroperiod in 2023 mostly resembled that of 2019 water year (Figure 5-35). Maximum inundation area was greater in 2023 than in baseline water year 2016, which was also an above normal water year (Figure 5-36).

Water quality parameters of Pond 3 South were mostly similar to reference vernal pools with the exception of pH and DO, which were higher in February but within the historical ranges of reference vernal pools (Figure 5-35 and Figure 5-4).

5.8.1 Data Quality Objective 1

Pond 3 South did not maintain the required average depth of 25 cm from the first rain event through March for CTS, but it maintained the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 3 South did not sustain sufficient depth for CTS (24 cm through March), but it did for fairy shrimp (26.8 cm through May).

5.8.2 Data Quality Objective 2

Maximum inundation area in 2023 water year was greater than in baseline year 2016, an above normal water year (Figure 5-36).

5.8.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 3 South, a post-subsurface munitions remediation vernal pool, was partially on track to meet the performance standard for Year 5 in 2023. Pond 3 South was not on track for DQO 1 for CTS, but it was on track for fairy shrimp indicating that it sustained suitable habitat for fairy shrimp in 2023. The inundation at Pond 3 South reached the biggest area on record and DQO 2 was on track.

5.8.4 Data Quality Objective 4

Water quality parameters of Pond 3 South were within the ranges of historical values and those observed at reference vernal pools and DQO 4 was on track (Figure 5-37 and Figures 5-2 through 5-5).

5.8.5 Performance Standard: Wildlife Usage

Pond 3 South was partially on track for this the performance standard for Year 5 in 2023 because it did not sustain sufficient inundation for CTS, but it did for fairy shrimp. Pond 3 South was partially on track for DQO 1. Water quality measurements were adequate for wildlife.

5.8.6 Conclusion

Pond 3 South, a post-subsurface munitions remediation vernal pool, was in a final Year 5 of required monitoring and was partially on track to meet the performance standards (Table 5-8). During the five years of post-prescribed burn and post-subsurface remediation monitoring, Pond 3 South was on track to meet the Hydrological Conditions and Inundation Area Performance Standard in 2019 and was partially on track to meet it 2020 and 2023, all normal or above normal water years. The two years when the Performance Standard was not on track was in 2018 and 2021, both below normal water years (Figure 5-38). Similarly, the two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were on track in 2019 and were partially on track in 2020 and 2023 water years. Pond 3 South is a shallow vernal pool that may only occasionally get deep enough to meet DQO 1 for CTS in above normal water years (Figure 5-39). The data collected following MEC cleanup activities demonstrate that hydrological functioning, suitable wildlife habitat, and water quality have not been negatively affected by the cleanup activities at Pond 3 South, and no additional monitoring is recommended.

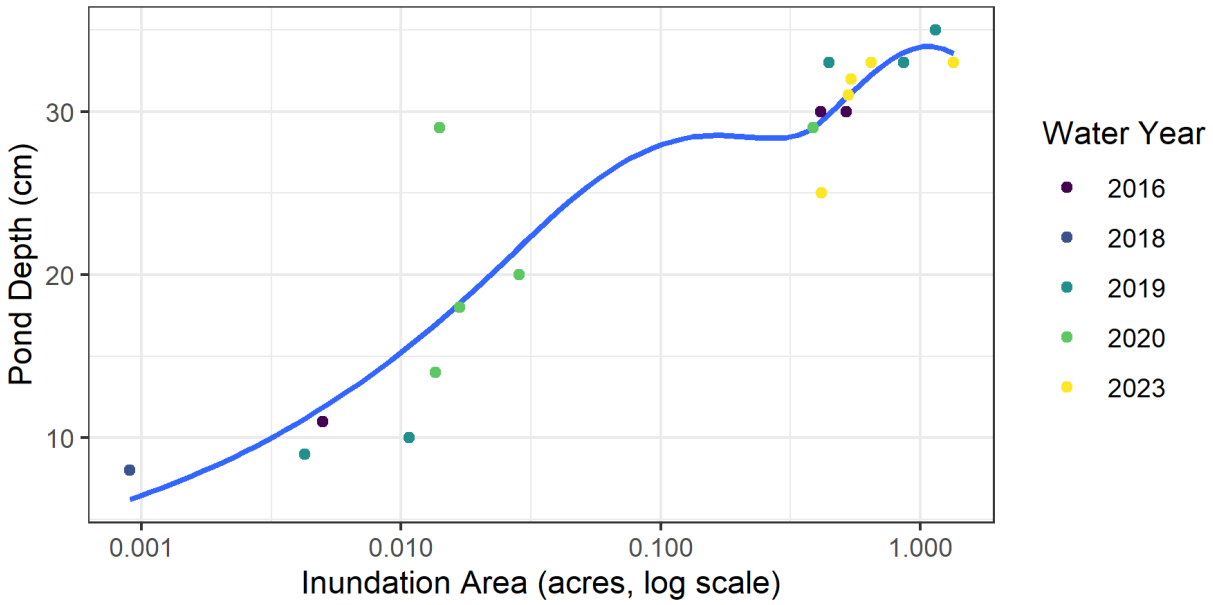

Figure 5-40. Pond 3 South (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2016.

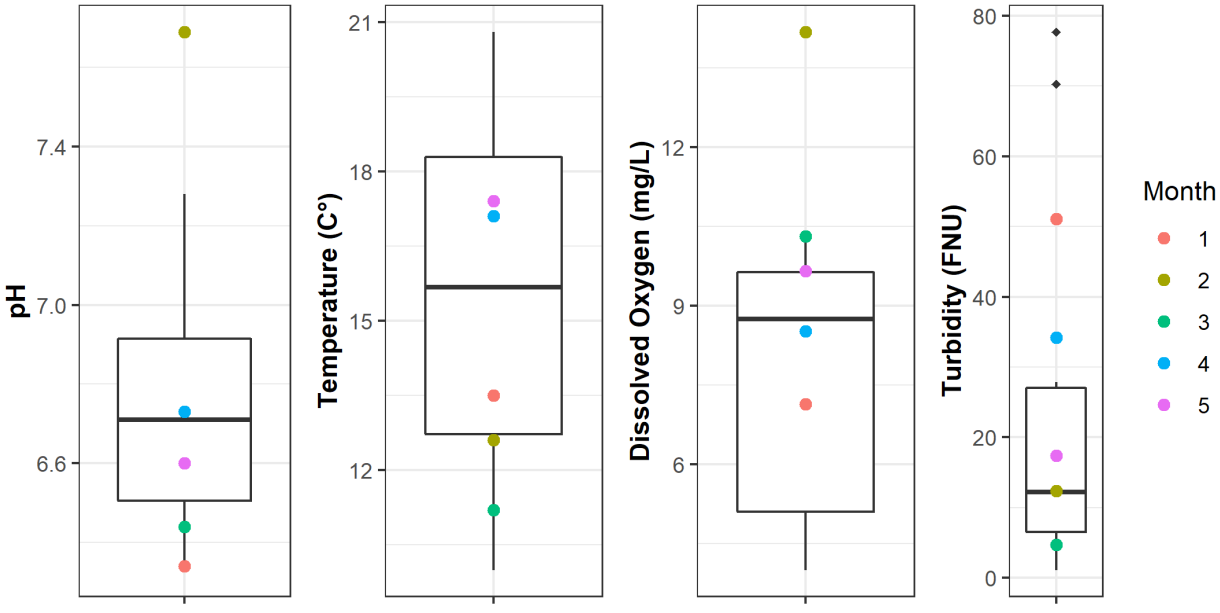

Figure 5-41. Pond 3 South (Year 5 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles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

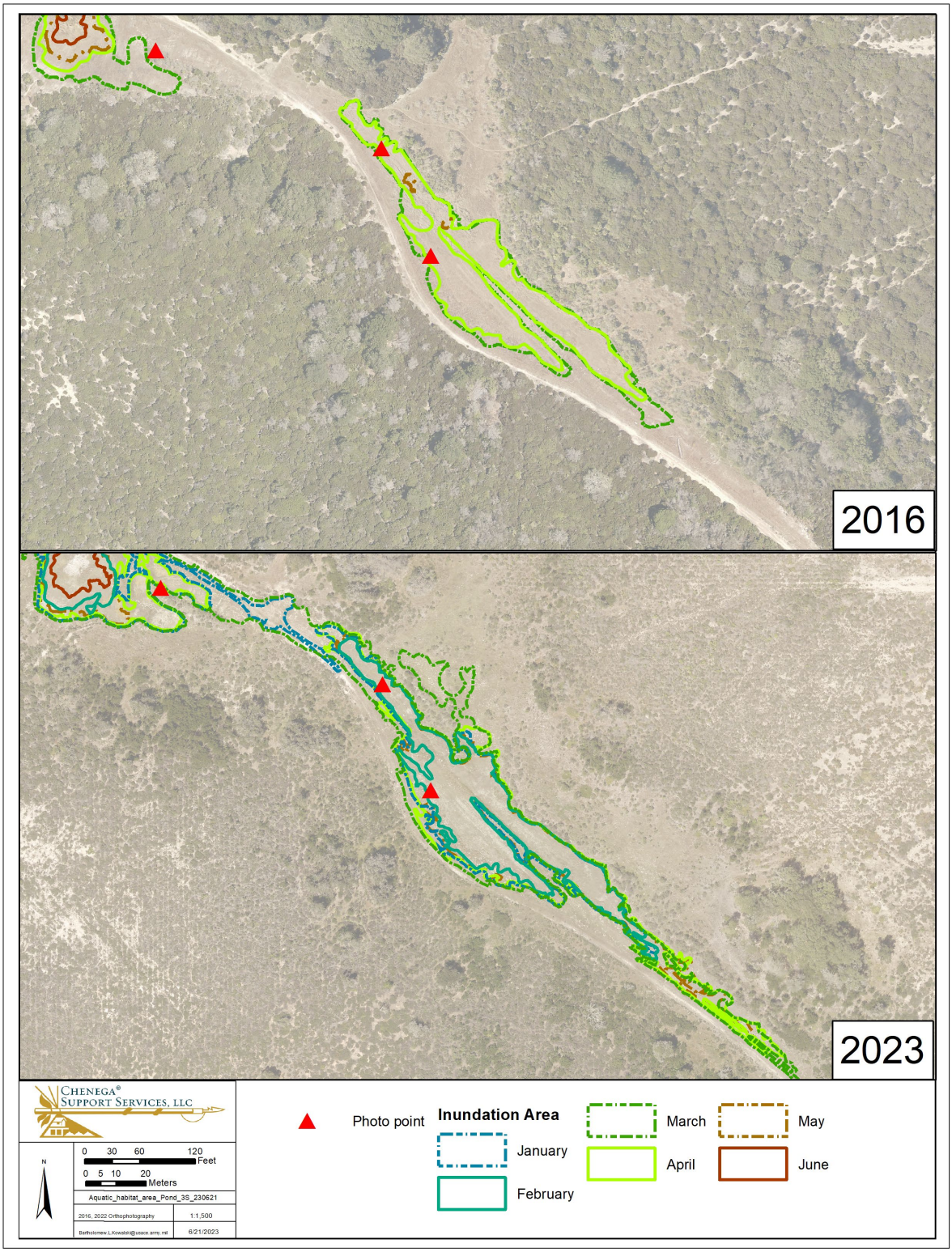

Figure 5-42. Pond 3 South (Year 5 Post-Subsurface Munitions Remediation) Inundations for 2016 and 2023 both above normal precipitation water years).

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

Performance Standard	Applicable DQO	2018	2019	2020	2021	2023
Hydrological Conditions & Inundation Area	DQO 1	Not on track	On track	Partially on track	Not on track	Partially on track
	DQO 2	On track	On track	On track	On track	On track
Wildlife Usage	DQO 1	Not on track	On track	Partially on track	Not on track	Partially on track
	DQO 4	On track	On track	On track	Cannot assess	On track

5.9 Pond 16 – Year 5 Post-Subsurface Munitions Remediation

Pond 16 is situated within a medium size basin with a steep profile in the southern part of the Fort Ord National Monument within the Impact Area (Figure 2-4). Depth and inundation of Pond 16 have been monitored for thirteen years (Figure 5-37). Above normal water years were 1995, 2017, 2019, and 2023. Years 1992, 1996 and 2020 were close to normal water years, and all other years were below normal (1994, 2009, 2018, 2021) or consecutive drought years (2015, 2022). In above normal water years water can spill out of primary basin of Pond 16 and significantly expand its inundated area to the north which last time occurred in 2017. By size, Pond 16 is most similar to reference Pond 101 East (East), although it has a much steeper profile (Figure 5-1).

Pond 16 was monitored in 2023 as a Year 5 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 2017, an above normal water year (Figure 5-37). Pond 16 reached a maximum depth of 137 cm and a maximum inundation area of 0.88 ac in 2023 water year (Figure 5-38). While inundation area was not hydrologically connected to the inundated area to the north at the time of surveys, it is possible that there was hydrological connectivity between both areas at some point during the 2023 water year. Inundation extent, depth, and water quality measurements values are presented in Figures 5-37 to 5-40.

During the thirteen years of monitoring of Pond 16 the cumulative precipitation in 2023 was the highest (Figure 5-37). Pond 16 was inundated from January to May when the last monitoring event occurred, and its hydroperiod in 2023 mostly resembled that of 2017 water year (Figure 5-37). Inundation area was similar in 2023 to 2017 water year, which was also an above normal water year (Figure 5-40).

Water quality parameters of Pond 16 were similar to reference vernal pools with the exception of turbidity and dissolved oxygen, which were higher and lower than in reference vernal pools, respectively, but within the historical ranges of reference vernal pools (Figure 5-39 and Figure 5-4).

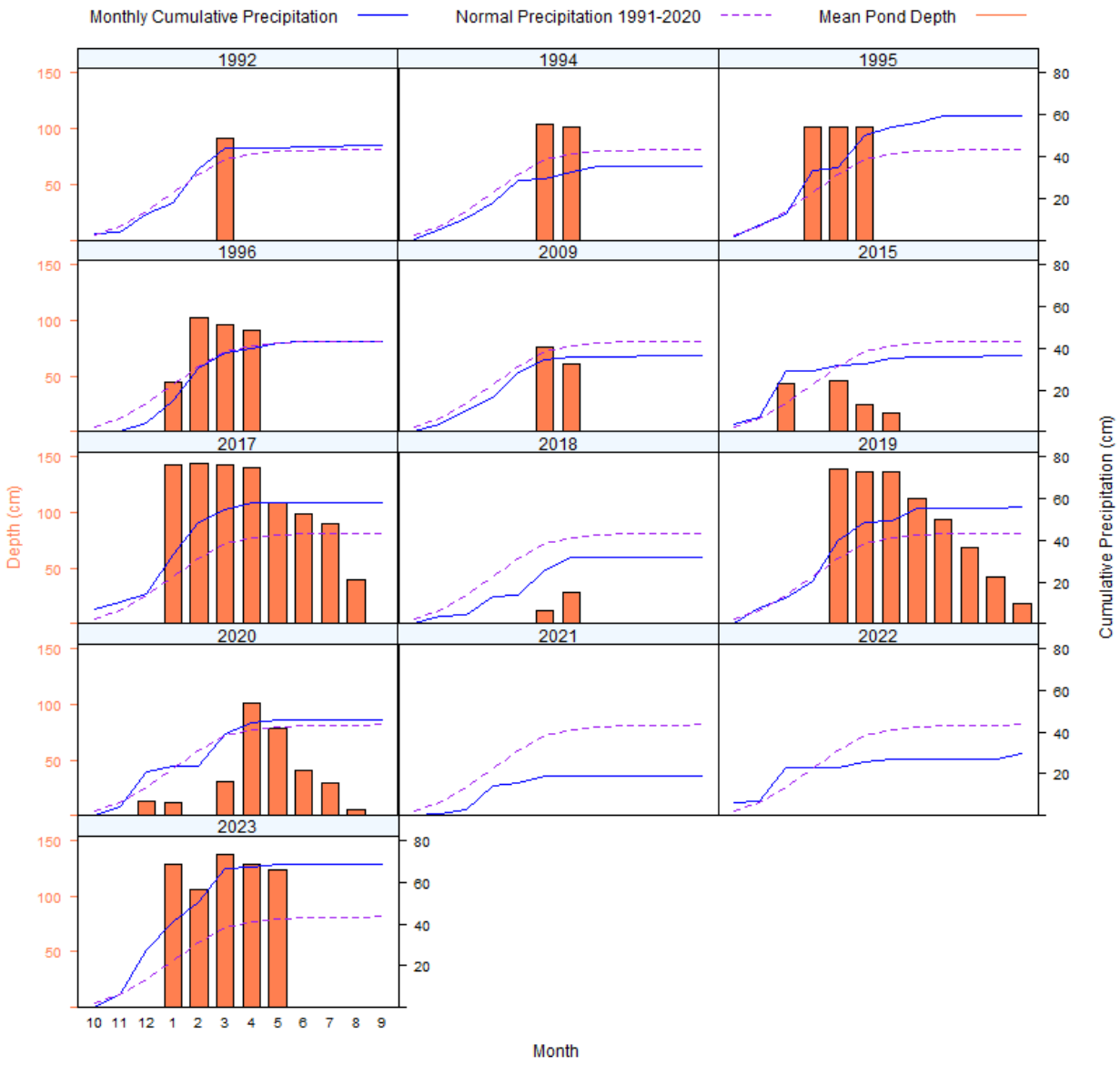

Figure 5-43. Pond 16 (Year 5 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

5.9.1 Data Quality Objective 1

Pond 16 maintained the required average depths of 25 cm from the first rain event through March for CTS, and the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 16 sustained sufficient depths for CTS (124.7 cm through March), and for fairy shrimp (124.6 cm through May).

5.9.2 Data Quality Objective 2

Maximum inundation area in 2023 water year was greater than in baseline year 1995, an above normal water year (Figure 5-37).

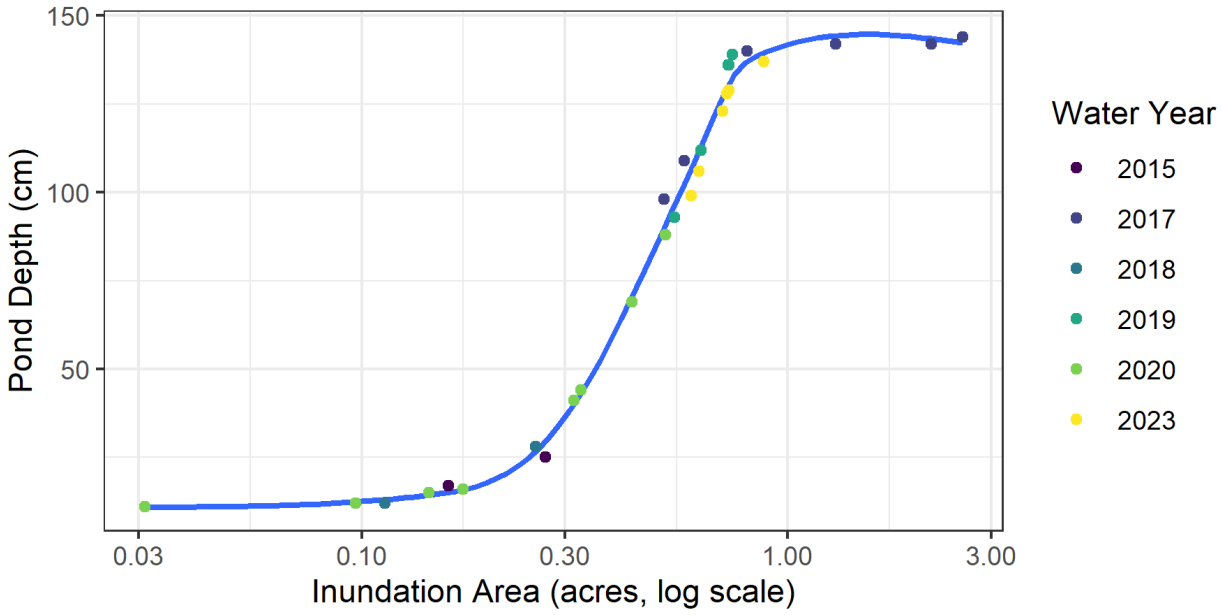

Figure 5-44. Pond 16 (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area since 2015 Water Year.

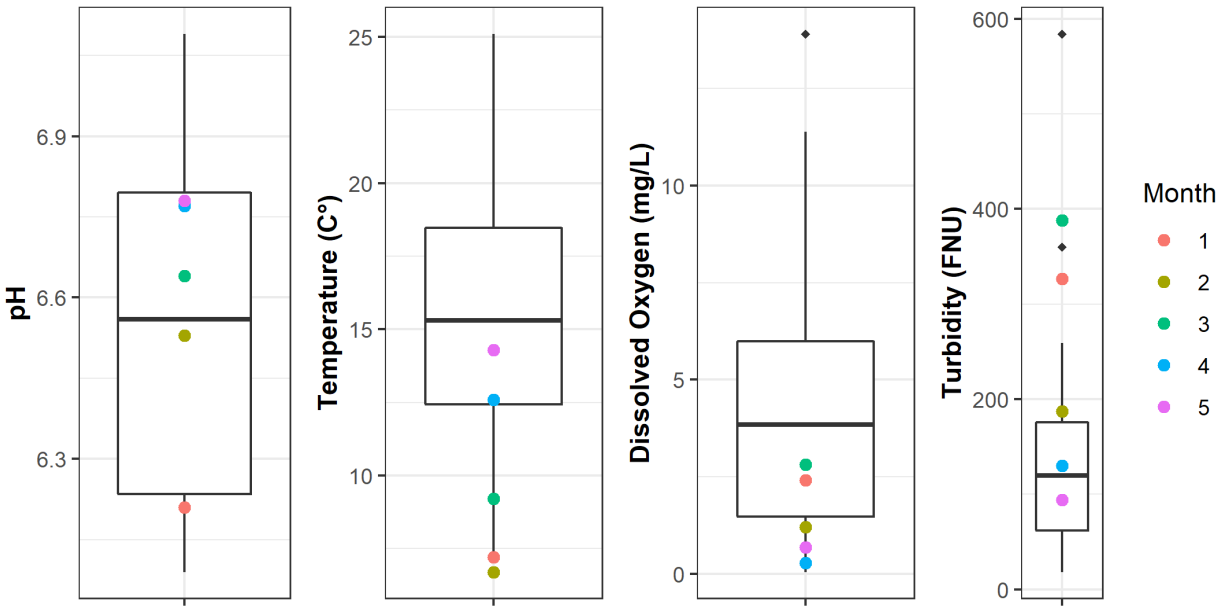

Figure 5-45. Pond 16 (Year 5 Post-Subsurface Munitions Remediation) historical and 2023 water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics and colored dots represent 2023 values.

5.9.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 16, a post-subsurface munitions remediation vernal pool, was on track to meet the performance standard for Year 5 in 2023 water year. Pond 16 was on track for DQO 1 indicating that it sustained suitable habitat for CTS and fairy shrimp in 2023. Pond 16 reached higher inundation area in 2023 water year than during baseline years and DQO 2 was on track.

5.9.4 Data Quality Objective 4

Water quality parameters of Pond 16 were within the ranges of historical values and those observed at reference vernal pools (Figure 5-39 and Figures 5-2 to 5-5).

5.9.5 Performance Standard: Wildlife Usage

Pond 16 was on track for this performance standard for Year 5 in 2023 as it sustained sufficient depth and inundation for CTS and fairy shrimp. Water quality measurements were adequate for wildlife.

5.9.6 Conclusion

Pond 16, a post-subsurface munitions remediation vernal pool, was in a final Year 5 of required monitoring in 2023 and was on track for the performance standards (Table 5-9). During the seven years of post-mastication and post-subsurface remediation monitoring, Pond 16 was on track for Hydrological Conditions and Inundation Area Performance Standard in 2017, 2019, and 2023, and was partially on track in 2020, all normal or above normal water years. The three years when the Performance Standard was not on track was in 2018, 2021, and 2022, all below normal water years (Figure 5-46). Similarly, the two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were on track or partially on track in normal, and above normal water years. The data collected following MEC cleanup activities demonstrate that hydrological functioning, suitable wildlife habitat, and water quality have not been negatively affected by the cleanup activities at Pond 16, and no additional monitoring is recommended.

Table 5-9. Success at Pond 16 (Year 5 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives

Performance Standard	Applicable DQO	2017	2018	2019	2020	2021	2022	2023
Hydrological Conditions & Inundation Area	DQO 1	On track	Not on track	On track	Partially on track	Not on track	Not on track	On track
	DQO 2	On track	On track	On track	On track	On track	On track	On track
Wildlife Usage	DQO 1	On track	Not on track	On track	Partially on track	Not on track	Not on track	On track
	DQO 4	On track	On track	On track	On track	Cannot assess	Cannot assess	On track

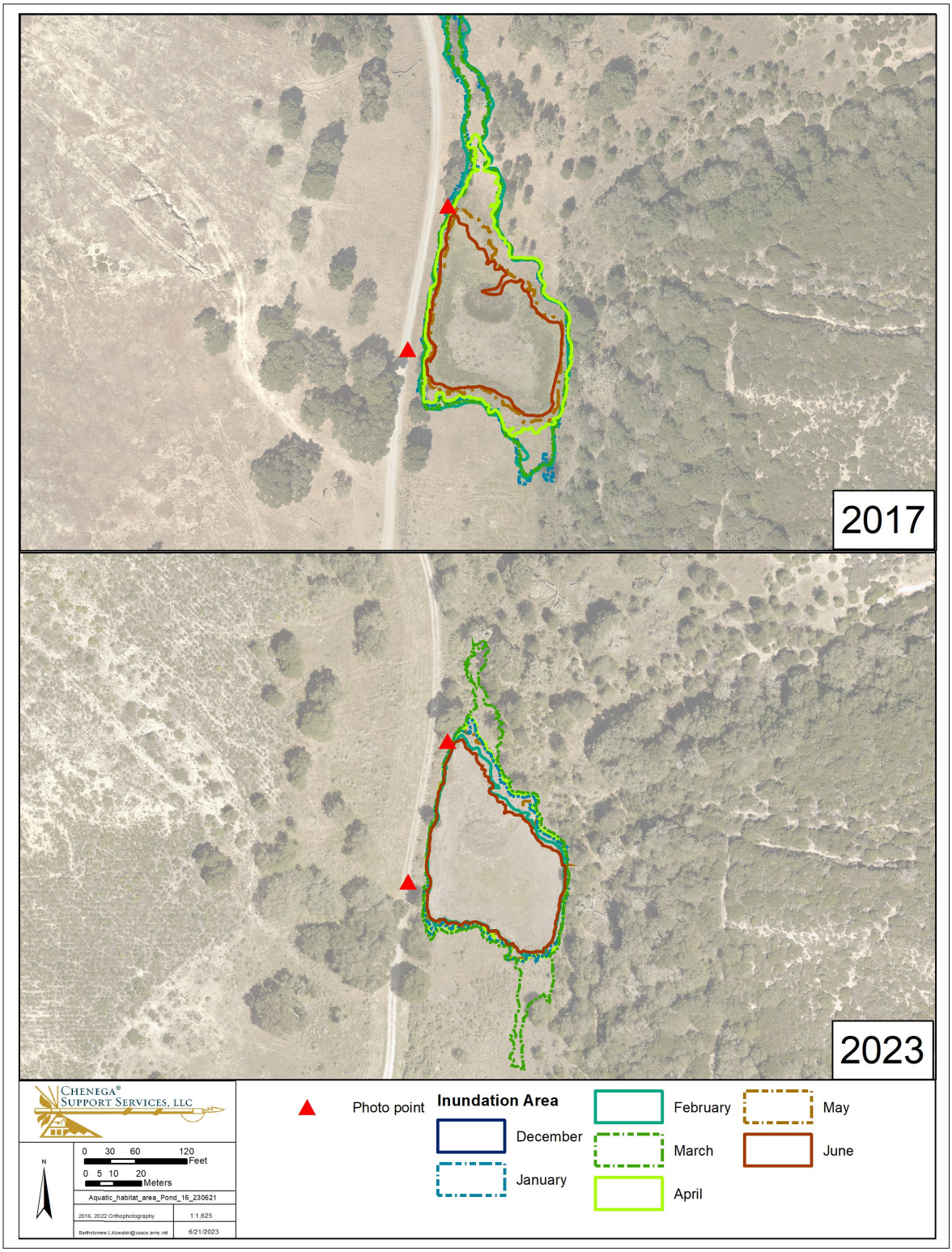

Figure 5-47. Pond 16 (Year 5 Post-Subsurface Munitions Remediation) Inundations for 2017 and 2023 (both years had above normal precipitation).

5.10 Pond 35 – Year 5 Post-Subsurface Munitions Remediation

Pond 35 is situated within a small basin with a moderately steep profile in the northern part of the Fort Ord National Monument (Figure 2-4). Pond 35 was monitored for twelve years (Figure 5-41). Above normal water years were 1995, 2016, 2019, and 2023. Years 1992, 1996, and 2020 were close to normal water years. All other years were below normal (1994, 2018, 2021) or consecutive drought years (2015, 2022). By size, Pond 35 is most similar to reference Pond 101 East (East) (Figure 5-1).

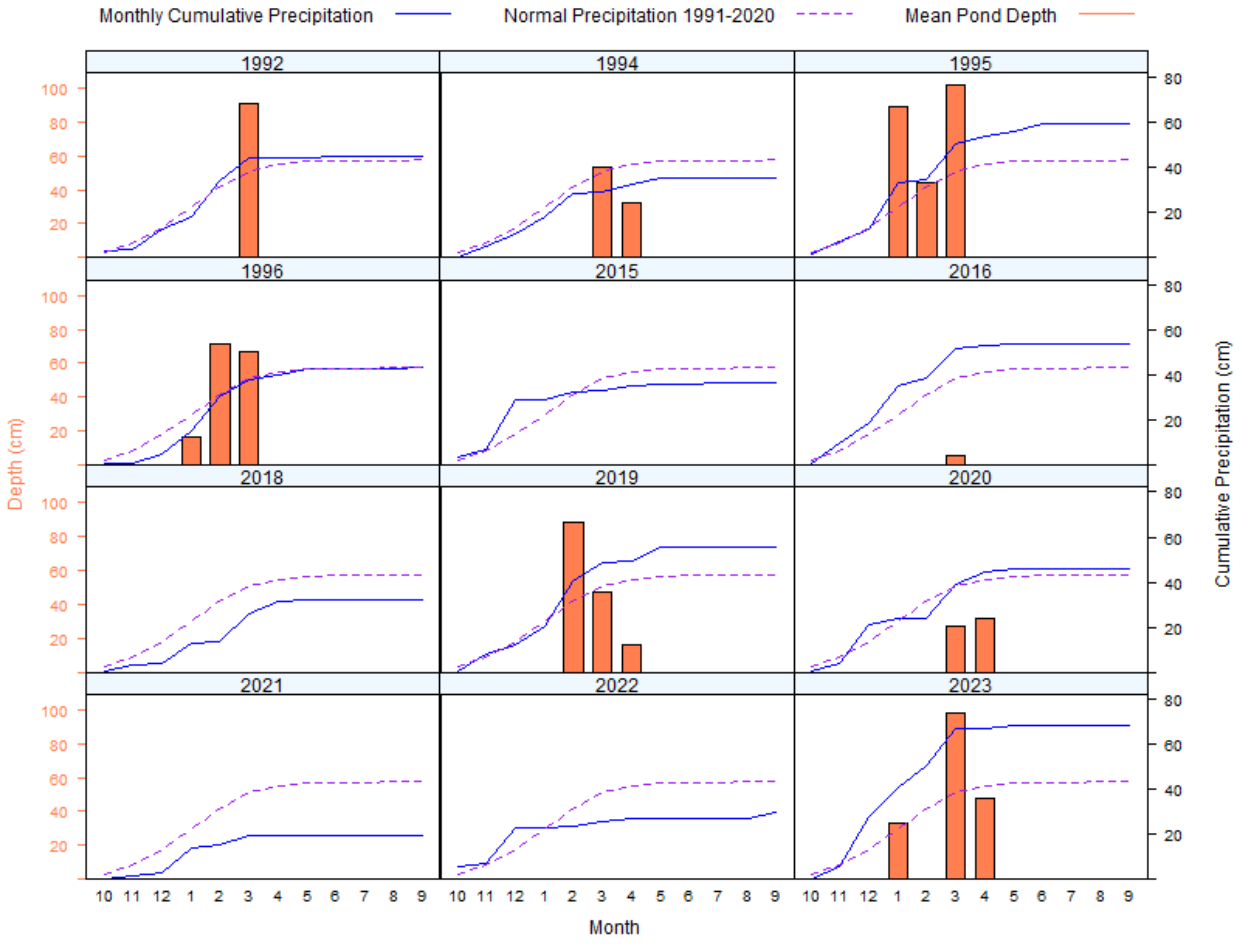

Figure 5-48. Pond 35 (Year 5 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

Pond 35 was monitored in 2023 as a Year 5 Post-Subsurface Munitions Remediation vernal pool. Vegetation within the Pond 35 watershed was masticated in summer of 2017 in preparation for a prescribed burn of BLM Area B Subunit B. Vegetation within and immediately around Pond 35 was not burned, although parts of the Pond 35 watershed were burned in October 2017. Subsurface anomaly investigations occurred in Pond 35 basin in 2018. Historically, Pond 35 remained completely dry in a consecutive drough years (2015, 2022) and in a below normal water years (2018, 2021). Pond 35 reached a maximum depth of 102 cm and a maximum inundation of 0.92 acres in 1995, an above normal water year (Figure 5-41). Pond 35 reached a maximum depth of 132 cm and a maximum

inundation of 2.97 ac in the 2023 water year, when it was hydrologically connected to Pond 39 (Figure 5-41). Inundation extent, depth, and water quality measurements are presented in Figures 5-41 to 5-44.

During the twelve years of monitoring of Pond 35 the cumulative precipitation in 2023 was the highest (Figure 5-41). Pond 35 was briefly inundated in January, and then again from beginning of March (when it reached maximum depth and inundation area on record) to beginning of April. Pond 35 dried by the end of April. The hydroperiod of Pond 35 in 2023 water year mostly resembled that of 1995 water year, when after initial inundation in January, the depth dropped the following month, only to reach a highest value in March (Figure 5-49). Maximum inundation area was greater in 2023 than in any baseline water year including 2016, which was also an above normal water year (Figure 5-50).

Water quality parameters of Pond 35 were similar to reference vernal pools and within historical ranges (Figure 5-44 and Figures 5-2 to 5-5).

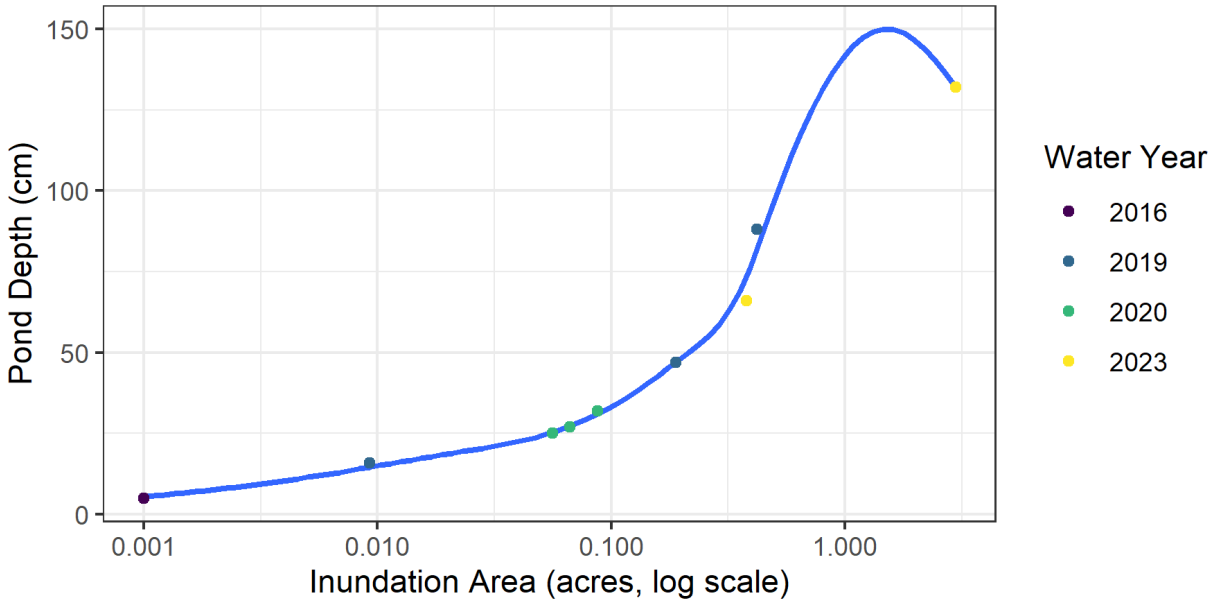

Figure 5-52. Pond 35 (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area since 2016 Water Year.

5.10.1 Data Quality Objective 1

Even though Pond 35 maintained the required average depth of 25 cm from the first rain event through March, it did not sustain sufficient depth for CTS because it dried in February. Pond 35 maintained the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 35 sustained sufficient depth for fairy shrimp (97.7 cm from March 2 to April 7).

5.10.2 Data Quality Objective 2

Maximum inundation area in 2023 water year was greater than in baseline year 1995, an above normal water year (Figure 5-43).

5.10.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 35, a post-subsurface munitions remediation vernal pool, was partially on track to meet the performance standard for Year 5 in 2023. Pond 35 was not on track for DQO 1 for CTS, but it was on

track for fairy shrimp indicating that it sustained suitable habitat for fairy shrimp in 2023. The inundation at Pond 35 reached the biggest area on record and DQO 2 was on track.

5.10.4 Data Quality Objective 4

Water quality parameters of Pond 35 were within the ranges of historical values and those observed at reference vernal pools.

5.10.5 Performance Standard: Wildlife Usage

Pond 35 was partially on track fro this performance standard for Year 5 in 2023 because it did not sustain sufficient inundation for CTS, but it did for fairy shrimp. Pond 35 was partially on track for DQO 1. Water quality measurements were adequate for wildlife.

5.10.6 Conclusion

Pond 35, a post-subsurface munitions remediation vernal pool, was in a final Year 5 of required monitoring in 2023 and was partially on track for the performance standards (Table 5-10). During the five years of post-mastication and post-subsurface remediation monitoring, Pond 35 was on track for the Hydrological Conditions and Inundation Area Performance Standard in 2019, and partially on track in 2020 and 2023, all close to normal or above normal water years. The two years when the Performance Standard was not on track were 2018 and 2021, both below normal water years (Figure 5-53). Similarly, the two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were on track or partially on track in close to normal and above normal water years. The 2019 Wetland Monitoring Report (Burleson, 2020) indicated Pond 35 was on track for DQO 1 for CTS but it was not on track for fairy shrimp due to it drying out by May. Pond 35 had an average depth of 14.5 cm from Jan 16th to May 7th, 2019, and thus the DQO 1 for fairy shrimp and both Performance Standards were on track in the 2019 water year. The data collected following MEC cleanup activities on hydrological functioning, suitable wildlife habitat, and water quality are consistent with baseline and the reference vernal pools and demonstrate that Pond 35 has not been negatively affected by the cleanup activities. No additional monitoring is recommended for Pond 35.

Table 5-10. Success at Pond 35 (Year 5 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives

Performance Standard	Applicable DQO	2018	2019	2020	2021	2023
Hydrological Conditions & Inundation Area	DQO 1	Not on track	On track^	Partially on track	Not on track	Partially on track
	DQO 2	On track	On track	On track	On track	On track
Wildlife Usage	DQO 1	Not on track	On track^	Partially on track	Not on track	Partially on track
	DQO 4	Cannot assess	On track	On track	Cannot assess	On track

^ The 2019 Wetland Monitoring Report (Burleson, 2020) indicated Pond 35 did not meet DQO 1 for fairy shrimp due to it drying out by May. It had an average depth of 30.2 cm from Jan 16th to May 7th, 2019.

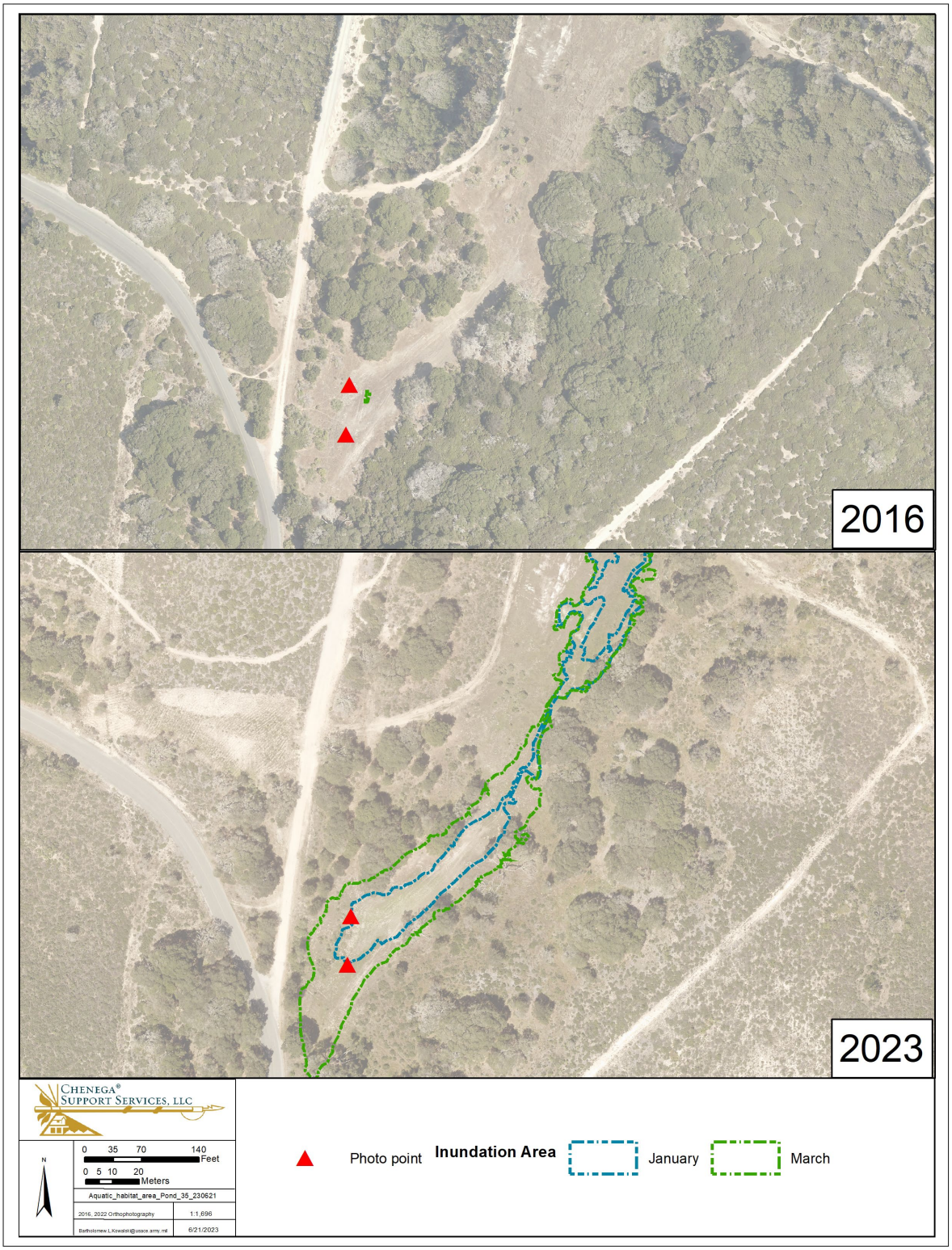

Figure 5-54. Pond 35 (Year 5 Post-Subsurface Munitions Remediation) Inundations for 2016 and 2023 (both above normal water years).

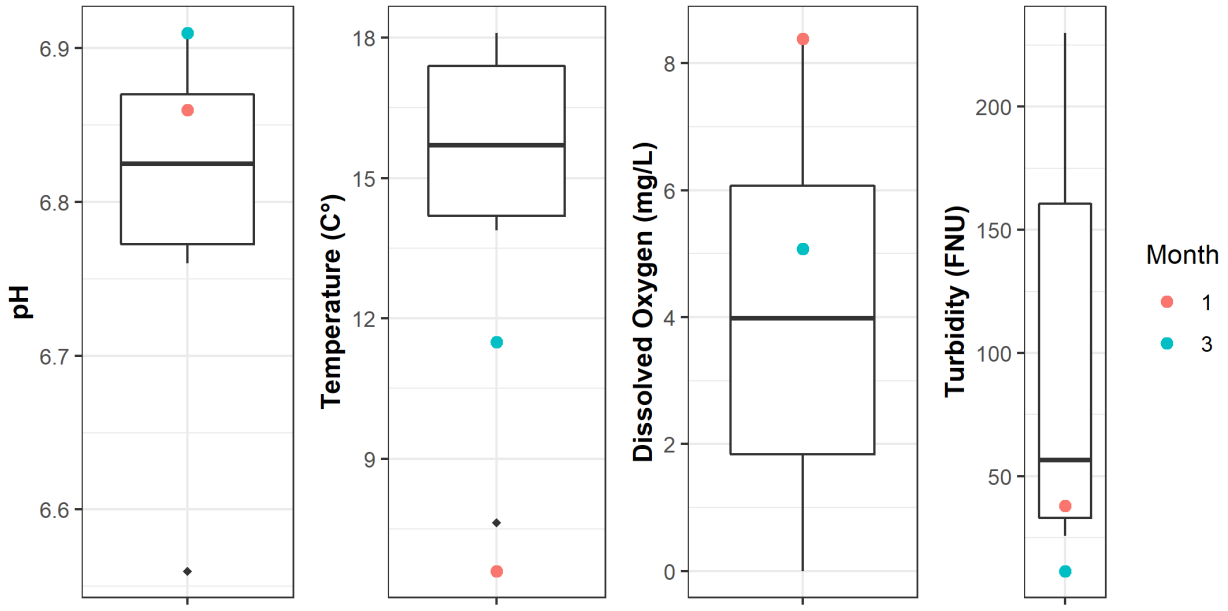

Figure 5-55. Pond 35 (Year 5 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics and colored dots represent 2023 values.

5.11 Pond 39 – Year 5 Post-Subsurface Munitions Remediation

Pond 39 is situated within a very small basin with a steep profile, surrounded by topographically varied small inundations that in an above normal water year can become inundated and hydrologically connected. Pond 39 is located in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 39 have been monitored for nine years (Figure 5-45). Above normal water years were 1998, 2016, 2019, and 2023. Year 2020 was a close to normal water year. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015, 2022). By size, Pond 39 is most similar to reference Pond 997, although it has a much steeper profile and in years with above normal precipitation it can reach a much greater area.

Pond 39 was monitored in 2023 as a Year 5 Post-Subsurface Munitions Remediation vernal pool. 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 2023 maximum depth of Pond 39 was 54 cm and maximum inundation was 2.97 acres, which were the highest on record (Figure 5-46).

During the nine years of monitoring of Pond 39 the cumulative precipitation in 2023 was the second highest (Figure 5-45). Pond 39 was inundated from mid-December to mid-May, when the last monitoring event occurred. The hydroperiod of Pond 39 in 2023 water year resembled that of 2019 water year the most. Maximum inundation area was greater in 2023 than in any baseline water year including 2016, which was also an above normal water year (Figure 5-47).

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

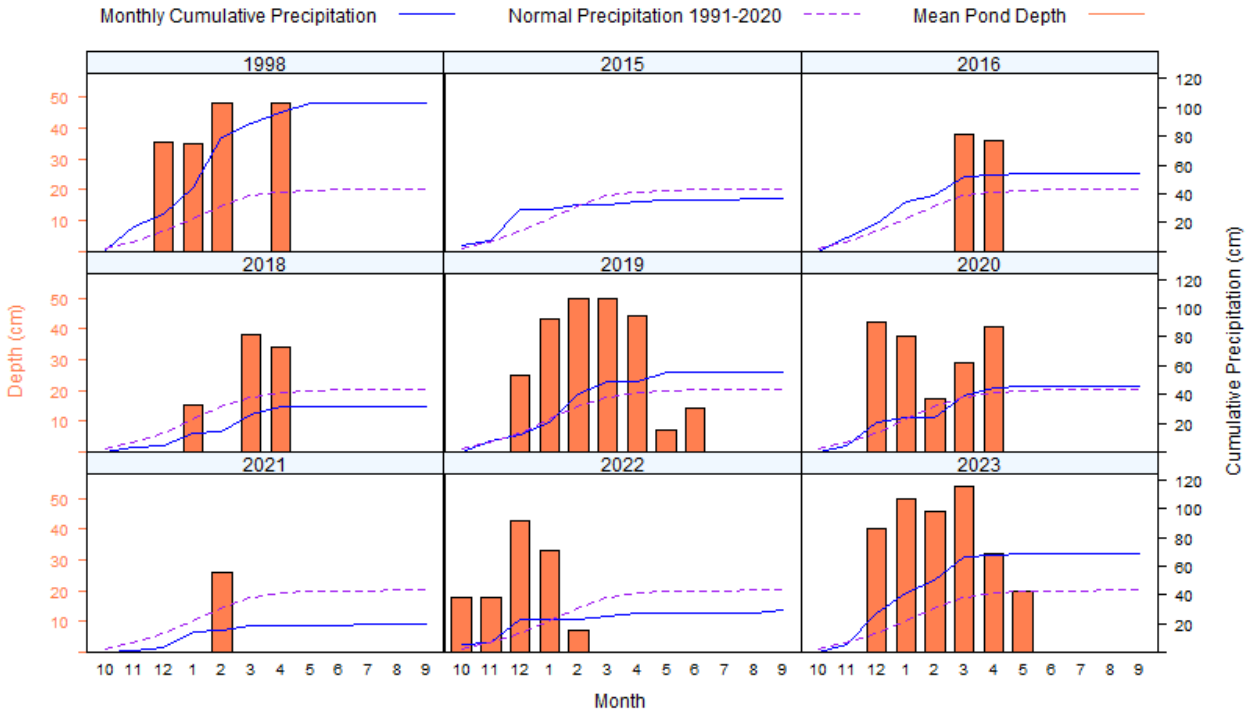

Figure 5-56. Pond 39 (Year 5Post-Burn, Year 5 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

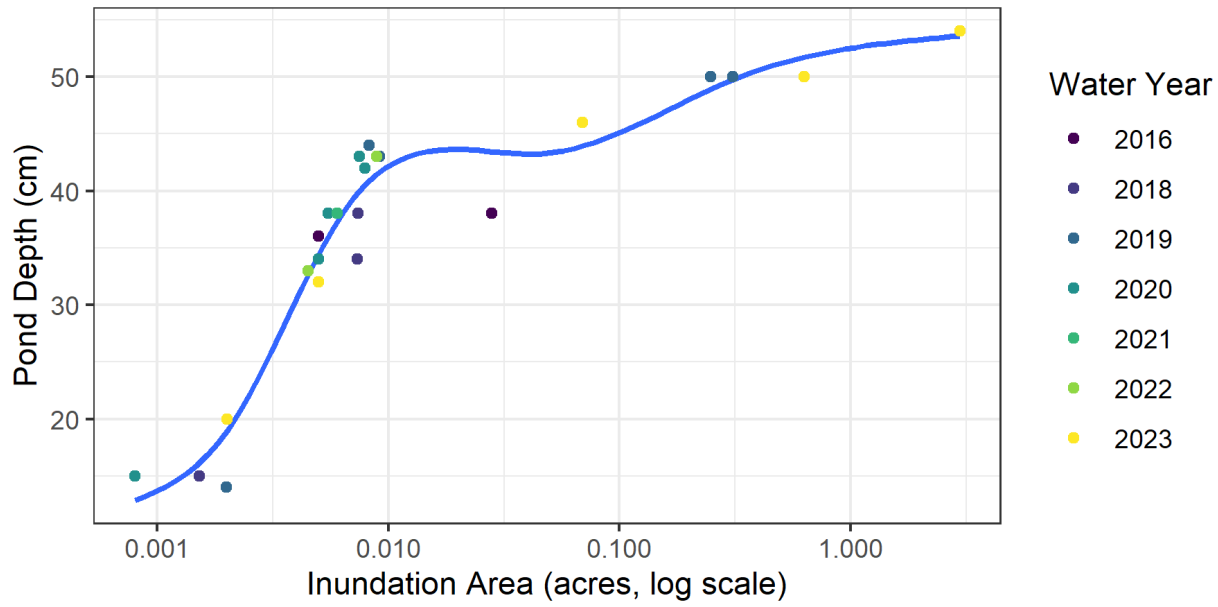

Figure 5-57. Pond 39 (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2015.

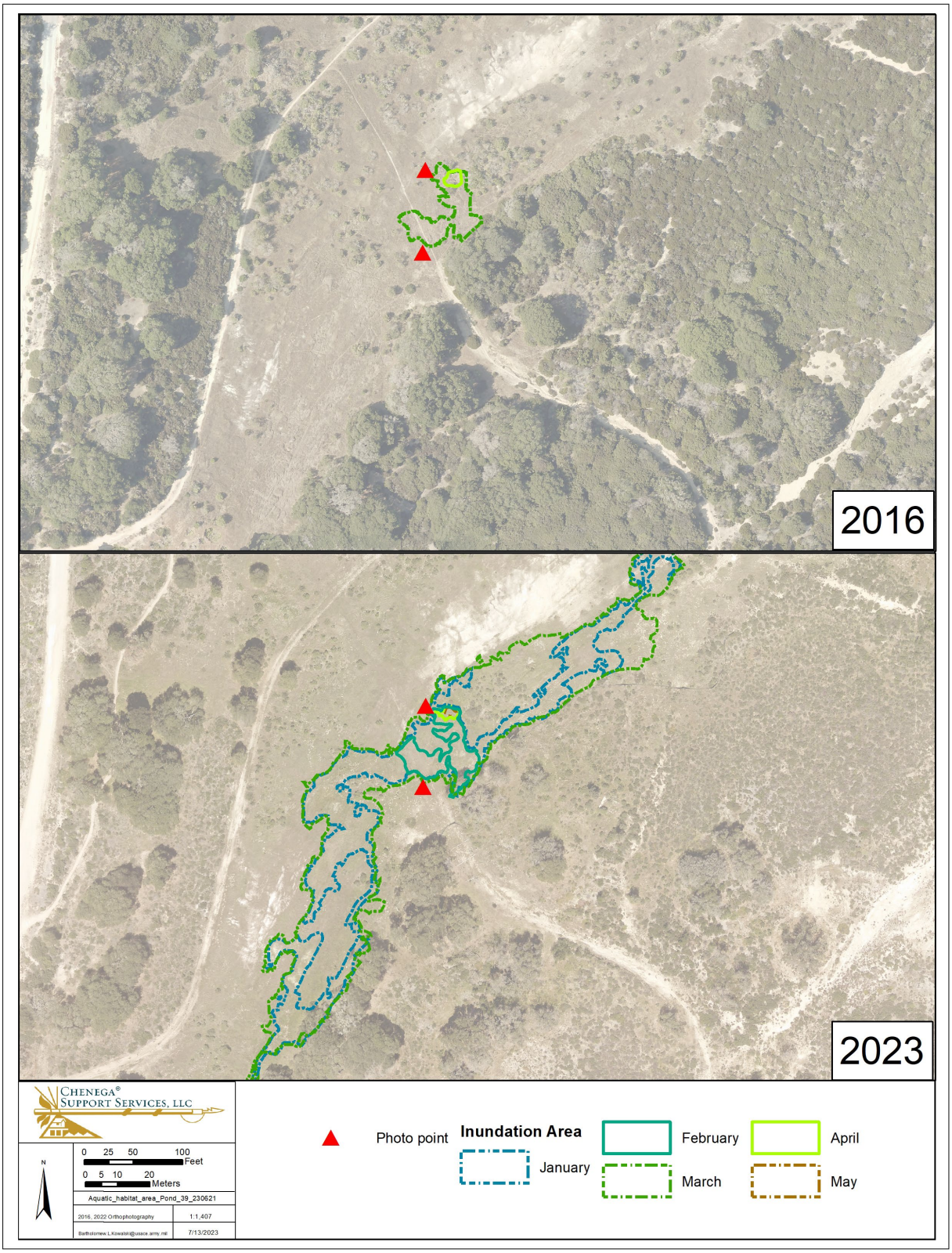

Figure 5-58. Pond 39 (Year 5 Post-Subsurface Munitions Remediation) Inundations for 2016 and 2023 (both above normal water years).

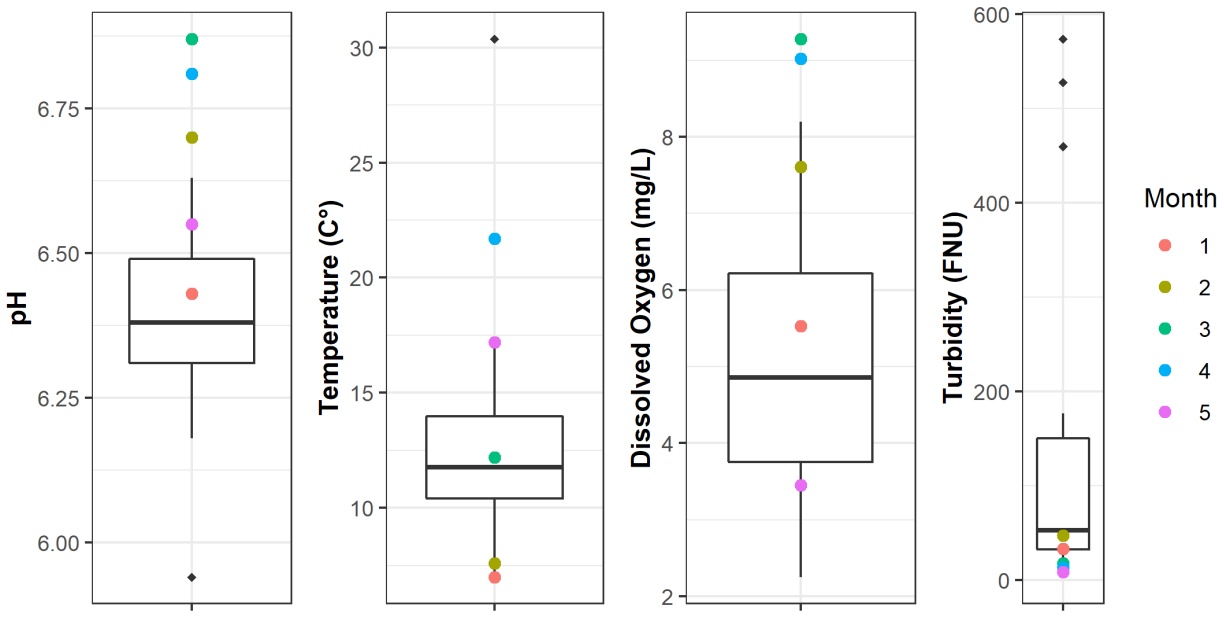

Figure 5-59. Pond 39 (Year 5 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The colored dots represent observed values in 2023 water year. The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics.

5.11.1 Data Quality Objective 1

Pond 39 maintained the required average depths of 25 cm from the first rain event through March for CTS, and the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 39 sustained sufficient depths for CTS (47.5 cm through March), and for fairy shrimp (40.3 cm through May).

5.11.2 Data Quality Objective 2

Maximum inundation area in 2023 water year was greater than in baseline year 2016, an above normal water year (Figure 5-47).

5.11.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 39, a post-subsurface munitions remediation vernal pool, was on track for the performance standard for Year 5 in 2023. Pond 39 was on track for DQO 1 indicating that it sustained suitable habitat for CTS and fairy shrimp in 2023. Pond 39 reached higher inundation area in 2023 water year than during baseline years and DQO 2 was on track.

5.11.4 Data Quality Objective 4

Water quality parameters of Pond 39 were within the ranges of historical values and those observed at reference vernal pools (Figure 5-48).

5.11.5 Performance Standard: Wildlife Usage

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

5.11.6 Conclusion

Pond 39, a post-subsurface munitions remediation vernal pool, was in Year 5 of monitoring in 2023 and was on track for the performance standards (Table 5-11). During the six years of post-mastication and post-subsurface remediation monitoring, Pond 39 was on track for the Hydrological Conditions and Inundation Area Performance Standard in 2019, 2020, and 2023, and was partially on track in 2022, all normal or above normal water year, with the exception of 2022 water year, which was a consecutive drought year. The two years when the Performance Standard was not on track were 2018 and 2021, both below normal water years (Figure 5-60). Similarly, the two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were on track in normal, and above normal water years, and was partially on track in a consecutive drought year. Pond 39 may only get deep enough to meet DQO 1 for CTS in normal or above normal water years (Figure 5-61). The data collected following MEC cleanup activities demonstrate that hydrological functioning, suitable wildlife habitat, and water quality have not been negatively affected by the cleanup activities at Pond 39, and no additional monitoring is recommended.

Table 5-11. Success at Pond 39 (Year 5 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives

Performance Standard	Applicable DQO	2018	2019	2020	2021	2022	2023
Hydrological Conditions & Inundation Area	DQO 1	Not on track	On track	On track	Not on track	Partially on track	On track
	DQO 2	On track	On track	On track	On track	On track	On track
Wildlife Usage	DQO 1	Not on track	On track	On track	Not on track	Partially on track	On track
	DQO 4	On track	On track	On track	On track	On track	On track

5.12 Pond 40 South – Year 5 Post-Subsurface Munitions Remediation

Pond 40 South is situated within a small and shallow basin, surrounded by topographically varied small depressions that in an above normal water year can become inundated and hydrologically connected. Pond 40 South is located in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 40 South have been monitored for ten years (Figure 5-49). Above normal water years were 1998, 2016, 2017, 2019, and 2023. Year 2020 was a close to normal water year. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015, 2022). By size, Pond 40 South is most similar to reference Pond 997.

Pond 40 South was monitored in 2023 as a Year 5 Post-Subsurface Munitions Remediation vernal pool. 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 2017, an above normal water year, when it was hydrologically connected to Pond 39. Pond 40 South reached a maximum depth of 31 cm and a maximum inundation area of 2.97 ac in 2023 water year (Figure 5-49). Inundation extent, depth, and water quality measurements are presented in Figures 5-49 to 5-52.

During the ten years of monitoring of Pond 40 South the cumulative precipitation in 2023 was the second highest (Figure 5-62). Pond 40 South was inundated from mid-January through May. The

hydroperiod of Pond 40 South in 2023 water year resembled that of 2017 and 2019 water years. Maximum inundation area was greater in 2023 than in any baseline water year including 2017, which was also an above normal water year (Figure 5-50).

Water quality parameters of Pond 40 South were similar to reference vernal pools and within historical ranges (Figure 5-64 and Figures 5-2 to 5-5).

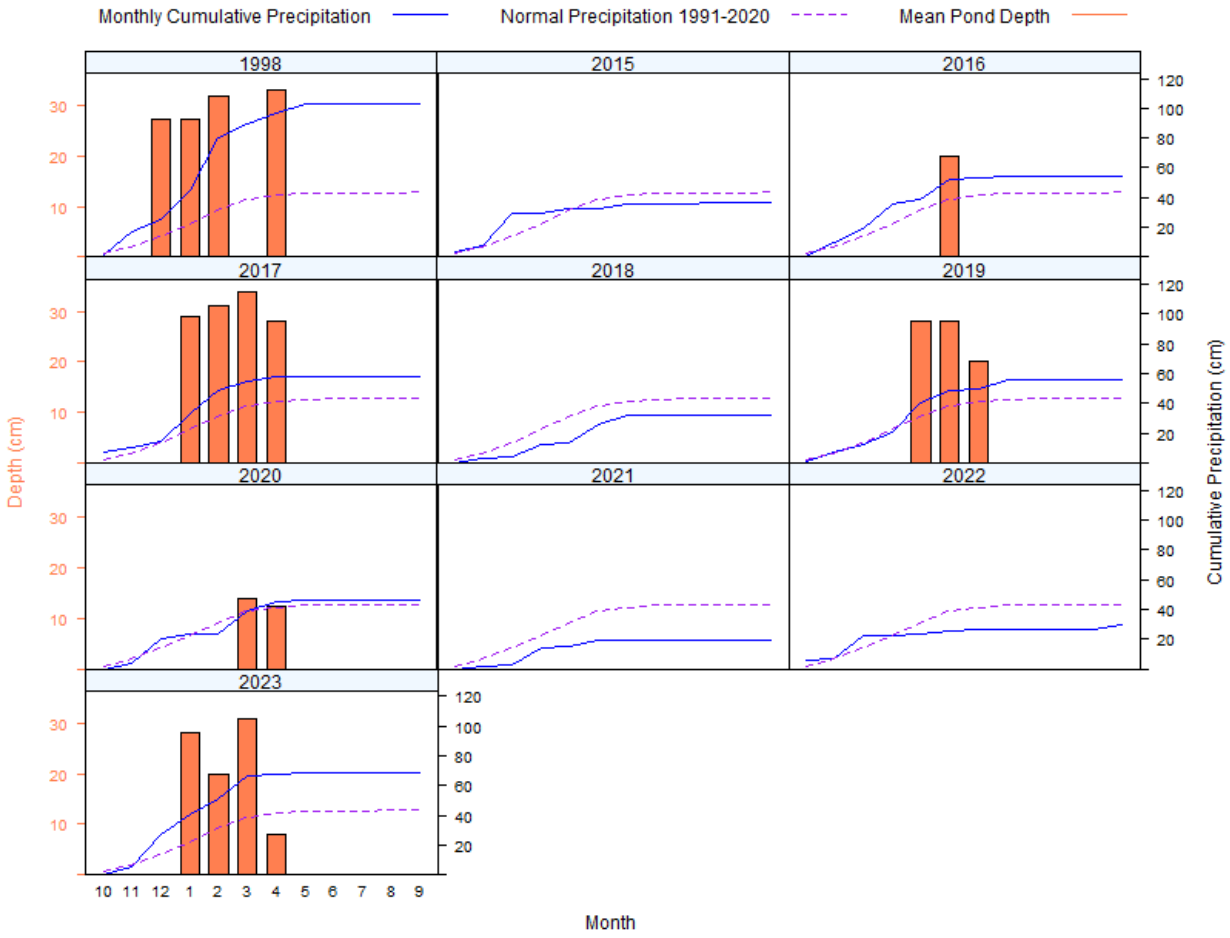

Figure 5-65. Pond 40 South (Year 5 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

5.12.1 Data Quality Objective 1

Pond 40 South did not maintain the required average depths of 25 cm from the first rain event through March for CTS, but it maintained the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 40 South did not sustain sufficient depth for CTS (19.8 cm through March) but it did for fairy shrimp (14.5 cm from March through May).

5.12.2 Data Quality Objective 2

Maximum inundation area in 2023 water year was greater than in baseline year 2017, an above normal water year (Figure 5-52).

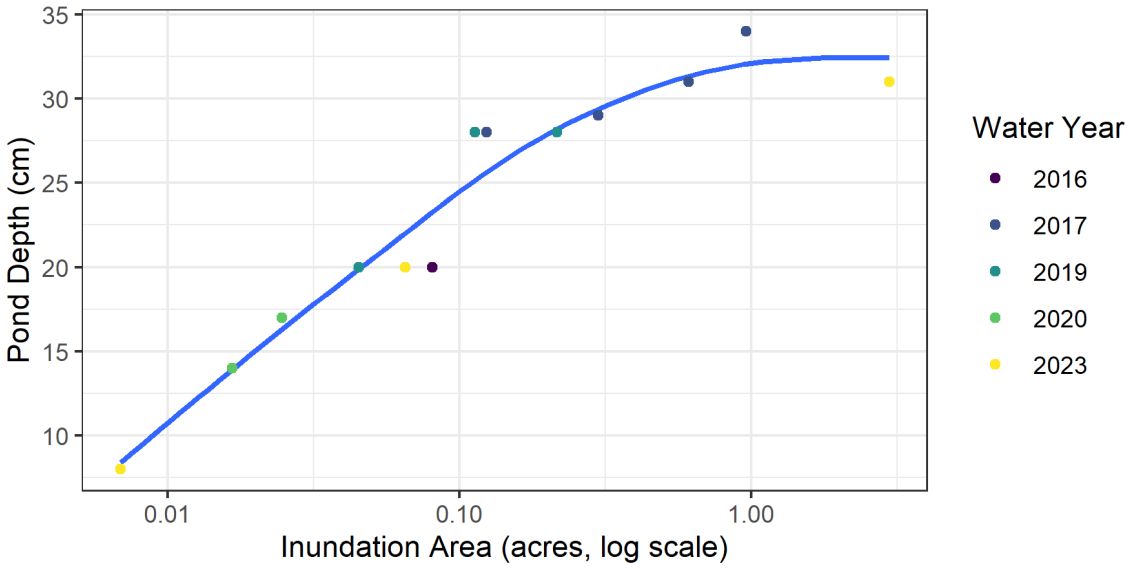

Figure 5-66. Pond 40 South (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2016.

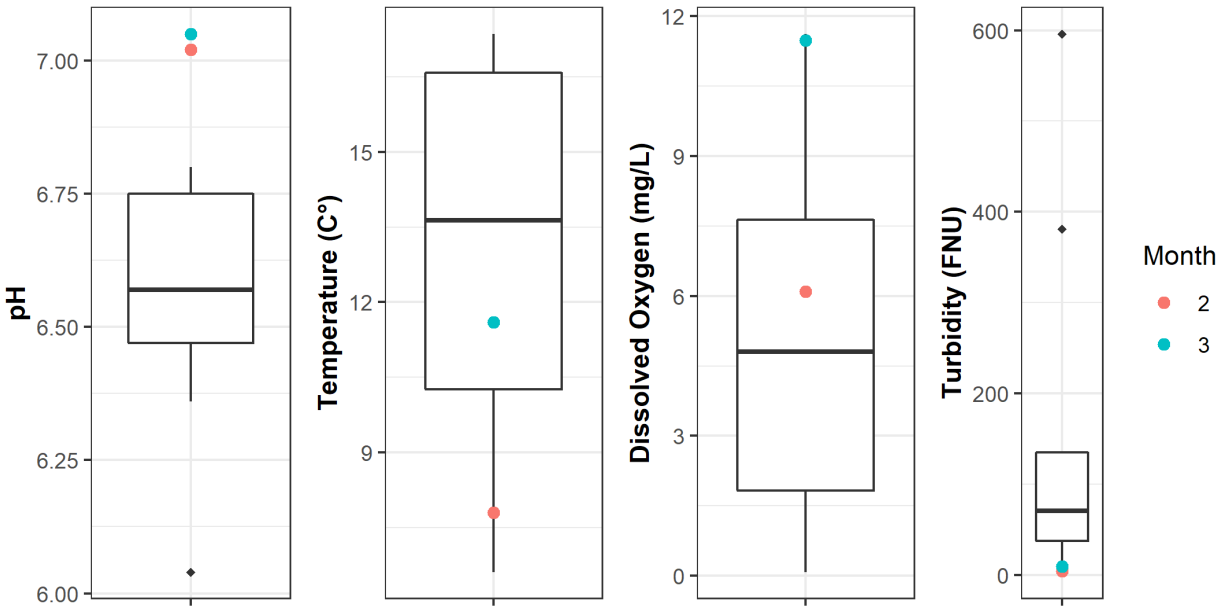

Figure 5-67. Pond 40 South (Year 5 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics and colored dots represent 2023 values.

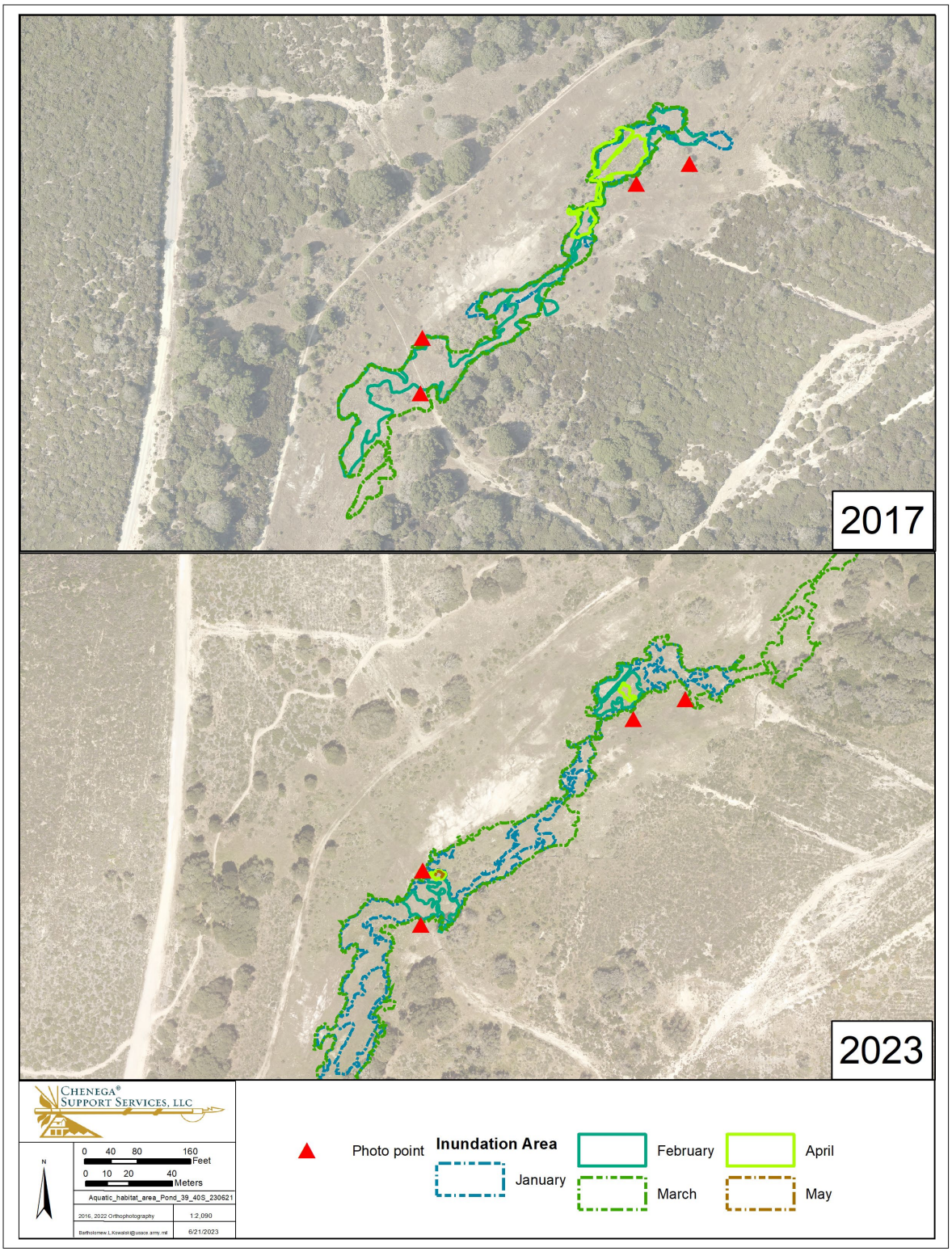

Figure 5-68. Ponds 39 and 40 South (Year 5 Post-Subsurface Munitions Remediation) Inundations for 2017 and 2023 (both above normal water years).

5.12.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 40 South, a post-subsurface munitions remediation, vernal pool, was partially on track for the performance standard for Year 5 in 2023. Pond 40 South was not on track for DQO 1 for CTS, but it was on track for fairy shrimp indicating that it sustained suitable habitat for fairy shrimp in 2023. The inundation at Pond 40 South reached the biggest area on record and DQO 2 was on track.

5.12.4 Data Quality Objective 4

Water quality parameters of Pond 40 South were within the ranges of historical values and those observed at reference vernal pools and DQO 4 was on track (Figure 5-69 and Figures 5-2 through 5-5).

5.12.5 Performance Standard: Wildlife Usage

Pond 40 South was partially on track for the performance standard for Year 5 in 2023 because it did not sustain sufficient inundation for CTS, but it did for fairy shrimp. Pond 40 South was partially on track for DQO 1. Water quality measurements were adequate for wildlife and DQO 4 was on track.

5.12.6 Conclusion

Pond 40 South, a post-subsurface munitions remediation vernal pool, was in Year 5 of monitoring in 2023 and was partially on track for the performance standards (Table 5-13). During the six years of post-prescribed burn and post-subsurface remediation monitoring, Pond 40 South was partially on track for the Hydrological Conditions and Inundation Area Performance Standard in 2019, 2020 and 2023, all normal or above normal water years. The three years when the Performance Standard was not on track were 2018, 2021, and 2022, all below normal water years (Figure 5-70). Similarly, the two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were partially on track in 2019, 2020 and 2023 water years. Pond 40 South is a shallow vernal pool that may only occasionally get deep enough to maintain DQO 1 for CTS in above normal water years (Figure 5-71). The data collected following MEC cleanup activities demonstrate that hydrological functioning, suitable wildlife habitat, and water quality have not been negatively affected by the cleanup activities at Pond 40 South, and no additional monitoring is recommended.

Table 5-12. Success at Pond 40 South (Year 5 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives

Performance Standard	Applicable DQO	2018	2019	2020	2021	2022	2023
Hydrological Conditions & Inundation Area	DQO 1	Not on track	Partially on track	Partially on track	Not on track	Not on track	Partially on track
	DQO 2	On track	On track	On track	On track	On track	On track
Wildlife Usage	DQO 1	Not on track	Partially on track	Partially on track	Not on track	Not on track	Partially on track
	DQO 4	Cannot assess	On track	On track	Cannot assess	Cannot assess	On track

5.13 Pond 41 – Year 5 Post-Subsurface Munitions Remediation

Pond 41 is situated within a medium size shallow basin in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 41 have been monitored for eight years (Figure 5-53). Above normal water years were 1998, 2016, 2019, and 2023. Year 2020 was a close to normal water year. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015, 2022). By size, Pond 41 is most similar to reference Pond 101 East (East).

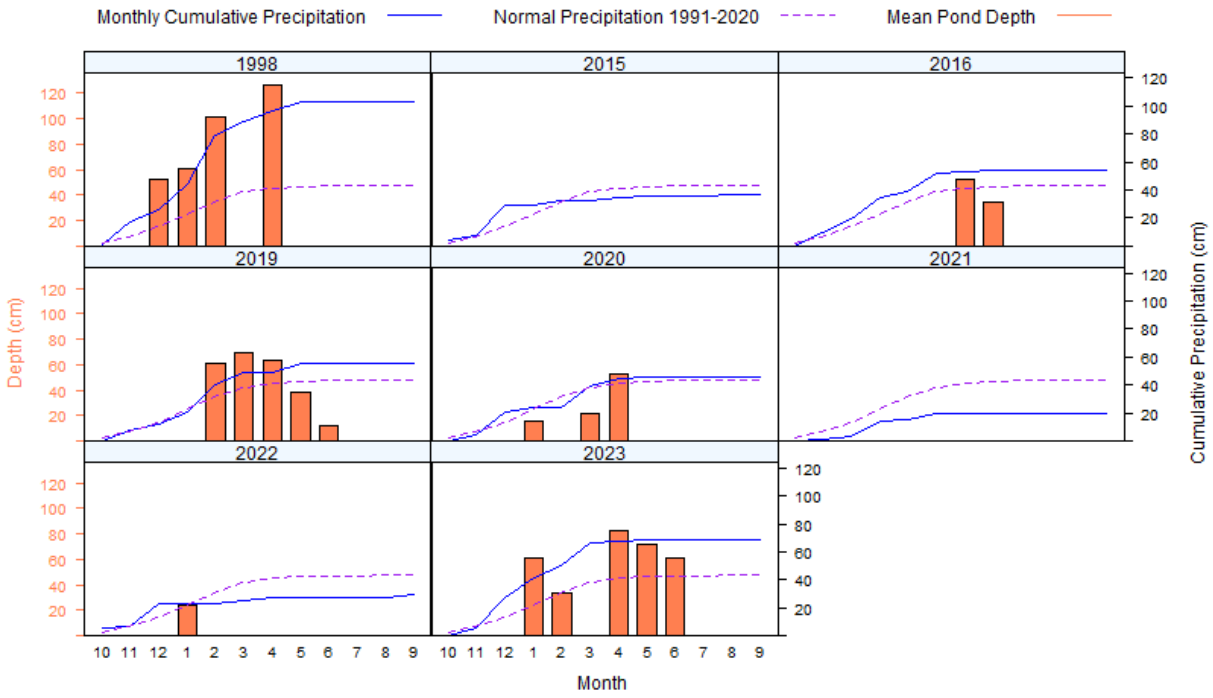

Figure 5-72. Pond 41 (Year 5 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

Pond 41 was monitored in 2023 as a Year 5 Post-Subsurface Munitions Remediation vernal pool. In 2018 intrusive anomaly investigations occurred at Pond 41. Historically, Pond 41 remained dry in a below normal water year (2021) and in a consecutive drought year (2015), and it reached a maximum depth of 127 cm and a maximum inundation of 2.13 acres in an extremely above normal El Niño year (1998, Figure 5-53). Pond 41 reached a maximum depth of 86 cm and a maximum inundation area of 1.63 ac in 2023 water year (Figure 5-53). Inundation extent, depth, and water quality measurements are presented in Figures 5-53 to 5-56.

During the eight years of monitoring of Pond 41 the cumulative precipitation in 2023 was the second highest (Figure 5-53). Pond 41 was inundated from mid-January to mid-June, when the last monitoring event occurred. The hydroperiod of Pond 41 in 2023 water year resembled that of 2019 water year the most. Maximum inundation area was greater in 2023 than in 2016 baseline water year, which was also an above normal water year (Figure 5-54).

Water quality parameters of Pond 41 were similar to reference vernal pools and within historical ranges (Figure 5-73 and Figures 5-2 to 5-5).

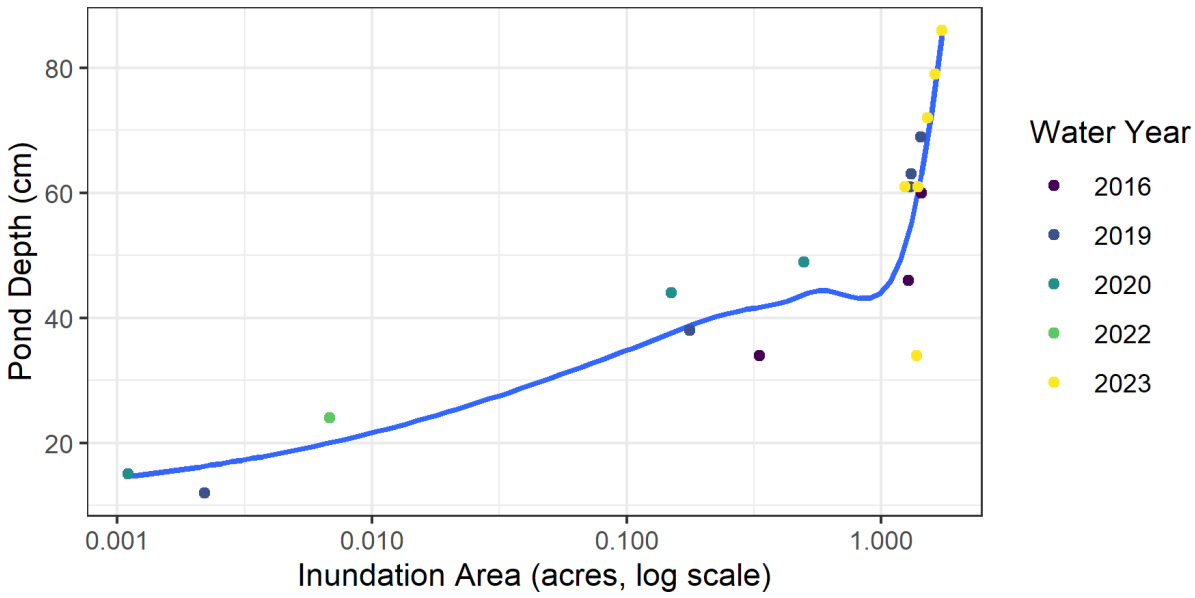

Figure 5-74. Pond 41 (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since 2016 Water Year.

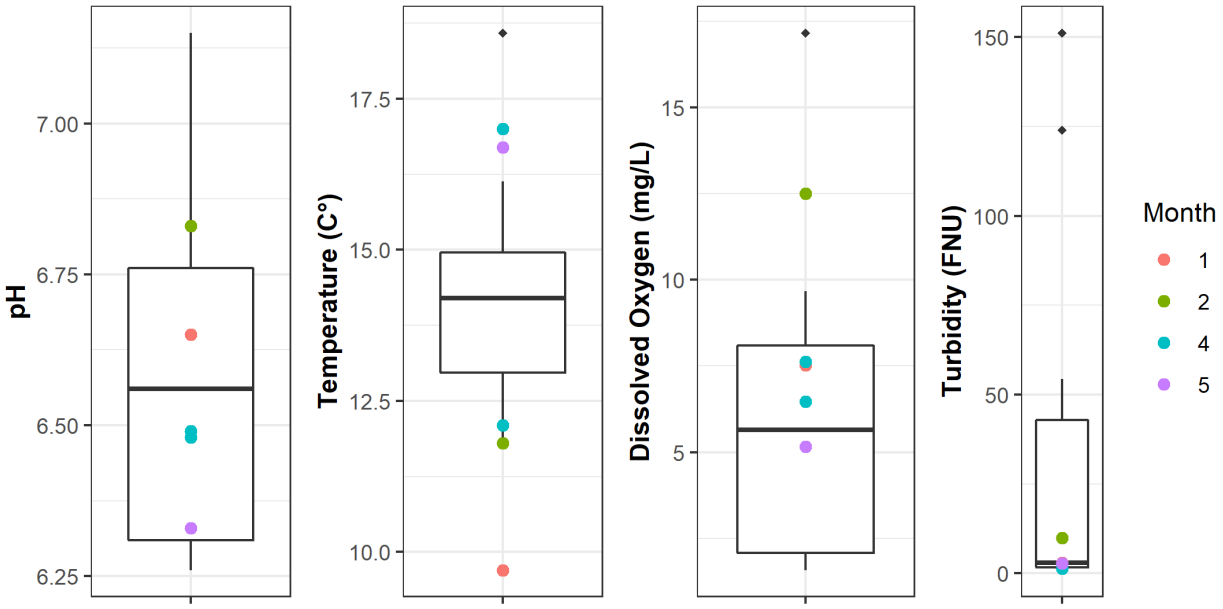

Figure 5-75. Pond 41 (Year 5 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics and colored dots represent 2023 values.

5.13.1 Data Quality Objective 1

Pond 41 maintained the required average depths of 25 cm from the first rain event through March for CTS, and the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 41 sustained sufficient depth for CTS (45.3 cm through April 5), and for fairy shrimp (55 cm through May).

5.13.2 Data Quality Objective 2

Maximum inundation area in 2023 water year was greater than in baseline year 2016, an above normal water year, and DQO 2 was on track (Figure 5-56).

5.13.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 41, a post-subsurface munitions remediation vernal pool, was on track for the performance standard for Year 5 in 2023. Pond 41 met DQO 1 indicating that it sustained suitable habitat for CTS and fairy shrimp in 2023. Pond 41 reached higher inundation area in 2023 water year than during baseline year 2016 and DQO 2 was on track.

5.13.4 Data Quality Objective 4

Water quality parameters of Pond 41 were within the ranges of historical values and those observed at reference vernal pools and DQO 4 was on track (Figure 5-76 and Figures 5-2 to 5-5).

5.13.5 Performance Standard: Wildlife Usage

Pond 41 was on track for this the performance standard for Year 5 in 2023 as it sustained sufficient depth and inundation for CTS and fairy shrimp. Water quality measurements were adequate for wildlife.

5.13.6 Conclusion

Pond 41, a post-subsurface munitions remediation vernal pool, was in Year 5 of monitoring in 2023 and was on track for the performance standards (Table 5-13). During the five years of post-prescribed burn and post-subsurface remediation monitoring, Pond 41 was on track for the Hydrological Conditions and Inundation Area Performance Standard in 2019 and 2023 and was partially on track in 2020, all normal or above normal water years. The two years when the Performance Standard was not on track were 2021 and 2022, both below normal water years (Figure 5-77). Similarly, the two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were on track in above normal water years. Pond 41 appears to only get deep enough to meet DQO 1 for CTS in above normal water years (Figure 5-78). The data collected following MEC cleanup activities demonstrate that hydrological functioning, suitable wildlife habitat, and water quality have not been negatively affected by the cleanup activities at Pond 41, and no additional monitoring is recommended.

Table 5-13. Success at Pond 41 (Year 5 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives

Performance Standard	Applicable DQO	2019	2020	2021	2022	2023
Hydrological Conditions & Inundation Area	DQO 1	On track	Partially on track	Not on track	Not on track	On track
	DQO 2	On track	On track	On track	On track	On track
Wildlife Usage	DQO 1	On track	Partially on track	Not on track	Not on track	On track
	DQO 4	On track	On track	Cannot assess	On track	On track

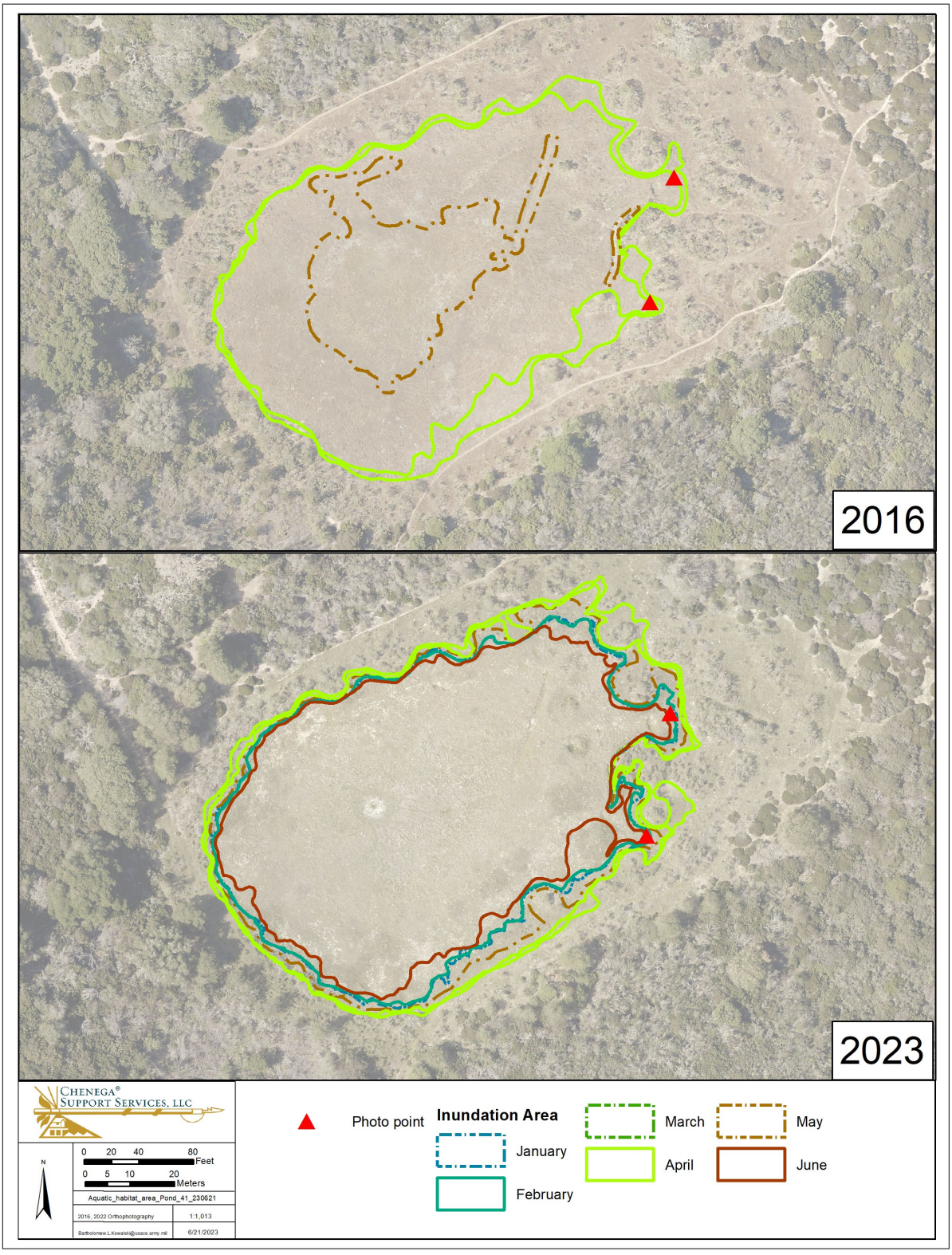

Figure 5-79. Pond 41 (Year 5 Post-Subsurface Munitions Remediation) Inundations for 2016 and 2023 (both above normal water year).

5.14 Pond 42 – Year 5 Post-Subsurface Munitions Remediation

Pond 42 is situated within a small shallow basin in the northern part of Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 42 have been monitored for thirteen years (Figure 5-57). Above normal water years were 1998, 2017, 2019, and 2023. Years 2000, 2001, 2003, and 2020 were close to normal water year. All other monitoring was conducted in below normal water years (2002, 2018, 2021), or in a consecutive drought year (2015, 2022). By size, Pond 42 is most similar to reference Pond 997, but it has a steeper profile (Figure 5-1).

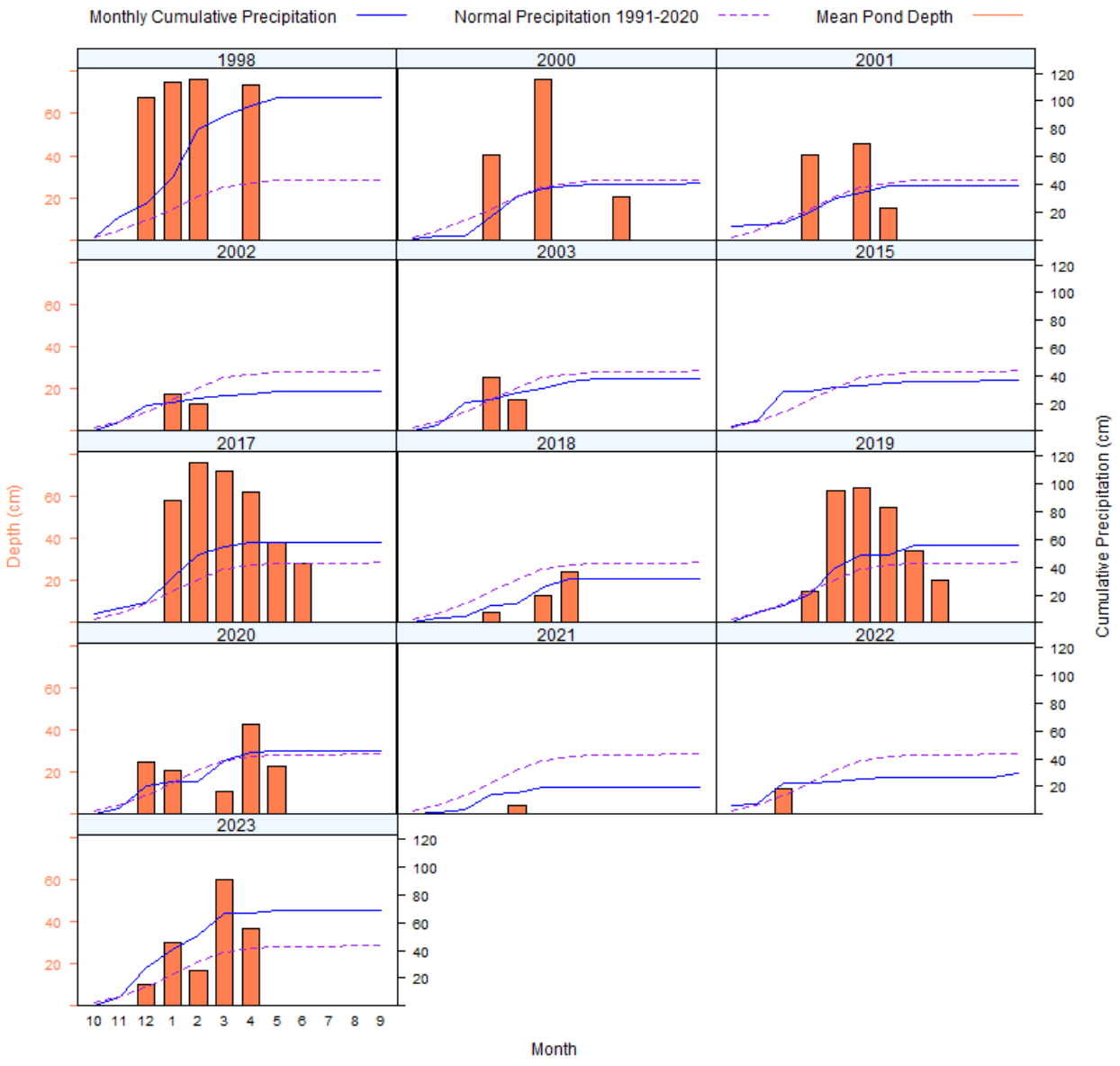

Figure 5-80. Pond 42 (3 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

Pond 42 was monitored in 2023 as a Year 5 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 2017, an above normal water year (Figure 5-58). The 2023 maximum depth of Pond 42 was 60 cm and maximum inundation was 0.53 acres (Table 4-15). The depth and inundation values were within the range of previously recorded values (Figure 5-58).

During the nine years of monitoring of Pond 42 the cumulative precipitation in 2023 was the second highest (Figure 5-57). Pond 42 was inundated from mid-December through April, when the last monitoring event occurred. Hydroperiod of Pond 42 was similar to that of reference vernal pool 101 East (East); both became inundated in mid-December, decreased in depth in February, and increased again in March/April. Maximum inundation area of Pond 42 was smaller than in 2017, which was also an above normal water year (Figure 5-59). This is similar to the inundation observed at reference vernal pools 5 and 101 East (East), amd may be due to 2021 and 2022 water years receiving well below normal precipitation, while 2016 water year was an above normal water year. Generally, vernal pools don't become inundated until the sandy loam layer and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. This suggests that the dry conditions present prior to the 2023 water year dried out the underlying clay layer which required more water to saturate it completely before Pond 42 could become inundated. Even though the 2023 water year had more precipitation, 2016 was an above normal water year which likely caused the underlaying clay layer to retain some moisture going into the 2017 water year, and thus requiring less precipitation to saturate it.

Water quality parameters of Pond 42 were generally within the ranges of reference vernal pools. The exceptions were the pH and dissolved oxygen values, which were a bit higher than the the reference vernal pools but within historical ranges of Pond 42 (Figure 5-60). The February reading of dissolved oxygen was highest on record at Pond 42, but that may have been due to the reading being taken with the probe on its side because it could not be fully submerged as the depth was shallow. There was no indication of an increasing trend of dissolved oxygen at Pond 42, and comparison to historical measurements of other vernal pools indicates this value is not outside of the observed range (Figure 5-4).

5.14.1 Data Quality Objective 1

Pond 42 maintained the required average depths of 25 cm from the first rain event through March for CTS, and the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 42 sustained sufficient depths for CTS (29.3 cm through March), and for fairy shrimp (30.8 cm through May).

5.14.2 Data Quality Objective 2

Maximum inundation area in 2023 water year was smaller than in baseline year 2017, an above normal water year (Figure 5-59). Pond 42 monthly inundation pattern was similar to inundations observed at reference Ponds 5 and 101 East (East), and DQO 2 was met.

5.14.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 42, a post-subsurface munitions remediation vernal pool, was on track for the performance standard for Year 5 in 2023. Pond 42 met DQO 1 indicating that it sustained suitable habitat for CTS and fairy shrimp in 2023. Pond 42 inundation pattern resembled that of reference Pond 101 East (East) in 2023 and DQO 2 was met.

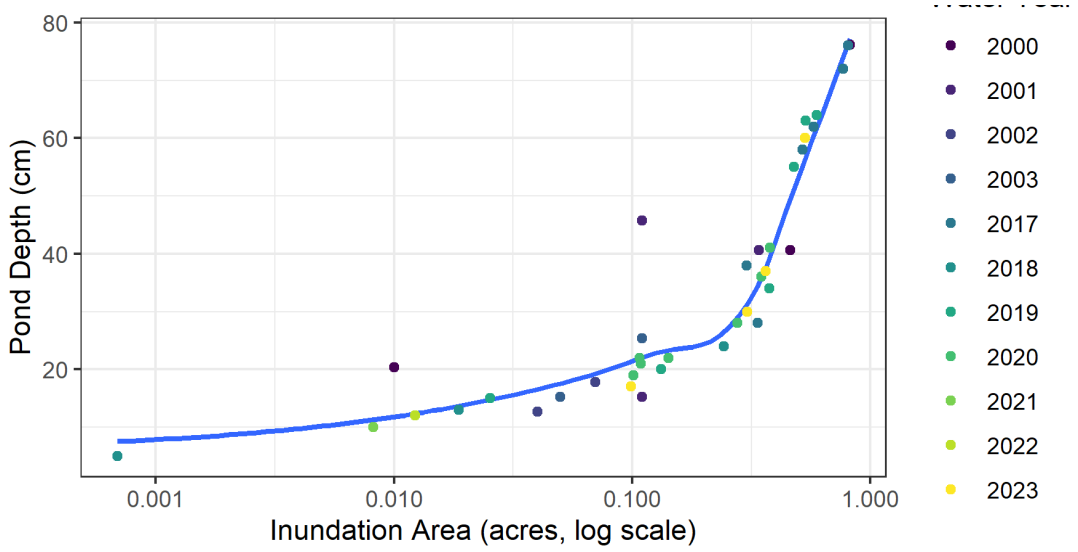

Figure 5-81. Pond 42 (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Data since 2000 Water Year.

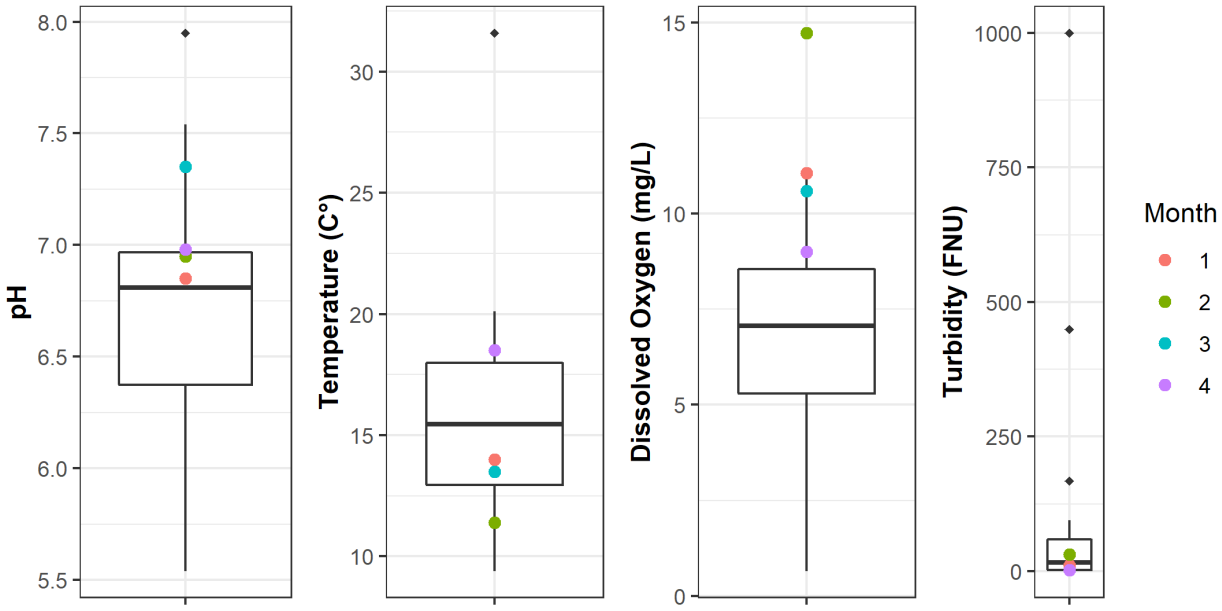

Figure 5-82. Pond 42 (Year 5 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The colored dots represent observed values in 2023 water year. The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics.

5.14.4 Data Quality Objective 4

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

5.14.5 Performance Standard: Wildlife Usage

Pond 42 was on track for performance standard as it sustained sufficient depth and inundation for CTS and fairy shrimp. Water quality measurements were adequate for wildlife.

5.14.6 Conclusion

Pond 42, a post-subsurface munitions remediation vernal pool, was in Year 5 of monitoring in 2023 and was on track for performance standards (Table 5-14). During the six years of post-mastication and burn and post-subsurface remediation monitoring, Pond 42 was on track for the Hydrological Conditions and Inundation Area Performance Standard in 2019 and 2023 and was partially on track in 2020, all normal or above normal water years. The three years when the Performance Standard was not on track was in 2018, 2021, and 2022, all below normal water years (Figure 5-83). Similarly, the two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were on track in above normal water years and was partially on track in a normal water year. Pond 42 is a shallow vernal pool that may only get deep enough to meet DQO 1 for CTS in normal or above normal water years (Figure 5-84). The data collected following MEC cleanup activities demonstrate that hydrological functioning, suitable wildlife habitat, and water quality have not been negatively affected by the cleanup activities at Pond 42, and no additional monitoring is recommended.

Table 5-14. Success at Pond 42 (Year 5 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives

Performance Standard	Applicable DQO	2018	2019	2020	2021	2022	2023
Hydrological Conditions & Inundation Area	DQO 1	Not on track	On track	Partially on track	Not on track	Not on track	On track
	DQO 2	On track	On track	On track	On track	On track	On track
Wildlife Usage	DQO 1	Not on track	On track	Partially on track	Not on track	Not on track	On track
	DQO 4	On track	On track	On track	On track	On track	On track

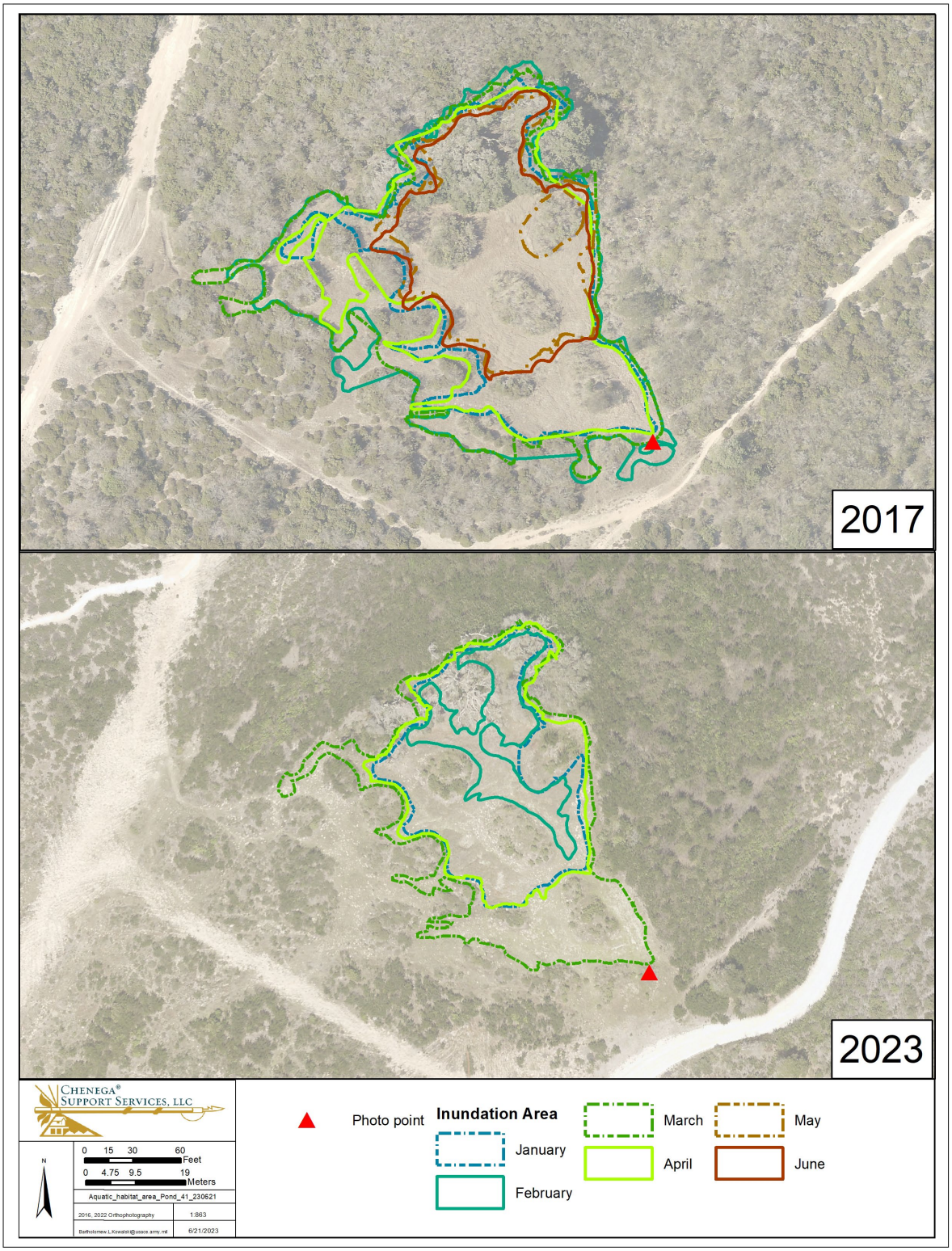

Figure 5-85. Pond 42 (Year 5 Post-Subsurface Munitions Remediation) Inundations for 2017 and 2023 (both above normal precipitation water years).

5.15 Pond 43 – Year 5 Post-Subsurface Munitions Remediation

Pond 43 is situated within a small and shallow basin in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 43 have been monitored for nine years (Figure 5-61). Above normal water years were 1998, 2016, 2019 and 2023. Years 2000 and 2020 were close to normal water years. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015). By size, Pond 43 is most similar to reference Pond 997.

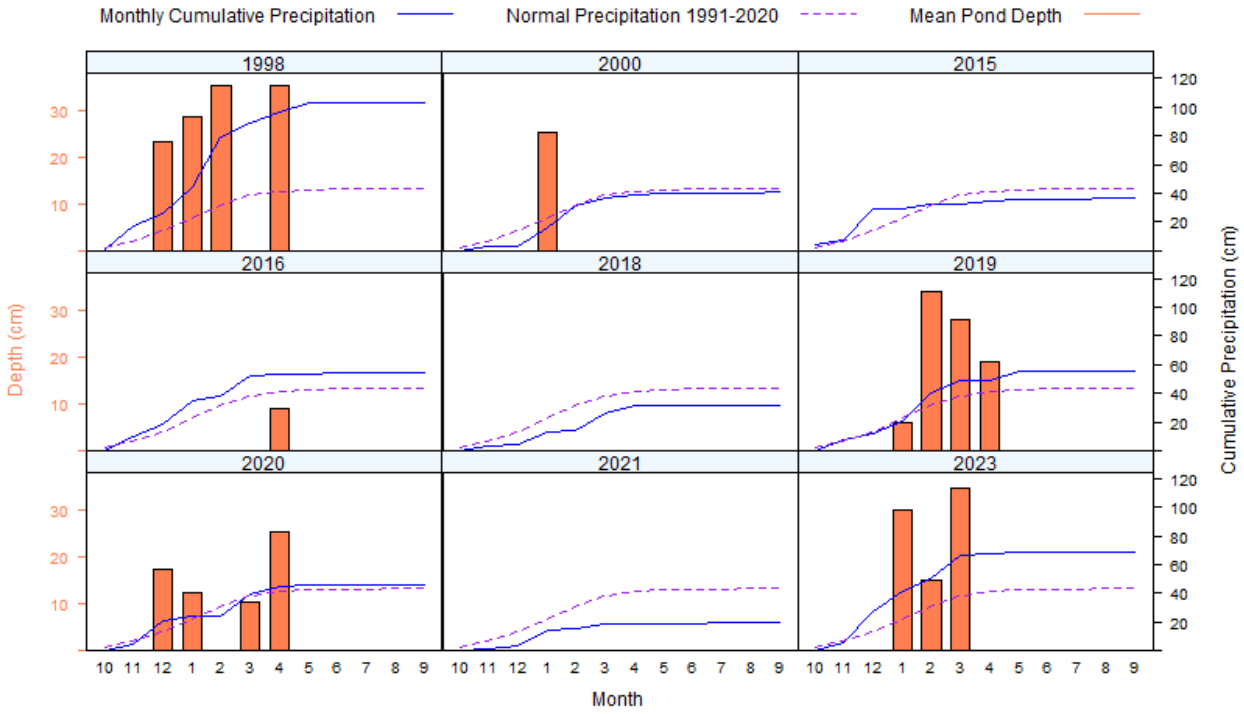

Figure 5-86. Pond 43 (Year 5 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

Pond 43 was monitored in 2023 as a Year 5 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. Following munitions cleanup of Subunit B, BLM closed and restored the trail that was directly adjacent to Pond 43. Historically, Pond 43 remained dry in 2015, a consecutive drought year, and in 2018 and 2021, both below normal water years. In 2019, an above normal water year, it reached a maximum depth of 34 cm and a maximum inundation of 0.06 acres. Pond 43 reached a maximum depth of 35 cm and a maximum inundation area of 0.09 ac in March, when it extended into the restored road (Figures 5-62 and 5-63). Inundation extent, depth, and water quality measurements are presented in Figures 5-61 to 5-64.

During the nine years of monitoring of Pond 43 the cumulative precipitation in 2023 was the second highest. Pond 43 was inundated from mid-January through March. The hydroperiod of Pond 43 in 2023 water year had the biggest resemblance to that of 2019 and 2020 water years. Maximum inundation area was greater in 2023 than in any baseline water year including 2016, which was also an above normal water year (Figure 5-63).

Water quality parameters of Pond 43 were similar to reference vernal pools with the exception of pH values which were higher in 2023 water year but within historical ranges. The February value of Turbidity was the highest on record at Pond 43, but it was taken with the probe was not fully submerged and was still within historical ranges observed at reference vernal pools (Figure 5-63 and Figure 5-4).

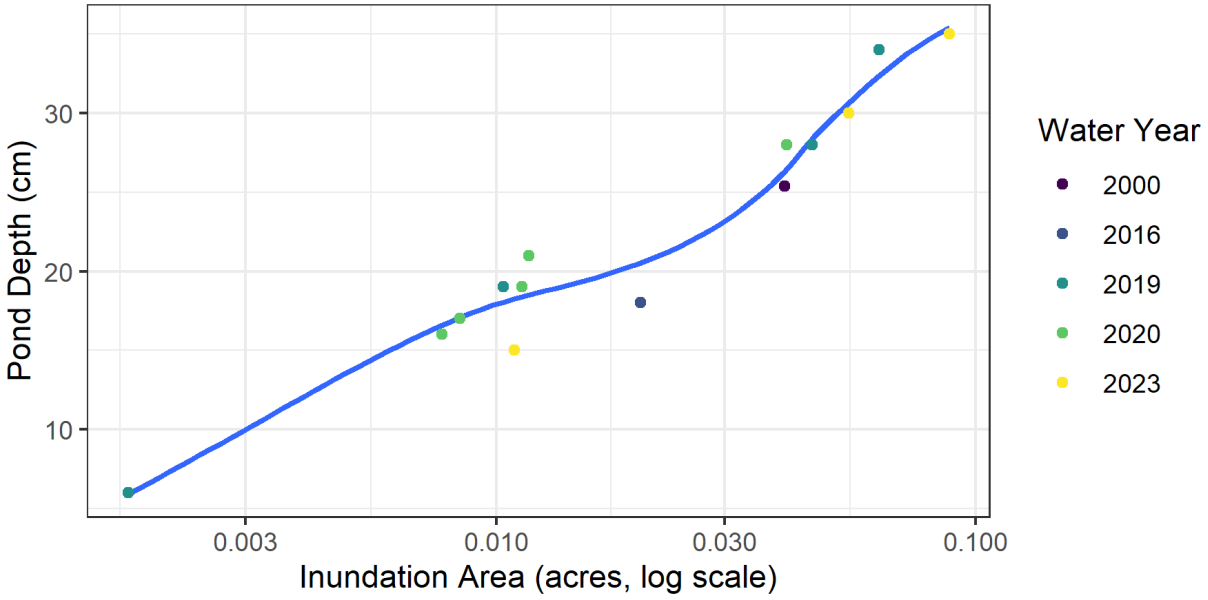

Figure 5-87. Pond 43 (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2000.

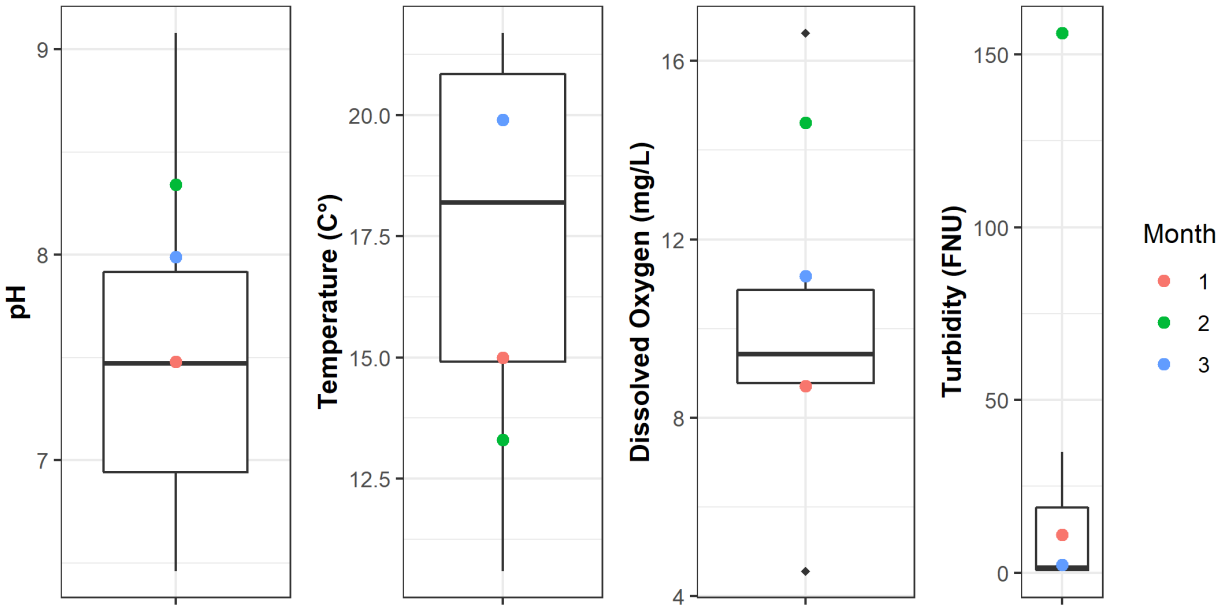

Figure 5-88. Pond 43 (Year 5 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics.

5.15.1 Data Quality Objective 1

Pond 43 did not maintain the required average depths of 25 cm from the first rain event through March for CTS, but it did maintain the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 43 did not sustain sufficient depth for CTS (20 cm through March), but it did for fairy shrimp (16 cm through May).

5.15.2 Data Quality Objective 2

Maximum inundation area in 2023 water year was greater than in baseline year 2016, an above normal water year (Figure 5-61).

5.15.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 43, a post-subsurface munitions remediation vernal pool, was partially on track for the performance standard for Year 5 in 2023. Pond 43 was not on track for DQO 1 for CTS, but it was on track for fairy shrimp indicating that it sustained suitable habitat for that species in 2023. The inundation at Pond 43 reached the biggest area on record and DQO 2 was met.

5.15.4 Data Quality Objective 4

Water quality parameters of Pond 43 were within the ranges of historical values observed at the reference vernal pools and DQO 4 was on track (Figure 5-89 and Figures 5-2 to 5-5)

5.15.5 Performance Standard: Wildlife Usage

Pond 43 was partially on track for the performance standard for Year 5 in 2023 because it did not sustain sufficient inundation for CTS, but it did for fairy shrimp. Pond 43 was partially on track for DQO 1. Water quality measurements were adequate for wildlife and DQO 4 was met.

5.15.6 Conclusion

Pond 43, a post-subsurface munitions remediation vernal pool, was in the final Year 5 of required monitoring in 2023 and was partially on track for the performance standards (Table 5-15). During the five years of post-prescribed burn and post-subsurface remediation monitoring, Pond 43 was partially on track for the Hydrological Conditions and Inundation Area Performance Standard in 2019, 2020, and 2023, all normal or above normal water years. The two years when the Performance Standard was not on track was in 2018, and 2021, both below normal water years (Figure 5-90). Similarly, the two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were partially on track in normal and above normal water years. The 2019 Wetland Monitoring Report (Burleson, 2020) indicated Pond 43 was not on track for DQO 1 for fairy shrimp due to it drying out by May. Pond 43 had an average depth of 14.5 cm from Dec 13th, 2018, to May 7th, 2019, and thus the DQO 1 for fairy shrimp was on track and both Performance Standards were partially on track in the 2019 water year. The only year when DQO 1 was on track for CTS in Pond 43 was during the 1998 baseline year, which was a record El Niño year and resulted in massive flooding across the Monterey Bay Area. Pond 43 is a shallow vernal pool that stayed dry in below normal water years, and it does not get deep enough to satisfy DQO 1 for CTS except in water years with extremely above normal precipitation. The data collected following MEC cleanup activities on hydrological functioning, suitable wildlife habitat, and water quality are consistent with baseline and the reference vernal pools and demonstrate that Pond 43 has not been negatively affected by the cleanup activities. No additional monitoring is recommended for Pond 43.

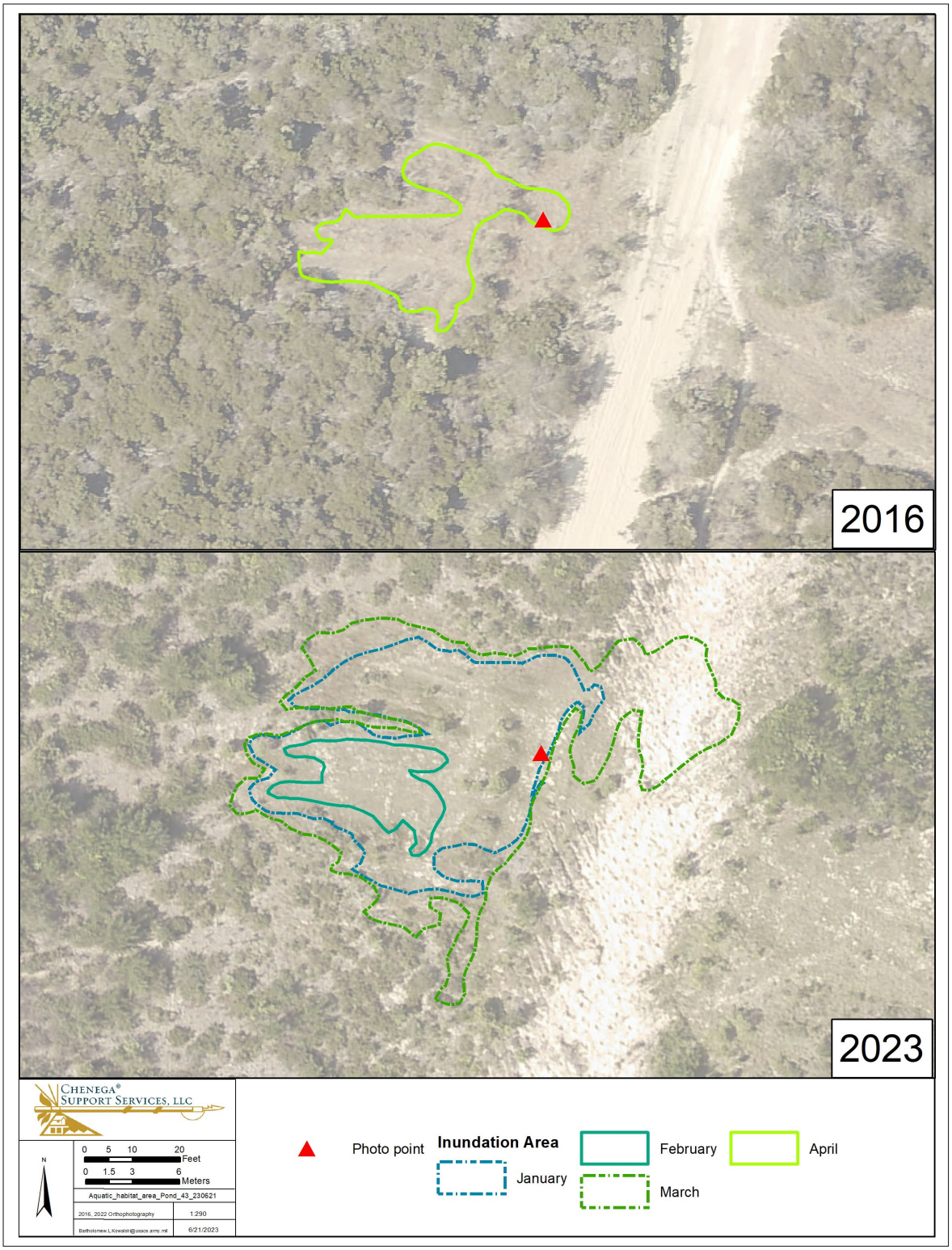

Figure 5-91. Pond 43 (Year 5 Post-Subsurface Munitions Remediation) Inundations for 2016 and 2023 (both above normal precipitation water years).

Table 5-15. Success at Pond 43 (Year 5 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives

Performance Standard	Applicable DQO	2018	2019	2020	2021	2023
Hydrological Conditions & Inundation Area	DQO 1	Not on track	Partially on track*	Partially on track	Not on track	Partially on track
	DQO 2	On track	On track	On track	On track	On track
Wildlife Usage	DQO 1	Not on track	Partially on track*	Partially on track	Not on track	Partially on track
	DQO 4	On track	On track	On track	Cannot assess	On track

*The 2019 Wetland Monitoring Report (Burleson, 2020) indicated Pond 43 did not meet DQO 1 for fairy shrimp due to it drying out by May. It provided and average depth of 14.5 cm from Dec 13th to May 7th.

5.16 Pond 44 – Year 5 Post-Subsurface Munitions Remediation

Pond 44 is situated within a small and shallow basin. Pond 44 is located in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 44 have been monitored for eight years (Figure 5-65). Above normal water years were 1998, 2016, 2019, and 2023. Year 2020 was a close to normal water year. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015). By size, Pond 44 is most similar to reference Pond 997.

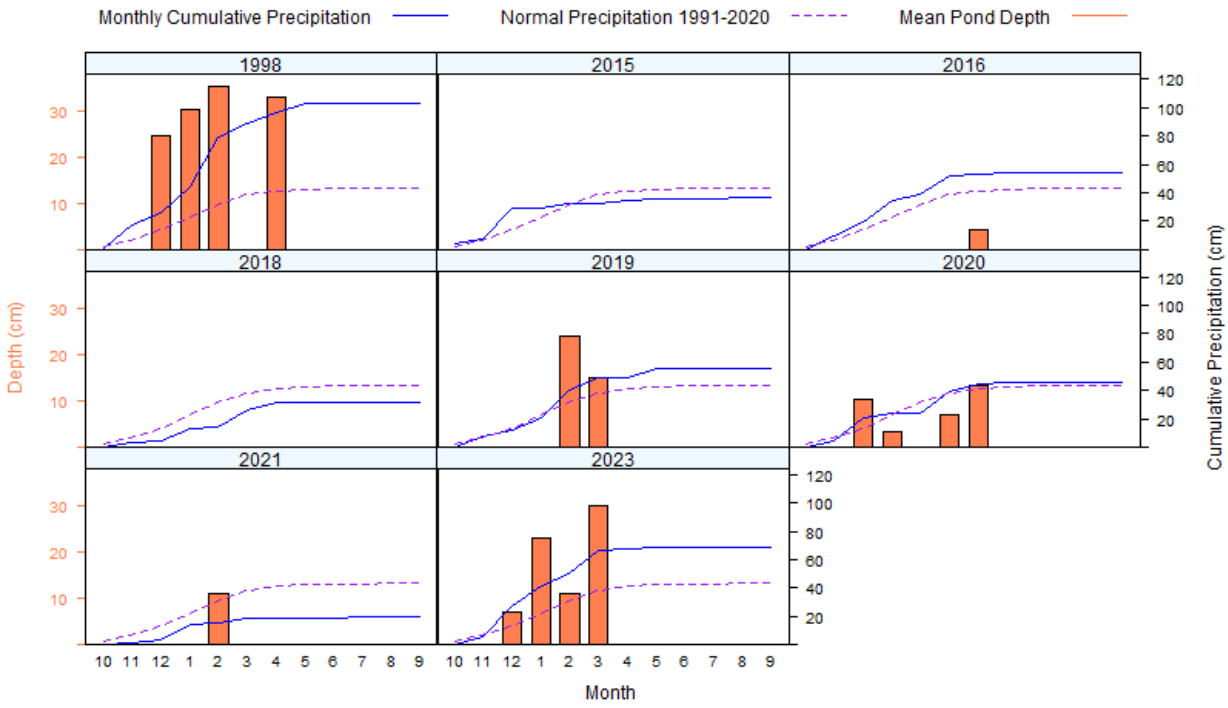

Figure 5-92. Pond 44 (Year 5 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

Pond 44 was monitored in 2023 as a Year 5 Post-Subsurface Munitions Remediation vernal pool. Vegetation in Pond 44 and within its watershed was masticated in 2017 during preparations for a

prescribed burn of BLM Area B Subunit B. Subsurface anomaly investigations occurred within the Pond 44 basin in 2018. Historically, Pond 44 remained dry in a consecutive drought year (2015), and it reached a maximum depth of 36 cm and a maximum inundation of 0.19 acres in 1998, an extreme above normal water year. Pond 44 reached a maximum depth of 30 cm and a maximum inundation area of 0.21 ac in 2023 water year (Figure 5-65). Inundation extent, depth, and water quality measurements are presented in Figures 5-65 to 5-68.

During the eight years of monitoring of Pond 44 the cumulative precipitation in 2023 was the second highest (Figure 5-65). Pond 44 was inundated from mid-December through March. The hydroperiod of Pond 44 in 2023 water year resembled that of 2020 water year the most. Maximum inundation area was greater in 2023 than in 2016 baseline water year, which was the greatest on record (Figure 5-65 and 5-93).

Water quality parameters of Pond 44 were similar to reference vernal pools and within historical ranges (Figure 5-94 and Figures 5-2 to 5-5).

5.16.1 Data Quality Objective 1

Pond 44 did not maintain the required average depths of 25 cm from the first rain event through March for CTS, but it did maintain the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 44 did not sustain sufficient depth for CTS (18.8 cm through March) but it did for the fairy shrimp (15.7 cm through April).

5.16.2 Data Quality Objective 2

Maximum inundation area in 2023 water year was greater than in baselines years, and DQO 2 was on track (Figure 5-65).

5.16.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 44, a post-subsurface munitions remediation, vernal pool, was partially on track for the performance standard for Year 5 in 2023. Pond 44 was not on track for DQO 1 for CTS, but it was on track for fairy shrimp indicating that it sustained suitable habitat for fairy shrimp in 2023. The inundation at Pond 44 reached the biggest area on record and DQO 2 was on track.

5.16.4 Data Quality Objective 4

Water quality parameters of Pond 44 were within the ranges of those observed at the reference vernal pools and DQO 4 was on track (Figure 5-95 and Figures 5-2 through 5-5).

5.16.5 Performance Standard: Wildlife Usage

Pond 44 was partially on track for the performance standard for Year 5 in 2023 because it did not sustain sufficient inundation for CTS, but it did for fairy shrimp. Pond 44 was partially on track for DQO 1. Water quality measurements were adequate for wildlife and DQO 4 was on track.

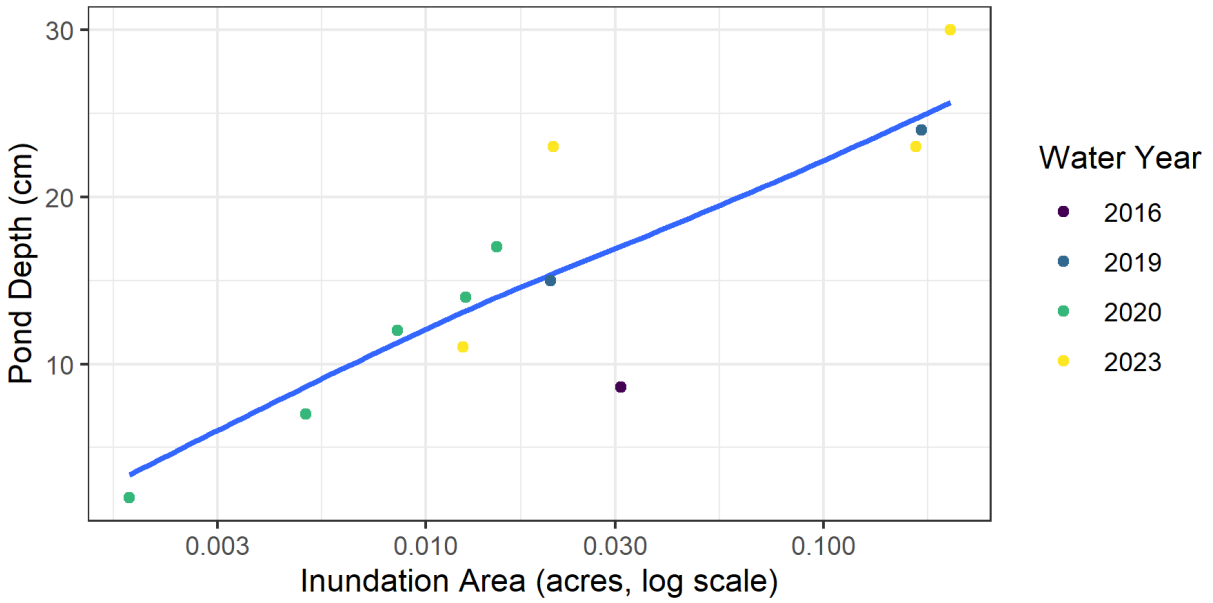

Figure 5-96. Pond 44 (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Data since 2016 Water Year.

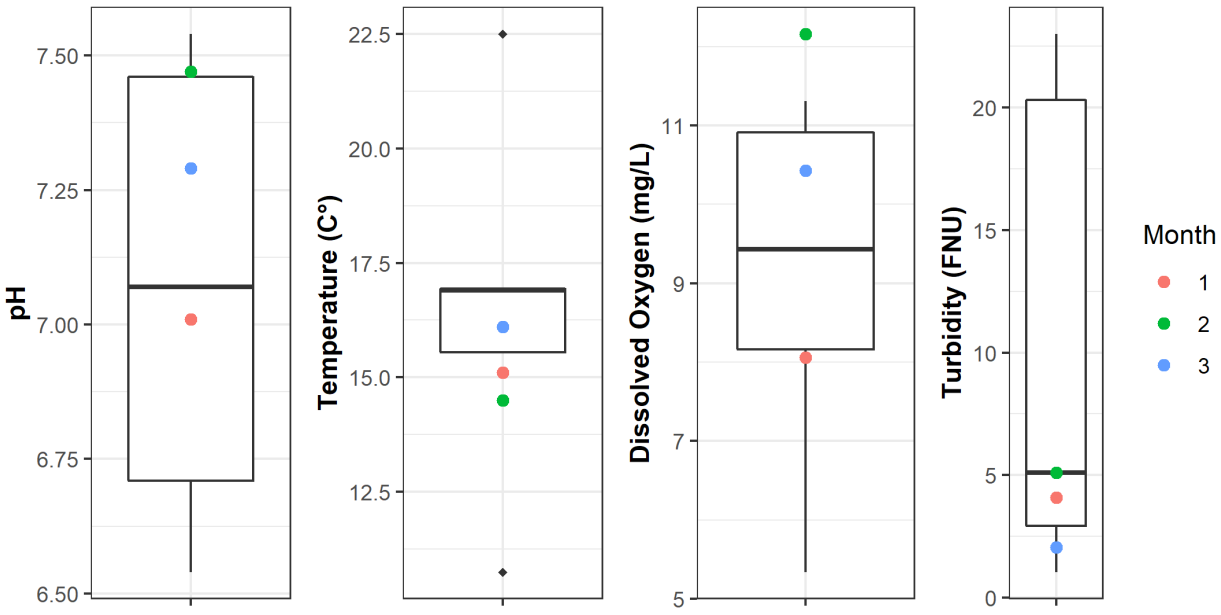

Figure 5-97. Pond 44 (Year 5 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics.

5.16.6 Conclusion

Pond 44, a post-mastication and post-subsurface munitions remediation vernal pool, was in the final Year 5 of required monitoring in 2023 and was partially on track for the performance standards (Table 5-16). During the five years of post-mastication and post-subsurface remediation monitoring, Pond 44 was partially on track for Hydrological Conditions and Inundation Area Performance Standard in 2019 and 2023, both above normal water years. The three years when the Performance Standard was not on track was in 2018, 2020, and 2021, all close to normal, or below normal water years (Figure 5-98). Similarly, the two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were partially on track in above normal water years. The 2019 Wetland Monitoring Report (Burleson, 2020) indicated Pond 44 was not on track for DQO 1 for fairy shrimp due to it drying out by May. Pond 44 had an average depth of 19.5 cm from Feb 12th to March 6th, 2019, and thus the DQO 1 for fairy shrimp was on track and both Performance Standards were partially on track in the 2019 water year. The only year when DQO 1 was on track for CTS in Pond 44 was likely during the 1998 baseline year (depth was not measured in Mach), which was an El Niño year and resulted in massive flooding in Monterey Bay Area. Pond 44 is a shallow vernal pool that stayed dry in below normal water years, and it does not get deep enough to satisfy DQO 1 for CTS except in water years with extremely above normal precipitation. The data collected following MEC cleanup activities on hydrological functioning, suitable wildlife habitat, and water quality are consistent with baseline and the reference vernal pools and demonstrate that Pond 44 has not been negatively affected by the cleanup activities. No additional monitoring is recommended for Pond 44.

Table 5-16. Success at Pond 44 (Year 5 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives

Performance Standard	Applicable DQO	2018	2019	2020	2021	2023
Hydrological Conditions & Inundation Area	DQO 1	Not on track	Partially on track^	Not on track	Not on track	Partially on track
	DQO 2	On track	On track	On track	On track	On track
Wildlife Usage	DQO 1	Not on track	Partially on track^	Not on track	Not on track	Partially on track
	DQO 4	Cannot assess	On track	On track	Cannot assess	On track

^ The 2019 Wetland Monitoring Report (Burleson, 2020) indicated Pond 44 did not meet DQO 1 for fairy shrimp due to it drying out by May. It provided and average depth of 19.5 cm from Feb 12th to March 6th.

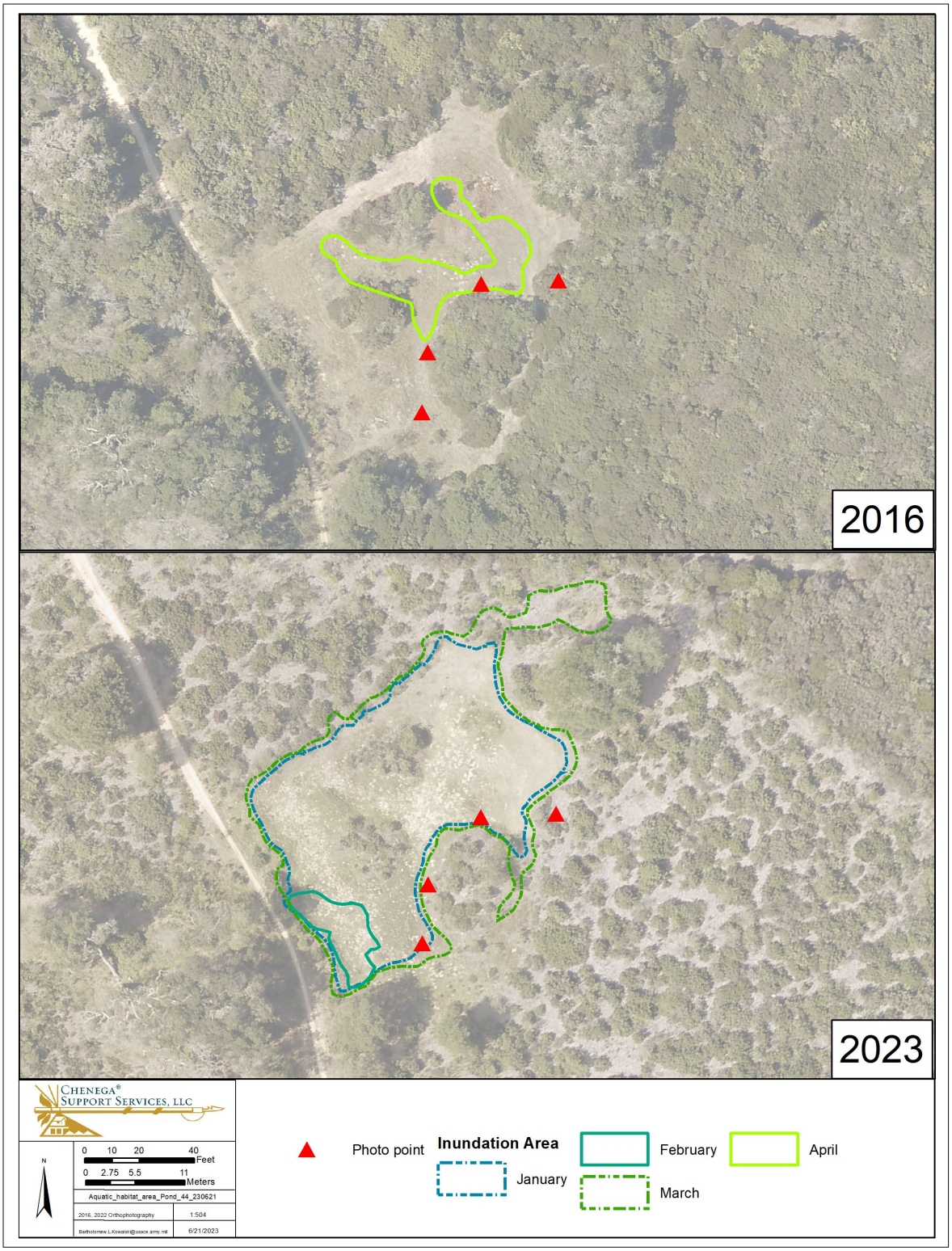

Figure 5-99. Pond 44 (Year 5 Post-Subsurface Munitions Remediation) Inundations for 2016 and 2023 (both above normal precipitation water years).

5.17 Pond 54 – Year 5 Post-Subsurface Munitions Remediation

Pond 54 is situated within a medium size basin in the southern part of the Fort Ord National Monument within the Impact Area (Figure 2-4). The surrounding slopes are much steeper than most vernal pools monitored in 2023 water year. Depth and inundation of Pond 54 have been monitored for seven years (Figure 5-69). Years 2017, 2019 and 2023 were above normal water years, and years 2004, 2009, 2018 and 2021 were below normal water years. By size, Pond 54 is most similar to reference Pond 101 East (East) (Figure 5-1).

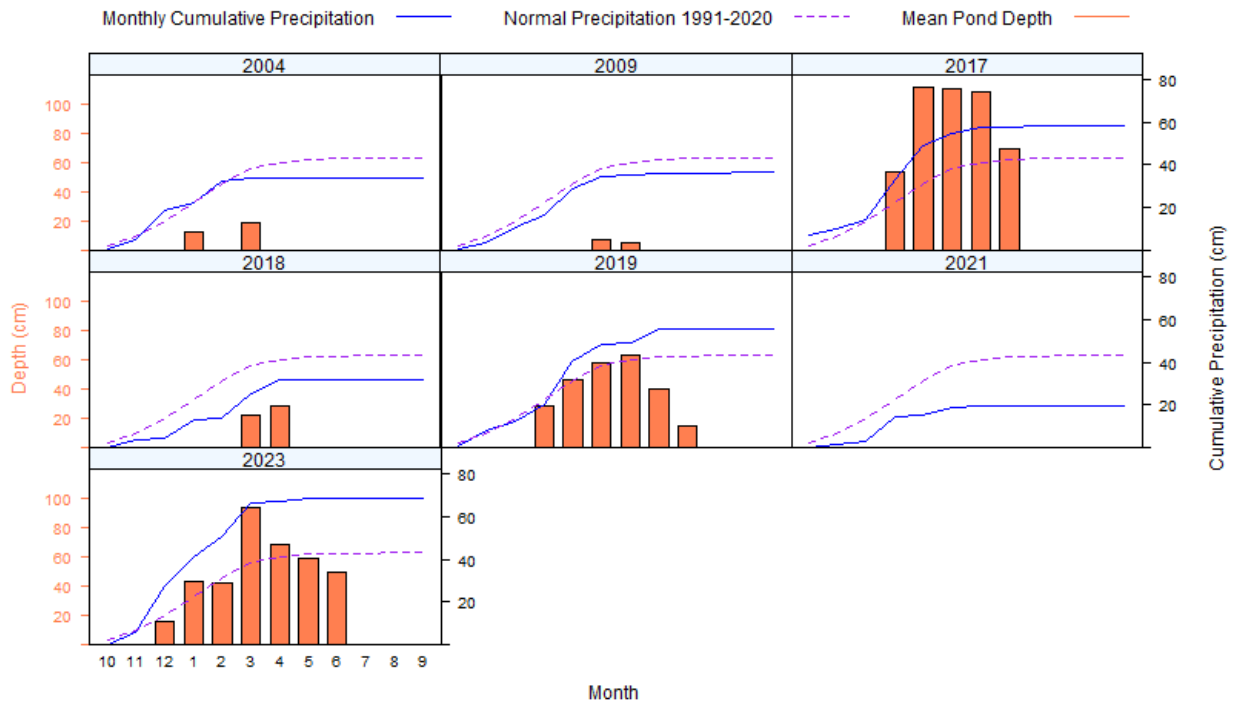

Figure 5-100. Pond 54 (Year 5 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

Pond 54 was monitored in 2023 as a Year 5 Post-Subsurface Munitions Remediation vernal pool. Vegetation within Pond 54 watershed was masticated in the summer of 2015 in support of MEC remediation in Unit 23. Risk reduction activities in Unit 23 resulted in subsurface munitions remediation in Pond 54 in 2018. Historically, Pond 54 reached a maximum depth of 112 cm and a maximum inundation of 3.10 acres in 2017, an above normal water year (Figure 5-70). Pond 54 reached a maximum depth of 94 cm and a maximum inundation area of 3 ac in 2023 water year (Figure 5-69). The inundation extent, depth, and water quality measurements are presented in Figures 5-69 to 5-72.

During the seven years of monitoring of Pond 54 the cumulative precipitation in 2023 was the highest (Figure 5-69). Pond 54 was inundated from mid-December to June, when the last monitoring event occurred. Hydroperiod of Pond 54 in 2023 water year resembled those of 2017 and 2019, both above normal water years (Figure 5-59). Maximum inundation area of Pond 54 was smaller than in 2017. This is similar to the inundation observed at reference vernal pools 5 and 101 East (East) and may be due to 2021 and 2022 water years receiving well below normal precipitation, while 2016 water year was an above normal water year. Generally, vernal pools don't become inundated until the sandy loam layer

and the underlying clay layer become saturated. Once the clay layer becomes completely saturated, any additional input in water to the basin results in ponding. This suggests that the dry conditions present prior to the 2023 water year dried out the underlying clay layer which required more water to saturate it completely before Pond 54 could become inundated. Even though the 2023 water year was well above normal, 2016 was an above normal water year which likely caused the underlaying clay layer to retain some moisture going into the 2017 water year, and thus requiring less precipitation to saturate it.

Water quality parameters of Pond 54 were similar to reference vernal pools and within historical ranges (Figure 5-101 and Figures 5-2 to 5-5).

5.17.1 Data Quality Objective 1

Pond 54 maintained the required average depths of 25 cm from the first rain event through March for CTS, and the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 54 sustained sufficient depth for CTS (48.8 cm through March), and for fairy shrimp (53.8 cm through May).

5.17.2 Data Quality Objective 2

Maximum inundation area in 2023 water year was smaller than in baseline year 2017, an above normal water year (Figure 5-69). Pond 54 monthly inundation pattern was similar to inundations observed at reference Ponds 5 and 101 East (East), and DQO 2 was on track.

5.17.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 54, a post-subsurface munitions remediation, vernal pool, was on track for the performance standard for Year 5 in 2023. Pond 54 was on track for DQO 1 indicating that it did sustain suitable habitat for CTS and for fairy shrimp in 2023. Pond 54 inundation pattern resembled that of reference Pond 101 East (East) in 2023 and DQO 2 was on track.

5.17.4 Data Quality Objective 4

Water quality parameters of Pond 54 were within the ranges of historical values and those observed at reference vernal pools and DQO 4 was on track (Figure 5-102 and Figures 5-2 to 5-5).

5.17.5 Performance Standard: Wildlife Usage

Pond 54 was on track for the performance standard for Year 5 in 2023 as it sustained sufficient depth and inundation for CTS and fairy shrimp. Water quality measurements were adequate for wildlife.

5.17.6 Conclusion

Pond 54, a post-subsurface munitions remediation vernal pool, was in the final Year 5 of required monitoring in 2023 and was on track for the performance standards (Table 5-17). During the five years of post-mastication and post-subsurface remediation monitoring, Pond 54 was on track for Hydrological Conditions and Inundation Area Performance Standard in 2017, 2019, and 2023, all above normal water years. The two years when the Performance Standard was not on track were 2018 and 2021, both below normal water years (Figure 5-103). Similarly, the two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were on track in above normal water years. The data collected following MEC cleanup activities on hydrological functioning, suitable wildlife habitat, and water quality are consistent with baseline and the reference vernal pools and demonstrate that Pond 54 has not been negatively affected by the cleanup activities. No additional monitoring is recommended for Pond 54.

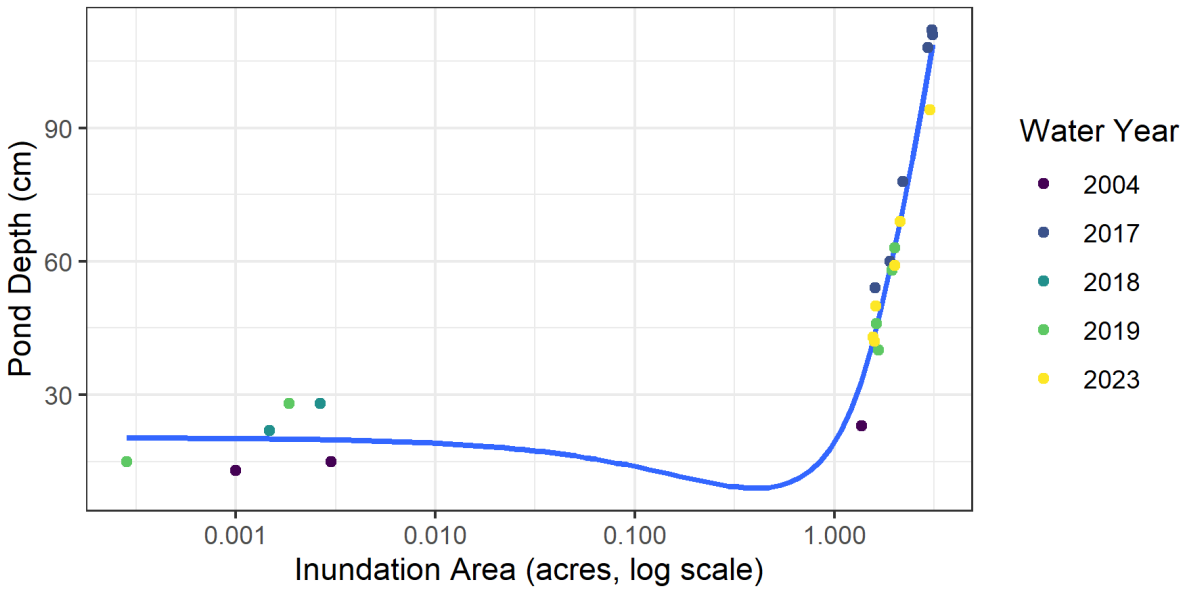

Figure 5-104. Pond 54 (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since 2004 Water Year.

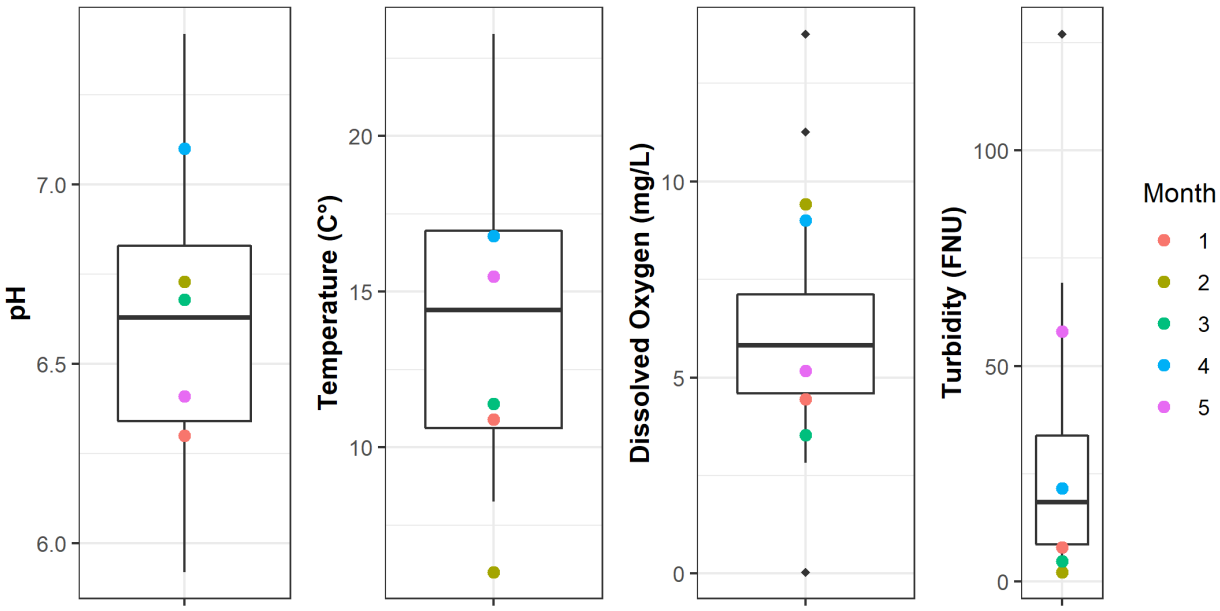

Figure 5-105. Pond 54 (Year 5 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics.

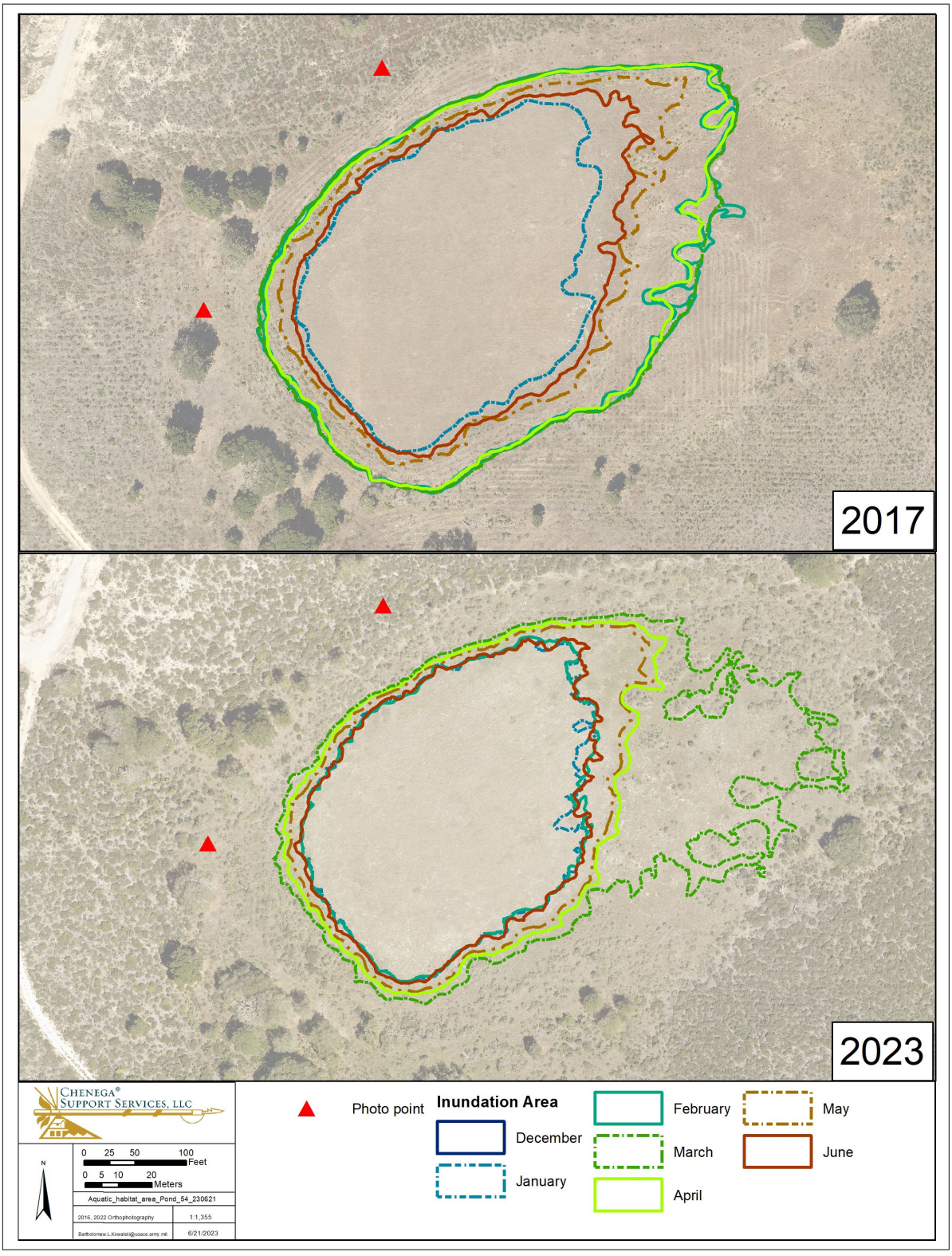

Figure 5-106. Pond 54 (Year 5 Post-Subsurface Munitions Remediation) Inundations for 2017 and 2023 (both above normal water years).

Table 5-17. Success at Pond 54 (Year 5 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives

Performance Standard	Applicable DQO	2017	2018	2019	2021	2023
Hydrological Conditions & Inundation Area	DQO 1	On track	Not on track	On track	Not on track	On track
	DQO 2	On track	On track	On track	On track	On track
Wildlife Usage	DQO 1	On track	Not on track	On track	Not on track	On track
	DQO 4	On track	On track	On track	Cannot assess	On track

5.18 Pond 60 – Year 5 Post-Subsurface Munitions Remediation

Pond 60 is situated within a medium sized basin with a moderate profile in the northern part of the Fort Ord National Monument (Figure 2-4). Depth and inundation of Pond 60 have been monitored for eight years (Figure 5-73). Above normal water years were 2016, 2019, and 2023. Water year 2020 was close to normal. All other monitoring was conducted either in a below normal water year (2018, 2021), or a consecutive drought year (2015, 2022). By size, Pond 60 is most similar to reference Pond 101 East (East), but it has a slightly steeper profile (Figure 5-1).

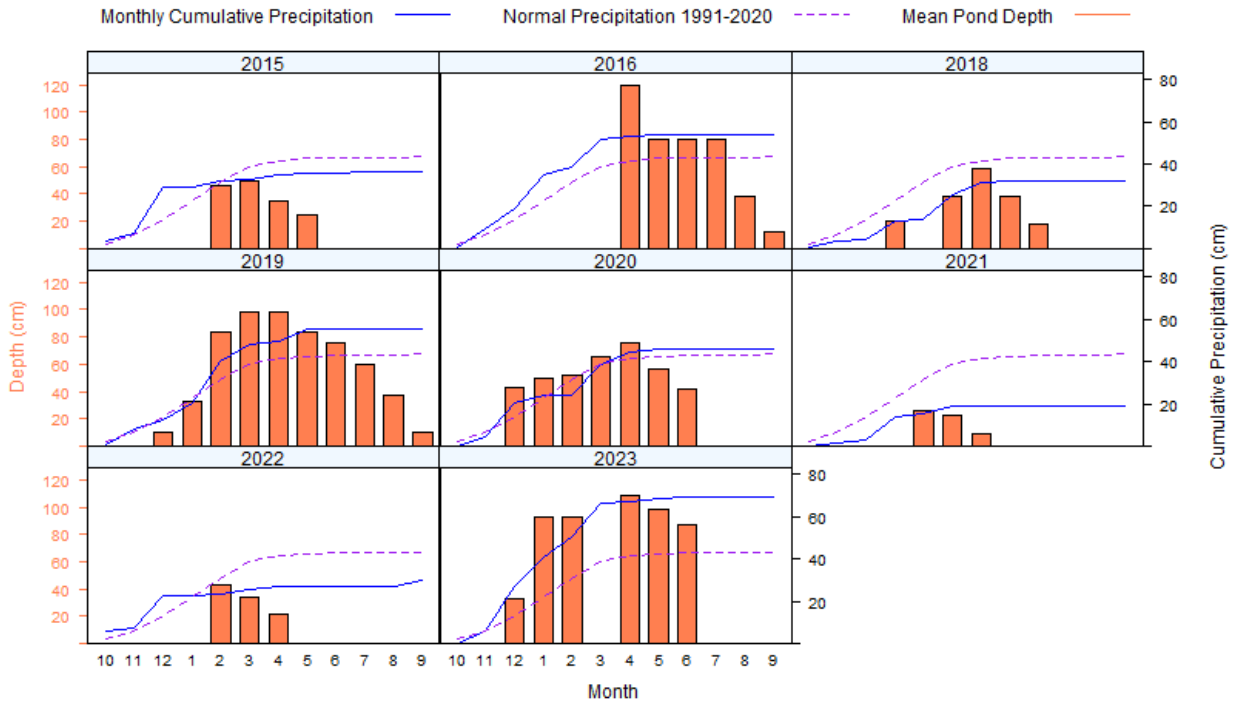

Figure 5-107. Pond 60 (Year 5 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

Pond 60 was monitored in 2023 as a Year 5 Post-Subsurface Munitions Remediation vernal pool. Pond 60 was monitored for baseline conditions in 2015 and 2016. Vegetation within the watershed of Pond 60 was masticated in 2017 to support MEC remediation activities and prepare areas for a prescribed burn. Subsurface anomaly investigations occurred in Pond 60 basin in 2018. Historically, Pond 60 reached an estimated depth of 50 cm and 1.31 ac in 2015, a consecutive drought year, and it reached a maximum depth of 130 cm and a maximum inundation of 2.65 acres in 2016, an above normal water year (Figure 5-76). The 2023 maximum depth of Pond 60 reached 113 cm and maximum measured inundation was 2.84 ac (Table 4-19). The depth and inundation values were within range of previously recorded values (Figure 5-76).

During the eight years of monitoring of Pond 60 the cumulative precipitation in 2023 was the highest (Figure 5-73). Pond 60 was inundated from mid-December through June when the last monitoring event occured (Table 4-19 and Figure 4-19). The hydroperiod of Pond 60 was similar to those of the reference vernal pools 5 and 101 East (East). Maximum inundation area was larger in 2023 than in 2016, which was an above normal water year (Figure 5-76).
Water quality parameters of Pond 60 were generally within ranges observed at reference vernal pools (Figure 5-75 and Figures 5-2 to 5-5).

5.18.1 Data Quality Objective 1

Pond 60 maintained the required average depths of 25 cm from the first rain event through March for CTS, and the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 60 sustained sufficient depth for CTS (83 cm through March), and it provided suffient depth for fairy shrimp (89 cm through May).

5.18.2 Data Quality Objective 2

Maximum inundation area in 2023 was greater than in 2016, an above normal water year (Figure 5-76). Pond 60 monthly inundation pattern was similar to inundations observed at reference Ponds 5 and 101 East (East), and DQO 2 was on track.

5.18.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 60, a post-subsurface munitions remediation vernal pool, was on track for this performance standard for Year 5 in 2023. Pond 60 was on track for DQO 1 indicating that it provided suitable habitat for CTS and fairy shrimp. Pond 60 reached maximum inundation in 2023 and by comparison to reference vernal pools DQO 2 was on track.

5.18.4 Data Quality Objective 4

Water quality parameters of Pond 60 were generally within the historical ranges and DQO 4 was on track (Figure 5-75 and Figure 5-2).

5.18.5 Performance Standard: Wildlife Usage

This performance standard was on track in 2023 at Pond 60 as it sustained sufficient depth and inundation for CTS and fairy shrimp. Water quality measurements were adequate for wildlife.

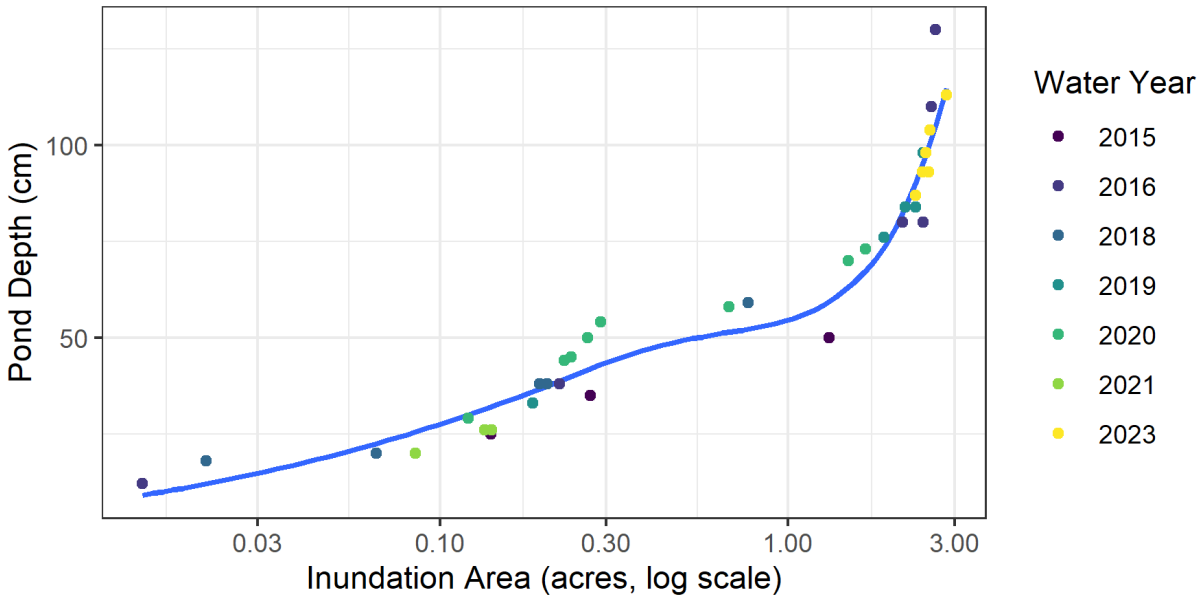

Figure 5-108. Pond 60 (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Data since 2015 Water Year.

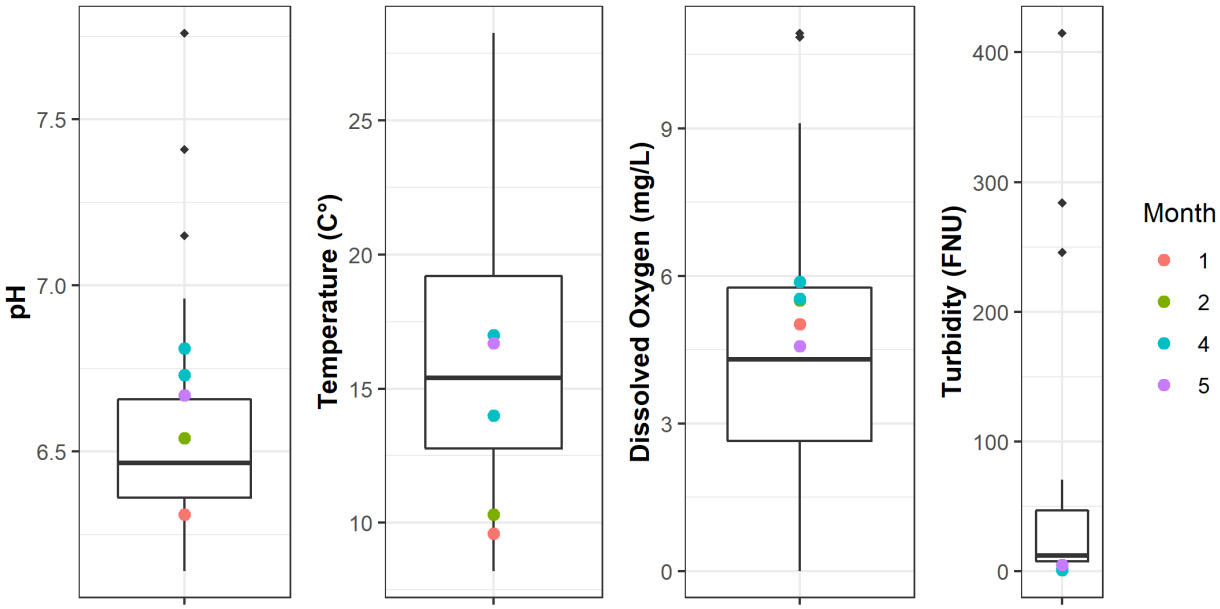

Figure 5-109. Pond 60 (Year 5 Post-Subsurface Munitions Remediation) historical and 2023 water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The colored dots represent observed values in 2023 water year. The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics.

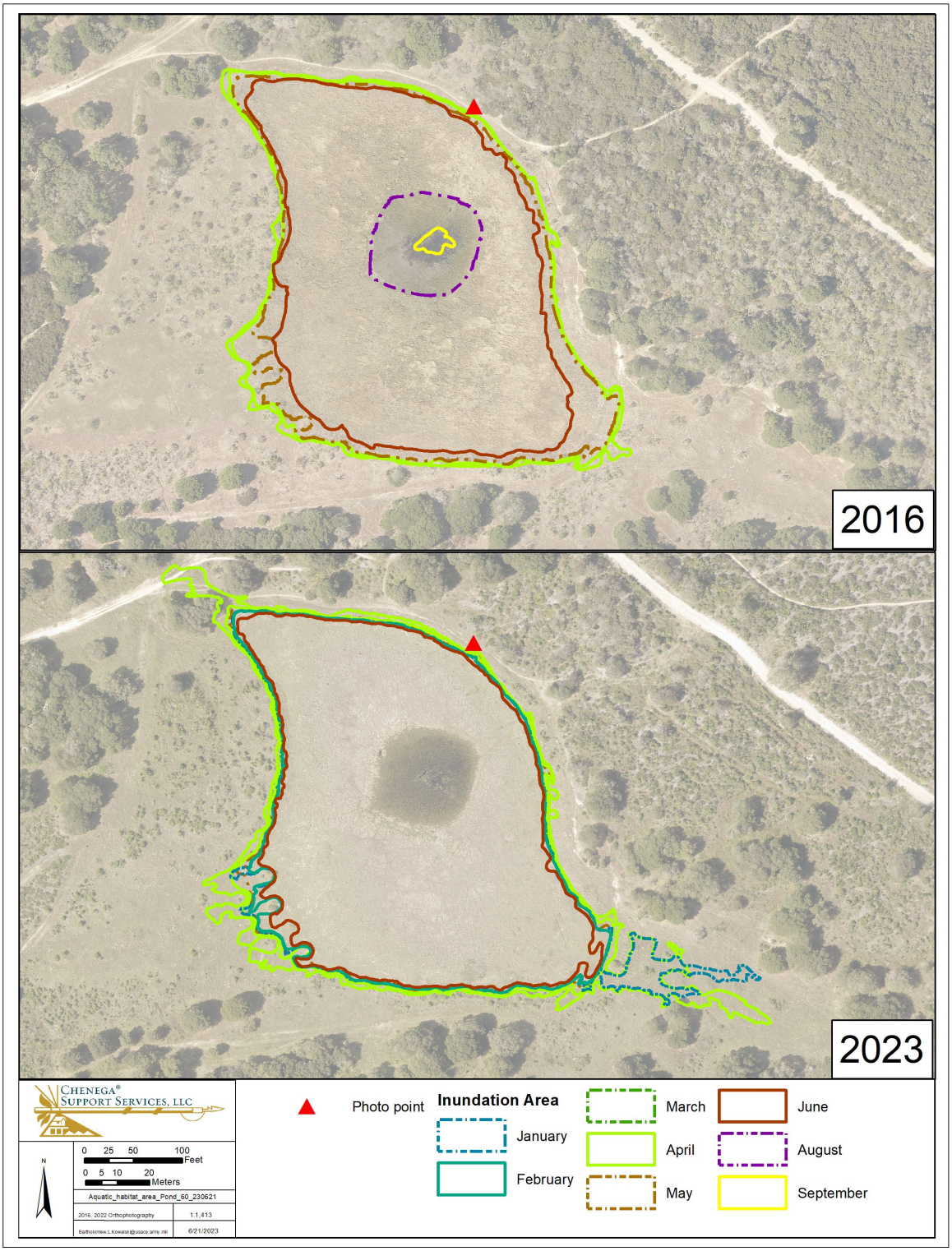

Figure 5-110. Pond 60 (Year 5 Post-Subsurface Munitions Remediation) Inundations for 2016 and 2023 (both above normal precipitation water years).

5.18.6 Conclusion

Pond 60, a post-subsurface munitions remediation vernal pool, was in the final Year 5 of required monitoring in 2023. The vernal pool was on track for the performance standards (Table 5-18). During the five years of post-mastication and post-subsurface remediation monitoring, Pond 60 was on track for the Hydrological Conditions and Inundation Area Performance Standard in 2019, 2020, and 2023, all close to normal or above normal water years. The two years when the Performance Standard was only partially on track were 2018 and 2021, both below normal water years (Figure 5-111). Similarly, the two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were on track in close to normal and above normal water years. The data collected following MEC cleanup activities on hydrological functioning, suitable wildlife habitat, and water quality are consistent with baseline and the reference vernal pools and demonstrate that Pond 60 has not been negatively affected by the cleanup activities. No additional monitoring is recommended for Pond 60.

Table 5-18. Success at Pond 60 (Year 5 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives

Performance Standard	Applicable DQO	2018	2019	2020	2021	2023
Hydrological Conditions & Inundation Area	DQO 1	Partially on track	On track	On track	Partially on track	On track
	DQO 2	On track	On track	On track	On track	On track
Wildlife Usage	DQO 1	Partially on track	On track	On track	Partially on track	On track
	DQO 4	On track	On track	On track	On track	On track

5.19 Pond 61 – Year 5 Post-Subsurface Munitions Remediation

Pond 61 is situated within a medium sized basin in the northern part of the Fort Ord National Monument. It is characterized by mima mounds and topographically varied small depressions that in an above normal water year can become inundated and hydrologically connected. In close to normal and below normal water years Pond 61 consist of several separate depressions, with two largest ones in the west and in the east portion of the basin. The western depression requires less precipitation to become inundated, however, the first water gauge was installed in the eastern depression. As a result, while some gauge readings in the eastern depression had zero values, the western depression may have been holding water, and in those instances it was recorded as “peripheral inundation present” (Appendix B). Per recommendations in the 2020 hydrology report (Chenega, 2023) a staff gauge was installed in the western portion of Pond 61 and readings for the eastern and western portions were recorded separately starting in 2021. Pond 61 was monitored for five years (Figure 5-77). Above normal water years were 2017, 2019, 2023. Year 2020 was a close to normal water year, while 2018 and 2021 were below normal water years, and 2022 was a consecutive drought 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 East remained completely dry in a below normal water years (2018, 2021, 2022), and it reached a maximum depth of 21 cm and a maximum inundation of 0.70 acres in 2017 when it was hydrologically connected

to Pond 61 West (Figure 5-79). Pond 61 East reached maximum depth of 19 cm in 2023. Pond 61 West held water in all monitoring years. The 2023 maximum depth of Pond 61 West was 51 cm. Both ponds were hydrologically connected in January and April and reached a maximum inundation area of 0.64 acres (Table 4-20).

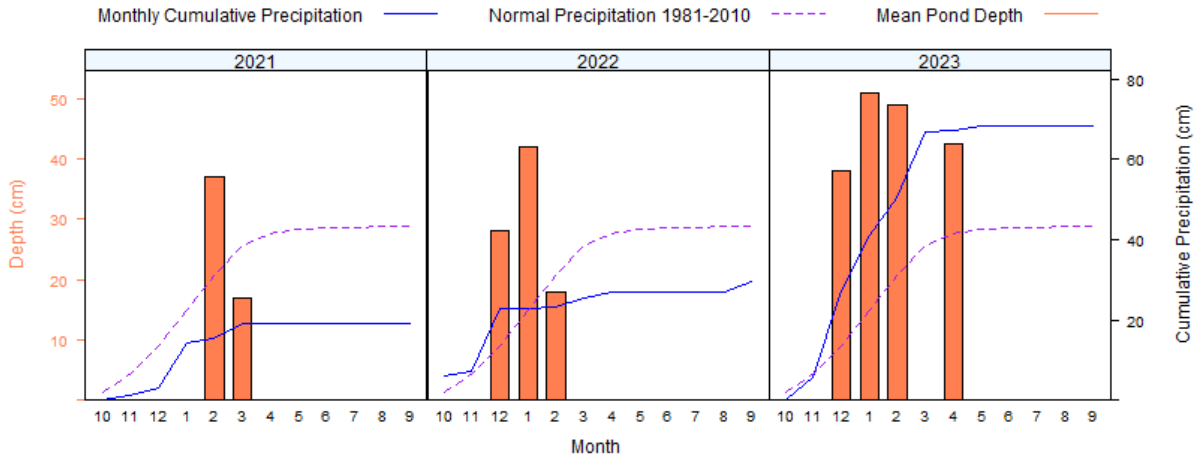

Figure 5-112. Pond 61 West (Year 5 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

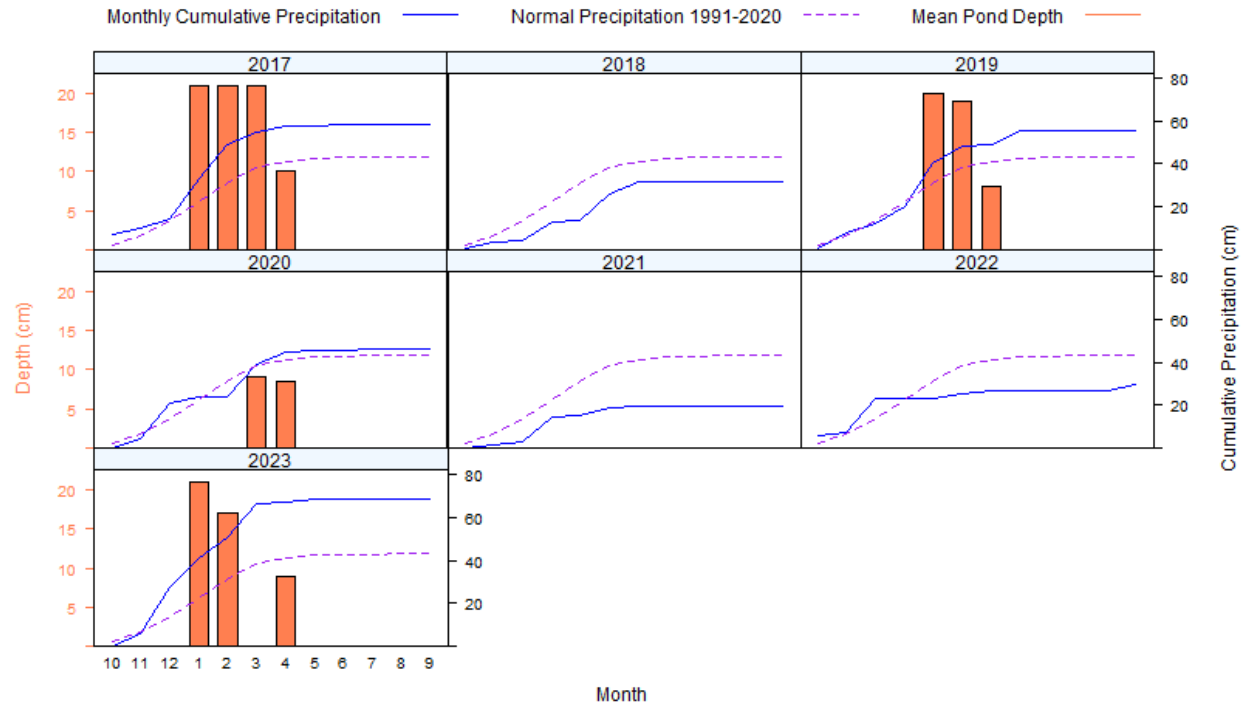

Figure 5-113. Pond 61 East (Year 5 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

Pond 61 West was inundated from mid-December through April, and Pond 61 East was inundated from mid-January to beginning of April (Table 4-20 and Figure 4-20).

Water quality parameters of Pond 61 West were generally within the ranges of historical values observed at reference vernal pools, with the exception of higher pH and temperature values in April. Pond 61 East water quality values were within ranges observed at reference vernal pools (Figure 5-81 and Figures 5-4 to 5-5).

5.19.1 Data Quality Objective 1

Pond 61 West maintained the required average depths of 25 cm from the first rain event through March for CTS, but Pond 61 East did not. Both vernal pools maintained the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 61 West sustained sufficient depth for CTS (47.3 cm through April 7th) and for fairy shrimp (44.6 cm through April 7th). Pond 61 East did not sustain sufficient depth for CTS (14 cm through April 7th) but it did sustain sufficient depth for fairy shrimp (11.2 cm through April 7th).

5.19.2 Data Quality Objective 2

Maximum inundation area of Ponds 61 West and East when they were hydrologically connected in 2023 water year was smaller than in baseline year 2017, an above normal water year (Figure 5-82). Monthly inundation patterns of Ponds 61 West and East were similar to inundations observed at reference Ponds 997, and DQO 2 was on track.

5.19.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 61 (encompassing both west and east depressions), a post-subsurface munitions remediation vernal pool, was on track for the performance standard for Year 5 in 2023. Even though Pond 61 East was not on track for DQO 1 for CTS, Pond 61 West provided suitable habitat for the species. Both vernal pools provided suitable habitat for fairy shrimp. Pond 61 showed similar inundation pattern to reference Pond 997 and DQO 2 was on track.

5.19.4 Data Quality Objective 4

Water quality parameters of Ponds 61 East and 61 West were generally within the historical ranges observed at reference vernal pools and DQO 4 was on track (Figures 5-2 to 5-5).

5.19.5 Performance Standard: Wildlife Usage

This performance standard was on track in 2023 at Pond 61 as it sustained sufficient depth and inundation for CTS and fairy shrimp. Water quality measurements were adequate for wildlife.

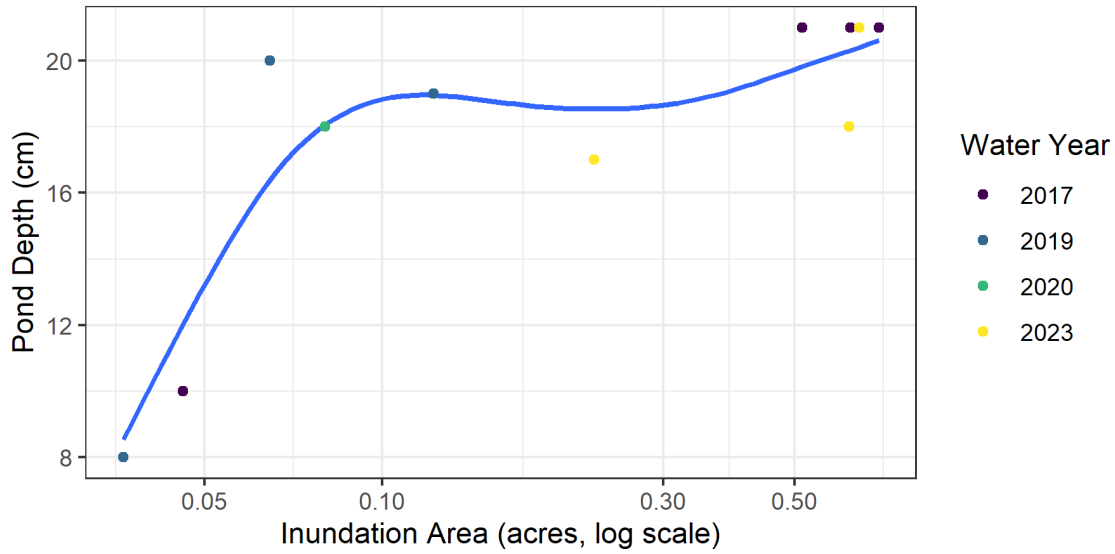

Figure 5-114. Pond 61 East (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area since 2017 Water Year.

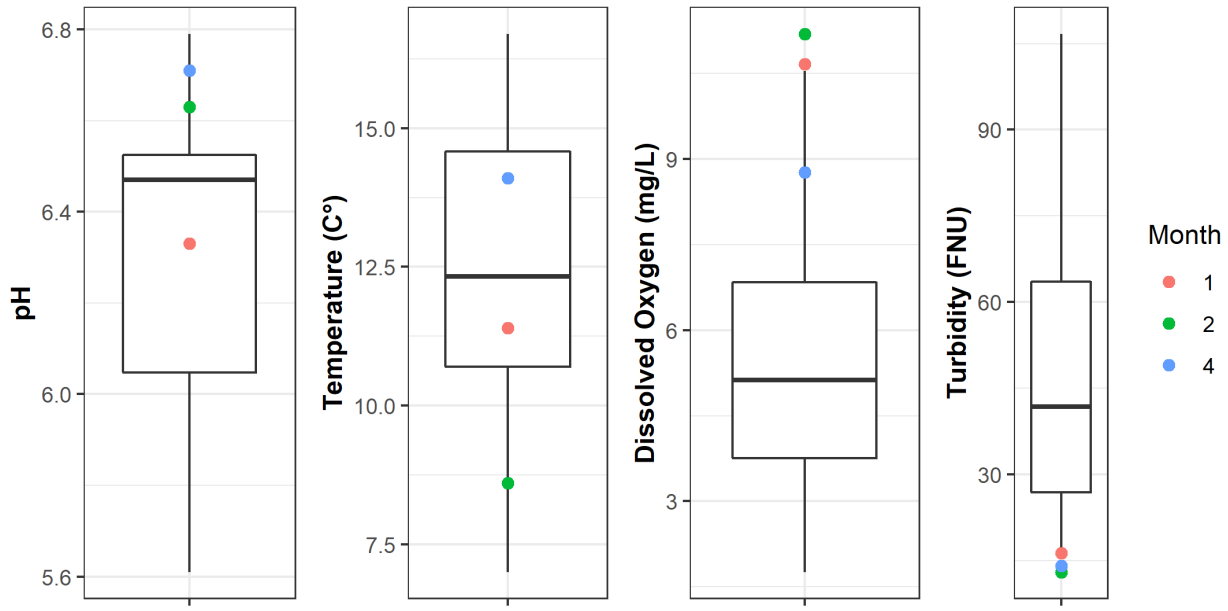

Figure 5-115. Pond 61 East (Year 5 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The colored dots represent observed values in 2023 water year at Pond 61 West. The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively.

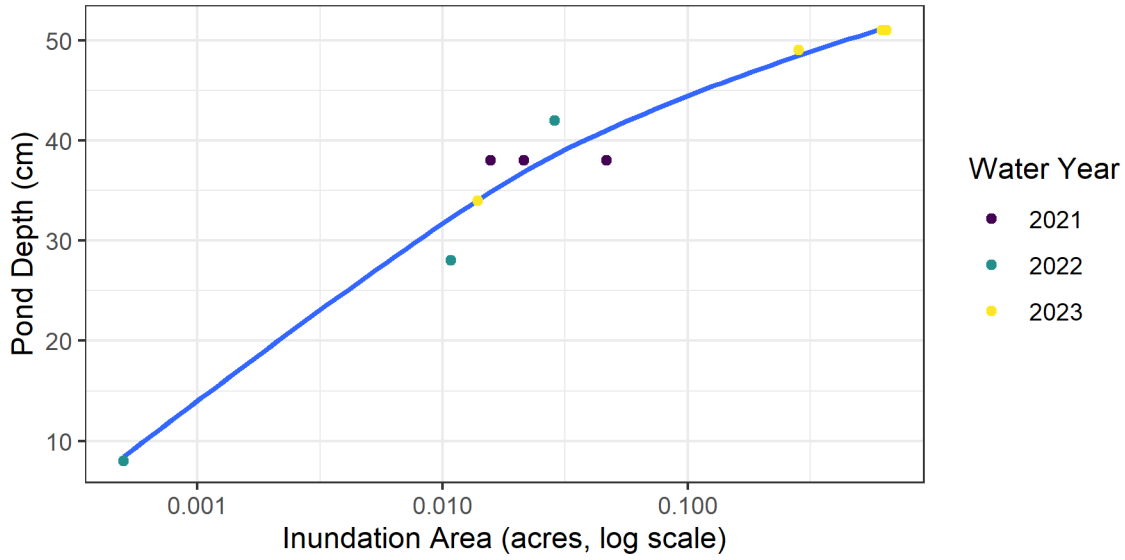

Figure 5-116. Pond 61 West (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area since 2021 Water Year.

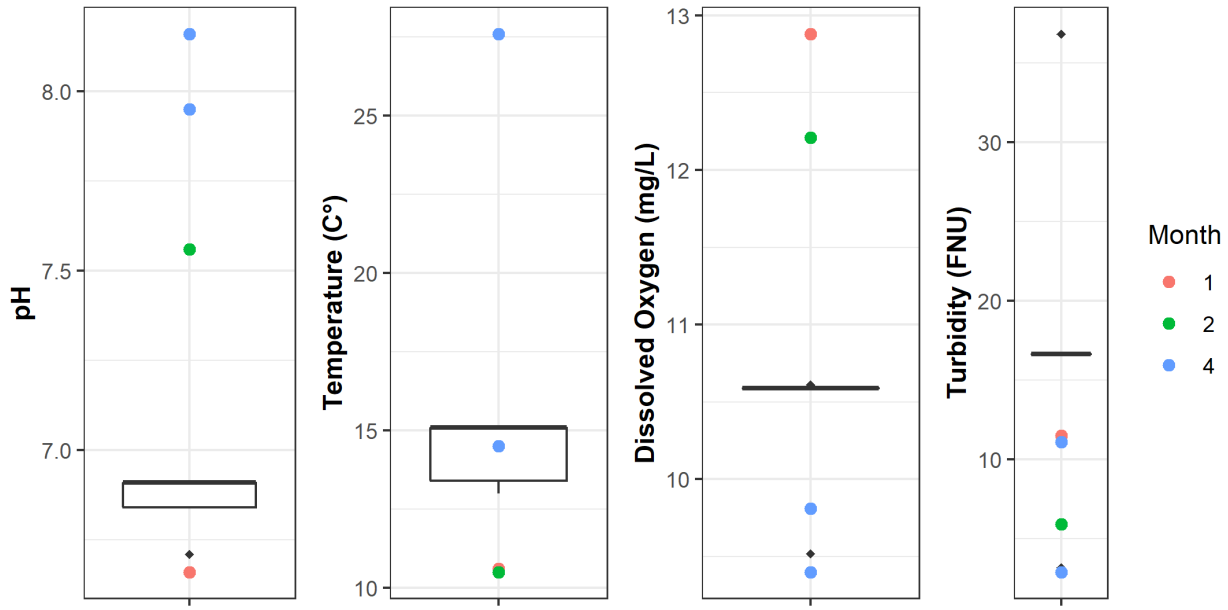

Figure 5-117. Pond 61 West (Year 5 Post-Subsurface Munitions Remediation) water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The colored dots represent observed values in 2023 water year at Pond 61 West. The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics.

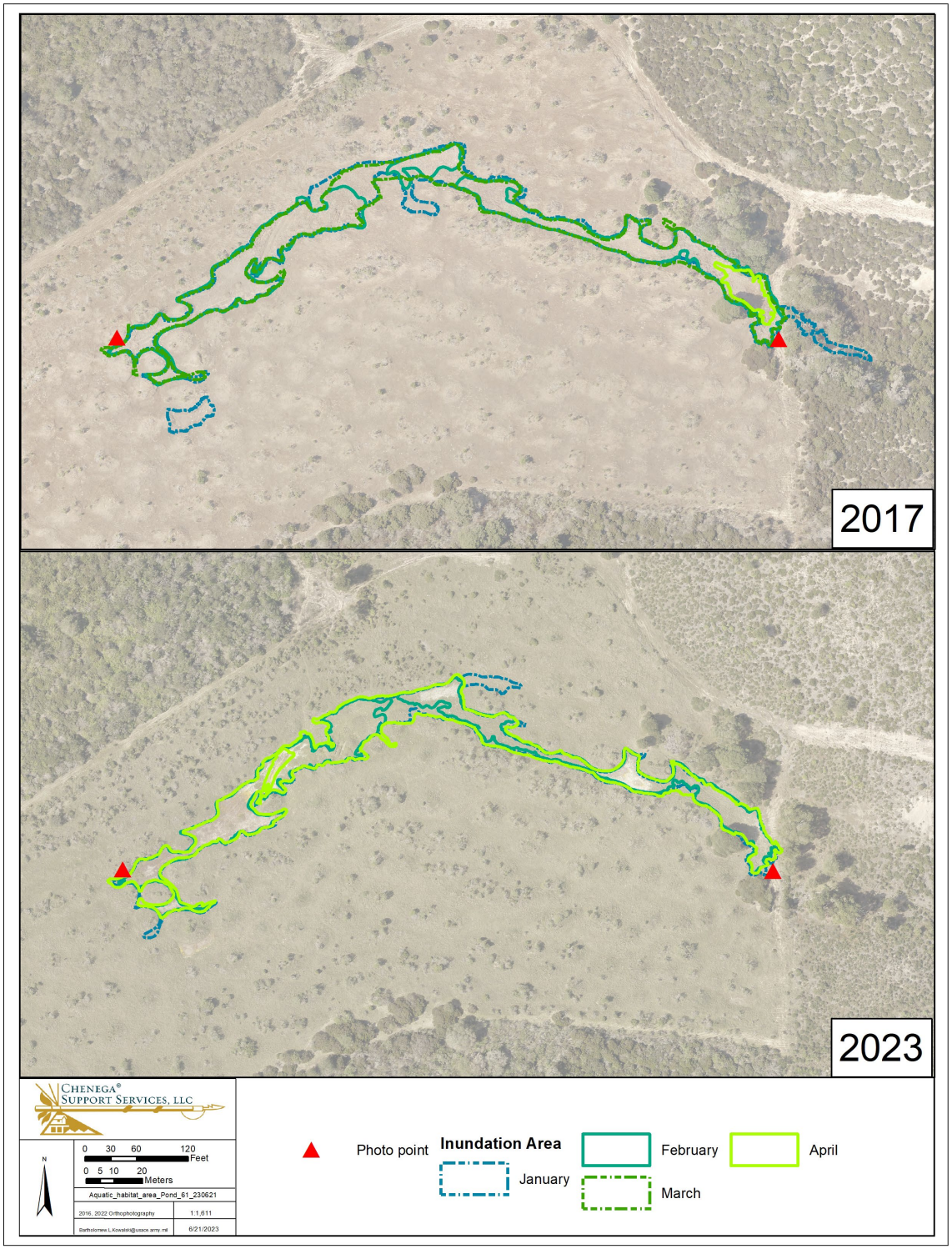

Figure 5-118. Ponds 61 East and 61 West (Year 5 Post-Subsurface Munitions Remediation) Inundations for 2017 and 2023 (both above normal precipitation water years).

5.19.6 Conclusion

Pond 61, a post-subsurface munitions remediation vernal pool, was in the final Year 5 of required monitoring in 2023 and was on track for the performance standards (Table 5-19). That was the only year that the Hydrological Conditions and Inundation Area Performance Standard was on track during the six years of post-mastication and post-subsurface remediation monitoring. Pond 61 was partially on track for the Hydrological Conditions and Inundation Area Performance Standard in 2019 and 2021, an above normal water and a below normal water years, respectively. The three years when the Performance Standard was not on track was in 2018, 2020, and 2022, all below normal water years (Figure 5-119). Similarly, the two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were on track or partially on track in above normal water years with the exception of 2021, which was a below normal water year. The 2019 Wetland Monitoring Report (Burleson, 2020) indicated Pond 61 was not on track for DQO 1 for fairy shrimp due to it drying out by May. Pond 61 had an average depth of 15.7 cm from Feb 13th to April 3rd, 2019, and thus the DQO 1 for fairy shrimp was on track and both Performance Standards were partially on track in the 2019 water year.

It is important to note that prior to the 2021 water year, Pond 61 was only monitored in the eastern depression, and since referred to as Pond 61 East. Records indicate that peripheral inundation was present when Pond 61 East was dry, and it is possible that Pond 61 West was inundated and that it might have been fully on track for DQO 1 in 2019 water year, and possibly partially on track in 2020. The only year when DQO 1 was on track for CTS in Pond 61 was in 2023 water year. The data collected following MEC cleanup activities on hydrological functioning, suitable wildlife habitat, and water quality are consistent with baseline and the reference vernal pools and demonstrate that Pond 61 has not been negatively affected by the cleanup activities. No additional monitoring is recommended for Pond 61.

Table 5-19. Success at Pond 61 (Year 5 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives

Performance Standard	Applicable DQO	2018	2019	2020	2021	2022	2023
Hydrological Conditions & Inundation Area	DQO 1	Not on track	Partially on track^	Not on track	Partially on track	Not on track	On track
	DQO 2	On track	On track	On track	On track	On track	On track
Wildlife Usage	DQO 1	Not on track	Partially on track^	Not on track	Partially on track	Not on track	On track
	DQO 4	Cannot assess	On track	On track	On track	On track	On track

^ The 2019 Wetland Monitoring Report (Burleson, 2020) indicated Pond 61 did not meet DQO 1 for fairy shrimp due to it drying out by May. It provided and average depth of 15.7 cm from Feb 13th to April 3rd.

5.20 Pond 73 – Year 5 Post-Subsurface Munitions Remediation

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 five years (Figure 5-83) Baseline inundation was recorded in 2017 but depth and water quality parameters were not measured that year. Years 2017, 2019, and 2023 were above normal water years, 2020 was close to normal water year, and 2018 and 2021 were below normal water years. By size, Pond 73 can be compared to reference Ponds 101 East (East) and 997 (Figure 5-1).

Pond 73 was monitored in 2023 as a Year 5 Post-Subsurface Munitions Remediation vernal pool. Vegetation within the Pond 73 watershed was masticated in the summer of 2017 to support MEC remediation in BLM Area B Subunit B-3 East. Subsurface anomaly investigations occurred in Pond 73 basin in 2018. Historically, Pond 73 reached a depth of 14 cm and an inundation area of 0.001 ac in 2018, a below normal year, and it reached a maximum depth of 56 cm and a maximum inundation of 0.85 acres in 2019, an above normal water year (Figure 5-84). Pond 73 reached maximum depth of 55 cm, and a maximum inundation area of 0.85 ac in 2023 water year (Figure 5-83). Inundation extent, depth, and water quality values are presented in Figure 5-83 to Figure 5-86.

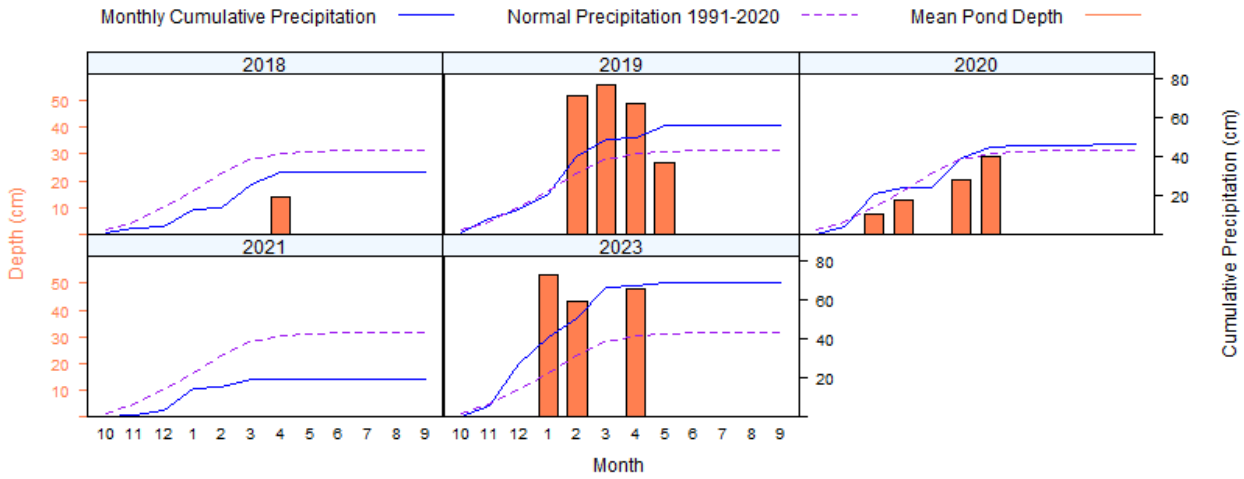

Figure 5-120. Pond 73 (Year 5 Post-Subsurface Munitions Remediation) Historical Mean Monthly Depths and Cumulative Monthly Precipitation Compared to the 30-Year Normal (mean 1991-2020) (NPS, 2023; NCDC NOAA, 2023)

During the five years of monitoring of Pond 73 the cumulative precipitation in 2023 was the highest (Figure 5-83). Pond 73 was inundated from mid-January through April, and it was dry on June 9th. Hydroperiod of Pond 73 was similar to those of reference Ponds 5 and 101 East (East) when following initial inundation, the depth decreased and then increased again. The maximum inundation area of Pond 73 was slightly larger in 2023 than in 2017 (an above normal water year), although only a single measurement was made that year, and no depth measurements were taken (Figure 5-86). The maximum inundation areas were practically the same in 2023 and 2019, which were both above normal water years (Figure 5-84).

Water quality parameters of Pond 73 were generally similar to reference vernal pools and within the historical ranges, with an exception of April pH values which were the highest on record at Pond 73, but still within ranges observed at other vernal pools (Figure 5-85 and Figures 5-2 to 5-5).

5.20.1 Data Quality Objective 1

Pond 73 maintained the required average depth of 25 cm from the first rain event through March for CTS, and the required 10 cm for 18 consecutive days through May for fairy shrimp. Pond 73 sustained sufficient depth for CTS (37.8 cm through April 7th), and for fairy shrimp (32 cm through June 9th).

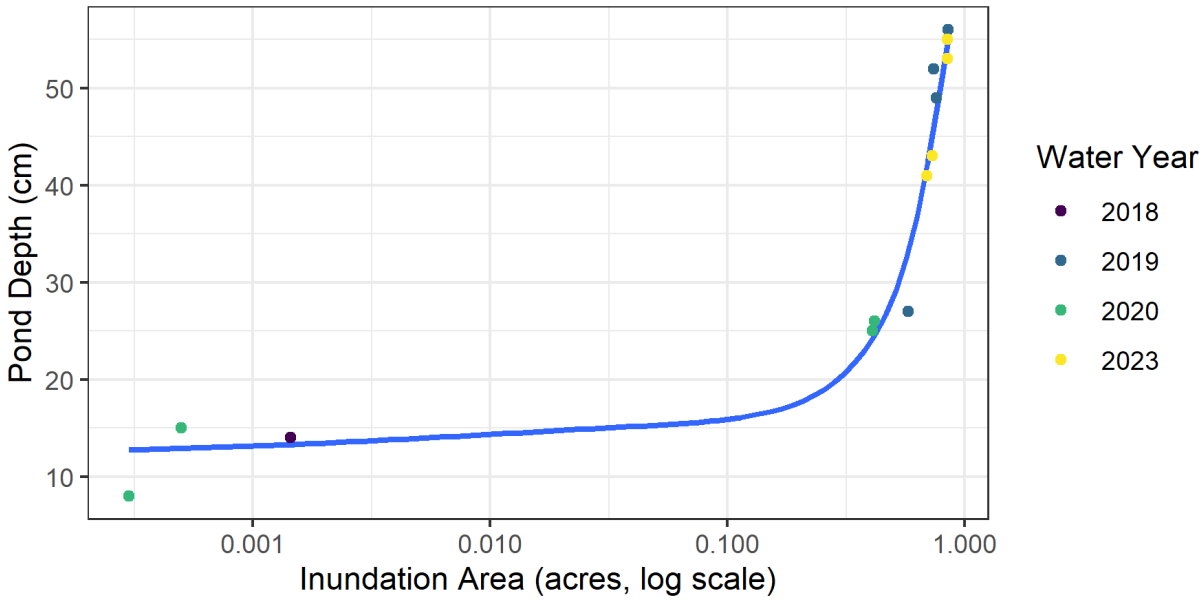

Figure 5-121. Pond 73 (Year 5 Post-Subsurface Munitions Remediation) Plot of Depth vs Area Since Water Year 2018.

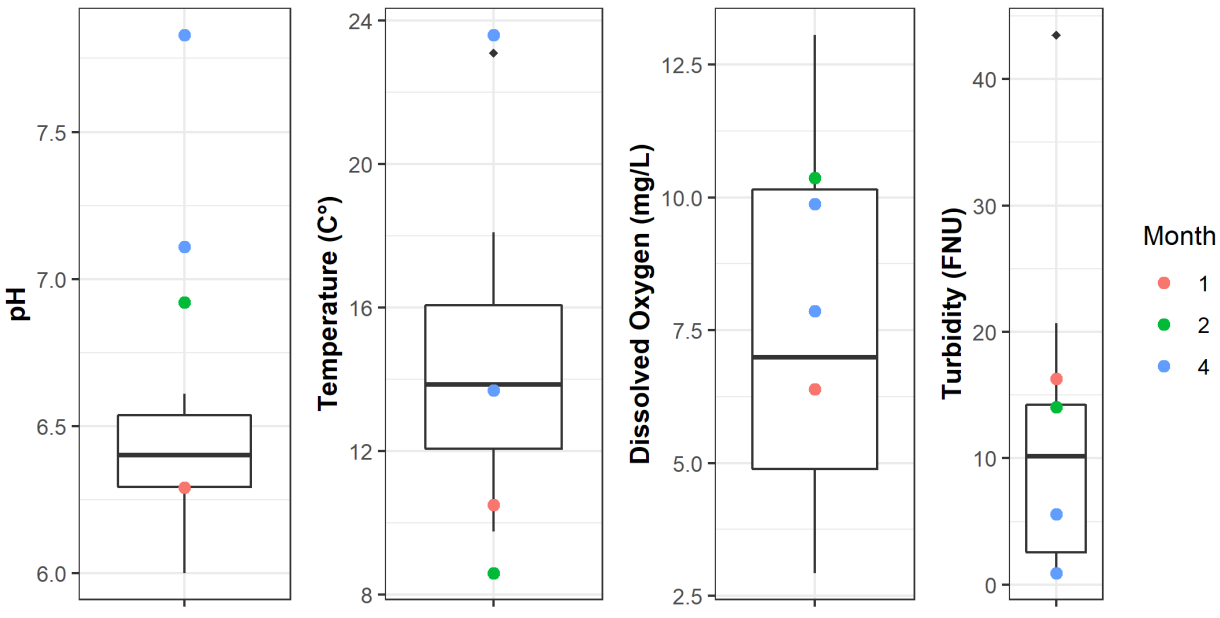

Figure 5-122. Pond 73 (Year 5 Post-Subsurface Munitions Remediation) historical water quality measurements for pH, Temperature (C), Dissolved Oxygen (mg/L), and Turbidity (FNU). The line in the middle of the box represents the median, and the lower and upper ends of the box are the 25% and 75% quartiles respectively. The upper and lower whiskers represent largest and smallest values within 1.5 times above and below the size of the hinge, which is the 75% minus 25% quartiles, respectively. Black diamonds represent values outside of those statistics.

5.20.2 Data Quality Objective 2

Maximum inundation area in 2023 was greater than in 2017, an above normal water year (Figure 5-86). Pond 73 monthly inundation pattern was similar to inundations observed at reference Ponds 101 East (East) and 997, and DQO 2 was on track.

5.20.3 Performance Standard: Hydrological Conditions and Inundation Area

Pond 73, a post-subsurface munitions remediation, vernal pool, was on track for the performance standard for Year 5 in 2023. Pond 73 was on track for DQO 1 indicating that it sustained suitable habitat for CTS and for fairy shrimp in 2023.

5.20.4 Data Quality Objective 4

Water quality parameters of Pond 73 were generally within the historical ranges and DQO 4 was on track (Figure 5-85 and Figures 5-2 to 5-5).

5.20.5 Performance Standard: Wildlife Usage

Pond 73 was on track for the performance standard for Year 5 in 2023 as it sustained sufficient depth and inundation for CTS and fairy shrimp. Water quality measurements were adequate for wildlife.

5.20.6 Conclusion

Pond 73, a post-subsurface munitions remediation vernal pool, was in Year 5 of monitoring in 2023 and was on track for performance standards (Table 5-20). During the five years of post-mastication and post-subsurface remediation monitoring, Pond 73 was on track fir the Hydrological Conditions and Inundation Area Performance Standard in 2019, and 2023, both above normal water years, and was partially on track in 2020, a close to normal water year. The two years when the Performance Standard was not on track were 2018 and 2021, both below normal water years (Figure 5-123). Similarly, the two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were on track in above normal water years and was partially on track in a close to normal water year. Although baseline data were not collected for Pond 73, data collected following MEC cleanup activities on hydrological functioning, suitable wildlife habitat, and water quality are consistent with the trends observed at the reference vernal pools and demonstrate that Pond 73 has not been negatively affected by the cleanup activities. No additional monitoring is recommended for Pond 73.

Table 5-20. Success at Pond 73 (Year 5 Post-Subsurface Munitions Remediation) Based on Performance Standards and Applicable Data Quality Objectives

Performance Standard	Applicable DQO	2018	2019	2020	2021	2023
Hydrological Conditions & Inundation Area	DQO 1	Not on track	On track	Partially on track	Not on track	On track
	DQO 2	On track	On track	On track	On track	On track
Wildlife Usage	DQO 1	Not on track	On track	Partially on track	Not on track	On track
	DQO 4	On track	On track	On track	Cannot assess	On track

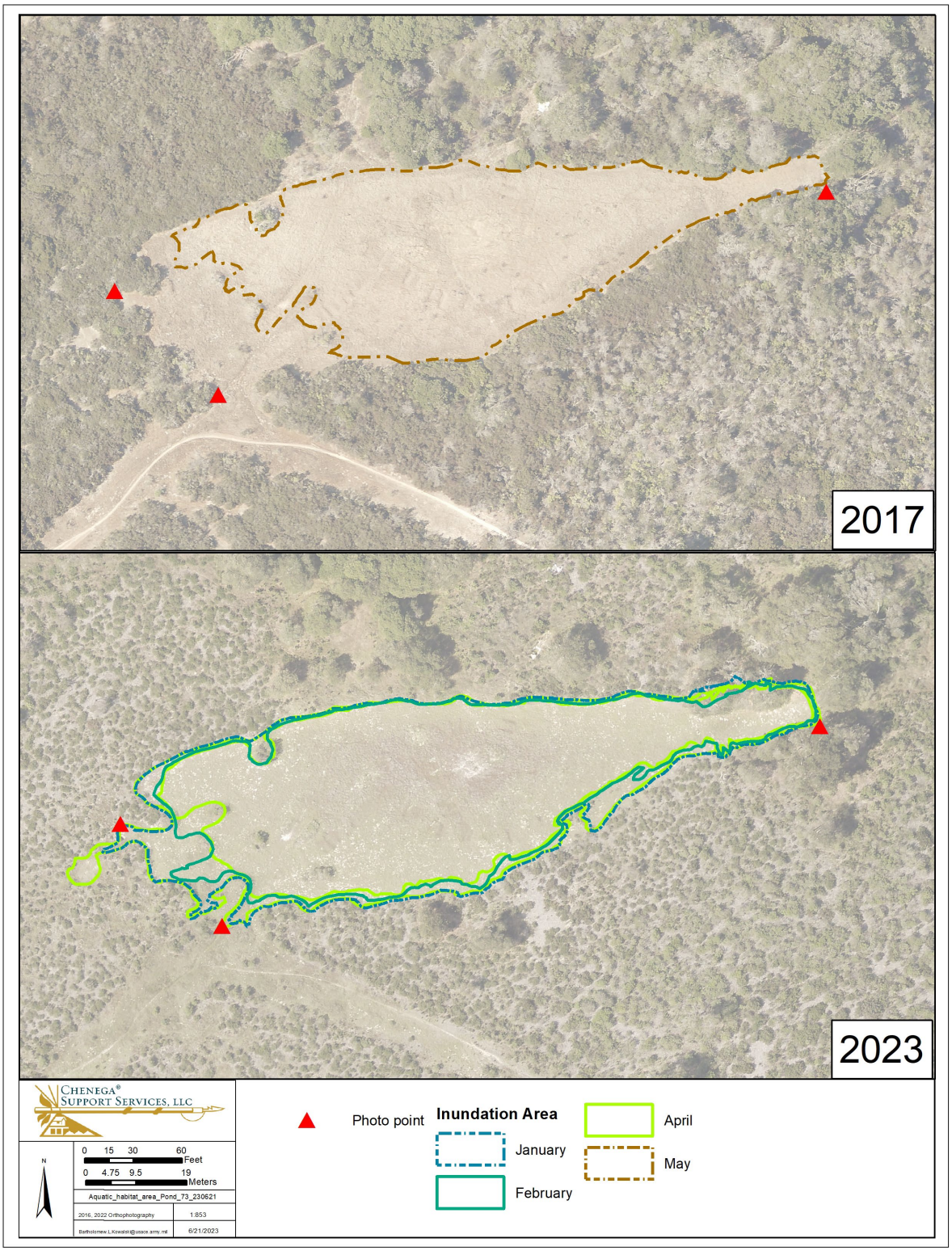

Figure 5-124. Pond 73 (Year 5 Post-Subsurface Munitions Remediation) Inundations for 2017 and 2023 (both above normal water years).

6 CONCLUSION

In the 2023 water year, the Monterey Bay area received the cumulative precipitation that was approximately 159% of normal (Figure 2-2). From November through March, and in May, monthly cumulative precipitation was above normal (Figure 2-3). Unsurprisingly, this resulted in ponding at all monitored vernal pools, and several of them reached highest depths and inundation areas on record. All of the monitored remediated vernal pools met the DQO 1 for CTS and for fairy shrimp, as well as DQOs 2 and 4. Consequently, the Hydrological Conditions and Inundation Area performance standard was on track in the 2023 water year. Water quality metrics were within the expected ranges at all the remediated vernal pools, therefore two out of the three DQOs used for assessment of the Wildlife Usage Performance Standard were on track in the 2023 water year (Table 6-1).

Ponds 3 North, 3 South, 16, 35, 39, 40 South, 41, 42, 43, 44, 54, 60, 61, and 73 were in their last year of required monitoring following subsurface munitions remediation, which occurred in 2018. All of these vernal pools were assessed for meeting the performance standards across the required monitoring period and frequency as outlined in the Wetland Plan. Inundation patterns at these vernal pools were similar to those observed at reference vernal pools and were similar to the patterns observed in baseline years, with the exception of Pond 73 which was not monitored for baseline. Ponds 40 South, 43 and 44 were not on track to satisfy DQO 1 requirements for CTS in any post-remediation monitoring year. Their failure to reach the minimum average depth of 25 cm from the first rain event through March are a function of their small size and shallow profiles (Figure 5-1), rather than a result or remediation activities, as evidenced by comparison to baseline data and a reference Pond 997. Based on the collected data it does not appear that 2018 subsurface anomaly investigations and remediation activities within the basins of these vernal pools affected their ability to hold water and reach sufficient depths for CTS and fairy shrimp, and they did not affect the water quality required to support wildlife. Additional monitoring at Ponds 3 North, 3 South, 16, 35, 39, 40 South, 41, 42, 43, 44, 54, 60, 61, and 73 is not recommended.

Remaining vernal pools monitored in 2023 were Ponds 75 (baseline), Pond 76 (Year 1 post-mastication) and Pond 21 (Year 1 post-mastication and post-subsurface munitions remediation). Ponds 76 and 21 will be monitored in the future according to specified requirements in PBO and the wetland plan. Pond 75 will be monitored again after munitions remediation activities will be conducted in Unit 17.

Reference Ponds 5 and 101 East (East), as well as remediated Ponds 21, 3 North, 16, 41, 54, and 60 were still inundated in June at the last hydrology monitoring event presented in this report, but additional opportunistic observations of the depths of these vernal pools will continue throughout the water year and will be added to the data base.

It is important to point out that DQO 1 used for assessment of suitable habitat for CTS has its limitations. Pond 21, for example, technically did not provide suitable habitat for CTS in 2023 water year as its average depth was 15 cm from Dec 14th to March 30th, yet CTS larvae were detected at Pond 21 this year (data to be reported in a separate report). Conversely, a vernal pool that meets the definition does not necessarily have to support CTS, as shown by Pond 39, which met the requirement in 2019, 2020, and 2023, yet has no history of CTS detections in any of the nine years it was monitored. Study of natural, constructed, and altered vernal pools in Sonoma County, CA, revealed that the shallowest pools with successful breeding were 19 cm deep (Cook et al, 2023). Considering that CTS larvae require at least 90 days to complete metamorphosis (Johnson et al, 2013), and pools that dry out sooner may result in mass larval mortality (Cooper, 2021), the length of pool hydroperiod is the limiting factor for successful

completion of CTS life cycle. Naturally, pool depth and its hydroperiod are correlated, but the strength of the correlation will depend on many factors including the pond's geomorphic features and will be unique to each vernal pool. Having a single average depth limit for assessment of breeding habitat suitability is a quick and useful tool for comparing different vernal pools to each other, but it will occasionally misidentify which vernal pools provide suitable habitat. Thus, it is important to also consider wildlife detection data from baseline years as well as from reference vernal pools to make a complete assessment of potential impacts of remediation on CTS within the affected vernal pools. Wildlife data from the 2023 water year will be presented and evaluated in a separate report which will be published under a separate contract.

Table 6-1. 2023 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 76*	Year 1 Post-mastication	Partial	On track	Partial	On track
Pond 21	Year 1 Post-mastication and Post-Subsurface Munitions Remediation	Partial	On track	Partial	On track
Pond 3 North	Year 5 Post-Subsurface Munitions Remediation	Met	Met	Met	Met
Pond 3 South	Year 5 Post-Subsurface Munitions Remediation	Met	Met	Met	Met
Pond 16	Year 5 Post-Subsurface Munitions Remediation	Met	Met	Met	Met
Pond 35	Year 5 Post-Subsurface Munitions Remediation	Met	Met	Met	Met
Pond 39	Year 5 Post-Subsurface Munitions Remediation	Met	Met	Met	Met
Pond 40 South	Year 5 Post-Subsurface Munitions Remediation	Met	Met	Met	Met
Pond 41	Year 5 Post-Subsurface Munitions Remediation	Met	Met	Met	Met
Pond 42	Year 5 Post-Subsurface Munitions Remediation	Met	Met	Met	Met
Pond 43	Year 5 Post-Subsurface Munitions Remediation	Met	Met	Met	Met
Pond 44	Year 5 Post-Subsurface Munitions Remediation	Met	Met	Met	Met
Pond 54	Year 5 Post-Subsurface Munitions Remediation	Met	Met	Met	Met
Pond 60	Year 5 Post-Subsurface Munitions Remediation	Met	Met	Met	Met
Pond 61	Year 5 Post-Subsurface Munitions Remediation	Met	Met	Met	Met
Pond 73*	Year 5 Post-Subsurface Munitions Remediation	Met	Met	Met	Met

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

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APPENDIX A

Hydrology and Water Quality Results for Vernal Pools by Month

Table A-1. Hydrology and Water Quality Results for December Monitoring (12/12/2022 - 12/14/2022)								
Pond	**Date**	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
101EE	2022-12-12	NS	16	NS	NS	NS	NS	NS
40S	2022-12-12	0	0					
41	2022-12-12	0	0					
44	2022-12-12	NS	7	NS	NS	NS	NS	NS
5	2022-12-12	NS	10	NS	NS	NS	NS	NS
60	2022-12-12	NS	33	NS	NS	NS	NS	NS
61E	2022-12-12	0	0					
61W	2022-12-12	NS	38	NS	NS	NS	NS	NS
73	2022-12-12	0	0					
997	2022-12-12	0	0					
16	2022-12-14	0	0					
21	2022-12-14	0	0					
35	2022-12-14	0	0					
39	2022-12-14	NS	40	NS	NS	NS	NS	NS
3N	2022-12-14	NS	22	NS	NS	NS	NS	NS
3S	2022-12-14	NS	7	NS	NS	NS	NS	NS

Table A-1. Hydrology and Water Quality Results for December Monitoring (12/12/2022 - 12/14/2022)								
Pond	**Date**	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
40N	2022-12-14	NS	10	NS	NS	NS	NS	NS
40S	2022-12-14	0	0					
42	2022-12-14	NS	10	NS	NS	NS	NS	NS
43	2022-12-14	0	0					
54	2022-12-14	NS	16	NS	NS	NS	NS	NS

NS = Not Surveyed

Table A-2. Hydrology and Water Quality Results for January Monitoring (1/12/2023 - 1/23/2023)								
Pond	**Date**	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
21	2023-01-12	0.8313	14	6.44	12.8	8.48	6.44	95.4
3N	2023-01-12	0.4097	60	5.71	13.4	40.99	6.57	137.7
3S	2023-01-12	0.5273	31	7.14	13.5	51.11	6.34	272.4
42	2023-01-12	0.3035	30	11.07	14	10.15	6.85	85.8
43	2023-01-12	0.0544	30	8.71	15	10.99	7.48	123.3
44	2023-01-12	0.1705	23	8.06	15.1	4.08	7.01	127.9
54	2023-01-12	1.5578	43	4.45	10.9	7.96	6.3	138.7
76	2023-01-12	NS	10	7.51	12.2	86.45	5.95	99
101EE	2023-01-18	2.8555	50	7.17	10.06	3.91	6.68	167.6
35	2023-01-18	0.3802	66	8.39	6.6	37.94	6.86	142.2
39	2023-01-18	0.6305	50	5.53	7	33.18	6.43	113
40S	2023-01-18	NS	28	2.94	7.7	51.93	6.11	168.5
41	2023-01-18	1.3925	61	7.52	9.7	3.04	6.65	97.9
5	2023-01-18	4.8949	55	5.36	11.9	3.48	6.4	169.7
16	2023-01-20	0.7186	128	2.42	7.2	326.7	6.21	249.3
60	2023-01-20	2.5282	93	5.02	9.6	4.5	6.31	210
61E	2023-01-20	0.6445	21	10.66	11.4	16.29	6.33	124.7

Table A-2. Hydrology and Water Quality Results for January Monitoring (1/12/2023 - 1/23/2023)								
Pond	**Date**	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
61W	2023-01-20	0.6445	51	12.88	10.6	11.5	6.66	115.9
73	2023-01-20	0.8443	53	6.39	10.5	16.28	6.29	136.8
997	2023-01-20	0.4414	19	10.56	9.2	3.03	6.16	140
35	2023-01-23	0	0					

NS = Not Surveyed

Table A-3. Hydrology and Water Quality Results for February Monitoring (2/15/2023-2/17/2023)								
Pond	**Date**	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
16	2023-02-15	0.6183	106	1.21	6.7	187.4	6.53	303.6
21	2023-02-15	0.8153	11	11.34	10.7	36.23	6.56	157.3
3N	2023-02-15	0.1275	48	9.17	10.4	7.1	6.97	188.4
3S	2023-02-15	0.4164	25	14.18	12.6	12.38	7.69	371.9
54	2023-02-15	1.5863	42	9.42	6	2.22	6.73	136.2
75	2023-02-15	0.1998	35	1.83	8	217.22	6.44	411.5
76	2023-02-15	0.1049	15	9.96	6.9	27.09	7.13	147
35	2023-02-16	0	0					
39	2023-02-16	0.0694	46	7.61	7.6	47.18	6.7	110.2
40S	2023-02-16	0.0651	20	6.1	7.8	4.51	7.02	272.4
41	2023-02-16	1.3806	34	12.5	11.8	9.98	6.83	115.4
42	2023-02-16	0.099	17	14.73	11.4	31.32	6.95	90.5
43	2023-02-16	0.0109	15	14.61	13.3	156.26	8.34	137.6
44	2023-02-16	0.0124	11	12.16	14.5	5.11	7.47	113.6
61E	2023-02-16	0.2287	17	11.19	8.6	12.98	6.63	149.8
61W	2023-02-16	0.2836	49	12.21	10.5	5.91	7.56	143.4

Table A-3. Hydrology and Water Quality Results for February Monitoring (2/15/2023-2/17/2023)								
Pond	**Date**	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
101EE	2023-02-17	2.6451	48	4.61	6.5	2.8	6.52	191.5
5	2023-02-17	4.6222	54	6.48	8.5	2.08	6.69	201.8
60	2023-02-17	2.432	93	5.5	10.3	2.33	6.54	253.2
73	2023-02-17	0.7267	43	10.37	8.6	14.04	6.92	177.7
74	2023-02-17	NS	21	NS	NS	NS	NS	NS
997	2023-02-17	0.1101	15	12.58	13.4	5.3	6.6	277.8
MGF	2023-02-17	NS	138	NS	NS	NS	NS	NS

NS = Not Surveyed

Table A-4. Hydrology and Water Quality Results for March Monitoring (3/2/2023-3/31/2023)								
Pond	**Date**	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
101W	2023-03-02	NS	52	NS	NS	NS	NS	NS
35	2023-03-02	NS	65	NS	NS	NS	NS	NS
16	2023-03-30	0.8795	137	2.81	9.2	387.74	6.64	250
21	2023-03-30	0.9961	35	8.21	10.8	62.26	6.22	308.5
43	2023-03-30	0.0881	35	11.18	19.9	2.27	7.99	158.9
44	2023-03-30	0.208	30	10.43	16.1	2.07	7.29	96.3
54	2023-03-30	3.0029	94	3.53	11.4	4.7	6.68	173
76	2023-03-30	0.221	30	4.37	9.9	71.39	6.67	175.6
35	2023-03-31	2.9714	132	5.08	11.5	11.48	6.91	219.4
39	2023-03-31	2.9714	54	9.28	12.2	18.19	6.87	238
3N	2023-03-31	1.33972	64	6.17	11.9	32.95	6.72	317.8
3S	2023-03-31	1.3397	33	10.31	11.2	4.75	6.44	341.1
40N	2023-03-31	NS	83	NS	NS	NS	NS	NS
40S	2023-03-31	2.9714	31	11.48	11.6	9.32	7.05	261.1
42	2023-03-31	0.5312	60	10.59	13.5	1.98	7.35	100.2

NS = Not Surveyed

Table A-5. Hydrology and Water Quality Results for April Monitoring (4/5/2023-4/28/2023)								
Pond	**Date**	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
101EE	2023-04-05	8.2233	142	4.05	14.3	2.83	6.76	174.6
101EW	2023-04-05	NS	75	NS	NS	NS	NS	NS
101W	2023-04-05	NS	52	NS	NS	NS	NS	NS
41	2023-04-05	1.73	86	7.62	12.1	2.86	6.49	113.3
5	2023-04-05	7.3529	119	6.38	14.3	2.26	6.91	167.3
997	2023-04-05	0.5843	16	12.25	22.8	7.63	6.57	176.6
35	2023-04-07	NS	96	NS	NS	NS	NS	NS
60	2023-04-07	2.8424	113	5.88	14	0.82	6.73	194
61E	2023-04-07	0.6196	18	8.76	14.1	14.08	6.71	166.2
61W	2023-04-07	0.6196	51	9.81	14.5	11.09	7.95	158.2
73	2023-04-07	0.8452	55	7.86	13.7	0.92	7.11	141.8
MGF	2023-04-07	12.9751	200	NS	NS	NS	NS	NS
3N	2023-04-26	0.2683	57	4.8	16.5	5.29	6.58	463.1
3S	2023-04-26	0.6463	33	8.52	17.1	34.17	6.73	472.5
41	2023-04-26	1.6331	79	6.47	17	1.42	6.48	126.5
42	2023-04-26	0.3632	37	9.01	18.5	1.95	6.98	130.9

Table A-5. Hydrology and Water Quality Results for April Monitoring (4/5/2023-4/28/2023)								
Pond	**Date**	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
43	2023-04-26	0	0					
44	2023-04-26	0	0					
73	2023-04-26	0.6893	41	9.88	23.6	5.56	7.83	185.1
101EE	2023-04-27	5.9252	131	3.08	18.2	3.59	6.95	204.9
5	2023-04-27	6.3024	108	5.01	18.5	1	6.99	195.5
60	2023-04-27	2.5525	104	5.54	17	0.76	6.81	227.4
61E	2023-04-27	0	0					
61W	2023-04-27	0.0139	34	9.4	27.6	2.89	8.16	249.4
997	2023-04-27	0	0					
16	2023-04-28	0.728	129	0.28	12.6	130.16	6.77	356.6
21	2023-04-28	0.9342	26	10.24	22.4	101.53	6.63	363.4
35	2023-04-28	0	0					
39	2023-04-28	0.005	32	9.02	21.7	13.43	6.81	325.1
40S	2023-04-28	0.0069	8	NS	NS	NS	NS	NS
54	2023-04-28	2.1345	69	9	16.8	21.58	7.1	208.6
76	2023-04-28	0.1807	25	6.7	18	22.16	6.77	234.5

NS = Not Surveyed

Table A-6. Hydrology and Water Quality Results for May Monitoring (5/9/2023 – 5/12/2023)								
Pond	**Date**	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
35	2023-05-09	0	0					
39	2023-05-09	0.002	20	3.45	17.2	8.65	6.55	333.5
3N	2023-05-09	0.1596	54	4.39	16.5	2.39	6.41	497.9
3S	2023-05-09	0.5418	32	9.66	17.4	17.38	6.6	488.9
40S	2023-05-09	0	0					
101EE	2023-05-11	5.6507	125	2.12	16.9	5.23	6.74	218.6
5	2023-05-11	6.1122	103	4.8	17.9	2.96	7.08	209.4
60	2023-05-11	2.4838	98	4.57	16.7	4.63	6.67	250.8
16	2023-05-12	0.7035	123	0.69	14.3	94.23	6.78	395.4
21	2023-05-12	0.8935	22	7.06	15.5	55.06	5.93	357.9
41	2023-05-12	1.5176	72	5.16	16.7	2.76	6.33	131.7
54	2023-05-12	1.9998	59	5.17	15.5	58.06	6.41	197.9

NS = Not Surveyed

Table A-7. Hydrology and Water Quality Results for June Monitoring (6/9/2023 – 6/16/2023)								
Pond	**Date**	**Inundated Surface Area (acres)**	**Max Depth (cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (C)**	**Turbidity (FNU)**	**pH**	**Conductivity (µs/cm)**
21	2023-06-09	0.7156	8	NS	NS	NS	NS	NS
54	2023-06-09	1.6187	50	NS	NS	NS	NS	NS
60	2023-06-09	2.318	87	NS	NS	NS	NS	NS
73	2023-06-09	0	0					
76	2023-06-09	0	0					
101EE	2023-06-16	NS	97	NS	NS	NS	NS	NS
16	2023-06-16	0.5949	99	NS	NS	NS	NS	NS
3N	2023-06-16	0.0616	33	NS	NS	NS	NS	NS
3S	2023-06-16	0	0					
41	2023-06-16	1.2444	61	NS	NS	NS	NS	NS

NS = Not Surveyed

APPENDIX B

Historical Hydrology and Water Quality Monitoring Results for Reference and Remediated Vernal Pools

Table B-1. Pond 5 (Reference) Historical Hydrology Results on Former Fort Ord 1994-2023

Water Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1994	3/29/1994	-	17.00	-	-	31	2.75
	4/13/1994	-	20.00	-	-	20	-
1995	1/11/1995	-	16.00	-	-	28	0.17
	1/26/1995	-	14.00	-	-	43	0.52
	2/10/1995	-	15.00	-	-	51	0.50
	2/24/1995	-	13.00	-	-	51	0.52
	3/10/1995	-	-	-	-	76	1.72
	3/24/1995	-	22.00	-	-	>100	6.89
1996	1/3/1996	-	-	-	-	0	-
	1/18/1996	-	-	-	-	5	-
	1/31/1996	-	-	-	-	5	-
	2/14/1996	-	-	-	-	15	-
	2/29/1996	-	-	-	-	28	-
	3/14/1996	-	-	-	-	38	-
	3/28/1996	-	-	-	-	38	-
	4/11/1996	-	-	-	-	15	-
	4/25/1996	-	-	-	-	13	-
	5/9/1996	-	-	-	-	0	-
2007	12/1/2006	-	-	-	-	0	-
	1/23/2007	-	-	-	-	0	-
	3/6/2007	7.20	-	-	5.1 (NTU)	17	1.58
2010	3/11/2010	-	-	-	-	46	-
	5/25/2010	-	-	-	-	30	-
2013	11/26/2012	-	-	-	-	0	-
	12/19/2012	-	-	-	-	0§	0.01
	1/22/2013	-	-	-	-	11	0.91
	2/25/2013	-	-	-	-	0	0.00
	3/15/2013	-	-	-	-	0	0.00
	4/12/2013	-	-	-	-	0	0.00
	5/10/2013	-	-	-	-	0	0.00
2014	12/11/2013	-	-	-	-	0	0.00
	2/18/2014	-	-	-	-	0	0.00
	3/17/2014	-	-	-	-	0	0.00
	4/7/2014	-	-	-	-	0	0.00
	5/6/2014	-	-	-	-	0	0.00
	6/3/2014	-	-	-	-	0	0.00

Table B-1. Pond 5 (Reference) Historical Hydrology Results on Former Fort Ord 1994-2023

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‡
2019	1/14/2019	6.70	11.09	10.16	4.7	4	0.47‡
	2/13/2019	6.89	10.55	10.24	8.4	42	4.21‡
	3/7/2019	6.58	14.10	5.58	1.5	56	4.83‡
	4/4/2019	6.41	14.87	1.71	1.2	53	4.59

Table B-1. Pond 5 (Reference) Historical Hydrology Results on Former Fort Ord 1994-2023

Water Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
	5/9/2019	6.51	17.15	3.80	0.6	37	3.96
	6/6/2019	7.09	20.32	6.07	13.6	30	3.62
	7/9/2019	-	-	-	-	25§	-
	8/13/2019	-	-	-	-	0	0.00
2020	12/4/2019	-	-	-	-	9	-
	12/20/2019#	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*	-	-	-	-	15	-
	3/27/2020	6.33	15.2	8.89	7.82	23	3.0472
	4/15/2020*	-	-	-	-	33	-
	4/28/2020	6.57	24.2	2.9	1.63	26	3.1494
	5/18/2020*	-	-	-	-	15	-
	5/26/2020	6.71	28.7	3.51	74.48	8	0.7328
	6/10/2020*	-	-	-	-	0	0
2021	1/7/2021	-	-	-	-	0	0
	2/1/2021‡	-	-	-	-	0	0
	3/29/2021‡	-	-	-	-	0	0
2022	10/28/2021	-	-	-	-	0	0
	12/17/2021‡	-	-	-	-	5	0.5021
	1/14/2022	6.44	13.2	10.26	2.38	15	2.2563
	2/1/2022	-	-	-	-	10	-
	2/17/2022#	-	-	-	-	1	0.3719
	3/2/2022‡	-	-	-	-	0	0
	3/22/2022	-	-	-	-	0	0
	3/30/2022	-	-	-	-	0	0
2023	2022-12-12‡	NS	NS	NS	NS	10	NS
	2023-01-18	6.4	11.9	5.36	3.48	55	4.8949
	2023-02-17	6.69	8.5	6.48	2.08	54	4.6222
	2023-04-05	6.91	14.3	6.38	2.26	119	7.3529
	2023-04-27	6.99	18.5	5.01	1	108	6.3024
	2023-05-11	7.08	17.9	4.8	2.96	103	6.1122

‡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 fifteen years between 1994 and 2023 water years. Pond 5 is a reference vernal pool and no remediation has occurred. The Historical data and precipitation are summarized below:

- 1994 (Jones & Stokes, 1996)
  - In a precipitation year below normal, Pond 5 held water during both monitoring events in March and April with a maximum recorded inundation of 2.75 acres. The temperatures were within a normal range.
  - Yearly cumulative precipitation 13.96 inches
  - Data collected only in March and April
  - Inundated during both monitoring events
  - Recorded inundation maximum 2.75 acres in March
  - Depth range 20-31 cm, mean 26
  - temperature 17°-20° C, mean 18.5° C
- 1995 (Jones & Stokes, 1996)
  - In a water-year that was above normal, Pond 5 was inundated by January monitoring and stayed inundated through March. Pond 5 inundation area was large compared to other monitored years and filled to 6.89 acres with a maximum depth of 102 cm. The temperature fluctuated greatly, which can be expected.
  - Yearly cumulative precipitation 23.38 inches
  - Data collected January-March, six monitoring events
  - Inundated during all monitoring events
  - Inundation range 0.17-6.89 acres, mean 1.72 acres
  - Depth range 28->100 cm, mean 58 cm
  - temperature range 13°-22° C, mean 16° C
- 1996 (Jones & Stokes, 1996)
  - In a water-year that was approximately normal, ponding occurred from January-May. The maximum depth was much lower than the previous year but similar to the 1994 water-year.
  - Yearly cumulative precipitation 16.96 inches
  - Data collected January-May, ten monitoring events
  - Inundated mid-January to early-May
  - No inundation area recorded
  - Depth range 5-38 cm, mean 20 cm
  - No water quality data collected
- 2007 (Shaw, 2008)
  - In a below normal rain year, Pond 5 was inundated to 1.58 acres. The pH at Pond 5 was neutral and the turbidity was relatively low.
  - Yearly cumulative precipitation 10.13 inches
  - Data collected December-March, three monitoring events
  - Some inundation in March, which comprised an area of 1.58 acres
  - Depth 17 cm
  - One water quality sample 7.20 pH, 5.1 FNU turbidity
- 2010 (Shaw, 2011)
  - DD&A conducted wildlife surveys in March and May. Only depth records were taken but data was not reported.
  - Below normal rain year
  - Yearly cumulative precipitation 14.6 inches
  - Maximum recorded depth was 46 cm

- 2013 (Tetra Tech, 2014)
  - In a drought year with below normal precipitation, Pond 5 was only inundated in December and January and was a fraction of the size with a maximum inundation of 0.91 acres.
  - Drought year with yearly cumulative precipitation of 11.17 inches
  - Data collected November-May, seven monitoring events
  - Inundated in December and January
  - Inundation range 0.01-0.91 acres, mean 0.46 acres
  - Depth 11 cm, only one depth recorded
  - No water quality data collected
- 2014 (Tetra Tech, 2015)
  - In a consecutive drought year Pond 5 did not fill.
  - Consecutive drought year with yearly cumulative precipitation 9.33 inches
  - Data collected December-June, six monitoring events
- 2016 (Burleson, 2017)
  - In a consecutive drought with precipitation above normal, Pond 5 was inundated from the first recorded monitoring in April through August. The maximum inundation area was 5.33 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was higher on average than some of the other large vernal pools, however, Pond 5 was often monitored in the late afternoon. Dissolved oxygen had a large range. Turbidity was low on average with a few high readings at the end of the season. It is likely that Pond 5 was inundated earlier in the water-year and maximum inundation was most likely not captured. It should be noted that data collection did not start with the first storm or inundation.
  - Consecutive drought year with yearly cumulative precipitation 21.21 inches
  - Data collected April-September, seven monitoring events
  - Inundated April through August
  - Inundation range 0.36-5.33 acres, mean 3.89 acres
  - Depth range 4-100 cm, mean 74 cm
  - pH range 6.37-6.85, mean 6.51
  - temperature range 16.4°-25.1° C, mean 20.7° C
  - dissolved oxygen range 0.34-7.30 mg/L, mean 4.65 mg/L
  - turbidity range 17.7-295.0 FNU, mean 83.8 FNU
- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 5 was inundated from the first recorded monitoring in January through September (Pond 5 did not 0 by last recorded monitoring in September). The maximum inundation area was 7.78 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord, with a few high readings in the middle of the season. Dissolved oxygen had a small range, with moderate levels. Turbidity was low on average.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected January - September, nine monitoring events
  - Inundated January through September (pond did not 0 at last reading in September)
  - Inundation range 5.32-7.78 acres, mean 6.65 acres
  - Depth range 45-~130 cm, mean 95 cm
  - pH range 6.09-7.12, mean 6.44
  - temperature range 8.9°-24.2° C, mean 16.5° C

  - dissolved oxygen range 0.00-4.52 mg/L, mean 2.41 mg/L
  - turbidity range 4.0-8.3 FNU, mean 6.1 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 5 was inundated from the first recorded monitoring in January through April. The maximum inundation area was 3.01 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity was low on average.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected November - May, six monitoring events
  - Inundated November through April
  - Inundation range 1.85-3.01 acres, mean 2.66 acres
  - Depth range 15-22 cm, mean 20 cm
  - pH range 7.01-7.29, mean 7.14
  - temperature range 6.00°-20.68° C, mean 12.75° C
  - dissolved oxygen range 5.27-7.09 mg/L, mean 6.39mg/L
  - turbidity range 4.7-40.6 FNU, mean 25.3 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 5 was inundated from the first recorded monitoring in January through July. The maximum inundation area was 4.83 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity was low on average.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - August, eight monitoring events
  - Inundated January through July
  - Inundation range 0.47-4.83 acres, mean 3.61 acres
  - Depth range 4-56 cm, mean 35 cm
  - pH range 6.41-7.09, mean 6.70
  - temperature range 10.55°-20.32° C, mean 14.68° C
  - dissolved oxygen range 1.71-10.24 mg/L, mean 6.26 mg/L
  - turbidity range 0.6-13.6 FNU, mean 5.0 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 5 was inundated from the first recorded monitoring in December through May. The maximum inundation area was 3.15 acres. Water quality was generally within historical ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen in January was highest on record, but otherwise within historical range. Turbidity values were somewhat elevated in February and May, but not outside of historical range.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - June, 13 monitoring events
  - Inundated December through May
  - Inundation range 0-3.15 acres, mean 1.49 acres
  - Depth range 0-33 cm, mean 13.6 cm
  - pH range 6.33-7.41, mean 6.80
  - temperature range 14.6°-28.7° C, mean 19.08° C
  - dissolved oxygen range 2.9-20.16 mg/L, mean 8.06 mg/L

  - turbidity range 1.63-91.61 FNU, mean 35.08 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 5 did not fill
  - Data collected Jan-March, three monitoring events
- 2022 (Chenega, 2023)
  - In consecutive below normal water year, Pond 5 was briefly inundated from mid-December to beginning of March
  - Yearly cumulative precipitation of 11.69 inches
  - Data collected October - March, 8 monitoring events
  - Inundated December through March
  - Inundation range 0-2.26 acres, mean 0.63 acres
  - Depth range 0-15 cm, mean 5.17 cm
  - pH single reading of 6.44
  - temperature single reading of 13.2° C
  - dissolved oxygen single reading of 10.26 mg/L
  - turbidity single reading of 2.38 FNU
- 2023
  - In a well above normal water-year, Pond 5 was inundated from the first recorded monitoring in December through the last monitoring event in May, when it still held water. The maximum inundation area was 6.3 acres. Water quality was within normal ranges. Slightly acidic to slightly basic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity was low.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December - May, six monitoring events
  - Inundated December through June, when the last monitoring event occurred
  - Inundation range 4.62-7.35 acres, mean 5.86 acres
  - Depth range 10-119 cm, mean 75 cm
  - pH range 6.40-7.08, mean 6.81
  - temperature range 8.5°-18.5° C, mean 14.22° C
  - dissolved oxygen range 4.8-6.48 mg/L, mean 5.61 mg/L
  - turbidity range 1-3.48 FNU, mean 2.36 FNU

Table B-2. Pond 101 East (East) (Reference) Historical Hydrology Results on Former Fort Ord 2001-2023

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

Table B-2. Pond 101 East (East) (Reference) Historical Hydrology Results on Former Fort Ord 2001-2023

Water Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
	4/20/2017	6.49	17.3	0.00	43.2	~160, gauge submerged	Connected to 101 East (West), total 9.38
	5/25/2017	6.89	19.0	2.38	4.0	~160, gauge submerged	6.52
	6/21/2017	6.91	20.1	3.58	10.7	~150, gauge submerged	5.57
	7/28/2017	NS	NS	NS	NS	100	NS
	8/16/2017	NS	NS	NS	NS	95	NS
	9/6/2017	NS	NS	NS	NS	77	NS
	11/20/2017	NS	NS	NS	NS	44	NS
	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
2018	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
	1/14/2019	-	-	-	-	0	0.00
	2/14/2019	6.88	14.36	8.94	10.4	47	2.21‡
	3/7/2019	6.51	14.08	5.48	9.7	56	2.76‡
2019	4/4/2019	6.80	14.15	5.63	6.1	53	2.51‡
	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
	12/04/2019	NS	NS	NS	NS	13	NS
	12/13/2019	-	-	-	-	0	0
	12/20/2019	-	-	-	-	0	0
	12/23/2019	-	-	-	-	0	0
	12/31/2019	6.84	13.3	9.98	5.46	12	0.0715
	1/06/2020	NS	NS	NS	NS	11	NS
2020	1/30/2020*#	6.68	14.6	23.33	28.16	12	0.1752
	2/19/2020	NS	NS	NS	NS	8	NS
	2/27/2020	NS	NS	NS	NS	1	0.0032
	3/11/2020	-	-	-	-	0	0
	3/20/2020^	NS	NS	NS	NS	26	0.6504
	3/30/2020	6.36	16.2	3.28	3.31	34	1.6103
	4/17/2020*	NS	NS	NS	NS	37	NS
	4/28/2020	6.56	23.1	2.24	4.72	29	1.0074

Table B-2. Pond 101 East (East) (Reference) Historical Hydrology Results on Former Fort Ord 2001-2023

Water Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
	5/19/2020*	NS	NS	NS	NS	4	NS
	5/26/2020	-	-	-	-	0	0
2021	1/7/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	2/12/2021	-	-	-	-	0	0
	3/29/2021	-	-	-	-	0	0
2022	10/28/2021	-	-	-	-	0	0
	12/15/2021	-	-	-	-	0	0
	1/14/2022	6.9	10.7	14.27	6.58	19	0.2873
	2/1/2022	NS	NS	NS	NS	2	NS
	2/17/2022	-	-	-	-	0	0
	3/2/2022	-	-	-	-	0	0
2023	2022-12-12^	NS	NS	NS	NS	16	NS
	2023-01-18	6.68	10.06	7.17	3.91	50	2.8555
	2023-02-17	6.52	6.5	4.61	2.8	48	2.6451
	2023-04-05	6.76	14.3	4.05	2.83	142	8.2233
	2023-04-27	6.95	18.2	3.08	3.59	131	5.9252
	2023-05-11	6.74	16.9	2.12	5.23	125	5.6507
	2023-06-16	NS	NS	NS	NS	97	NS

¥In 2001, depths were recorded for Waterbody 53, which includes the currently named ponds of Pond 101 West, Pond 101 East (West), and 101 East (East). It is unknown which pond was sampled for depth.
§No staff gauge. Cannot access ponds to measure depth due to potential for subsurface unexploded ordnance and other hazards. Depths are estimations
#Probe not fully submerged
*taken during Burleson surveys
^Peripheral inundation present
NS – not surveyed

Pond 101 East (East) was monitored thirteen years between 2001 and 2023 water years. Pond 101 East (East) is a reference vernal pool and no remediation has occurred. The Historical data and precipitation are summarized below:

- 2001 (Harding ESE, 2002)
  - In a year with early storms followed by below normal precipitation, Pond 101 East (East) was recorded as inundated from February through May with a maximum inundation of 1.47 acres. The water quality results indicate a slightly acidic to neutral pH.
  - Early storms with cumulative precipitation below normal (15.52 inches)
  - Data collected in January-May, five monitoring events
  - Inundated for all monitoring events
  - Inundation range 0.24-1.61 acres, mean 0.92 acres
  - Depth range 2-18 cm, mean 11.3 cm
  - Water quality data was collected twice, pH 6.3-6.81, mean 6.56

- 2007 (Shaw, 2008)
  - In a below normal water-year, Pond 101 East (East) was inundated only in the month of March. The water quality results indicated a slightly alkaline pH.
  - Cumulative precipitation was below normal (10.13 inches)
  - Data collected from December-June, 6 monitoring events
  - Inundated only in March to 0.32 acres and 20 cm depth
  - Inundation area was not recorded
  - pH 7.61
- 2013 (Tetra Tech, 2014)
  - In a 0 consecutive drought year with below normal cumulative precipitation, Pond 101 East (East) is thought to have held water briefly in January. It is unconfirmed if the brief inundation was at Pond 101 East (West) or 101 East (East) since the data were documented under Pond 101 East, with no further signification of East or West.
  - Consecutive drought year with cumulative precipitation below normal (11.17 inches)
  - Data collected November-May, seven monitoring events
  - Inundated in January, 0.08 acres
  - Depth 11 cm in January
  - No water quality data collected
- 2014 (Tetra Tech, 2015)
  - In a 0 consecutive drought year with below normal cumulative precipitation, Pond 101 East (East) did not hold water the entire year.
  - Consecutive drought year with cumulative precipitation below normal (9.33 inches)
  - Data collected December-June, six monitoring events
  - 0 in all monitoring events
  - No water quality data collected
- 2015 (Burleson, 2016)
  - In a 0 consecutive drought year with below normal cumulative precipitation, Pond 101 East (East) did not hold water.
  - Consecutive drought year with early storms above normal and cumulative precipitation slightly below normal (14.35 inches)
  - Data collected March to May, three monitoring events
  - 0 in all monitoring events
  - No water quality data collected
- 2016 (Burleson, 2017)
  - In a consecutive drought year with cumulative precipitation above normal, Pond 101 East (East) held water from April-June. Water quality results indicated a slightly acidic to neutral pH, normal temperatures, moderate to high dissolved oxygen and moderate turbidity. It should be noted that data collection did not start with the first storms or inundation. Maximum inundation could have been missed.
  - Drought year with cumulative precipitation above normal (21.21 inches)
  - Data collected April-July, five monitoring events
  - Inundated from April-June
  - Inundation range 1.23-3.24 acres, mean 2.59 acres
  - Depth range 32-68 cm, mean 56 cm
  - pH range 6.38-7.07, mean 6.60
  - temperature range 17.1°-23.0° C, mean 21.4° C
  - dissolved oxygen range 4.36-7.93 mg/L, mean 6.43 mg/L
  - turbidity range 106-553 FNU, mean 227 FNU

- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 101 East (East) was inundated from the first recorded monitoring in January through September (Pond 101EE did not 0 at last recorded monitoring in September). The maximum inundation area was 9.374 acres (101EE was connected to 101EW). Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a large range, with moderate levels.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected January - September, nine monitoring events
  - Inundated January through September (pond did not 0 by last recorded monitoring in September)
  - Inundation range 5.02-9.40 acres, mean 7.46 acres (pond was connected to 101 East (West) for range and mean values)
  - Depth range 77-~160 cm, mean 135 cm
  - pH range 5.5-6.91, mean 6.38
  - temperature range 10.0°-20.1° C, mean 15.7° C
  - dissolved oxygen range 0.0-3.68 mg/L, mean 2.11 mg/L
  - turbidity range 1.9-43.2 FNU, mean 20.13 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 101 East (East) was inundated from the first recorded monitoring in January through May. The maximum inundation area was 2.09 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a large range. Turbidity had a large range, with an out-of-range reading in May.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected November - June, seven monitoring events
  - Inundated January through May
  - Inundation range 0.04-2.09 acres, mean 1.42 acres
  - Depth range 14-48 cm, mean 38 cm
  - pH range 6.42-7.12, mean 6.83
  - temperature range 10.94°-21.88° C, mean 14.18° C
  - dissolved oxygen range 0.21-15.25 mg/L, mean 6.66 mg/L
  - turbidity range 40.8-1000 FNU, mean 263.44 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 101 East (East) was inundated from the second recorded monitoring in February through June. The maximum inundation area was 2.76 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range with moderate levels. Turbidity had a large range with moderate levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - July, seven monitoring events
  - Inundated February through June
  - Inundation range 0.38-2.76 acres, mean 1.80 acres
  - Depth range 26-56 cm, mean 43 cm
  - pH range 6.38-7.13, mean 6.74
  - temperature range 14.08°-21.92° C, mean 16.15° C
  - dissolved oxygen range 3.09-8.94 mg/L, mean 5.72 mg/L

  - turbidity range 6.1-79.8 FNU, mean 23.8 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 101 East (East) was inundated intermittently from the first recorded monitoring in December through May. The maximum inundation area was 1.61 acres. Water quality was generally within historical ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen in January was highest on record, but otherwise within the historical range. Turbidity values were within the historical range.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 15 monitoring events
  - Inundated intermittently from December through May, dried out three times
  - Inundation range 0-1.61 acres, mean 0.32 acres
  - Depth range 0-37 cm, mean 11.69 cm
  - pH range 6.33-6.87, mean 6.61
  - temperature range 13.3°-23.1° C, mean 16.8° C
  - dissolved oxygen range 2.24-23.33 mg/L, mean 9.707 mg/L
  - turbidity range 3.31-28.16 FNU, mean 10.11 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 101 East (East) did not fill
  - Data collected Jan-March, four monitoring events
- 2022 (Chenega, 2023)
  - In consecutive below normal water year, Pond 101 East (East) was briefly inundated from mid-December to beginning of March
  - Yearly cumulative precipitation of 11.69 inches
  - Data collected October - March, 6 monitoring events
  - Inundated January through February
  - Inundation range 0-0.29 acres, mean 0.1 acres
  - Depth range 0-19 cm, mean 5.25 cm
  - pH single reading of 6.9
  - temperature single reading of 10.7° C
  - dissolved oxygen single reading of 14.27 mg/L
  - turbidity single reading of 6.58 FNU
- 2023
  - In a well above normal water-year, Pond 101 East (East) was inundated from the first recorded monitoring in December through the last monitoring event in June, when it still held water. The maximum inundation area was 8.22 acres, when it was hydrologically connected to Pond 101 East (West). 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 narrow range with moderate levels. Turbidity values stayed low during monitoring events.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December - June, seven monitoring events
  - Inundated December through June, when the last monitoring event occurred
  - Inundation range 2.64-8.22 acres, mean 5.06 acres
  - Depth range 16-142 cm, mean 87 cm
  - pH range 6.52-6.95, mean 6.73
  - temperature range 6.5°-18.2° C, mean 13.19° C

- dissolved oxygen range 2.12-7.17 mg/L, mean 4.21 mg/L
- turbidity range 2.8 – 5.23 FNU, mean 3.67 FNU

Table B-3. Pond 997 (Reference) Historical Hydrology Results on Former Fort Ord 2017-2023

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†	25.5†	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†	11.79†	10.62†	26.0†	13	0.11‡
	3/5/2019	6.37†	12.61†	9.28†	24.2†	14	0.12‡
	4/9/2019	-	-	-	-	2	0.03
	5/9/2019	-	-	-	-	0	0.00
2020	12/04/19^	-	-	-	-	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^#	6.06	19.6	8.44	49.45	7	0.0507
	04/17/20*	-	-	-	-	6	-
	04/28/20	-	-	-	-	0	0
2021	1/7/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	3/29/2021	-	-	-	-	0	0
	4/05/2021	-	-	-	-	0	0
2022	10/28/2021	-	-	-	-	0	0
	12/17/2021	-	-	-	-	0	0
	3/2/2022	-	-	-	-	0	0
2023	2022-12-12‡	-	-	-	-	0	0
	2023-01-20	6.16	9.2	10.56	3.03	19	0.4414
	2023-02-17†	6.6	13.4	12.58	5.3	15	0.1101
	2023-04-05	6.57	22.8	12.25	7.63	16	0.5843
	2023-04-27‡	-	-	-	-	0	0

†Water quality probe was horizontal 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

Pond 997 was monitored seven years between 2017 and 2023 water years. Pond 997 is a reference vernal pool and no remediation has occurred. The Historical data and precipitation are summarized below:

- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 997 was inundated from the first recorded monitoring in January through April. The maximum inundation area was 0.33 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a large range, with moderate levels.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected January - May, five monitoring events
  - Inundated January through April
  - Inundation range 0.02-0.33 acres, mean 0.17 acres
  - Depth range 6-15 cm, mean 12 cm
  - pH range 6.40-7.07, mean 6.67
  - temperature range 10.2°-25.4° C, mean 16.4° C
  - dissolved oxygen range 7.14-12.20 mg/L, mean 8.60 mg/L
  - turbidity range 14.1-72.4 FNU, mean 34.4 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 997 did not hold water.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - April, four monitoring events
  - 0 in all monitoring events
  - No water quality data collected
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 997 was inundated from the second recorded monitoring in February through April. The maximum inundation area was 0.12 acres. Water quality was within normal ranges. Water quality data were collected in February and March. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a small range, with moderate levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January through May, five monitoring events
  - Inundated February through April
  - Inundation range 0.03-0.12 acres, mean 0.09 acres
  - Depth range 2-14 cm, mean 10 cm
  - pH range 6.37-6.39, mean 6.38
  - temperature range 11.79°-12.61° C, mean 12.20° C
  - dissolved oxygen range 9.28-10.62 mg/L, mean 9.95 mg/L
  - turbidity range 24.2-26.0 FNU, mean 25.1 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 997 was inundated from late March through mid-April. The maximum inundation area was 0.05 acres. Water quality was measured only once but it was within Historical ranges. Slightly acidic pH value was observed.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - April, nine monitoring events

  - Inundated from late March through mid-April
  - Inundation range 0-05 acres, mean 0.05 acres
  - Depth range 0-7 cm, mean 1.44 cm
  - pH value of 6.06
  - temperature value of 19.6
  - dissolved oxygen value of 8.44
  - turbidity value of 49.45
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 997 did not fill
  - Data collected Jan-April, four monitoring events
- 2022 (Chenega, 2023)
  - In consecutive below normal water year, Pond 997 did not fill
  - Yearly cumulative precipitation of 11.69 inches
  - Data collected October - March, 3 monitoring events
- 2023
  - In a well above normal water-year, Pond 997 was inundated from the second recorded monitoring event in January to April. The maximum inundation area was 0.58 acres. Water quality was within normal ranges. Water quality data were collected in January, 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 low levels.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December through April, five monitoring events
  - Inundated January to April
  - Inundation range 0.11-0.58 acres, mean 0.38 acres
  - Depth range 15-19 cm, mean 16.67 cm
  - pH range 6.16-6.57, mean 6.44
  - temperature range 9.2°-22.8° C, mean 15.13° C
  - dissolved oxygen range 10.56-12.58 mg/L, mean 11.8 mg/L
  - turbidity range 3.03-7.63 FNU, mean 5.32 FNU

Table B-4. Pond 75 (Baseline) Historical Hydrology Results on Former Fort Ord 2021 - 2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2021	1/7/2021	-	-	-	-	0	0
	2/2/2021	-	-	-	-	0	0
2022	12/20/2021	-	-	-	-	0	0
	1/12/2022	-	-	-	-	0	0
2023	2023-02-15	6.44	8	1.83	217.22	35	0.1998

Pond 75 was monitored for the third year of baseline in 2023 water year. Monitoring events and related activities are summarized below:

- 2021 (Chenega, 2021)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 75 did not fill
  - Data collected Jan-Feb, two monitoring events
- 2022 (Chenega, 2022)
  - In consecutive below normal water year, Pond 75 did not fill
  - Yearly cumulative precipitation of 11.69 inches
  - Data collected December - January, 2 monitoring events
- 2023
  - In a well above normal water-year, Pond 75 was inundated in February, the only month in which monitoring occurred. The inundation area was 0.2 acres. Water quality was within normal ranges, although measurements were taken from the edge of the vernal pool and the prove was not fully submerged. Value of pH was slightly acidic. Temperature was within normal averages for Fort Ord. Dissolved oxygen was low and turbidity was moderate.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected in February, a single monitoring events
  - Inundated in February
  - Inundation was 0.2 acres
  - Depth was 35 cm
  - pH was 6.44
  - temperature was 8° C
  - dissolved oxygen was 1.83 mg/L
  - turbidity was 217.22 FNU

Table B-5. Pond 76 (Year 1 Post-Mastication)
Historical Hydrology Results on Former Fort Ord 2023

Water Year	Date	pH	Temperature (C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Max Depth (cm)	Inundated Surface Area (acres)
2023	2023-01-12§	5.95	12.2	7.51	86.45	10	NS
	2023-02-15^	7.13	6.9	9.96	27.09	15	0.1049
	2023-03-30	6.67	9.9	4.37	71.39	30	0.221
	2023-04-28§	6.77	18	6.7	22.16	25	0.1807
	2023-06-09					0	0

NS = Not Surveyed, ^Peripheral inundation present, §Probe not fully submerged

Pond 76 was monitored for the first time in 2023 water year. Monitoring events and related activities are summarized below:

- 2021
  - Mastication of Unit 5
- 2022
  - Surface munitions cleanup
- 2023
  - In a well above normal water-year, Pond 76 was inundated from January through April. The maximum inundation area was 0.58 acres. Water quality was within normal ranges. Water quality data were collected monthly from January to April and were taken from the edge of the vernal pool. Probe was not fully submerged during January and April measurements. Acidic to slightly basic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a narrow range, with low levels. Turbidity had a moderate range, with moderate levels.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected January through June, five monitoring events
  - Inundated January to April
  - Inundation range 0.11-0.22 acres, mean 0.17 acres
  - Depth range 10-30 cm, mean 20 cm
  - pH range 5.95-6.77, mean 6.63
  - temperature range 6.9°-12.2° C, mean 11.75° C
  - dissolved oxygen range 4.37-9.96 mg/L, mean 7.14 mg/L
  - turbidity range 22.16-86.45 FNU, mean 51.77 FNU

Table B-4. Pond 21 (Year 1 Post-Mastication and Post-Subsurface Munitions Remediation) Historic Hydrology Results on Former Fort Ord from 1992-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1992	3/27/1992	NS	15	NS	slight[×]	20	NS
1999	1/12/1999	6.8	NS	NS	5 (NTU)	23	0.29
	2/16/1999	NS	NS	NS	NS	36	0.34
	3/25/1999	5.7	NS	NS	5 (NTU)	36	0.94
	4/20/1999	8.15	NS	NS	24 (NTU)	36	0.94
2007	Dec	-	-	-	-	0	-
	Jan	-	-	-	-	0	-
	March	-	-	-	-	0	-
	April	-	-	-	-	0	-
	May	-	-	-	-	0	-
	June	-	-	-	-	0	-
2019	1/17/2019‡	NS	NS	NS	NS	2	0.01
	2/12/2019‡	6.51	10.42	8.60	16.8	16	0.83
	3/5/2019‡†	6.39†	13.6	8.83	41.1	19	0.86
	4/2/2019‡†	6.66†	13.2	7.36	30.6	14	0.81
	5/6/2019	-	-	-	-	0	0
2022	1/12/2023	-	-	-	-	0	0
2023	2022-12-14					0	0
	2023-01-12	6.44	12.8	6.44	8.48	14	0.8313
	2023-02-15	6.56	10.7	11.34	36.23	11	0.8153
	2023-03-30	6.22	10.8	8.21	62.26	35	0.9961
	2023-04-28	6.63	22.4	10.24	101.53	26	0.9342
	2023-05-12	5.93	15.5	7.06	55.06	22	0.8935
	2023-06-09	NS	NS	NS	NS	8	0.7156

[×] In 1991-1992, turbidity was measured qualitatively.
†Water quality probe was on 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.
NS = Not Surveyed

Pond 21 was monitored six years between 1992 and 2023. The historic data and precipitation are summarized below:

- 1992 (Jones & Stokes, 1992)
  - In a year with near-normal precipitation, Pond 21 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 20 cm
  - temperature 15˚C
  - pH, turbidity, and dissolved oxygen data were not collected
- 1999 (HLA, 1999)
  - In a year with near-normal precipitation following an El Niño year, Pond 21 held water from January-April. The maximum inundation area was 0.94 acres. Water quality was within normal ranges. Slightly basic to slightly acidic pH values were observed. Turbidity had a small range, with moderate levels. Temperature and dissolved oxygen were not measured.
  - Yearly cumulative precipitation near-normal (16.31 inches)
  - Data collected January-April, four monitoring events
  - Inundated January through April
  - Inundation range 0.29-0.94 acres, mean 0.63 acres
  - Depth range 23-36 cm, mean 32 cm
  - pH range 5.7-8.15, mean 6.88
  - turbidity range 5-24 NTU, mean 11 NTU
  - temperature and dissolved oxygen data were not collected
- 2007 (Shaw, 2008)
  - In a below-normal rain year, Pond 21 did not hold water.
  - Yearly cumulative precipitation 10.13 inches
  - Data collected December to June, six monitoring events
  - Dry in all monitoring events
  - No water quality data collected
- 2019 (Burleson, 2020)
  - In an above-normal water-year, Pond 21 was inundated from the first recorded monitoring in January through April. The maximum inundation area was 0.86 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 small range, with moderate levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - May, six monitoring events
  - Inundated January through April
  - Inundation range 0.01-0.86 acres, mean 0.63 acres
  - Depth range 2-19 cm, mean 13 cm
  - pH range 6.39-6.66, mean 6.52
  - temperature range 10.42°-13.60° C, mean 12.41° C
  - dissolved oxygen range 7.36-8.83 mg/L, mean 8.26 mg/L
  - turbidity range 16.8-41.1 FNU, mean 29.5 FNU
- 2022 (unreported data)
  - In a consecutive drought year, Pond 21 was surveyed once opportunistically in January. There was no noticeable ponding, but the soil near the staff gauge was wet.
  - Yearly cumulative precipitation of 11.69 inches
- 2023
  - In a well above-normal water-year, Pond 21 was inundated from the second monitoring event in January through May. The maximum inundation area was 1 acre. Water quality was within normal ranges. Acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a narrow range. Turbidity had a moderate range, with moderate levels.

- Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
- Data collected December - June, seven monitoring events
- Inundated January through May
- Inundation range 0.72-1.00 acres, mean 0.88 acres
- Depth range 8-35 cm, mean 19 cm
- pH range 5.93-6.63, mean 6.36
- temperature range 10.07°-22.4° C, mean 14.44° C
- dissolved oxygen range 6.44-11.34 mg/L, mean 8.66 mg/L
- turbidity range 8.48-101.53 FNU, mean 52.71 FNU

Table B-7. Pond 3 North (Year 5 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1997-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1998	Jan	-	-	-	26.9 (NTU)	55	0.34
	Feb	7.57-7.95	-	-	40.1 (NTU)	46	0.38
	Apr		-	-	-	48	0.38
2015	2/24/2015	-	-	-	-	~40§	-
	3/18/2015	-	-	-	-	30§	0.07
	4/16/2015	7.60	26.30	11.80	104.0 (NTU)	15§	0.03
	5/28/2015	-	-	-	-	0	0.00
2016	3/31/2016	6.75	18.40	5.61	56.7	54	0.22
	4/19/2016	6.12	15.50	3.67	45.4	45	0.11
	5/9/2016	6.28	15.56	2.11	9.6	29	0.07
	6/7/2016	6.07	18.71	3.88	24.2	16	0.03
	7/7/2016	-	-	-	-	0	0.00
2018	1/16/2018	-	-	-	-	0	0.00
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018	6.27	11.33	8.75	57.4	10	0.02
	4/16/2018	6.61	13.33	7.60	5.3	24	0.05
	5/21/2018	-	-	-	-	0	0.00
2019	1/16/2019^	6.55	12.08	10.04	13.6	14	0.02
	2/11/2019^~	6.89	8.81	7.80	43.9	61	0.86
	3/7/2019^~	6.62	13.37	5.64	1.7	62	1.14
	4/3/2019^	6.64	16.26	5.43	0.3	59	0.27
	5/7/2019^	6.84	18.90	9.20	0.5	40	0.09
	6/11/2019	6.27	20.89	7.14	0.9	26	0.05
	7/9/2019	-	-	-	-	0	0.00
2020	12/6/2019^	-	-	-	-	30	0.0563
	1/6/2020^	-	-	-	-	26	-
	1/29/2020^#	7.54	19.5	12.79	8.76	29	0.0513
	2/21/2020	-	-	-	-	17	-
	2/27/2020	7.06	19.6	7.2	12.71	15	0.0163
	3/12/2020	-	-	-	-	5	-
	3/17/2020*	-	-	-	-	30	-
	3/20/2020^	-	-	-	-	30	-
	3/31/2020^	6.91	23.6	8.11	22.2	52	0.1568
2020	4/16/2020*	-	-	-	-	55	-
	4/29/2020^	6.36	19	2.4	1.51	46	0.1086
	5/20/2020*	-	-	-	-	31	-

	5/26/2020	6.59	28	4.29	0.94	26	0.04
	6/10/2020	-	-	-	-	11	-
	6/25/2020*	-	-	-	-	0	0
	6/30/2020	-	-	-	-	0	0
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021^	6.29	13.9	3.59	106.23	0.0165	13
	2/10/2021^	-	-	-	-	NS	5
	2/24/2021	-	-	-	-	0	0
	3/02/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0
2023	2022-12-14^	NS	NS	NS	NS	22	NS
	2023-01-12^	6.57	13.4	5.71	40.99	60	0.4097
	2023-02-15^	6.97	10.4	9.17	7.1	48	0.1275
	2023-03-31~	6.72	11.9	6.17	32.95	64	1.3397
	2023-04-26	6.58	16.5	4.8	5.29	57	0.2683
	2023-05-09	6.41	16.5	4.39	2.39	54	0.1596
	2023-06-16	NS	NS	NS	NS	33	0.0616

§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
~ Hydrologically connected to Pond 3 South

Pond 3 North was monitored eight years between 1997 and 2023. Burn activities occurred in 2017 and subsurface munitions remediation activities occurred in 2018. In 2023, Pond 3 North was in Year 5 of monitoring for post-subsurface munitions remediation. The historical data and precipitation are summarized below:

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

  - Data collected February to May, four monitoring events
  - Inundated February to May
  - Inundation range 0.03-0.07 acres, mean 0.05 acres
  - Depth range 15-~40 cm, mean ~28 cm (depths are estimations)
  - Water quality data were collected only in April
  - pH 7.6
  - temperature 26.3° C
  - dissolved oxygen 11.8 mg/L
  - turbidity 104 NTU
- 2016 (Burleson, 2017)
  - In a consecutive drought with precipitation above normal, Pond 3 North was inundated from the first recorded monitoring in March through June. The maximum inundation area was 0.22 acres. Water quality was within normal ranges. Slightly acidic to neutral pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range. Turbidity was low on average. It is likely that Pond 3 North was inundated earlier in the water-year and maximum inundation was most likely not captured. It should be noted that data collection did not start with the first storm or inundation.
  - Consecutive drought year with yearly cumulative precipitation 21.21 inches
  - Data collected March-July, five monitoring events
  - Inundated March through June
  - Inundation range 0.03-0.22 acres, mean 0.11 acres
  - Depth range 16-54 cm, mean 36 cm
  - pH range 6.07-6.75, mean 6.31
  - temperature range 15.50°-18.71° C, mean 17.04° C
  - dissolved oxygen range 2.11-5.61 mg/L, mean 3.82 mg/L
  - turbidity range 9.6-56.7 FNU, mean 34.0 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 3 North was not inundated until March and April. The maximum inundation area was 0.05 acres. Water quality was within normal ranges. Slightly acidic to neutral pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a moderate range, with low levels.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - May, five monitoring events
  - Inundated March and April
  - Inundation range 0.02-0.05 acres, mean 0.03 acres
  - Depth range 10-24 cm, mean 17 cm
  - pH range 6.27-6.61, mean 6.44
  - temperature range 11.33°-13.33° C, mean 12.33° C
  - dissolved oxygen range 7.60-8.75 mg/L, mean 8.18 mg/L
  - turbidity range 5.3-57.4 FNU, mean 31.5 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 3 North was inundated from the first recorded monitoring in January through June. The maximum inundation area was 1.14 acres (pond was connected to 3 South). Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord.

Dissolved oxygen had a small range, with low levels. Turbidity had a moderate range, with low levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - July, seven monitoring events
  - Inundated January through June
  - Inundation range 0.02-1.14 acres, mean 0.41 acres (pond connected to 3 South for upper range value and mean acreage)
  - Depth range 26-62 cm, mean 44 cm
  - pH range 6.27-6.89, mean 6.64
  - temperature range 8.81°-20.89° C, mean 15.05° C
  - dissolved oxygen range 5.43-10.04 mg/L, mean 7.54 mg/L
  - turbidity range 0.3-43.9 FNU, mean 10.2 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 3 North was inundated from the first recorded monitoring in December through mid-June. The maximum inundation area was 0.16 acres. Water quality was within Historical ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature, dissolved oxygen, and turbidity were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - June, 15 monitoring events
  - Inundated from December through June
  - Inundation range 0-0.16 acres, mean 0.05 acres
  - Depth range 0-55 cm, mean 25.19 cm
  - pH range 6.36-7.54, mean 6.89
  - temperature range 19°-28° C, mean 21.94° C
  - dissolved oxygen range 2.4-12.79 mg/L, mean 6.96 mg/L
  - turbidity range 0.94-22.2 FNU, mean 9.22 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 3 North was briefly inundated in February
  - Maximum inundation area was 0.0165, and maximum depth was 13 cm
- 2023
  - In a well above normal water-year, Pond 3 North was inundated from the first monitoring event in December to June, when the last monitoring event occurred. The maximum inundation area was 1.34 acres when it 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 narrow range, with moderate to low levels. Turbidity had a moderate range, with moderate to low levels.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected January - June, seven monitoring events
  - Inundated December to June
  - Inundation range 0.06-1.34 acres, mean 0.39 acres
  - Depth range 22-64 cm, mean 48 cm
  - pH range 6.41-6.97, mean 6.65
  - temperature range 10.4°-16.5°C, mean 13.74°C
  - dissolved oxygen range 4.39-9.17 mg/L, mean 6.05 mg/L
  - turbidity range 2.39-40.99 FNU, mean 17.74 FNU

Table B-8. Pond 3 South (Year 5 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1997-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1998	Dec	7.89	-	-	43.0-60.0 (NTU)	32	0.69
	Jan	-	-	-	27.1 (NTU)	32	0.71
	Feb	7.40-7.70	-	-	45.5 (NTU)	30	0.78
	Apr	-	-	-	-	33	0.78
2015	3/18/2015	-	-	-	-	0	0.00
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2016	3/31/2016	7.00	16.42	9.87	12.2	30	0.52
	4/19/2016	6.38	14.44	4.00	10.2	30	0.41
	5/9/2016	6.39	13.85	1.31	4.0	11	0.01
	6/7/2016	-	-	-	-	0	0.00
2018	1/16/2018	-	-	-	-	0	0.00
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018	-	-	-	-	0	0.00
	4/16/2018^	7.13	15.67	8.75	77.7	8	0.001
	5/21/2018	-	-	-	-	0	0.00
2019	1/16/2019^†	6.71	12.46	9.03	6.9	10	0.01
	2/11/2019^~	6.43	9.99	9.39	26.1	33	0.86
	3/7/2019^~	6.33	12.98	5.60	6.2	35	1.14
	4/3/2019^	6.70	15.87	6.91	27.9	33	0.44
	5/7/2019^	-	-	-	-	9	0.004
	6/11/2019	-	-	-	-	0	0.00
2020	12/6/2019^	-	-	-	-	14	0.0136
	1/6/2020^	-	-	-	-	11	-
	1/29/2020^	6.83	11	4.38	1.12	16	0.0141
	2/21/2020	-	-	-	-	0	0
	3/19/2020^	-	-	-	-	20	0.0285
	3/31/2020^	6.74	20.7	10.34	16.8	29	0.3869
	4/16/2020*	-	-	-	-	29	-
	4/29/2020^	7.28	20.8	10.28	1.76	18	0.0168
	5/26/2020	-	-	-	-	0	0
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0
2023	2022-12-14^	NS	NS	NS	NS	7	NS
	2023-01-12^	6.34	13.5	7.14	51.11	31	0.5273

	2023-02-15^	7.69	12.6	14.18	12.38	25	0.4164
	2023-03-31~	6.44	11.2	10.31	4.75	33	1.3397
	2023-04-26	6.73	17.1	8.52	34.17	33	0.6463
	2023-05-09	6.6	17.4	9.66	17.38	32	0.5418
	2023-06-16	-	-	-	-	0	0

†Water quality probe was on its side for measurements.
^Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.
~ Hydrologically connected to Pond 3 North, *taken during Burleson surveys

Pond 3 South was monitored eight years between 1997 and 2023. Burn activities occurred in 2017 and subsurface munitions remediation activities occurred in 2018. In 2023, Pond 3 South was in Year 5 of monitoring for post-subsurface munitions remediation. The historical data and precipitation are summarized below:

- 1998 (HLA, 1998)
  - In an El Niño year with yearly cumulative precipitation significantly above normal, Pond 3 South held water December through April. Turbidity and pH the only water quality parameters collected.
  - El Niño year with yearly cumulative precipitation above normal (40.54 inches)
  - Data collected December-April, four monitoring events
  - Inundated from December through April
  - Inundation range 0.69-0.78 acres, mean 0.74 acres
  - Depth range 31-33 cm, mean 32 cm
  - pH range 7.40-7.89, mean 7.66
    turbidity range 27.1-60 NTU, mean 43.9 NTU
- 2015 (Burleson, 2016)
  - In a 0 consecutive drought year with below normal precipitation, Pond 3 South did not hold water. No water quality data were collected.
  - Early storms pushed early cumulative precipitation above normal while total yearly cumulative precipitation fell below normal (14.35 inches)
  - Data collected March to May, three monitoring events
  - 0 during all monitoring events
- 2016 (Burleson, 2017)
  - In a consecutive drought with precipitation above normal, Pond 3 South was inundated from the first recorded monitoring in March through June. The maximum inundation area was 0.52 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range. Turbidity was low on average. It is likely that Pond 3 South was inundated earlier in the water-year and maximum inundation was most likely not captured. It should be noted that data collection did not start with the first storm or inundation.
  - Consecutive drought year with yearly cumulative precipitation 21.21 inches
  - Data collected March-June, four monitoring events
  - Inundated March through May
  - Inundation range 0.01-0.52 acres, mean 0.31 acres
  - Depth range 11-30 cm, mean 24 cm
  - pH range 6.38-7.00, mean 6.59
  - temperature range 13.85°-16.42° C, mean 14.90° C

  - dissolved oxygen range 1.31-9.87 mg/L, mean 5.06 mg/L
  - turbidity range 4.0-12.2 FNU, mean 8.8 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 3 South was inundated only in April. The maximum inundation area was 0.001 acres. Water quality was collected in April and was within normal ranges. Neutral pH value, temperature within normal averages for Fort Ord, moderate dissolved oxygen, and low turbidity were observed.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - May, five monitoring events
  - Inundated April
  - Inundation 0.001 acres
  - Depth 8 cm
  - pH 7.13
  - temperature 15.67° C
  - dissolved oxygen 8.75 mg/L
  - turbidity 77.7 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 3 South was inundated from the first recorded monitoring in January through May. The maximum inundation area was 1.14 acres (pond was connected to 3 North). Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range. Turbidity was low on average.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - June, six monitoring events
  - Inundated January through May
  - Inundation range 0.004-1.14 acres, mean 0.49 acres (pond connected to 3 North for upper range value and mean acreage)
  - Depth range 9-35 cm, mean 24 cm
  - pH range 6.33-6.71, mean 6.54
  - temperature range 9.99°-15.87° C, mean 12.83° C
  - dissolved oxygen range 5.60-9.39 mg/L, mean 7.73 mg/L
  - turbidity range 6.2-27.9 FNU, mean 16.8 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 3 South was inundated intermittently from the first recorded monitoring in December through April. The maximum inundation area was 0.39 acres. Water quality was within Historical ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 9 monitoring events
  - Inundated intermittently from December through April, dried out two times
  - Inundation range 0-0.39 acres, mean 0.07 acres
  - Depth range 0-29 cm, mean 15.22 cm
  - pH range 6.74-7.28, mean 6.95
  - temperature range 11°-20.8° C, mean 17.5° C
  - dissolved oxygen range 4.38-10.34 mg/L, mean 17.5 mg/L
  - turbidity range 1.12-16.8 FNU, mean 6.56 FNU
- 2021 (Chenega, 2022)

  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 3 South did not fill
  - Data collected Jan-March, three monitoring events
- 2023
  - In a well above normal water-year, Pond 3 South was inundated from the first recorded monitoring in December through May. The maximum inundation area was 1.34 acres when it was connected to Pond 3 North. Water quality was within normal ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen and turbidity values were within moderate ranges.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December - June, seven monitoring events
  - Inundated January through May
  - Inundation range 0.42-1.34 acres, mean 0.69 acres
  - Depth range 7-33 cm, mean 27 cm
  - pH range 6.34-7.69, mean 6.76
  - temperature range 11.2°-17.4° C, mean 14.36° C
  - dissolved oxygen range 7.14-14.18 mg/L, mean 9.96 mg/L
  - turbidity range 4.75-51.11 FNU, mean 23.96 FNU

Table B-9. Pond 16 (Year 5 Post-Subsurface Munitions Remediation)
Historical Hydrology Results on Former Fort Ord 1992-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1992	3/26/1992	NS	20	NS	extreme[ˇ]	91	NS
1994	3/15/1994	NS	NS	NS	NS	>102	NS
	3/29/1994	NS	NS	NS	NS	>102	NS
	4/13/1994	NS	NS	NS	NS	>102	NS
1995	1/11/1995	NS	NS	NS	NS	>102	NS
	1/26/1995	NS	NS	NS	NS	>102	NS
	2/10/1995	NS	NS	NS	NS	>102	NS
	2/24/1995	NS	NS	NS	NS	>102	NS
	3/10/1995	NS	NS	NS	NS	>102	NS
	3/24/1995	NS	NS	NS	NS	>102	NS
1996	1/3/1996	NS	NS	NS	NS	15	NS
	1/31/1996	NS	NS	NS	NS	>91	NS
	2/14/1996	NS	NS	NS	NS	>91	NS
	2/29/1996	NS	NS	NS	NS	>91	NS
	3/14/1996	NS	NS	NS	NS	>91	NS
	3/28/1996	NS	NS	NS	NS	>91	NS
	4/11/1996	NS	NS	NS	NS	>91	NS
	4/25/1996	NS	NS	NS	NS	>91	NS
2009	3/12/2009	NS	NS	NS	NS	76	NS
	4/2/2009	NS	NS	NS	NS	61	NS
2015	12/22/2014-12/23/2014	NS	NS	NS	NS	~43*	NS
	2/24/2015	NS	NS	NS	NS	~45*	NS
	3/18/2015	NS	NS	NS	NS	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

Table B-9. Pond 16 (Year 5 Post-Subsurface Munitions Remediation)
Historical Hydrology Results on Former Fort Ord 1992-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
	7/27/2017	NS	NS	NS	NS	90	-
	8/15/2017	NS	NS	NS	NS	40	-
	9/6/2017	NS	NS	NS	NS	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	NS	NS	NS	NS	15	0.1438
	12/27/2019	NS	NS	NS	NS	12	-
	1/8/2020	NS	NS	NS	NS	12	-
	1/29/2020^#	6.81	13.2	11.38	43.8	12	0.097
	2/21/2020	-	-	-	-	0	0
	3/19/2020	NS	NS	NS	NS	16	0.1734
	3/31/2020	6.28	18.8	4.38	156	44	0.3271
	4/20/2020	NS	NS	NS	NS	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	NS	NS	NS	NS	29	NS
	8/3/2020^	NS	NS	NS	NS	11	0.031
2021	1/7/2021	-	-	-	-	0	0
	2021-02-02	-	-	-	-	0	0
	2/12/2021	-	-	-	-	0	0
2022	10/28/2021	-	-	-	-	0	0
	12/17/2021	-	-	-	-	0	0
	1/12/2022	-	-	-	-	0	0
2023	2022-12-14^	-	-	-	-	0	0
	2023-01-20	6.21	7.2	2.42	326.7	128	0.7186
	2023-02-15	6.53	6.7	1.21	187.4	106	0.6183
	2023-03-30	6.64	9.2	2.81	387.74	137	0.8795
	2023-04-28	6.77	12.6	0.28	130.16	129	0.728
	2023-05-12	6.78	14.3	0.69	94.23	123	0.7035
	2023-06-16	NS	NS	NS	NS	99	0.5949

ˣ In 1992, turbidity was measured qualitatively.
* No staff gauge. Cannot access ponds to measure depth due to potential for subsurface unexploded ordnance and other hazards. Depths are estimations
#Probe not fully submerged
^Peripheral inundation present

Pond 16 was monitored thirteen years between 1992 and 2023 water years. Mastication activities occurred in 2016 and subsurface munitions remediation activities occurred in 2018. In 2023, Pond 16 was in year 5 of monitoring for post-subsurface munitions remediation. The historical data and precipitation are summarized below:

- 1992 (Jones & Stokes, 1992)
  - In a year with near-normal precipitation, Pond 16 was surveyed once in March 1992. It should be noted that data collection did not start with the first storms or inundation.
  - Yearly cumulative precipitation near-normal (17.84 inches)
  - Data collected March, one monitoring event
  - Inundated March
  - Depth 91 cm
  - temperature 20˚C
  - pH, turbidity, and dissolved oxygen data were not collected
- 1994 (Jones & Stokes, 1996)
  - In a precipitation year below normal, Pond 16 held water during both monitoring events in March and April.
  - Yearly cumulative precipitation 13.96 inches
  - Data collected in March and April, three monitoring events
  - Inundated during all monitoring events
  - No inundation areas recorded
  - Depth during all monitoring events >102 cm
  - No water quality data were collected
- 1995 (Jones & Stokes, 1996)
  - In a water-year that was above normal, Pond 16 was inundated by January monitoring and stayed inundated through March.
  - Yearly cumulative precipitation 23.38 inches
  - Data collected January-March, six monitoring events
  - Inundated during all monitoring events
  - No inundation areas recorded
  - Depth during all monitoring events >102 cm
  - No water quality data were collected
- 1996 (Jones & Stokes, 1996)
  - In a water-year that was approximately normal, Pond 16 was inundated from January to April. The maximum depth was lower but similar to previous years.
  - Yearly cumulative precipitation 16.96 inches
  - Data collected January-April, eight monitoring events
  - Inundated early-January to late-April
  - No inundation areas recorded
  - Depth range 15- >91 cm, mean 73 cm
  - No water quality data collected
- 2009 (Shaw, 2010)
  - In a water-year that was below normal, Pond 16 was inundated in March and April. Depth was recorded during wildlife surveys, which occurred three times, but depth was recorded only twice. No inundation area or water quality were measured. Depth values were taken from data sheets not included in the report.
  - Depth range 61-76 cm, mean 67.5 cm
- 2015 (Burleson, 2016)

  - In a consecutive drought year with cumulative precipitation below normal, Pond 16 was inundated at the first survey in April and held water through April. Maximum inundation was 0.27 acres. Water quality data were collected once, in April.
  - Consecutive drought year with yearly cumulative precipitation of 14.35 inches
  - Data collected December - May, five monitoring events
  - Inundated December - April
  - Inundation range 0-0.27 acres, mean 0.14 acres
  - Depth range ~15-~45 cm, mean ~26 cm
  - pH 6.4 in April
  - temperature 18.3°C in April
  - dissolved oxygen 13.9 mg/L in April
  - turbidity 572 NTU in April
- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 16 was inundated from the first recorded monitoring in January through September (pond did not 0 by last recorded monitoring in September). The maximum inundation area was 2.57 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord, with a few high readings in the middle of the season. Dissolved oxygen had a small range, with moderate levels. Turbidity had a large range, with high readings at the beginning of the season.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected January - September, nine monitoring events
  - Inundated January through September (pond did not 0 by last recorded monitoring in September)
  - Inundation range 0.51-2.57 acres, mean 1.32 acres
  - Depth range 28-144 cm, mean 104 cm
  - pH range 6.09-6.98, mean 6.65
  - temperature range 8.9°-20.0° C, mean 14.6° C
  - dissolved oxygen range 0.05-4.87 mg/L, mean 1.72 mg/L
  - turbidity range 33.8-584.0 FNU, mean 195.9 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 16 was inundated in March and April. The maximum inundation area was 0.26 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal range for Fort Ord. Dissolved oxygen had a small range and moderate levels. Turbidity had moderate levels.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected November, January - May, six monitoring events
  - Inundated March and April
  - Inundation range 0.11-0.26 acres, mean 0.18 acres
  - depth range 12-28 cm, mean 20 cm
  - pH range 6.10-6.65, mean 6.38
  - temperature range 10.24°-17.99° C, mean 14.12° C
  - dissolved oxygen range 5.29-8.43 mg/L, mean 6.86 mg/L
  - turbidity range 33.8-140 FNU, mean 86.9 FNU
- 2019 (Burleson, 2020)

  - In an above normal water-year, Pond 16 was inundated from the second recorded monitoring in February through September. The maximum inundation area was 0.74 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal range for Fort Ord, with higher readings in May and June. Dissolved oxygen had a small range and low levels. Turbidity had a moderate range, with high readings in February, March, and April.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - September, six monitoring events
  - Inundated February through September
  - Inundation range 0.54-0.74 acres, mean 0.67 acres
  - Depth range 18-139 cm, mean 93 cm
  - pH range 6.15-6.61, mean 6.40
  - temperature range 7.33°-17.94° C, mean 13.07° C
  - dissolved oxygen range 2.75-6.68 mg/L, mean 4.29 mg/L
  - turbidity range 60.1-360.0 FNU, mean 176.6 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 16 was inundated intermittently from the first recorded monitoring in December through beginning of August. The maximum inundation area was 0.52 acres. Water quality was within Historical ranges. Slightly acidic pH to normal values were observed. Temperature reached a record value of 25.1 °C in June, but otherwise was within normal averages for Fort Ord. Dissolved oxygen and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - August, 14 monitoring events
  - Inundated intermittently from December through August, dried out two times
  - Inundation range 0-0.52 acres, mean 0.19 acres
  - Depth range 0-101 cm, mean 30 cm
  - pH range 6.21-7.09, mean 6.61
  - temperature range 13.2°-25.1° C, mean 18.22° C
  - dissolved oxygen range 0.06-11.38 mg/L, mean 4.87 mg/L
  - turbidity range 18.31-156 FNU, mean 85.07 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 16 did not fill
  - Data collected Jan-February, three monitoring events
- 2022 (Chenega, 2023)
  - In consecutive below normal water year, Pond 16 did not fill
  - Yearly cumulative precipitation of 11.69 inches
  - Data collected October - January, three monitoring events
- 2023
  - In a well above normal water-year, Pond 16 was inundated from the second monitoring event in January to June, when the last monitoring event occurred. The maximum inundation area was 0.88 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal range for Fort Ord. Dissolved oxygen had a small range and low levels. Turbidity had a wide range, with highest readings in January and March.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December - June, seven monitoring events

- Inundated January to June, when last monitoring event occurred
- Inundation range 0.59-0.88 acres, mean 0.71 acres
- Depth range 99-137 cm, mean 120 cm
- pH range 6.21-6.78, mean 6.59
- temperature range 6.7°-14.3° C, mean 10°C
- dissolved oxygen range 0.28-2.81 mg/L, mean 1.48 mg/L
- turbidity range 94.23-387.74 FNU, mean 225.25 FNU

Table B-10. Pond 35 (Year 5 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1992-2023

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

Table B-10. Pond 35 (Year 5 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1992-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
	12/31/2019	-	-	-	-	0	0
	1/8/2020	-	-	-	-	0	0
	1/29/2020	-	-	-	-	0	0
	2/21/2020	-	-	-	-	0	0
2020	3/19/2020	NS	NS	NS	NS	27	0.0666
	4/3/2020	6.56	15.1	6.23	63.53	32	0.0872
	4/16/2020*	NS	NS	NS	NS	37	NS
	4/29/2020	6.88	18.1	1.67	49.77	25	0.0561
	5/21/2020*	-	-	-	-	0	0
	5/26/2020	-	-	-	-	0	0
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	3/02/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0
2023	2022-12-14	-	-	-	-	0	0
	2023-01-18	6.86	6.6	8.39	37.94	66	0.3802
	2023-01-23	-	-	-	-	0	0
	2023-02-16	-	-	-	-	0	0
	2023-03-02	NS	NS	NS	NS	65	NS
	2023-03-31+~	6.91	11.5	5.08	11.48	132	2.9714
	2023-04-07	NS	NS	NS	NS	96	NS
	2023-04-28	-	-	-	-	0	0
	2023-05-09	-	-	-	-	0	0

ˣ In 1992, turbidity was measured qualitatively; ‡ peripheral inundation present; NS – not surveyed
*taken during Burleson survey; +Depth greater than specified, water level above gauge; ~ Hydrologically connected to Pond 39

Pond 35 was monitored twelve years between 1992 and 2023. Mastication activities occurred in 2017 and subsurface munitions remediation activities occurred in 2018. In 2023, Pond 35 was in year 5 of monitoring for post-subsurface munitions remediation. The historical data and precipitation are summarized below:

- 1992 (Jones & Stokes, 1992)
  - In a year with near-normal precipitation, Pond 35 was surveyed once in March 1992. It should be noted that data collection did not start with the first storms or inundation.
  - Yearly cumulative precipitation near-normal (17.84 inches)
  - Data collected March, one monitoring event
  - Inundated March
  - Depth 91 cm
  - temperature 18˚C

  - pH, turbidity, and dissolved oxygen data were not collected
- 1994 (Jones & Stokes, 1996)
  - In a precipitation year below normal, Pond 35 held water during both monitoring events in March and April. No water quality data were collected.
  - Yearly cumulative precipitation 13.96 inches
  - Data collected in March and April, two monitoring events
  - Inundated during both monitoring events
  - No inundation areas recorded
  - depth range 33.02-60.96 cm, mean 46.57
  - No water quality data collected
- 1995 (Jones & Stokes, 1996)
  - In a water-year that was above normal, Pond 35 was inundated by January monitoring and stayed inundated through March. No water quality data were collected
  - Yearly cumulative precipitation 23.38 inches
  - Data collected January-March, six monitoring events
  - Inundated during all monitoring events
  - No inundation areas recorded
  - depth range 38.10 - >101.6 cm, mean 78.32 cm
  - No water quality data collected
- 1996 (Jones & Stokes, 1996)
  - In a water-year that was approximately normal, Pond 35 was inundated from the first monitoring in January through March. The maximum depth was lower than the previous year but similar to the 1994 water-year.
  - Yearly cumulative precipitation 16.96 inches
  - Data collected January-May, ten monitoring events
  - Inundated January to March
  - No inundation area recorded
  - depth range 2.58- >91.44 cm, mean 43.54 cm
  - no water quality data collected
- 2015 (Burleson, 2016)
  - In a 0, consecutive drought year with cumulative precipitation below normal, Pond 35 did not fill.
  - Consecutive drought year with yearly cumulative precipitation 14.35 inches
  - Data collected February-May, four monitoring events
  - 0 though the entire monitoring season
- 2016 (Burleson, 2017)
  - In a consecutive drought with precipitation above normal, Pond 35 was inundated only for March monitoring. The maximum inundation area was 0.001 acres. Water quality data were collected once in March and were within normal ranges. Neutral pH value, moderate temperature, low dissolved oxygen, and medium turbidity were observed. It should be noted that data collection did not start with the first storm or inundation.
  - Consecutive drought year with yearly cumulative precipitation 21.21 inches
  - Data collected March-April, two monitoring events
  - Inundated in March
  - Inundation 0.001 acres
  - depth 5 cm
  - pH 6.76
  - temperature range 17.76° C

  - dissolved oxygen 0.0 mg/L
  - turbidity 230.0 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 35 did not hold water.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January-April, four monitoring events
  - 0 in all monitoring events
  - No water quality data collected
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 35 was inundated from the second recorded monitoring in February through April. The maximum inundation area was 0.42 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range with low levels. Turbidity was moderate, with a high reading in February.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - May, five monitoring events
  - Inundated February through April
  - Inundation range 0.01-0.42 acres, mean 0.21 acres
  - Depth range 16-88 cm, mean 50 cm
  - pH range 6.81-6.91, mean 6.85
  - temperature range 7.64°-16.30° C, mean 12.61° C
  - dissolved oxygen range 2.35-8.48 mg/L, mean 5.48 mg/L
  - turbidity range 25.7-193.0 FNU, mean 82.0 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 35 was inundated from March through April. The maximum inundation area was 0.38 acres. Water quality was within Historical ranges. Slightly acidic pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 11 monitoring events
  - Inundated from March through May, dried out twice
  - Inundation range 0-0.09 acres, mean 0.02 acres
  - Depth range 0-37 cm, mean 10.08 cm
  - pH range 6.56-6.88, mean 6.72
  - temperature range 15.1°- 18.1° C, mean 18.1° C
  - dissolved oxygen range 1.67-6.23 mg/L, mean 3.95 mg/L
  - turbidity range 49.77-63.53 FNU, mean 56.65 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 35 did not fill
  - Data collected Jan-March, four monitoring events
- 2022 (unreported data collected opportunistically, Pond 35 was not on monitoring schedule)
  - In consecutive below normal water year, Pond 35 did not fill
  - Yearly cumulative precipitation of 11.69 inches
  - Data collected in January and March, two monitoring events

- 2023
  - In an above normal water-year, Pond 35 was inundated during the second monitoring event in January, it was dry in January and February, and became inundated again from March to April. The maximum inundation area was 2.97 acres when it was hydrologically connected to Pond 39. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a narrow range with low levels. Turbidity was moderate.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December - May, nine monitoring events
  - Inundated in January, and from March to April
  - Inundation range 0.38-2.97 acres, mean 1.68 acres
  - Depth range 65-132 cm, mean 90 cm
  - pH range 6.86-6.91, mean 6.89
  - temperature range 6.6°-11.5° C, mean 9.05° C
  - dissolved oxygen range 5.08-8.39 mg/L, mean 6.74 mg/L
  - turbidity range 11.48-37.94 FNU, mean 24.71 FNU

Table B-5. Pond 39 (Year 5 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1997-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1998	Dec	7.58-7.95	-	-	>100.0 (NTU)	36	0.24
	Jan	-	-	-	27.0-204.0 (NTU)	35	0.44
	Feb	7.57-8.00	-	-	48.7 (NTU)	48	0.49
	April	-	-	-	-	48	0.49
2015	2/24/2015	-	-	-	-	0	0.00
	3/18/2015	-	-	-	-	0	0.00
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2016	3/31/2016	6.31	13.85	2.25	177.0	38§	0.03
	4/19/2016	6.37	11.31	2.29	23.8	36§	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
	2/11/2019^	6.63	7.18	5.26	574.0	50	0.31
	3/6/2019^	6.38	13.80	4.29	528.0	50	0.25
	4/3/2019^	6.52	13.98	4.33	460.0	44	0.01
	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^	-	-	-	-	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#	6.42	16.7	7.65	34.17	15	8e-04
	3/12/2020	-	-	-	-	0	0
	3/17/2020*	-	-	-	-	44	-
	3/19/2020^	-	-	-	-	43	0.0075
	4/3/2020^	6.37	14.1	6.22	43.27	43	0.0089
	4/16/2020*	-	-	-	-	45	-
	4/29/2020^	6.38	17.4	4.86	3.32	34	0.005

	5/20/2020*	-	-	-	-	0	0
	5/26/2020	-	-	-	-	0	0
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021^	8	10.4	3.75	38.62	0.006	38
	2/10/2021	NS	NS	NS	NS	NS	27
	2/24/2021	NS	NS	NS	NS	NS	13
	3/02/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0
2022	10/28/2021	NS	NS	NS	NS	18	NS
	11/17/2021	NS	NS	NS	NS	18	NS
	12/15/2021^	6.49	9.2	7.32	62.31	43	0.0089
	1/12/2022^	6.51	10.2	7.46	26.96	33	0.0045
	2/1/2022	NS	NS	NS	NS	14	NS
	2/17/2022	-	-	-	-	0	0
	3/2/2022	-	-	-	-	0	0
	3/30/2022	-	-	-	-	0	0
2023	2022-12-14^	NS	NS	NS	NS	40	NS
	2023-01-18^	6.43	7	5.53	33.18	50	0.6305
	2023-02-16^	6.7	7.6	7.61	47.18	46	0.0694
	2023-03-31~	6.87	12.2	9.28	18.19	54	NS
	2023-04-28	6.81	21.7	9.02	13.43	32	0.005
	2023-05-09	6.55	17.2	3.45	8.65	20	0.002

§ 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
~ Hydrologically connected to Pond 35 and Pond 40 South

Pond 39 was monitored nine years between 1997 and 2023. Burn activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2023, Pond 39 was in year 5 of monitoring for post-subsurface munitions remediation. The historical data and precipitation are summarized below:

- 1998 (HLA, 1998)
  - In an El Niño year with yearly cumulative precipitation significantly above normal, Pond 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 (Chenega, 2021)
  - In a close to normal water year, Pond 39 was inundated intermittently from the first recorded monitoring in December through April. The maximum inundation area was 0.009 acres. Water quality was within Historical ranges. Slightly acidic pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 12 monitoring events
  - Inundated from December through April
  - Inundation range 0-0.009 acres, mean 0.004 acres
  - Depth range 0-45 cm, mean 27.77 cm
  - pH range 6.25-6.42, mean 6.36
  - temperature range 11.2°-17.4° C, mean 14.85° C
  - dissolved oxygen range 2.35-7.65 mg/L, mean 5.27 mg/L
  - turbidity range 3.32-74.97 FNU, mean 38.93 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 39 was briefly inundated in February
  - Maximum inundation area was 0.006, and maximum depth was 38 cm
- 2022 (Chenega, 2023)
  - In consecutive below normal water year, Pond 39 was inundated from October to February
  - Yearly cumulative precipitation of 11.69 inches
  - Data collected October - March, 8 monitoring events
  - Inundation range 0-0.0089 acres, mean 0.004 acres
  - Depth range 0-43 cm, mean 21 cm
  - pH range 6.49-6.51, mean 6.50
  - temperature range 9.2°-10.2° C, mean 9.7° C
  - dissolved oxygen range 7.32-7.46 mg/L, mean 7.39 mg/L
  - turbidity range 62.31-26.96 FNU, mean 44.64 FNU
- 2023
  - In a well above normal water-year, Pond 39 was inundated from the first recorded monitoring in December to May, when the last monitoring event occurred. The maximum inundation area was 0.63 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord, with a highest reading in April. Dissolved oxygen values were within a narrow range. Turbidity had moderate levels.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December - May, six monitoring events
  - Inundated December through May
  - Inundation range 0.002-0.63 acres, mean 0.18 acres
  - Depth range 20-50 cm, mean 40 cm
  - pH range 6.43-6.87, mean 6.67

- temperature range 7.0°-21.7° C, mean 13.14°C
- dissolved oxygen range 3.45-9.28 mg/L, mean 6.98 mg/L
- turbidity range 8.65-47.18 FNU, mean 24.13 FNU

Table B-6. Pond 40 South (Year 5 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1997-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1998	Dec	8.67	-	-	>100.0 (NTU)	27	0.12
	Jan	-	-	-	27.0 (NTU)	27	0.21
	Feb	7.60	-	-	50.4 (NTU)	32	0.21
	April	-	-	-	-	33	0.21
2015	3/18/2015	-	-	-	-	0	0.00
	4/16/2015	-	-	-	-	0	0.00
	5/28/2015	-	-	-	-	0	0.00
2016	3/31/2016	6.71	16.59	0.08	84.6	20	0.08
	4/19/2016	-	-	-	-	0	0.00
2017	1/23/2017	6.36	10.26	1.83	135.0	29	0.30
	2/28/2017	6.79	6.61	11.62	56.1	31	0.61
	3/22/2017	6.47	13.50	4.88	596.0	34	0.96
	4/18/2017	6.57	16.58	4.81	37.6	28	0.12
	5/25/2017	-	-	-	-	0	0.00
2018	1/16/2018	-	-	-	-	0	0.00
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018	-	-	-	-	0	0.00
	4/16/2018	-	-	-	-	0	0.00
2019	1/16/2019	-	-	-	-	0	0.00‡
	2/11/2019	6.55	7.58	7.63	381.0	28	0.22‡
	3/6/2019	6.80	17.36	9.75	19.2	28	0.11‡
	4/3/2019	6.75	13.63	3.30	3.3	20	0.05‡
	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^	-	-	-	-	14	0.0167
	4/3/2020^	6.04	13.8	1.31	70.47	17	0.0247
	4/16/2020*	-	-	-	-	20	-
	4/29/2020	-	-	-	-	0	0
	5/26/2020	-	-	-	-	0	0
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0
2022	10/28/2021	-	-	-	-	0	0
	11/17/2021	-	-	-	-	0	0

	1/12/2022	-	-	-	-	0	0
	3/2/2022	-	-	-	-	0	0
2023	2022-12-12	-	-	-	-	0	0
	2022-12-14	-	-	-	-	0	0
	2023-01-18	6.11	7.7	2.94	51.93	28	NS
	2023-02-16	7.02	7.8	6.1	4.51	20	0.0651
	2023-03-31	7.05	11.6	11.48	9.32	31	2.9714
	2023-04-28	NS	NS	NS	NS	8	0.0069
	2023-05-09	-	-	-	-	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 40 South was monitored ten years between 1997 and 2023. Burn activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2023, Pond 40 South was in year 5 of monitoring for post-subsurface munitions remediation. The historical data and precipitation are summarized below:

- 1998 (HLA, 1998)
  - In an El Niño year with yearly cumulative precipitation significantly above normal, Pond 40 South held water through April. Turbidity and pH were collected December through February.
  - El Niño year with yearly cumulative precipitation above normal (40.54 inches)
  - Data collected December-April, four monitoring events
  - Inundated from December through April
  - Inundation range 0.12-0.21 acres, mean 0.19 acres
  - Depth range 27-33 cm, mean 30 cm
  - pH range 7.60-8.67, mean 8.14
    turbidity range 27- >100 NTU, mean 59.1 NTU
- 2015 (Burleson, 2016)
  - In a consecutive drought year with cumulative precipitation below normal, Pond 40 South did not fill.
  - Consecutive drought year with yearly cumulative precipitation 14.35 inches
  - Data collected March-May, three monitoring events
  - 0 though the entire monitoring season
- 2016 (Burleson, 2017)
  - In a consecutive drought year with cumulative precipitation above normal, Pond 40 South held water through March. Water quality data were collected once, in March. It is likely that Pond 40 South was inundated earlier in the water-year and maximum inundation was not captured. It should be noted that data collection did not start with the first storm or inundation.
  - Drought year with cumulative precipitation above normal (21.21 inches)
  - Data collected March-April, two monitoring events
  - Inundated from March-April
  - Inundation 0.08 acres in March
  - Depth 20 cm in March
  - pH 6.71 in March
  - temperature 16.59° C

  - dissolved oxygen 0.08 mg/L
  - turbidity range 84.6 FNU
- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 40 South was inundated from the first recorded monitoring in January through May. The maximum inundation area was 0.96 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a large range. Turbidity was moderate on average, with a few high readings in January and March.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected January - May, five monitoring events
  - Inundated January through April
  - Inundation range 0.12-0.96 acres, mean 0.50 acres
  - Depth range 28-34 cm, mean 31 cm
  - pH range 6.36-6.79, mean 6.55
  - temperature range 6.6°-16.6° C, mean 11.7° C
  - dissolved oxygen range 1.83-11.62 mg/L, mean 5.79 mg/L
    turbidity range 37.6-596.0 FNU, mean 206.2 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 40 South did not hold water. No water quality data were collected.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - April, four monitoring events
  - 0 during all monitoring events
  - No water quality data were collected
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 40 South was inundated from the second recorded monitoring in February through April. Peripheral ponding not hydrologically connected to the staff gauge was observed in January. The maximum inundation area was 0.22 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range with low levels. Turbidity was moderate on average, with a high reading in February.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - May, five monitoring events
  - Inundated February through April
  - Inundation range 0.05-0.22 acres, mean 0.12 acres
  - Depth range 20-28 cm, mean 25 cm
  - pH range 6.55-6.80, mean 6.70
  - temperature range 7.58°-17.36° C, mean 12.86° C
  - dissolved oxygen range 3.30-9.75 mg/L, mean 6.89 mg/L
  - turbidity range 3.3-381.0 FNU, mean 134.5 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 40 South was inundated from March through April. The maximum inundation area was 0.025 acres. Water quality was within Historical ranges. Slightly acidic pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches

  - Data collected December - May, 12 monitoring events
  - Inundated from December through April
  - Inundation range 0-0.009 acres, mean 0.004 acres
  - Depth range 0-45 cm, mean 27.77 cm
  - pH range 6.25-6.42, mean 6.36
  - temperature range 11.2°-17.4° C, mean 14.85° C
  - dissolved oxygen range 2.35-7.65 mg/L, mean 5.27 mg/L
  - turbidity range 3.32-74.97 FNU, mean 38.93 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 40 South did not fill
  - Data collected January - March, three monitoring events
- 2022 (Chenega, 2023)
  - In consecutive below normal water year, Pond 40 South did not fill
  - Yearly cumulative precipitation of 11.69 inches
  - Data collected October - March, 4 monitoring events
- 2023
  - In a well above normal water-year, Pond 40 South was inundated from the third monitoring event in January through April. Peripheral ponding not hydrologically connected to the staff gauge was observed in December. The maximum inundation area of Pond 40 South was 2.97 acres when it was hydrologically connected to Pond 39. Water quality was within normal ranges. Acidic to normal pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen and turbidity values were within moderate ranges.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December - May, seven monitoring events
  - Inundated January through April
  - Inundation range 0.007-2.97 acres, mean 1.01 acres
  - Depth range 8-31 cm, mean 22 cm
  - pH range 6.11-7.05, mean 6.73
  - temperature range 2.94°-11.48° C, mean 9.03° C
  - dissolved oxygen range 2.94-11.48 mg/L, mean 6.84 mg/L
  - turbidity range 4.51-51.93 FNU, mean 21.92 FNU

Table B-7. Pond 41 (Year 5 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 1997-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1998	Dec	7.53	NS	NS	25 (NTU)	52	1.45
	Jan	NS	NS	NS	3.48 (NTU)	61	1.70
	Feb	7.48	NS	NS	3.82 (NTU)	102	2.13
	April	NS	NS	NS	NS	>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
	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
	5/7/2019^	6.27	16.13	3.30	1.7	38	0.18
	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^	-	-	-	-	0	0
	1/29/2020^#	7.08	11.9	17.16	1.46	15	0.0011
	2/19/2020	-	-	-	-	0	0
	3/11/2020	-	-	-	-	0	0
	3/19/2020^	NS	NS	NS	NS	44	0.1503
	4/3/2020^	6.26	12.9	1.58	151.21	49	0.4961
	4/16/2020*	NS	NS	NS	NS	56	NS
	4/29/2020^	6.26	17.6	0.01	7.62	47	0.4152
	5/26/2020	-	-	-	-	0	0
	6/16/2020*	-	-	-	-	0	0
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0
	10/28/2021	-	-	-	-	0.00	0
	11/17/2021	-	-	-	-	0.00	0

2022	12/15/2021	-	-	-	-	0.00	0
	1/12/2022^	7.15	14.9	9.67	1.69	24.00	0.0068
	2/1/2022	-	-	-	-	0.00	0
	3/2/2022	-	-	-	-	0.00	0
2023	2022-12-12^	-	-	-	-	0.00	0
	2023-01-18	6.65	9.7	7.52	3.04	61	1.3925
	2023-02-16^	6.83	11.8	12.5	9.98	34	1.3806
	2023-04-05	6.49	12.1	7.62	2.86	86	1.73
	2023-04-26	6.48	17	6.47	1.42	79	1.6331
	2023-05-12	6.33	16.7	5.16	2.76	72	1.5176
	2023-06-16	NS	NS	NS	NS	61	1.2444

^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

Pond 41 was monitored eight years between 1997 and 2023 water years. Munitions remediation activities occurred in 2018. Pond 41 is a post-subsurface munitions remediation vernal pool and was in Year 5 of monitoring in 2023. The Historical data and precipitation are summarized below:

- 1998 (HLA, 1998)
  - In an El Niño year with yearly cumulative precipitation significantly above normal, Pond 41 held water December through April. Turbidity and pH were the only water quality parameters collected in December and February.
  - El Niño year with yearly cumulative precipitation above normal (40.54 inches)
  - Data collected December-April, four monitoring events
  - Inundated from December through April
  - Inundation range 1.45-2.13 acres, mean 1.85 acres
  - Depth range 52 - >127 cm, mean 85 cm
  - pH range 7.48-7.53, mean 7.51
    turbidity range 3.48-25.0 NTU, mean 1.08 NTU
- 2015 (Burleson, 2016)
  - In a 0 consecutive drought year with below normal precipitation, Pond 41 did not hold water.
  - Early storms pushed early cumulative precipitation above normal while total yearly cumulative precipitation fell below normal (14.35 inches)
  - Data collected February to May, four monitoring events
  - 0 in all monitoring events
  - No water quality data collected
- 2016 (Burleson, 2017)
  - In a consecutive drought year with cumulative precipitation above normal, Pond 41 held water from April-May. Water quality results had a slightly acidic pH, normal temperature, low dissolved oxygen, and low to moderate turbidity. It should be noted that data collection did not start with the first storms or inundation. Maximum inundation could have been missed.
  - Drought year with cumulative precipitation above normal (21.21 inches)
  - Data collected April-June, four monitoring events

  - Inundated April through May
  - Inundation range 0.33-1.44 acres, mean 1.02 acres
  - Depth range 34-60 cm, mean 47 cm
  - pH range 6.56-6.79, mean 6.69
  - temperature range 12.64°-15.01° C, mean 14.13° C
  - dissolved oxygen range 1.58-2.40 mg/L, mean 1.91 mg/L
  - turbidity range 15.8-124.0 FNU, mean 64.7 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 41 was inundated from the first recorded monitoring in February through June. The maximum inundation area was 1.43 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range. Turbidity had a small range, with low levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected February through July, six monitoring events
  - Inundated February through June
  - Inundation range 0.18-1.43 acres, mean 0.84 acres
  - Depth range 12-69 cm, mean 49 cm
  - pH range 6.27-6.70, mean 6.41
  - temperature range 13.03°-18.59° C, mean 15.10° C
  - dissolved oxygen range 3.30-8.18 mg/L, mean 6.44 mg/L
  - turbidity range 0.9-31.4 FNU, mean 7.8 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 41 was inundated intermittently from the end of January through the end of April. The maximum inundation area was 0.50 acres. Water quality was generally within historical ranges. Slightly acidic pH to normal values were observed. Dissolved oxygen in January and turbidity in April were highest on record, but otherwise water quality parameters were within the historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 12 monitoring events
  - Inundated intermittently from January through August, dried out two times
  - Inundation range 0-0.50 acres, mean 0.09 acres
  - Depth range 0-56 cm, mean 16.23 cm
  - pH range 6.26-7.08, mean 6.53
  - temperature range 11.9°-17.6° C, mean 14.13° C
  - dissolved oxygen range 0.01-17.16 mg/L, mean 4.87 mg/L
  - turbidity range 1.46-151.21 FNU, mean 53.43 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 41 did not fill
  - Data collected Jan-March, three monitoring events
- 2022 (Chenega, 2023)
  - In consecutive below normal water year, Pond 41 was briefly inundated in January
  - Yearly cumulative precipitation of 11.69 inches
  - Data collected October - March, six monitoring events
  - Inundation range 0-0.007 acres
  - Depth range 0-24 cm
  - pH single reading of 7.15

  - temperature single reading of 14.9° C
  - dissolved oxygen single reading of 9.67 mg/L
  - turbidity single reading of 1.69 FNU
- 2023
  - In a well above normal water-year, Pond 41 was inundated from the second monitoring event in January to June, when the last monitoring event occurred. The maximum inundation area was 1.63 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen values were within a moderate range. Turbidity values were within a narrow range, with low levels.
  - Yearly cumulative precipitation of 27.22 inches (from Oct 1st to June 30th)
  - Data collected December through June, seven monitoring events
  - Inundated January through June
  - Inundation range 1.24-1.73 acres, mean 1.48 acres
  - Depth range 34-86 cm, mean 65.5 cm
  - pH range 6.33-6.83, mean 6.56
  - temperature range 9.7°-16.7° C, mean 13.46° C
  - dissolved oxygen range 5.16-12.5 mg/L, mean 7.85 mg/L
  - turbidity range 1.42-9.98 FNU, mean 4.01 FNU

Table B-8. Pond 42 (Year 5 Post-Subsurface Munitions Remediation)
Historical Hydrology Results on Former Fort Ord 1997-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1998	Dec	8.90	NS	NS	40.0 (NTU)	68	0.46
	Jan	NS	NS	NS	4.5-5.0 (NTU)	75	0.77
	Feb	7.40	NS	NS	3.0 (NTU)	76	0.96
	April	NS	NS	NS	NS	74	0.96
2000	1/26/2000	NS	NS	NS	NS	41	0.46
	2/23/2000	NS	NS	NS	NS	NS	0.69
	3/13/2000	5.91	NS	NS	2.42 (NTU)	>76	0.82
	6/15/2000	NS	NS	NS	NS	20	0.01
2001	1/12/2001	NS	NS	NS	NS	41	0.34
	3/26/2001	6.30	NS	NS	NS	46	0.11
	4/18/2001-4/19/2001	7.40	NS	NS	NS	15	-
	5/23/2001-5/24/2001	-	-	-	-	0	0.00
2002	1/23/2002	NS	NS	NS	10.8 (NTU)	18	0.07
	2/25/2002	NS	NS	NS	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	NS	NS	16.0 (NTU)	25	0.11
	2/24/2003	NS	NS	NS	NS	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
	6/15/2017ǂ	5.54	17.01	2.63	70.4	~28	0.34
	7/7/2017	-	-	-	-	0	0.00
2018	1/15/2018	6.82	18.26	0.65	93.9	5	0.001
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018^	6.78	15.61	6.85	40.3	13	0.02
	4/16/2018	6.79	12.18	8.69	16.1	24	0.24
	5/21/2018	-	-	-	-	0	0.00

Table B-8. Pond 42 (Year 5 Post-Subsurface Munitions Remediation)
Historical Hydrology Results on Former Fort Ord 1997-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2019	1/16/2019^	6.84	11.99	9.94	14.8	15	0.03
	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^	NS	NS	NS	NS	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^	NS	NS	NS	NS	22	0.1075
	4/3/2020^	7.21	20.1	9.86	1.62	36	0.3487
	4/15/2020*	NS	NS	NS	NS	51	NS
	4/29/2020^	7.17	18.1	9.23	0.74	41	0.3787
	5/19/2020*	NS	NS	NS	NS	26	NS
	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
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021^	6.84	18.9	5.56	449.52	0.0082	10
	2/10/2021	-	-	-	-	0	0
	2/12/2021	NS	NS	NS	NS	2	NS
	3/10/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0
2022	10/28/2021	-	-	-	-	0.00	0
	11/17/2021	-	-	-	-	0.00	0
	12/15/2021	-	-	-	-	0.00	0
	1/12/2022^	7.15	14.9	9.67	1.69	24.00	0.0068
	2/1/2022	-	-	-	-	0	0
	3/2/2022	-	-	-	-	0	0
2023	2022-12-14^	NS	NS	NS	NS	10	NS
	2023-01-12^	6.85	14	11.07	10.15	30	0.3035

Table B-8. Pond 42 (Year 5 Post-Subsurface Munitions Remediation)
Historical Hydrology Results on Former Fort Ord 1997-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
	2023-02-16^§	6.85	14	11.07	10.15	30	0.0403
	2023-03-31	6.95	11.4	14.73	31.32	17	0.099
	2023-04-26	7.35	13.5	10.59	1.98	60	0.5312
	2022-12-14^	6.98	18.5	9.01	1.95	37	0.3632

NS – not surveyed, ^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, ǂDepth estimated due to reduced visibility through the emergent vegetation

Pond 42 was monitored thirteen years between 1997 and 2023. Burn activities occurred in October 2017 and mastication and Munitions remediation activities occurred in the summer of 2018. In 2023, Pond 42 was in Year 5 of monitoring for post-subsurface munitions remediation. All years prior to 2018 are baseline. The historical data and precipitation are summarized below:

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

  - Inundated January through April
  - Inundation range 0.11-0.34, mean 0.15 acres
  - Depth range 15-46 cm, mean 34 cm
  - pH range 6.30-7.40, mean 6.85
- 2002 (Mactec, 2003)
  - In a precipitation year below normal, Pond 42 held water from January through April with a maximum recorded inundation of 0.07 acres. Turbidity was the only water quality parameter measured.
  - Yearly cumulative precipitation 11.42 inches
  - Data collected January-May, five monitoring events
  - Inundated January through February
  - Inundation range 0.04-0.07 acres, mean 0.06 acres
  - Depth range 13-18 cm, mean 16 cm
  - Turbidity range 10.8-12.0 NTU, mean 11.4 NTU
- 2003 (Mactec, 2004)
  - In a precipitation year below normal, Pond 42 held water from January through April with a maximum recorded inundation of 0.11 acres. Water quality data were only collected once, in January.
  - Yearly cumulative precipitation 15.02 inches
  - Data collected January-March, three monitoring events
  - Inundated January through February
  - Inundation range 0.05-0.11 acres, mean 0.08 acres
  - Depth range 15-25 cm, mean 20 cm
  - pH 6.3 in January
  - turbidity 16.0 NTU in January
- 2015 (Burleson, 2016)
  - In a 0, consecutive drought year with cumulative precipitation below normal, Pond 42 did not fill.
  - Consecutive drought year with yearly cumulative precipitation 14.35 inches
  - Data collected March-May, three monitoring events
  - 0 through the entire monitoring season
- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 42 was inundated from the first recorded monitoring in January through July. The maximum inundation area was 0.806 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a large range, with a very high reading in March.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected January - July, seven monitoring events
  - Inundated January through June
  - Inundation range 0.30-0.81 acres, mean 0.55 acres
  - Depth range ~28-76 cm, mean 56 cm
  - pH range 5.54-6.97, mean 6.32
  - temperature range 9.4°-17.6° C, mean 14.0° C
  - dissolved oxygen range 2.60-11.15 mg/L, mean 5.41 mg/L
  - turbidity range 2.0 - >1000 FNU, mean 206.9 FNU
- 2018 (Burleson, 2019)

  - In a below normal water-year, Pond 42 held water for the January, March, and April monitoring, but was 0 in February and May. The maximum inundation area was 0.24 acres. Water quality was within normal ranges. Neutral pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a large range and turbidity had a small range, with moderate levels.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - May, five monitoring events
  - Inundated January, March-April
  - Inundation range 0.001-0.24 acres, mean 0.09 acres
  - Depth range 5-24 cm, mean 14 cm
  - pH range 6.78-6.82, mean 6.80
  - temperature range 12.18°-18.26° C, mean 15.35° C
  - dissolved oxygen range 0.65-8.69 mg/L, mean 5.40 mg/L
  - turbidity range 16.1-93.9 FNU, mean 50.1 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 42 was inundated from the first recorded monitoring in January through June. The maximum inundation area was 0.59 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen and turbidity had small ranges, with moderate levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - July, seven monitoring events
  - Inundated January through June
  - Inundation range 0.03-0.59 acres, mean 0.36 acres
  - Depth range 15-64 cm, mean 42 cm
  - pH range 6.45-7.14, mean 6.84
  - temperature range 10.40°-19.59° C, mean 14.47° C
  - dissolved oxygen range 4.42-9.94 mg/L, mean 7.08 mg/L
  - turbidity range 0.8-28.2 FNU, mean 10.7 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 42 was inundated intermittently from the first recorded monitoring in December through May. The maximum inundation area was 0.38 acres. Water quality was within Historical ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature value in May was highest on record. Dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - June, 15 monitoring events
  - Inundated intermittently from December through May, dried out twice
  - Inundation range 0-0.38 acres, mean 0.11 acres
  - Depth range 0-51 cm, mean 17.88 cm
  - pH range 6.75-7.95, mean 7.32
  - temperature range 14.7°- 31.6° C, mean 19.96° C
  - dissolved oxygen range 6.86-10.24 mg/L, mean 8.81 mg/L
  - turbidity range 0.05-4.87 FNU, mean 2.03 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 42 was intermittently inundated in February
  - Maximum inundation area was 0.008, and maximum depth was 10 cm

- 2022 (Chenega, 2023)
  - In consecutive below normal water year, Pond 42 was briefly inundated in December
  - Yearly cumulative precipitation of 11.69 inches
  - Data collected October - March, 6 monitoring events
  - Inundation range 0-0.01 acres
  - Depth range 0-12 cm
  - pH single reading of 6.35
  - temperature single reading of 14.3° C
  - dissolved oxygen single reading of 7.53 mg/L
  - turbidity single reading of 167.36 FNU
- 2023
  - In a well above normal water-year, Pond 42 was inundated from the first recorded monitoring in December through April, when the last monitoring event occurred. The maximum inundation area was 0.53 acres. Water quality was within normal ranges. Slightly basic to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen values were within a narrow range. Turbidity values were within a moderate range.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December - April, six monitoring events
  - Inundated January through April
  - Inundation range 0.03-0.53 acres, mean 0.26 acres
  - Depth range 10-60 cm, mean 36 cm
  - pH range 6.85-7.35, mean 7.03
  - temperature range 11.4°-18.5° C, mean 14.35° C
  - dissolved oxygen range 9.01-14.73 mg/L, mean 11.35 mg/L
  - turbidity range 1.95-31.32 FNU, mean 11.35 FNU

Table B-9. Pond 43 (Year 5 Post-Subsurface Munition Remediation) Historical Hydrology Results on Former Fort Ord 1997-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
1998	Dec	9.72	NS	NS	75.0 (NTU)	24	0.04
	Jan	NS	NS	NS	5.5 (NTU)	29	0.04
	Feb	7.31	NS	NS	10.7 (NTU)	36	0.04
	Apr	NS	NS	NS	NS	36	0.04
2000	1/26/2000	NS	NS	NS	NS	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^	NS	NS	NS	NS	6	0.002
	2/12/2019^	6.83	10.59	8.91	35.0	34	0.06
	3/6/2019^	7.05	14.47	8.73	4.4	28	0.05
	4/2/2019^	7.47	20.00	9.93	1.0	19	0.01
	5/7/2019	-	-	-	-	0	0.00
2020	12/6/2019^	NS	NS	NS	NS	19	0.0113
	12/31/2019	NS	NS	NS	NS	16	-
	1/8/2020^	NS	NS	NS	NS	9	-
	1/29/2020^	9.08	18.2	16.63	1.51	16	0.0077
	2/19/2020	-	-	-	-	0	0
	3/11/2020	-	-	-	-	0	0
	3/19/2020^	NS	NS	NS	NS	21	0.0117
	4/3/2020	7.99	21.7	11.17	0.49	28	0.0404
	4/15/2020*	NS	NS	NS	NS	31	-
	4/29/2020	7.84	21.7	11:05	0.62	17	0.0084
	5/26/2020	-	-	-	-	0	0
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0
2023	2022-12-14	-	-	-	-	0	0
	2023-01-12	7.48	15	8.71	10.99	30	0.0544
	2023-02-16^§	8.34	13.3	14.61	156.26	15	0.0109
	2023-03-30	7.99	19.9	11.18	2.27	35	0.0881
	2023-04-26	-	-	-	-	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, §Probe not fully submerged

Pond 43 was monitored nine years between 1997 and 2023. Burn activities occurred in 2017 and munition remediation activities occurred in 2018. In 2023, Pond 43 was in Year 5 of monitoring for post-subsurface munition remediation. The historical data and precipitation are summarized below:

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

  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - April, four monitoring events
  - 0 during all monitoring events
  - No water quality data were collected
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 43 was inundated from the first recorded monitoring in January through April. The maximum inundation area was 0.06 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range with low levels. Turbidity was moderate.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - May, five monitoring events
  - Inundated January through April
  - Inundation range 0.002-0.06 acres, mean 0.03 acres
  - Depth range 6-34 cm, mean 22 cm
  - pH range 6.83-7.47, mean 7.12
  - temperature range 10.59°-20.00° C, mean 15.02° C
  - dissolved oxygen range 8.73-9.93 mg/L, mean 9.19 mg/L
  - turbidity range 1.0-35.0 FNU, mean 13.5 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 43 was inundated intermittently from the first recorded monitoring in December through April. The maximum inundation area was 0.04 acres. Water quality was generally within Historical ranges. Slightly alkaline pH values were observed. Dissolved oxygen value in January was highest on record. Temperature and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 11 monitoring events
  - Inundated from December through April
  - Inundation range 0-0.04 acres, mean 0.01 acres
  - Depth range 0-31 cm, mean 14.27 cm
  - pH range 7.84-9.08, mean 8.3
  - temperature range 18.2°-21.7° C, mean 20.53° C
  - dissolved oxygen range 11.17-16.63 mg/L, mean 13.9 mg/L
  - turbidity range 0.49-1.51 FNU, mean 0.87 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 43 did not fill
  - Data collected Jan-March, three monitoring events
- 2023
  - In a well above normal water-year, Pond 43 was inundated from the second monitoring event in January through March. The maximum inundation area was 0.09 acres. Water quality was within normal ranges. Basic pH values were observed with a maximum value of 8.34. Temperature was within normal averages for Fort Ord. Dissolved oxygen and turbidity values were within moderate ranges.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December - April, five monitoring events
  - Inundated January through March
  - Inundation range 0.01-0.09 acres, mean 0.05 acres

- Depth range 15-35 cm, mean 27 cm
- pH range 7.48-8.34, mean 7.94
- temperature range 13.3°-19.9° C, mean 16.07°C
- dissolved oxygen range 8.71-14.61 mg/L, mean 11.5 mg/L
- turbidity range 2.27-156.26 FNU, mean 56.51 FNU

Table B-10. Pond 44 (Year 5 Post-Subsurface Munitions Remediation)
Historical Hydrology Results on Former Fort Ord 1997-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2003	Dec	8.15	NS	NS	60.0 (NTU)	25	0.19
	Jan	NS	NS	NS	2.9 (NTU)	31	0.19
	Feb	7.50	NS	NS	3.8 (NTU)	37	0.19
	Apr	NS	NS	NS	NS	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
2019	1/16/2019^	-	-	-	-	0	0.00
	2/12/2019^	6.71	10.75	8.16	20.3	24	0.18
	3/6/2019^†	7.07	15.55	9.43	5.1	15	0.02
	4/2/2019^	-	-	-	-	0	0.00
2020	12/6/2019^	NS	NS	NS	NS	12	0.0085
	12/31/2019^	NS	NS	NS	NS	9	NS
	1/8/2020	-	-	-	-	0	0
	1/29/2020^†	7.46	16.9	11.31	2.93	7	0.005
	2/19/2020	-	-	-	-	0	0
	3/11/2020	-	-	-	-	0	0
	3/19/2020^	NS	NS	NS	NS	14	0.0126
	4/3/2020^	7.54	22.5	10.91	1.05	17	0.0151
	4/15/2020*	NS	NS	NS	NS	21	NS
	4/29/2020^	NS	NS	NS	NS	2	0.0018
	5/26/2020	-	-	-	-	0	0
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	2021-03-25	-	-	-	-	0	0
2023	2022-12-12^	NS	NS	NS	NS	7	NS
	2023-01-12	7.01	15.1	8.06	4.08	23	0.1705
	2023-02-16^†	7.47	14.5	12.16	5.11	11	0.0124
	2023-03-30	7.29	16.1	10.43	2.07	30	0.208
	2023-04-26					0	0

NS – not surveyed, †Water quality probe was on its side for measurements.
^Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.
*taken during Burleson surveys

Pond 44 was monitored eight years between 1997 and 2023. Mastication activities occurred in 2017 and Munitions remediation occurred in 2018. In 2023, Pond 44 was in Year 5 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 help water only in peripheral puddles the were not have surface hydrological connectively to the staff gauge.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January-April, four monitoring events
  - 0 in all monitoring events
  - No water quality data collected
- 2019 (Burleson, 2019)
  - In an above normal water-year, Pond 44 was inundated only for February and March. Peripheral ponding that was not hydrologically connected to the staff gauge was

observed in January and April. The maximum inundation area was 0.18 acres. Water quality data were collected in February and March and were within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen and turbidity had small ranges, with moderate levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - April, four monitoring events
  - Inundated February and March
  - Inundation range 0.02-0.18 acres, mean 0.10 acres
  - Depth range 15-24 cm, mean 20 cm
  - pH range 6.71-7.07, mean 6.89
  - temperature range 10.75°-15.55° C, mean 13.15° C
  - dissolved oxygen range 8.16-9.43 mg/L, mean 8.80 mg/L
  - turbidity range 5.1-20.3 FNU, mean 12.7 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 44 was inundated intermittently from the first recorded monitoring in December through April. The maximum inundation area was 0.02 acres. Water quality was within Historical ranges. Slightly alkaline pH values were observed. Temperature value in April was highest on record. Dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 11 monitoring events
  - Inundated intermittently from December through April, dried out twice
  - Inundation range 0-0.02 acres, mean 0.01 acres
  - Depth range 0-21 cm, mean 7.46 cm
  - pH range 7.46-7.54, mean 7.5
  - temperature range 16.9°- 22.5° C, mean 19.7° C
  - dissolved oxygen range 10.91-11.31 mg/L, mean 11.11 mg/L
  - turbidity range 1.05-2.93 FNU, mean 1.99 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 44 did not fill
  - Data collected Jan-March, three monitoring events
- 2023
  - In a well above normal water-year, Pond 44 was inundated from the first monitoring event in January through March. Peripheral ponding that was not hydrologically connected to the staff gauge was observed in December and February. The maximum inundation area was 0.17 acres. Water quality data were collected in January through March and were within normal ranges. Neutral to slightly basic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen and turbidity had narrow ranges, and turbidity values were low.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December - April, four monitoring events
  - Inundated January through March
  - Inundation range 0.01-0.2 acres, mean 0.13 acres
  - Depth range 7-30 cm, mean 17.75 cm
  - pH range 7.01-7.47, mean 7.26
  - temperature range 15.1°-16.1° C, mean 15.23° C

- dissolved oxygen range 8.06-12.16 mg/L, mean 10.22 mg/L
- turbidity range 2.07-5.11 FNU, mean 3.75 FNU

Table B-17. Pond 54 (Year 5 Post-Subsurface Munitions Remediation) Historic Hydrology Results on Former Fort Ord from 2004-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2004	1/27/2004	7.12	-	-	120.0 (NTU)	13	0.001
	3/3/2004	7.42	-	-	143.7 (NTU)	23	1.37
	3/24/2004	6.83	-	-	1000.0 (NTU)	15	0.003
	April	-	-	-	-	DRY	0.00
2009	3/12/2009	-	-	-	-	8	-
	4/2/2009	-	-	-	-	10	-
	4/22/2009	-	-	-	-	0	-
2017	1/23/2017	6.64	10.13	2.82	8.4	54	1.60
	2/28/2017	6.63	8.26	4.92	5.3	112	3.09
	3/22/2017	6.51	13.78	0.04	29.7	111	3.10
	4/18/2017	6.85	15.06	5.55	37.6	108	2.95
	5/25/2017	6.69	17.32	6.08	69.3	78	2.21
	6/21/2017	6.98	23.28	7.22	10.5	~60ǂ	1.90
	7/31/2017	-	-	-	-	DRY	0.00
2018	1/18/2018	-	-	-	-	DRY	0.00
	2/22/2018	-	-	-	-	DRY	0.00
	3/20/2018	6.19	10.07	3.82	35.2	22	0.001
	4/16/2018	6.47	12.90	13.76	24.1	28	0.003
	5/22/2018	-	-	-	-	DRY	0.00
2019	1/17/2019‡	6.13	12.09	6.62	127.0	28	0.002
	2/12/2019‡	6.62	9.37	9.16	12.7	46	1.62
	3/4/2019‡	6.70	17.73	11.26	9.1	58	1.95
	4/2/2019‡	6.34†	15.88†	6.82†	2.6†	63	2.00
	5/6/2019‡	5.98	15.57	4.49	6.1	40	1.66
	6/10/2019	5.92	20.45	4.99	28.6	15	0.0003
	7/9/2019	-	-	-	-	DRY	0.00
2021	1/7/2021						0
	2/2/2021						0
2023	2022-12-14‡	NS	NS	NS	NS	16	NS
	2023-01-12^	6.3	10.9	4.45	7.96	43	1.5578
	2023-02-15^	6.73	6	9.42	2.22	42	1.5863
	2023-03-30^	6.68	11.4	3.53	4.7	94	3.0029
	2023-04-28^	7.1	16.8	9	21.58	69	2.1345
	2023-05-12^	6.41	15.5	5.17	58.06	59	1.9998
	2023-06-09^	NS	NS	NS	NS	50	1.6187

NS – not surveyed, ǂDecreased visibility due to emergent vegetation; †Water quality probe was on its side for measurements; ‡Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge; ^ water quality measurements were taken from the edge of the pond

Pond 54 was monitored seven years between 2004 and 2023. Mastication activities occurred in 2015, and subsurface munitions remediation occurred in 2018. In 2023, Pond 54 was in Year 5 of monitoring for post-subsurface munitions remediation. The historic data and precipitation are summarized below:

- 2004 (Mactec, 2005)
  - In a below-normal water year, Pond 54 was inundated from the first recorded monitoring in January through March. The maximum inundation area was 1.37 acres. Water quality was within normal ranges, with slightly acidic pH values and relatively high turbidity. Temperature and dissolved oxygen were not measured.
  - Yearly cumulative precipitation 13.45 inches
  - Data collected January - April, four monitoring events
  - Inundated January through March
  - Inundation range 0.00-1.37 acres, mean 0.34 acres
  - Depth range 13-23 cm, mean 17 cm
  - pH range 6.83-7.42, mean 7.12
  - turbidity range 120-1000 NTU, mean 421 NTU
- 2009 (Shaw, 2010)
  - Depth values were taken from data sheets not included in the report.
  - Maximum depth was 10 cm
- 2017 (Burleson, 2018)
  - After the end of a historic drought with precipitation above-normal, Pond 54 was inundated from the first recorded monitoring in January through July. The maximum inundation area was 3.10 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a wide range, with moderate levels. Turbidity had a moderate range.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected January - July, seven monitoring events
  - Inundated January through June
  - Inundation range 1.60-3.10 acres, mean 2.47 acres
  - Depth range 54-112 cm, mean 87 cm
  - pH range 6.51-6.98, mean 6.72
  - temperature range 8.3°-23.3° C, mean 14.6° C
  - dissolved oxygen range 0.04-7.22 mg/L, mean 4.44 mg/L
  - turbidity range 5.3-69.3 FNU, mean 26.8 FNU
- 2018 (Burleson, 2019)
  - In a below-normal water-year, Pond 54 was inundated in March and April. The maximum inundation area was 0.003 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal ranges for Fort Ord. Dissolved oxygen had a large range. Turbidity had low levels.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - May, five monitoring events
  - Inundated March and April
  - Inundation range 0.001-0.003 acres, mean 0.002 acres
  - Depth range 22-28 cm, mean 25 cm
  - pH range 6.19-6.47, mean 6.33
  - temperature range 10.07°-12.90° C, mean 11.49° C
  - dissolved oxygen range 3.82-13.76 mg/L, mean 8.79 mg/L

  - turbidity range 24.1-35.2 FNU, mean 29.7 FNU
- 2019 (Burleson, 2020)
  - In an above-normal water-year, Pond 54 was inundated from the first recorded monitoring in January through June. The maximum inundation area was 2.00 acres. Water quality was within normal ranges. Moderately to slightly acidic pH values were observed. Temperature was within normal ranges for Fort Ord, with a high reading in June. Dissolved oxygen had a small range with low levels. Turbidity was low on average, with a high reading in January.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - July, seven monitoring events
  - Inundated January through June
  - Inundation range 0.0003-2.00 acres, mean 1.21 acres
  - Depth range 15-63 cm, mean 42 cm
  - pH range 5.92-6.70, mean 6.28
  - temperature range 9.37°-20.45° C, mean 15.18° C
  - dissolved oxygen range 4.49-11.26 mg/L, mean 7.22 mg/L
  - turbidity range 2.6-127.0 FNU, mean 31.0 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 54 did not fill
  - Data collected Jan-Feb, two monitoring events
- 2023
  - In a well above-normal water-year, Pond 54 was inundated from the first monitoring event in December to June, when the last monitoring event occurred. The maximum inundation area was 3 acres. Water quality was within normal ranges. Slightly acidic to slightly basic pH values were observed. Temperature was within normal ranges for Fort Ord. Dissolved oxygen had a narrow range with low levels. Turbidity was low on average, with a higher reading in May.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December - June, seven monitoring events
  - Inundated December through June
  - Inundation range 1.56-3.00 acres, mean 1.98 acres
  - Depth range 16-94 cm, mean 53.29 cm
  - pH range 6.3-7.1, mean 6.64
  - temperature range 6°-16.8° C, mean 12.12° C
  - dissolved oxygen range 3.53-9.53 mg/L, mean 6.31 mg/L
  - turbidity range 4.7-58.06 FNU, mean 18.9 FNU

Table B-18. Pond 60 (Year 5 Post-Subsurface Munitions Remediation) Historical Hydrology Results on Former Fort Ord 2015-2023

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

2020	3/27/2020	6.56	16.4	5.51	13.3	70	1.4878
	4/14/2020*	NS	NS	NS	NS	79	-
	4/28/2020	6.37	16.7	1.75	18.65	73	1.6664
	5/18/2020*	NS	NS	NS	NS	61	-
	5/26/2020	NS	NS	NS	NS	55	-
	5/27/2020	6.65	18.8	0.63	2.01	54	0.2889
	6/10/2020	NS	NS	NS	NS	54	-
	6/30/2020	6.96	20.5	1.14	11.78	29	0.1207
	7/14/2020	-	-	-	-	0	0
2021	1/7/2021	-	-	-	-	0	0
	2/1/2021	6.14	15	0.43	283.97	26	0.1411
	2/10/2021	NS	NS	NS	NS	25	-
	2/12/2021	NS	NS	NS	NS	25	-
	2/24/2021	NS	NS	NS	NS	26	-
	3/02/2021	7.15	12.6	10.94	57.68	20	0.085
	3/10/2021	NS	NS	NS	NS	21	-
	3/24/2021	6.57	8.2	4.45	5.02	26	0.1346
	3/29/2021	NS	NS	NS	NS	24	-
	4/05/2021	NS	NS	NS	NS	19	-
	4/16/2021	-	-	-	-	0	0
2023	2022-12-12^	NS	NS	NS	NS	33	NS
	2023-01-20^	6.31	9.6	5.02	4.5	93	2.5282
	2023-02-17	6.54	10.3	5.5	2.33	93	2.432
	2023-04-07	6.73	14	5.88	0.82	113	2.8424
	2023-04-27	6.81	17	5.54	0.76	104	2.5525
	2023-05-11	6.67	16.7	4.57	4.63	98	2.4838
	2023-06-09	NS	NS	NS	NS	87	2.318

NS – not surveyed, § Depths are estimated due to lack of staff gauge. Pond could not be entered due to potential for subsurface unexploded ordnance hazards.

†Water quality probe was on its side for measurements.

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

*taken during Burleson surveys

Pond 60 was monitored eight years between 2015 and 2023. Mastication activities occurred in 2017 and subsurface munitions remediation occurred in 2018. Pond 60 was in Year 5 of monitoring for post-subsurface munitions remediation in 2023. The historical data and precipitation are summarized below:

- 2015 (Burleson, 2016)
  - In a consecutive drought year with below normal precipitation, Pond 60 was inundated February through May, and did not 0 by the last monitoring in May. Water quality data were collected only in April.
  - Early storms pushed early cumulative precipitation above normal while total yearly Cumulative precipitation fell below normal (14.35 inches)
  - Data collected February to May, four monitoring events
  - Inundated February to May (did not 0 by last monitoring event in May)
  - Inundation range 0.14-1.31 acres, mean 0.57 acres

  - depth range ~25- >50 cm, mean 39 cm (depths are estimations)
  - Water quality data were collected only in April
  - pH 6.40
  - temperature 25.70° C
  - dissolved oxygen 8.90 mg/L
  - turbidity 238 NTU
- 2016 (Burleson, 2017)
  - In a consecutive drought with precipitation above normal, Pond 60 was inundated from the first recorded monitoring in April through September. The maximum inundation area was 2.646 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a moderate range. Turbidity was low on average with a few high readings in August and September. It is likely that Pond 60 was inundated earlier in the water-year and maximum inundation was most likely not captured. It should be noted that data collection did not start with the first storm or inundation.
  - Consecutive drought year with yearly cumulative precipitation 21.21 inches
  - Data collected April - October, eight monitoring events
  - Inundated April through September
  - Inundation range 0.01-2.65 acres, mean 1.58 acres
  - depth range 12-130 cm, mean 73 cm
  - pH range 6.18-7.41, mean 6.51
  - temperature range 15.03°-26.38° C, mean 19.63° C
  - dissolved oxygen range 0.00-10.86 mg/L, mean 3.94 mg/L
  - turbidity range 7.6-415 FNU, mean 123.4 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 60 was inundated from the first recorded monitoring in January through July. The maximum inundation area was 0.77 acres. Water quality was within normal ranges. Neutral to slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord with a relatively high temperature in June. Dissolved oxygen had a small range, with moderate levels. Turbidity had low levels.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - July, seven monitoring events
  - Inundated January, and March through June
  - Inundation range 0.02-0.77 acres, mean 0.25 acres
  - Depth range 18-59 cm, mean 35 cm
  - pH range 6.29-6.74, mean 6.42
  - temperature range 11.00°-28.26° C, mean 16.09° C
  - dissolved oxygen range 3.60-8.71 mg/L, mean 5.88 mg/L
  - turbidity range 00.0-25.7 FNU, mean 9.32 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 60 was inundated from the first recorded monitoring in December through September. The maximum inundation area was 2.48 acres. Water quality was within normal ranges.
  - Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord with a relatively high temperature in June. Dissolved oxygen had a small range, with moderate levels. Turbidity had moderate range, with low levels.
  - Yearly cumulative precipitation 21.97 inches

  - Data collected December - September, ten monitoring events
  - Inundated January through September
  - Inundation range 0.18-2.48 acres, mean 1.91 acres
  - Depth range 10-98 cm, mean 59 cm
  - pH range 6.36-6.84, mean 6.55
  - temperature range 9.23°-20.01° C, mean 14.16° C
  - dissolved oxygen range 4.12-9.10 mg/L, mean 6.10 mg/L
  - turbidity range 1.2-67.1 FNU, mean 15.7 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 60 was inundated from the first recorded monitoring in December through June. The maximum inundation area was 1.67 acres. Water quality was within Historical ranges. Slightly acidic to slightly alkaline pH values were observed. Temperature, dissolved oxygen, and turbidity values were within the Historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - September, 17 monitoring events
  - Inundated from December through June
  - Inundation range 0-1.67 acres, mean 0.55 acres
  - Depth range 0-79 cm, mean 51.06 cm
  - pH range 6.37-7.76, mean 6.82
  - temperature range 11.2°- 20.5° C, mean 15.69° C
  - dissolved oxygen range 0.63-5.51 mg/L, mean 3.0 mg/L
  - turbidity range 2.01-34.54 FNU, mean 14.31 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 60 was inundated from February through April
  - Maximum inundation area was 0.14 ac, and maximum depth was 26 cm
  - Data collected January -April, 11 monitoring events
  - Inundation range 0-0.14 acres, mean 0.07 acres
  - Depth range 0-26 cm, mean 19.27 cm
  - pH range 6.14-7.15, mean 6.62
  - temperature range 8.2°- 15° C, mean 11.93° C
  - dissolved oxygen range 0.43-10.94 mg/L, mean 5.27 mg/L
  - turbidity range 5.02-283.97 FNU, mean 115.56 FNU
- 2023
  - In a well above normal water-year, Pond 60 was inundated from the first recorded monitoring in December through June, when the last monitoring event occurred. The maximum inundation area was 2.84 acres. Water quality was within normal ranges.
  - Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen and turbidity values were withing a narrow range and were low.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December to June, seven monitoring events
  - Inundated December through June
  - Inundation range 2.32-2.84 acres, mean 2.53 acres
  - Depth range 33-113 cm, mean 89 cm
  - pH range 6.31-6.81, mean 6.61
  - temperature range 9.6°-16.7°C, mean 13.52°C

- dissolved oxygen range 4.57-5.88 mg/L, mean 5.3 mg/L
- turbidity range 0.76-4.63 FNU, mean 2.61 FNU

Table B-11. Pond 61 East (Year 5 Post-Subsurface Munitions Remediation)
Historical Hydrology Results on Former Fort Ord 2017-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2017	1/24/2017	5.61	7.00	1.76	59.1	21	0.70
	2/28/2017	6.66	11.13	10.54	31.3	21	0.52
	3/22/2017	6.16	15.89	4.08	76.7	21	0.62
	4/19/2017	6.48	12.26	4.31	28.8	10	0.05
	5/25/2017	-	-	-	-	0	0.00
2018	1/16/2018	-	-	-	-	0	0.00
	2/20/2018	-	-	-	-	0	0.00
	3/19/2018^	-	-	-	-	0	0.00
	4/17/2018^	-	-	-	-	0	0.00
2019	1/15/2019^	-	-	-	-	0	0.00
	2/13/2019^	6.46	9.42	9.34	52.3	20	0.06
	3/6/2019^	6.48	12.40	5.94	21.1	19	0.12
	4/3/2019^	6.79†	14.15†	6.01†	17.1†	8	0.04
	5/8/2019	-	-	-	-	0	0.00
2020	12/6/2019^	-	-	-	-	0	0.1092
	12/23/2019^	-	-	-	-	0	0
	1/8/2020^	-	-	-	-	0	0
	1/30/2020^	-	-	-	-	0	0
	2/27/2020^	-	-	-	-	0	0.009
	3/20/2020^	-	-	-	-	0	0
	3/30/2020	5.71	16.7	2.78	106.68	18	0.0801
	4/14/2020*	-	-	-	-	17	-
	4/29/2020	-	-	-	-	0	0
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	3/24/2021	-	-	-	-	0	0
2022	10/28/2021	-	-	-	-	0	0
	12/15/2021	-	-	-	-	0	0
	1/12/2022^	-	-	-	-	0	0
2023	2022-12-12^	-	-	-	-	0	0
	2023-01-20^~	6.33	11.4	10.66	16.29	21	0.6445
	2023-02-16^	6.63	8.6	11.19	12.98	17	0.2287
	2023-04-07~	6.71	14.1	8.76	14.08	18	0.6196
	2023-04-27^	-	-	-	-	0	0

NS – not surveyed, †Water quality probe was on its side for measurements.
^Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.
*taken during Burleson surveys, ~ Ponds 61 East and West hydrologically connected

Pond 61 East was monitored for six years between 2016 and 2022. Mastication activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2022, Pond 61 was in year 4 for post-subsurface Munitions remediation. The Historical data and precipitation are summarized below:

- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 61 was inundated from the first recorded monitoring in January through April. The maximum inundation area was 0.695 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a large range, with moderate levels.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected January - May, five monitoring events
  - Inundated January through April
  - Inundation range 0.05-0.70 acres, mean 0.47 acres
  - Depth range 10-21 cm, mean 18 cm
  - pH range 5.61-6.66, mean 6.23
  - temperature range 7.0°-15.9° C, mean 11.6° C
  - dissolved oxygen range 1.76-10.54 mg/L, mean 5.17 mg/L
  - turbidity range 28.8-76.7 FNU, mean 48.98 FNU
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 60 did not hold water. No water quality data were collected.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected January - April, four monitoring events
  - 0 in all monitoring events
  - No water quality data collected
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 61 was inundated from the second recorded monitoring in February through April. Peripheral ponding that was not hydrologically connected to the staff gauge was observed in January. The maximum inundation area was 0.12 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with moderate levels. Turbidity had a small range, with moderate levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - May, five monitoring events
  - Inundated February through April
  - Inundation range 0.04-0.12 acres, mean 0.07 acres
  - Depth range 8-20 cm, mean 16 cm
  - pH range 6.46-6.79, mean 6.58
  - temperature range 9.42°-14.15° C, mean 11.99° C
  - dissolved oxygen range 5.94-9.34 mg/L, mean 7.10 mg/L
  - turbidity range 17.1-52.3 FNU, mean 30.2 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 61 was inundated from late March to mid-April. The maximum inundation area was 0.11 acres. Water quality was within Historical ranges. Slightly acidic pH value was observed. Temperature, dissolved oxygen, and turbidity values were within the Historical ranges.

  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - April, nine monitoring events
  - Inundated from late March to mid-April
  - Inundation range 0-0.1 acres, mean 0.03 acres
  - Depth range 0-18 cm, mean 3.89 cm
  - pH value of 5.71
  - temperature value of 16.7° C
  - dissolved oxygen value 2.78 mg/L
  - turbidity value of 106.7 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 61 East did not fill
  - Data collected Jan-March, three monitoring events
- 2022 (Chenega, 2023)
  - In consecutive below normal water year, Pond 61 East did not fill
  - Yearly cumulative precipitation of 11.69 inches
  - Data collected October - January, three monitoring events
- 2023
  - In a well above normal water-year, Pond 61 East was inundated from the second monitoring event in January to April. Peripheral ponding was observed from December to February. Pond 61 East was hydrologically connected to Pond 61 West in January and in April. The maximum inundation area was 0.64 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen and turbidity values were within narrow ranges.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December - April, five monitoring events
  - Inundated January to April
  - Inundation range 0.22-0.64 acres, mean 0.05 acres
  - Depth range 18-21 cm, mean 19 cm
  - pH range 6.33-6.71, mean 6.56
  - temperature range 8.6°-14.1° C, mean 11.37°C
  - dissolved oxygen range 8.76-11.19 mg/L, mean 10.2 mg/L
  - turbidity range 12.98-16.29 FNU, mean 14.45 FNU

Table B-12. Pond 61 West (Year 5 Post-Subsurface Munitions Remediation)
Historical Hydrology Results on Former Fort Ord 2017-2023

Water-Year	Date	pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Turbidity (FNU)	Depth (cm)	Inundated Surface Area (acres)
2021	1/5/2021	-	-	-	-	0	0
	2/1/2021^	6.91	15.1	10.59	16.63	38	0.0214
	2/10/2021	NS	NS	NS	NS	34	NS
	3/02/2021	7.07	14.8	11.96	1.3	18	0.0048
	3/24/2021	6.95	10.7	10.14	0.07	16	0.0045
	4/05/2021	-	-	-	-	0	0
2022	10/28/2021	-	-	-	-	0	0
	12/15/2021^	6.71	13	10.61	36.83	28	0.0108
	1/12/2022^	6.84	13.4	9.52	3.17	42	0.0287
	2/1/2022	NS	NS	NS	NS	28	NS
	2/17/2022#	NS	NS	NS	NS	8	5e-04
	3/2/2022	-	-	-	-	0	0
2023	2022-12-12^	NS	NS	NS	NS	38	NS
	2023-01-20^~	6.66	10.6	12.88	11.5	51	NS
	2023-02-16^	7.56	10.5	12.21	5.91	49	0.2836
	2023-04-07~	7.95	14.5	9.81	11.09	51	0.6196
	2023-04-27^	8.16	27.6	9.4	2.89	34	0.0139

NS – not surveyed, #Water quality probe was on its side for measurements, ^Peripheral inundation present, ~ Ponds 61 East and West hydrologically connected

Pond 61 West was monitored for three years between 2021 and 2023. Mastication activities occurred in 2017 and subsurface munitions remediation activities occurred in 2018. Historically, Pond 61 West became connected to Pond 61 East in water years with above normal precipitation. In 2023, Pond 61 was in Year 5 for post-subsurface munitions remediation. The historical data and precipitation are summarized below:

- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 61 West was inundated from February through March
  - Maximum inundation area was 0.02 ac, and maximum depth was 38 cm
  - Data collected January - April, six monitoring events
  - Inundation range 0-0.02 acres, mean 0.006 acres
  - Depth range 0-38 cm, mean 17.67 cm
  - pH range 6.91-7.07, mean 6.98
  - temperature range 10.7°- 15.1° C, mean 13.53° C
  - dissolved oxygen range 10.14-11.96 mg/L, mean 10.9 mg/L
  - turbidity range 0.07-16.63 FNU, mean 6 FNU
- 2022 (Chenega, 2023)
  - In consecutive below normal water year, Pond 40 South did not fill
  - Yearly cumulative precipitation of 11.69 inches

  - Data collected October - March, 4 monitoring events
  - Inundation range 0-0.03 acres, mean 0.008 acres
  - Depth range 0-42 cm, mean 17.67 cm
  - pH range 6.71-6.84, mean 6.78
  - temperature range 13.0°- 13.4° C, mean 13.2° C
  - dissolved oxygen range 10.61-9.52 mg/L, mean 10.07 mg/L
  - turbidity range 36.83-3.17 FNU, mean 20.00 FNU
- 2023
  - In a well above normal water-year, Pond 61 West was inundated from the first monitoring event in December through April, when the last monitoring event occurred. Peripheral ponding was observed from December to February. Pond 61 West was hydrologically connected to Pond 61 East in January and in April. The maximum inundation area was 0.64 acres. Water quality was within normal ranges. Slightly acidic to basic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen and turbidity values were within narrow ranges.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December - April, five monitoring events
  - Inundated January to April
  - Inundation range 0.01-0.64 acres, mean 0.31 acres
  - Depth range 34-51 cm, mean 45 cm
  - pH range 6.66-8.16, mean 7.58
  - temperature range 10.5°-14.5°C, mean 15.8°C
  - dissolved oxygen range 9.4-12.88 mg/L, mean 11.08 mg/L
  - turbidity range 12.98-16.29 FNU, mean 7.85 FNU

Table B-13. Pond 73 (Year 5 Post-Subsurface Munitions Remediation)
Historical Hydrology Results on Former Fort Ord 2017-2023

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^	NS	NS	NS	NS	8	3e-04
	12/23/2019	NS	NS	NS	NS	7	NS
	1/6/2020^	NS	NS	NS	NS	10	NS
	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^	NS	NS	NS	NS	15	5e-04
	3/27/2020	6.61	18.1	13.06	12.06	26	0.4167
	4/20/2020*	NS	NS	NS	NS	33	NS
	4/28/2020	6.18	23.1	8.36	1.15	25	0.4074
2021	1/7/2021	-	-	-	-	0	0
	2/1/2021	-	-	-	-	0	0
	3/29/2021	-	-	-	-	0	0
2023	2022-12-12^	-	-	-	-	0	0
	2023-01-20	6.29	10.5	6.39	16.28	53	0.8443
	2023-02-17	6.92	8.6	10.37	14.04	43	0.7267
	2023-04-07	7.11	13.7	7.86	0.92	55	0.8452
	2023-04-26	7.83	23.6	9.88	5.56	41	0.6893
	2023-06-09^	-	-	-	-	0	0

^Peripheral ponding was observed but was not mapped as there was no surface hydrological connectivity between the peripheral ponding and location of the staff gauge.
#Probe not fully submerged
*taken during Burleson surveys

Pond 73 was monitored five years between 2017 and 2023. Mastication activities occurred in 2017 and Munitions remediation activities occurred in 2018. In 2023, Pond 73 was in year 5 of monitoring for post-subsurface munitions remediation. The historical data and precipitation are summarized below:

- 2017 (Burleson, 2018)
  - After the end of a Historical drought with precipitation above normal, Pond 73 was monitored once for inundation in May with an area of 0.636 acres. No depth or water quality data were collected.
  - Yearly cumulative precipitation 22.92 inches
  - Data collected in May, one monitoring event
  - Inundated January through April
  - Inundation 0.636 acres
- 2018 (Burleson, 2019)
  - In a below normal water-year, Pond 73 was inundated only in April. The maximum inundation area was 0.001 acres. Water quality data were collected in April.
  - Yearly cumulative precipitation 12.57 inches
  - Data collected November, January - May, six monitoring events
  - Inundated in April
  - Inundation 0.001 acres
  - Depth 14 cm
  - pH 6.33
  - temperature 11.33° C
  - dissolved oxygen 5.63mg/L
  - turbidity 9.5 FNU
- 2019 (Burleson, 2020)
  - In an above normal water-year, Pond 73 was inundated from the second recorded monitoring in February through May. Peripheral ponding that was not hydrologically connected to the staff gauge was observed in January. The maximum inundation area was 0.85 acres. Water quality was within normal ranges. Slightly acidic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen had a small range, with low levels. Turbidity had a large range, with low to moderate levels.
  - Yearly cumulative precipitation 21.97 inches
  - Data collected January - June, six monitoring events
  - Inundated February through May
  - Inundation range 0.57-0.85 acres, mean 0.73 acres
  - Depth range 27-56 cm, mean 46 cm
  - pH range 6.00-6.53, mean 6.33
  - temperature range 9.75°-15.39° C, mean 12.89° C
  - dissolved oxygen range 2.93-9.59 mg/L, mean 5.54 mg/L
  - turbidity range 2.4-43.5 FNU, mean 14.8 FNU
- 2020 (Chenega, 2021)
  - In a close to normal water year, Pond 73 was inundated intermittently from the first recorded monitoring in December through April. The maximum inundation area was 0.42 acres. Water quality was within Historical ranges. Slightly acidic pH values were observed. Temperature value in April was highest on record. Dissolved oxygen, and turbidity values were within the historical ranges.
  - Yearly cumulative precipitation 18.08 inches
  - Data collected December - May, 10 monitoring events

  - Inundated intermittently from December through April, dried out twice
  - Inundation range 0-0.42 acres, mean 0.12 acres
  - Depth range 0-33 cm, mean 13.9 cm
  - pH range 6.18-6.61, mean 6.45
  - temperature range 13.6°- 23.1° C, mean 18.27° C
  - dissolved oxygen range 8.36-13.06 mg/L, mean 11.08 mg/L
  - turbidity range 1.15-20.69 FNU, mean 11.3 FNU
- 2021 (Chenega, 2022)
  - In a year of lowest cumulative precipitation of 7.57 inches in last 30 years, Pond 73 did not fill
  - Data collected Jan-March, three monitoring events
- 2023
  - In a well above normal water-year, Pond 73 was inundated from the second recorded monitoring in January through June. Peripheral ponding was observed in December. The maximum inundation area was 0.85 acres. Water quality was within normal ranges. Slightly acidic to basic pH values were observed. Temperature was within normal averages for Fort Ord. Dissolved oxygen values were within a narrow range. Turbidity values were within a moderate range.
  - Yearly cumulative precipitation 27.22 inches (from Oct 1st to June 30th)
  - Data collected December to June, six monitoring events
  - Inundated January through April
  - Inundation range 0.68-0.84 acres, mean 0.78 acres
  - Depth range 41-55 cm, mean 48 cm
  - pH range 6.29-7.83, mean 7.04
  - temperature range 8.6°-23.6° C, mean 14.1° C
  - dissolved oxygen range 6.39-10.37 mg/L, mean 8.63 mg/L
  - turbidity range 0.92-16.28 FNU, mean 9.2 FNU

APPENDIX C

Site Photos

Figure C-1. Pond 5 (Reference): Hydrology Survey on 4/27/2023

Figure C-2. Pond 101 East (East) (Reference): Hydrology Survey on 4/5/2023

Figure C-3. Pond 997 (Reference): Hydrology Photo Point 1 on 2/17/2023

Figure C-4. Pond 75 (Baseline) Hydrology Photo Point 1 on 2/15/2023

Figure C-3. Pond 76 (Year 1 Post Mastication) Hydrology Photo Point 2 on 4/28/2023

Figure C-6. Pond 21 (Year 1 Post Mastication and Post Subsurface Munitions Remediation) Hydrology Survey on 3/30/2023

Figure C-7. Pond 3 North (Year 5 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 2/15/2023

Figure C-8. Pond 3 South (Year 5 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 2/15/2023

Figure C-9. Pond 16 (Year 5 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 4/28/2023

Figure C-10. Pond 35 (Year 5 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 3/31/2023

Figure C-11. Pond 39 (Year 3 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 3/31/2023

Figure C-12. Pond 40 South (Year 5 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 3/31/2023

Figure C-13. Pond 41 (Year 5 Post Subsurface munitions remediation) Hydrology Survey on 4/15/2023

Figure C-14. Pond 42 (Year 5 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 3/31/2023

Figure C-15. Pond 43 (Year 5 Post Subsurface munitions remediation) Hydrology Photo Point on 2/16/2023

Figure C-16. Pond 44 (Year 5 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 3/30/2023

Figure C-17. Pond 54 (Year 5 Post Subsurface munitions remediation) Hydrology Survey on 3/30/2023

Figure C-18. Pond 60 (Year 5 Post Subsurface munitions remediation) Hydrology Photo Point on 4/27/2023

Figure C-19. Pond 61 East (Year 5 Post Subsurface munitions remediation) Hydrology Photo Point 2 on 2/16/2023

Figure C-20. Pond 61 West (Year 5 Post Subsurface munitions remediation) Hydrology Photo Point 1 on 2/16/2023

Figure C-21. Pond 73 (Year 5 Post Subsurface munitions remediation) Hydrology Survey on 2/17/2023