AQUATIC RESOURCES DELINEATION REPORT

Glen Canyon Recreation Area
Bullfrog Launch Ramp Relocation
Lake Powell, Utah

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ACRONYMS USED

AgACIS	Agricultural Applied Climate Information System
AMSL	above mean sea level
APE	Area of Potential Effect
CFR	Code of Federal Regulations
CWA	Clean Water Act
EPA	Environmental Protection Agency
FGDC	Federal Geographic Data Committee
GLCA	Glen Canyon Recreation Area
GPS	Global Positioning System
HUC	Hydrologic Unit Code
NHD	National Hydrography Dataset
NPS	National Park Service
NWI	National Wetlands Inventory
NWPR	Navigable Waters Protection Rule
OHWM	Ordinary High Water Mark
SWReGAP	Southwest Regional Gap Analysis Program
TNW	Traditional Navigable Water
USACE	US Army Corps of Engineers
USDA	US Department of Agriculture
USGS	US Geologic Survey
WOTUS	Waters of the Us
WSP	WSP USA, Inc.

EXECUTIVE SUMMARY

Qualified ecologists from WSP USA Inc. visited the Bullfrog Marina in Glen Canyon Recreation Area on October 11-12, 2022, to evaluate and delineate aquatic resources within the Area of Potential Effect (APE) for the Bullfrog Launch Ramp Project (Project; Figure 1).

Aquatic resource delineations were performed for the proposed Project located in Kane County, Utah. The APE is located within the Bullfrog Bay – Colorado River Hydrologic Unit (12-digit hydrologic unit code 140700011301).

Wetland delineations were performed in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) the *Regional Supplement to the Corps of Engineers Delineation Manual: Arid West Region* (Version 2.0; USACE 2008a), and the 2016 *National Park Service Procedural Manual #77-1: Wetland Protection* (NPS 2016). For water features determined to be streams, delineations were conducted in accordance with *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2008b).

Seven wetlands, 17 ephemeral drainages, and 1 deepwater lacustrine limnetic system were observed within the APE. Four of the 7 wetlands exhibited hydrophytic vegetation, hydric soil, and wetland hydrology indicators and are likely Waters of the US (WOTUS) subject to USACE jurisdiction (USACE 1987). Three wetlands did not exhibit all 3 indicators but did exhibit wetland hydrology indicators and meet the National Park Service definition of a wetland (NPS 2016). All 17 ephemeral drainages possess a bed, bank, and OHWM indicators and are potential WOTUS (i.e., likely subject to USACE jurisdiction). All 17 ephemeral drainages generally flow from north to south ultimately into Lake Powell, a Traditional Navigable Water. All ephemeral drainages within the APE are solely charged from stormwater runoff during precipitation events.

1 INTRODUCTION

The National Park Service (NPS) Glen Canyon National Recreation Area (GLCA) is initiating a project to provide ongoing visitor services via a new sustainable roadway, boat ramp, parking lot, and the installation of utilities (water, sewer, and electric) at Bullfrog Marina on North Lake Powell (Project). A ramp extension at Bullfrog was completed this spring and provides access to water elevation 3,529 feet for houseboats and to 3,525 feet for smaller vessels. Bullfrog remains the only low-water access to North Lake Powell at this time. Constructing an additional low-water ramp at Bullfrog would provide continued lake access to an elevation of 3,450 feet.

The NPS contracted WSP USA Inc. (WSP) to conduct a wetland delineation and prepare a wetland delineation report and wetland geodatabase to meet NPS Director's Order (DO)-77.1 standards for sites, and US Army Corps of Engineers (USACE) standards for sites in Utah.

WSP prepared this Aquatic Resources Delineation Report (report) for the proposed Bullfrog Launch Ramp Relocation Project (Project) on behalf of the NPS. This report was developed in accordance with the USACE *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports*, dated January 2016 (USACE, 2016) and describes wetland and waterway resources observed in the APE during the October 2022 field visit. Pertinent jurisdictional information and field data for the water resources located in the Area of Potential Effect (APE) are also included.

1.1 NPS Director's Order #77-1: Wetland Protection

The purpose of the Director's Order is to establish NPS policies, requirements, and standards for implementing Executive Order (E.O.) 11990: "Protection of Wetlands" (42 Fed. Reg. 26961). E.O. 11990 was issued by President Carter in 1977 in order "…to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative...."

Included in DO #77-1 were: 1) adoption of a "no net loss of wetlands" goal, which was first proclaimed in 1989 by President George Bush and has been sustained by subsequent Administrations; and 2) adoption of the Cowardin et al. (1979) wetland classification system as the NPS standard for defining, classifying, and inventorying wetlands.

Actions proposed by the NPS that have the potential to have adverse impacts on wetlands will be evaluated through the National Environmental Policy Act (NEPA) planning and compliance process. Regardless of the associated NEPA compliance pathway (environmental assessment, environmental impact statement, or categorical exclusion), a Wetland Statement of Findings documenting compliance with this Director's Order and Procedural Manual #77-1 will be completed for proposed actions that would result in adverse impacts on wetlands. Actions that may be excepted from the Statement of Findings requirement are identified in the Procedural Manual.

For the purpose of delineating jurisdictional wetlands and determining compliance with NPS DO#77-1: Wetland Protection, the jurisdictional parameters defined for compliance with Clean Water Act (CWA) Section 404 permitting do not apply. For example, all wetlands defined by the Cowardin classification system (Classification of Wetlands and Deepwater Habitats. Of the US),

regardless of size or isolation, and all ephemeral, intermittent, or perennial riverine wetland stream channels are under NPS jurisdiction. Therefore, all wetlands are under NPW jurisdiction and should be delineated and evaluated for functional value.

1.2 CLEAN WATER ACT

The CWA was implemented to restore and maintain the chemical, physical and biological integrity of the nation's waters. Under Sections 401 and 404 of the CWA, permits must be issued for certain activities that may impact wetlands or waterways and water quality. Section 404 of the CWA requires that a permit be obtained for the discharge of dredged or fill material into Waters of the US (WOTUS), including wetlands. WOTUS are defined under 33 Code of Federal Regulations (CFR) Parts 328.3(a) and (b), and wetlands are defined under 33 CFR Parts 328.3(b) and (c). The permitting agency responsible for Section 404 permits is the USACE. The Project falls within the jurisdiction of the USACE Sacramento District.

Section 401 of the CWA requires a water quality certification or waiver for any federal permitted action involving discharges into WOTUS to ensure that the permitted action will not violate the state's water quality standards or impair designated uses.

Recently, several federal and state CWA cases regarding the legal definition of WOTUS have been litigated at the District Court level. These cases addressed the regulatory definition of WOTUS proposed in 2015. A South Carolina District Court stay issued on August 16, 2018, resulted in 22 states using the 2015 definition of WOTUS, while 28 other states retained the 1986 WOTUS definition. The 2015 definition of WOTUS was repealed in December 2019, and the US Environmental Protection Agency and USACE redefined WOTUS in the 2020 Navigable Waters Protection Rule (NWPR), which took effect on June 22, 2020. On August 30, 2021, in the case of Pascua Yaqui Tribe v. US Environmental Protection Agency (EPA), the US District Court for the District of Arizona vacated and remanded the NWPR. In light of this order, the EPA and USACE halted implementation of the NWPR and, until further notice, are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime.

1.3 WETLANDS CLASSIFICATIONS

USACE Definition — The USACE definition of a wetland requires three positive indicators of environmental parameters: hydrology, hydric soil, and hydrophytic vegetation (USACE 1987).

NPS Definition — Any area that is classified as a wetland according to the Federal Geographic Data Committee (FGDC) Wetlands Classification Standard (FGDC-STD-004-2013) is subject to D.O. #77-1. Under the FGDC Wetlands Classification Standard, a wetland must have one or more of the following three attributes:

1. At least periodically, the land supports predominantly hydrophytes (wetland vegetation).
2. The substrate is predominantly undrained hydric soil.
3. The substrate is non-soil and is saturated with water or covered by shallow water during the growing season of each year.

All of the attributes present at a particular site must be used to identify wetlands, as follows:

- If plants and soil are present (e.g., swamps, marshes, or wet meadows), then all three attributes (wetland hydrology, hydrophytic vegetation and hydric soil) are required for positive wetland identification.
- If plants are present but soil is absent (e.g., vegetated rock substrates), then a predominance of hydrophytic vegetation and presence of wetland hydrology are required for positive wetland identification.
- If plants are absent but soil is present (e.g., playas or mudflats), then a predominance of undrained hydric soil and wetland hydrology are required for positive wetland identification.
- If neither plants nor soil are present (e.g., rocky shorelines or unvegetated shallow stream bottoms), then wetland identification must be made solely on the basis of hydrology.

The boundary between wetlands and deepwater habitat in the Riverine and Lacustrine Systems lies at a depth of 2.5 meter (8.2 feet) below low water (FGDC 2013). The 2.5-meter lower limit for inland wetlands was selected because it approximates the maximum depth to which emergent plants normally grow (Welch 1952; Zhadin and Gerd 1963; Sculthorpe 1967) and the depth beyond which soil does not occur, according to the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS; Soil Survey Staff 1999).

2 PROJECT LOCATION

The Project is located in Bullfrog Marina in Kane County, Utah. Bullfrog Marina is one of the NPS recreation sites of the GLCA and is located approximately 13 miles southwest of the unincorporated community of Ticaboo in Garfield County, Utah (Appendix I, Figure 1). The APE can be reached from Green River, Utah, by traveling southwest on Interstate-70 for approximately 10 miles; southwest on Utah Highway-24 for about 44 miles; southeast on Utah Highway-95 for approximately 26 miles; and then south on Utah Highway-276 for approximately 39 miles to the APE at latitude 37.533156° North, longitude -110.704717° West. The APE includes 331.43 acres and encompasses the proposed Project.

The APE extends approximately 3.7 miles southeast between latitude 37. 533156° North, longitude -110.704822° West at the north end to latitude 37. 704717°N, longitude -110.693056°W at the south end.

- Center coordinates: 37.500365°N, -110.7693952W
- Universal Transverse Mercator: 526518.05 Easting, 4151570.61 Northing
- Public Land Survey System: Sections 04, 05, 09, 15, 16, 21, 22, 27, 27 of Township 38 South, Range 11 East
- Name of nearest waterbody: Lake Powell
- Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Lake Powell
- Name of watershed or Hydrologic Unit Code (HUC): Bullfrog Bay – Colorado River 140700011301

3 METHODS

3.1 DESKTOP ASSESSMENT

Prior to conducting field delineations, a desktop review was conducted to locate areas where potential water features may be observed in the APE. The review included hydric soil maps, US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) and US Geological Survey (USGS) National Hydrography Dataset (NHD) maps (Appendix I, Figure 3); and current and historic Google Earth aerial imagery were reviewed to determine potential locations of wetlands and waterways in the APE based on soil, hydrology, vegetation, functions, and related characteristics.

Based on results of the desktop review, it was determined that field verification was necessary to determine the presence and extent of wetlands and waterways in the APE. The entire APE was field surveyed for aquatic resources.

3.2 AQUATIC RESOURCES DELINEATION

Ecologists from WSP conducted the field evaluation and delineation on October 11-12, 2022, within the APE. The field evaluation was conducted during the growing season for the region, as defined by the Agricultural Applied Climate Information System (AgACIS). AgACIS lists the growing season for this area of Kane County as generally March to November (USDA NRCS 2020). The APE encompasses approximately 331.43 acres and includes the proposed limits of disturbance for the Project (Appendix I, Figure 2).

Wetland and waterway surveys were conducted in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987), the *Regional Supplement to the Corps of Engineers Delineation Manual: Arid West Region* (Version 2.0; USACE, 2008a), the 2016 *National Park Service Procedural Manual #77-1: Wetland Protection* (NPS 2016), and the 2013 *Classification of Wetlands and Deepwater Habitats of the United States* (FGDC 2013). Where potential wetland indicators were observed, data were collected at sample plot locations to document hydrophytic vegetation indicators, hydric soil indicators, and hydrology indicators. Data plot locations were recorded using a sub-meter-capable Global Positioning System (GPS) unit loaded with Esri® software. Significant features were photographed and, if applicable, recorded using a *Wetland Determination Data Form – Arid West Region* for each potential wetland and associated upland data point.

Waterways were delineated in accordance with *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE, 2008b). Each waterway encountered was assigned a unique alphanumeric identifier to assist in waterway documentation. Waterways encountered were assessed based on USACE definitions and assigned an “ED” for Ephemeral Drainage, “IS” for Intermittent Stream, or “PS” for Perennial Stream, followed by a number to assign the feature a unique identifier (e.g., “ED-01”). Wetland

data sheets and photographs from the field delineation are included in Appendix II and Appendix III, respectively.

4 RESULTS

4.1 EXISTING CONDITIONS

Topography — The APE gently slopes down from the northeast to the southwest. Elevations range from 3,120 feet above mean sea level (AMSL) up to 5,840 feet AMSL. Much of the APE has been previously disturbed by road construction and maintenance activities.

Hydrology — The APE is located within the Bullfrog Bay – Colorado River Hydrologic Unit (12-digit HUC 140700011301), which drains to Lake Powell. Three intermittent stream features mapped by the NHD traverse the APE, and all other waterways include minor ephemeral waterways (refer to Section 4.2). All drainages ultimately flow into Lake Powell.

Vegetation — USGS National Southwest Regional Gap Analysis Program (SWReGAP) vegetation community data were used to determine potential vegetation communities in the APE. Nine vegetation communities were identified within the APE: Colorado Plateau Mixed Bedrock Canyon and Tableland; Inter-Mountain Basins Active and Stabilized Dune; Colorado Plateau Blackbrush-Mormon-tea Shrubland; Inter-Mountain Basins Mixed Salt Desert Scrub; Inter-Mountain Basins Semi-Desert Shrub Steppe; Inter-Mountain Basins Semi-Desert Grassland; Invasive Southwest Riparian Woodland and Shrubland; Invasive Annual Grassland; and Open Water.

Dominant plant species identified within the APE during the field evaluation are listed in the table below.

Common Name	Scientific Name	Wetland Indicator[1,2]
Annual Beard-Grass	*Polypogon monspeliensis*	FACW
Broom Snakeweed	*Gutierrezia sarothrae*	UPL
Cat's-Eye Species	*Cryptantha sp.*	N/A
Creosote Bush	*Larrea tridentata*	UPL
Four-Wing Saltbush	*Atriplex canescens*	UPL
Indian Rice Grass	*Achnatherum hymenoides*	UPL
King Cup Cactus	*Echinocereus triglochidiatus*	UPL
Mojave Yucca	*Yucca schidigera*	UPL
Mormon Tea	*Ephedra viridis*	UPL
Native Grass Species	*Poaceae spp.*	N/A
Pennsylvania Smartweed	*Persicaria pensylvanica*	FACW
Pepperwort Species	*Lepidium sp.*	N/A
Purple Loosestrife	*Lythrum salicaria*	OBL
Red-rooted Flatsedge	*Cyperus erythrorhizos*	OBL
Russian Thistle	*Salsola tragus*	FACU

[1,A1] FACU = Facultative Upland; FACW = Facultative Wetland; FAC = Facultative; OBL = Obligate
[2] Plant species not listed in the USACE 2020 Arid West Plant List and assumed to be UPL

Geology & Soils — The APE lies within the Lower Escalante River Area in the GLCA of Eastern Kane County, Utah, according to the USDA NRCS Soil Survey. Six soil map units are mapped within the APE:

- 29.3 percent (%) Moenkopie-Rock outcrop complex, 3 to 24 percent slopes;
- 25.8% as Water;
- 18% Myton very gravelly sandy loam, 5 to 18% slopes, very bouldery;
- 17% Pagina-Denazar complex, 2 to 14% slopes;
- 9.3% Farb-Pagina-Rock outcrop complex, 4 to 20% slopes, bouldery; and
- 0.6% as Rock outcrop-Torriorthents complex, 20 to 65% slopes, extremely bouldery.

4.2 AQUATIC RESOURCES

Overview — During the desktop review and preliminary habitat assessment conducted on September 27, 2022, over 20 potential ephemeral waterways were identified. Additionally, potential wetlands were identified in the southern portion of the APE near Lake Powell. Satellite imagery, NHD data, and NWI data in the area depicts the surface of the lake at a higher elevation than current conditions, preventing an in-depth preliminary wetland review within the APE using these databases. All features were investigated in the field on October 11 and 12, 2022. The aquatic features were located and delineated in the field or removed from further evaluation based on a lack of wetland or OHWM indicators.

Seventeen of the identified ephemeral drainage features were determined to be separate ephemeral drainage systems that exhibited distinct geomorphological and vegetative OHWM indicators within the APE. All other observed drainage features were determined to be erosional in nature and exhibited no OHWM, bed, or bank features. Four wetland features exhibited hydrophytic vegetation, hydric soil, and wetland hydrology indicators and are potentially WOTUS subject to USACE jurisdiction. Three additional wetland features exhibited wetland hydrology indicators and meet the NPS wetland definition.

The USACE has a designated OHWM elevation for Lake Powell at 3,558 feet AMSL. All areas of the lake under the designated OHWM are subject to USACE jurisdiction. NPS does not have jurisdiction over waters that are greater than 2.5 meters deep.

Waterways & Drainages — Seventeen waterways identified during the desktop assessment were confirmed to be natural ephemeral drainage features. These drainage features were evaluated and delineated in the field to characterize the hydrology of the APE.

The individual ephemeral drainages were identified from north to south as ED-01 to ED-17. All drainage systems are separate and distant, and cross the APE individually. All drainages in the APE are ephemeral in nature and are charged exclusively by stormwater during precipitation or snowmelt events. Characteristics of the individual drainages are summarized in the tables below.

In addition, the APE encompasses Lake Powell, a deepwater lacustrine limnetic system.

Table 1. **Ephemeral drainages observed during the October 2022 field survey**

Aquatic Resource	Sample Location	Flow Status	Cowardian Code	OHWM Width (feet)	Approx. Length (feet)[1]	Approx. Area (acres)[2]
ED-01	37.528835°N -110.711524°W	Ephemeral	R4SB4C	7-15	650	0.140
ED-02	37.532717°N -110.704486°W	Ephemeral	R4SB4J	1-5	600	0.047
ED-03	37.530596°N -110.702179 °W	Ephemeral	R4SB4J	1-15	3,690	0.555
ED-04	37.518145°N -110.696347 °W	Ephemeral	R4SB4J	1-10	200	0.026
ED-05	37.515473°N -110.698320 °W	Ephemeral	R4SB4J	1-5	480	0.071
ED-06	37.514678°N -110.698384 °W	Ephemeral	R4SB4J	1-5	840	0.101
ED-07	37.511682°N -110.699909 °W	Ephemeral	R4SB4C	1-15	1,600	0.456
ED-08	37.506182°N -110.697781 °W	Ephemeral	R4SB4C	6-30	530	0.201
ED-09	37.505737°N -110.697079 °W	Ephemeral	R4SB4J	4-10	610	0.148
ED-10	37.502491°N -110.694553 °W	Ephemeral	R4SB4J	3-30	1,090	0.459
ED-11	37.499973°N -110.693604 °W	Ephemeral	R4SB4J	6-15	1,630	0.314
ED-12	37.496454°N -110.693333 °W	Ephemeral	R4SB4J	2-30	2,450	0.564
ED-13	37.492483°N -110.691495 °W	Ephemeral	R4SB4J	2-20	2,560	0.560
ED-14	37.491535°N -110.690567 °W	Ephemeral	R4SB4J	2-6	1,438	0.209
ED-15	37.489860°N -110.691653 °W	Ephemeral	R4SB4J	1-5	1,130	0.140
ED-16	37.488244°N -110.693236 °W	Ephemeral	R4SB4J	2-30	2,050	0.708
ED-17	37.487325°N -110.691061 °W	Ephemeral	R4SB4J	2-30	1,160	0.278
					Total Acres :	4.98

[1] Approximate Length refers to the full length of the mapped features within the APE, including discontinuous portions of OHWM, if separated by less than 50 feet.

[2] Area refers to total acreage within the OHWM for each waterbody within the APE.

Table 2. **General descriptions of the 17 ephemeral drainages identified during the October 2022 field survey**

Aquatic Resource	General Description
ED-01	ED-01 is a relatively large ephemeral drainage feature in the APE that flows through a culvert under State Highway 276. OHWM indicators are distinct and consistent within the APE. The drainage receives minor amounts of stormwater from BMP features along State Highway 276. There is a minor surface disturbance adjacent the drainage on the north side of the Highway.
ED-02	ED-02 is a small drainage charged by sheet flow from erosional features northwest of the APE. The drainage flows through a culvert under State Highway 276 within the APE. Although the OHWM indicators are consistent within the APE, as the drainage leaves the APE to the east it dissipates into sheet flow. Surface water from the drainage ultimately flows into ED-03.
ED-03	ED-03 originates in the APE as sheet flow, receiving stormwater from ED-02, erosional features along Stanton Creek Road, and stormwater from the road surface. The drainage runs along the roadside where the OHWM indicators become more evident and consistent. The drainage flows through a culvert

Aquatic Resource	General Description
	under an access road to wastewater ponds prior the leaving the APE. After leaving the APE, the drainage flows adjacent the APE until ultimately crossing the APE again within ED-08. ED-03 becomes an NHD mapped water feature after it leaves the APE.
ED-04	ED-04 receives stormwater from Stanton Creek Road. OHWM indicators are discontinuous and inconsistent until the drainage begins to leave the APE to the southeast. The drainage ultimately flows into the NHD mapped water feature that originates from ED-03.
ED-05	ED-05 originates from runoff on the hillslope to the west of the APE. The drainage develops more distinct OHWM indicators as it progresses southeast through the APE and ultimately crosses Stanton Creek Road as surface flow and into the NHD mapped water feature that originates from ED-03.
ED-06	ED-06 exists as 3 separate drainage channels charged from runoff from the hillslope west of the APE. The drainage features combine within the APE and flow into ED-04 and ultimately into the NHD mapped water feature that originates as ED-03 east of the APE. The drainage is erosional in nature, however OHWM are continuing to develop over time as the drainage receive more runoff.
ED-07	ED-07 is a relatively large ephemeral drainage with consistent, continuous OHWM indicators within the APE. The drainage runs north to south within the APE and turns into multiple braided channels in a few locations. The drainage flows into Stanton Canyon south of the APE.
ED-08	ED-08 is a relatively large drainage channel mapped by the NHD. The drainage originates as ED-03 further north within the APE and is charged by ED-04, ED-05, ED-06, and other erosional features east of the APE. The drainage crosses Stanton Creek Road via a low-water crossing and flows into Stanton Canyon southwest of the APE at a confluence with ED-07.
ED-09	ED-09 exists as 2 drainage channels that combine within the APE. The feature is charged from precipitation runoff east of the APE, and both channels have distinct and continuous OHWM indicators within the APE. The channels cross Stanton Creek Road via low-water crossings and flow into ED-08 southwest of the APE.
ED-10	ED-10 exists as 2 channels that combine within the APE. The northern channel has two additional fingers that charge the drainage from stormwater runoff. The southern channel is a mapped NHD waterway with distinct, continuous OHWM indicators. The drainage flows southwest through the APE.
ED-11	ED-11 is charged by sheet flow and erosional features east of the APE. The erosional features ultimately consolidate and develop OHWM indicators within the APE. The drainage splits into 2 distinct channels around an 'island' within the APE, and the channels combine again before the drainage leaves the APE to the southwest. The drainage combines with ED-10 further southwest of the APE before entering Lake Powell.
ED-12	ED-12 exists as 2 drainage channels that combine into one within the APE. Both channels are charged from run-off from the hills and valleys immediately northeast of the APE. OHWM indicators become more evident as the drainages move through the APE. The southern channel begins as an erosional feature within the APE before developing consistent OHWM indicators, and the channel has eroded down to bedrock in many areas.
ED-13	ED-13 exists as 2 drainage channels within the APE. The northern channel begins as sheet flow within the APE and develops OHWM indicators as more erosional channels combine. The southern channel originates from sheet flow and stormwater runoff from the hills and valleys immediately east of the APE.
ED-14	ED-14 is a relatively small drainage channel within the APE, originating as sheet flow before developing OHWM indicators as the drainage flows from northeast to southwest through the APE.
ED-15	ED-15 is a relatively small drainage channel within the APE. The drainage originates as sheet flow and stormwater runoff from a hill on the east side of the APE. The drainage develops more distinct OHWM indicators as it flows through the APE from east to west.
ED-16	ED-16 is charged from sheet flow and stormwater runoff within the APE. The drainage flows from north to south and exhibits discontinuous OHWM indicators as it dissipates into sheet flow in the southern reaches within the APE. The drainage combines with ED-17 prior to draining into WL-07, WL-05, and Lake Powell.
ED-17	ED-17 is charged from sheet flow and precipitation runoff within and east of the APE. The feature exists as 2 drainage channels that combine on the east side of the APE. The feature exhibits discontinuous OHWM indicators and dissipates into sheet flow before flowing into ED-16.

Wetlands — Seven wetlands were identified within the APE. Four of the wetland features exhibit hydrophytic vegetation, hydric soils, and wetland hydrology indicators and are likely WOTUS subject to USACE jurisdiction. Three of the wetlands exhibit a predominance of hydrophytic vegetation and/or wetland hydrology indicators and are considered wetlands under the NPS wetland definition.

Table 3. **Wetlands observed during the October 2022 field survey.**

Aquatic Resource	Wetland Pit Coordinates	Cowardian Code	Area (acres)[1]	NPS Classification	USACE Classification[2]
WL-01	37.482471°N -110.691882°W	L2RS1Ch	8.955	Wetland	Lake Powell waterbody; Below USACE OHWM; Wetland hydrology indicators only
WL-02	37.483007°N -110.691539°W	L2US2Ch	0.075	Wetland	Wetland
WL-03	37.483830°N -110.691343 °W	L2US2Ch	0.039	Wetland	Wetland
WL-04	37.518145°N -110.696347 °W	L2US2Ch	0.292	Wetland	Wetland
WL-05	37.515473°N -110.698320 °W	L2US2Ch	0.118	Wetland	Wetland
WL-06	37.514678°N -110.698384 °W	PUS2Ch	0.095	Wetland	Partially below USACE OHWM; Hydrophytic vegetation and wetland hydrology indicators only
WL-07	37.511682°N -110.699909 °W	PUS2Ch	0.147	Wetland	Vegetated ephemeral drainage. Hydrophytic vegetation and wetland hydrology indicators only
			Total acres :	NPS: 9.721	USACE: 0.524

[1] Area refers to total acreage within the OHWM for each waterbody within the APE
[2] USACE Lake Powell OHWM elevation = 3,558 feet AMSL

Table 4. **General descriptions of the 7 wetland features identified during the October 2022 field survey**

Aquatic Resource	General Description
WL-01	WL-01 primarily consists of the bedrock terrace, rocky shoreline, and cliff face above the current Lake Powell waterline that experienced flooding or saturation at least once during the 2022 growing season. The aquatic feature was primarily delineated by the prominent water mark, salt crust buildup, and aquatic invertebrate evidence (fingernail clam shells) along the edge of the rock terrace. The wetland feature does not support a predominance of hydrophytic vegetation or hydric soils and is only considered a wetland under the NPS wetland definition. The aquatic feature is below the USACE Lake Powell OHWM of 3,558 feet. Per the NPS Procedural Manual #77-1, the lacustrine wetland was delineated to a water depth of 2.5 meters within the lake designating the potential limits of emergent or woody vegetation.
WL-02	WL-02 is a small lacustrine wetland feature immediately adjacent to Lake Powell that receives water from precipitation events and experiences saturation and water inundation during the high-water stage of the lake. The wetland supports a predominance of hydrophytic vegetation, hydric soils, and wetland hydrology. The wetland is likely subject to USACE jurisdiction and meets the NPS definition of wetland. The aquatic feature is below the USACE Lake Powell OHWM of 3,558 feet.
WL-03	Similar to WL-02, WL-03 is a small lacustrine wetland feature immediately adjacent to Lake Powell. The wetland supports a predominance of hydrophytic vegetation, hydric soils, and wetland hydrology. The wetland is likely subject to USACE jurisdiction and meets the NPS definition of wetland. The wetland is fed by a seasonally active seep upgradient of the wetland, and precipitation runoff. The aquatic feature is below the USACE Lake Powell OHWM of 3,558 feet.

Aquatic Resource	General Description
WL-04	WL-04 is a relatively larger lacustrine wetland feature in the APE charged by a perpetually active spring/seep that originates immediately upgradient of the wetland feature. Surface water was evident at the time of the delineation, and the soils exhibited a hydrogen sulfide odor. The wetland supports a predominance of hydrophytic vegetation, hydric soils, and wetland hydrology. The wetland is likely subject to USACE jurisdiction and meets the NPS definition of wetland. The aquatic feature is below the USACE Lake Powell OHWM of 3,558 feet.
WL-05	WL-05 is also charged by a perpetually active spring/seep that originates immediately upgradient of the lacustrine wetland feature. Surface water was observed at the time of the delineation, and the wetland supports a variety of obligate wetland plant species. The wetland also exhibits hydric soils, and wetland hydrology. The wetland is likely subject to USACE jurisdiction and meets the NPS definition of wetland. The aquatic feature is below the USACE Lake Powell OHWM of 3,558 feet.
WL-06	WL-06 is an isolated palustrine wetland feature that is only charged by precipitation runoff. The feature was likely historically charged from high-water stages of the lake, but now sits partially above the USACE Lake Powell OHWM of 3,558 feet. The aquatic feature supports a predominance of hydrophytic vegetation and potential wetland hydrology indicators but does not support hydric soils. Wetland hydrology indicators include surface cracking and salt crust, but no soil saturation was observed. As such, the wetland area above the USACE OHWM of 3,558 feet is not likely subject to USACE jurisdiction but is considered a wetland under the NPS definition.
WL-07	WL-07 is a palustrine wetland charged from precipitation runoff from ED-16. The feature was likely historically charged from high-water stages of the lake, but now rests primarily above the USACE Lake Powell OHWM of 3,558 feet. The aquatic feature continues to support a predominance of hydrophytic vegetation and wetland hydrology indicators. Wetland hydrology indicators include surface cracking and salt crust, but no soil saturation was observed. As such, the aquatic resource is not likely considered a special aquatic site by the USACE. ED-16 flows directly into the aquatic resource, and USACE may consider the feature a vegetated extension of the ephemeral drainage. Because the aquatic feature supports hydrophytic vegetation and wetland hydrology indicators, the feature is considered a wetland under the NPS definition. The southern reaches of the aquatic resource are inundated with weedy species including *Salsola tragus* and *Lythrum salicaria*.

5 CONCLUSIONS & RECOMMENDATIONS

There were 17 ephemeral drainages, 1 deepwater lacustrine limnetic system, and 7 waterbodies with wetland indicators identified within the APE during the October 2022 field survey. All of these 7 waterbodies qualify as wetlands according to the NPS definition (refer to Section 1.2 above). Four of these waterbodies are potential WOTUS and may be subject to USACE jurisdiction. Within the APE, ephemeral drainages total 4.98 acres, NPS wetlands total 9.72 acres, and potential wetlands subject to USACE jurisdiction total 0.524 acre.

According to the NPS wetland definition, the outer boundary of Lake Powell qualifies as a wetland from the low water line to a depth of 2.5 meters (8.2 feet). This area is classified in this report as WL-01. Beyond 2.5 meters below low water, the remainder of Lake Powell qualifies as a deepwater lacustrine limnetic system. Lake Powell is regulated under Section 10 of the Rivers and Harbors Appropriation Act of 1899 (*33 U.S.C. Sec. 401 et seq.*), and Section 404 of the CWA. Pursuant to the USACE definition of WOTUS, Lake Powell is a TNW and the USACE OHWM is currently designated at 3,558 feet AMSL elevation. Within this area, Lake Powell encompasses 16.4 acres within the APE (Figure 6). All areas below this designated OHWM are assumed WOTUS subject to USACE jurisdiction. NPS does not have jurisdiction over waters that are greater than 2.5 meters deep.

Permanent project impacts to wetlands and waters of the US are limited to dredge and/or fill within the APE. Thus, impact areas cannot be calculated until the final design is determined. The impact areas, permitting, and mitigation requirements will differ between NPS and USACE due to the differences in wetland definitions between the 2 agencies.

6 REFERENCES

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Table 5. **Comment Matrix: comments included in NPS review of the Draft Aquatic Resources Delineation Report (submitted on [11/02/2022])**

Comment Number	Comment	Resolution	Resolution Date
1	Timm Kennedy: A Teams meeting with Kevin Noon (NPS) may be appropriate. We should get an idea of what we are looking at for potential impacts, mitigation, etc.	A meeting will be scheduled prior to WSOF preparation with the project team including Kevin Noon. Line 260.	11/29/2022
2	Timm Kennedy: I'd suggest adding language somewhere in this report that all the wetlands, ephemeral drainages, and anything below the OHWM of Lake Powell (3558) is jurisdictional for Corps of Engineers permitting purposes. This is accurate if we are NOT requesting a preliminary jurisdictional determination of delineated waters/wetlands.	Text updated. Line 266.	12/06/2022
2	Erin Chipps: I agree with this, but I would want to say "assumed jurisdictional" rather than just saying they are jurisdictional	Text updated. Line 266.	12/06/2022
2	Kevin Noon: Looks like the only difference is NPS does not have jurisdiction over waters that are greater than 2.5 meters deep.	Text updated. Line 266.	12/06/2022
3	Timm Kennedy: Also, section 404 of the Clean Water Act	Text updated. Line 273.	12/06/2022
4	Deidre Duffy: Figure showing this area in production	Figure included in Appendix I. Line 276.	11/29/2022

APPENDIX I

FIGURES

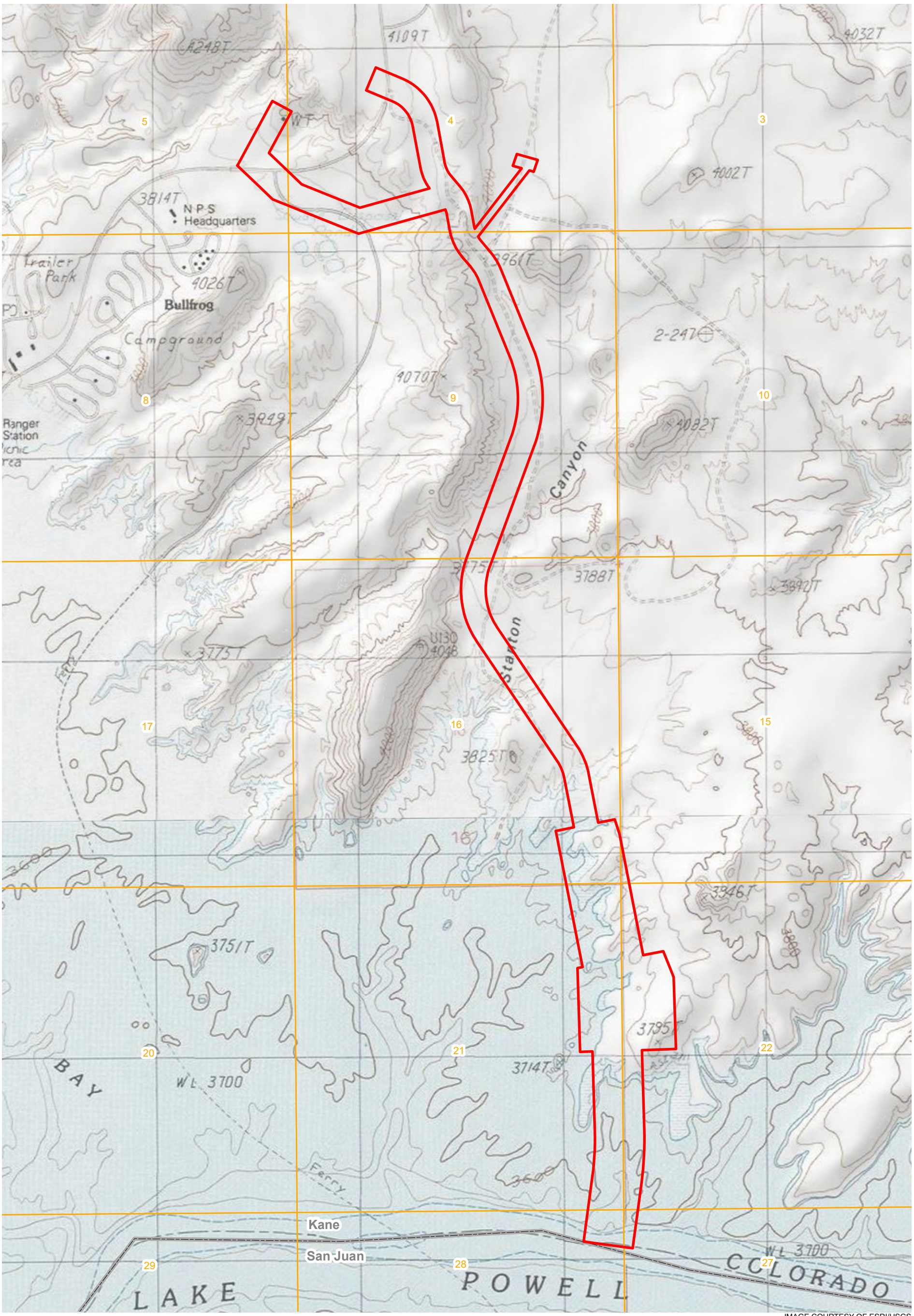


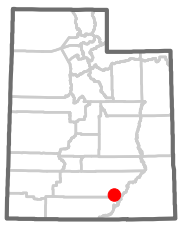
IMAGE COURTESY OF ESRI/USGS

LEGEND

- AREA OF POTENTIAL EFFECT (331.43 ACRES)
- PLSS SECTION
- COUNTY

PLSS: PUBLIC LAND SURVEY SYSTEM

UTAH



0 1,500 3,000
Feet

N

FIGURE 1
PROJECT LOCATION MAP
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG01_PROJECT_SL.mxd

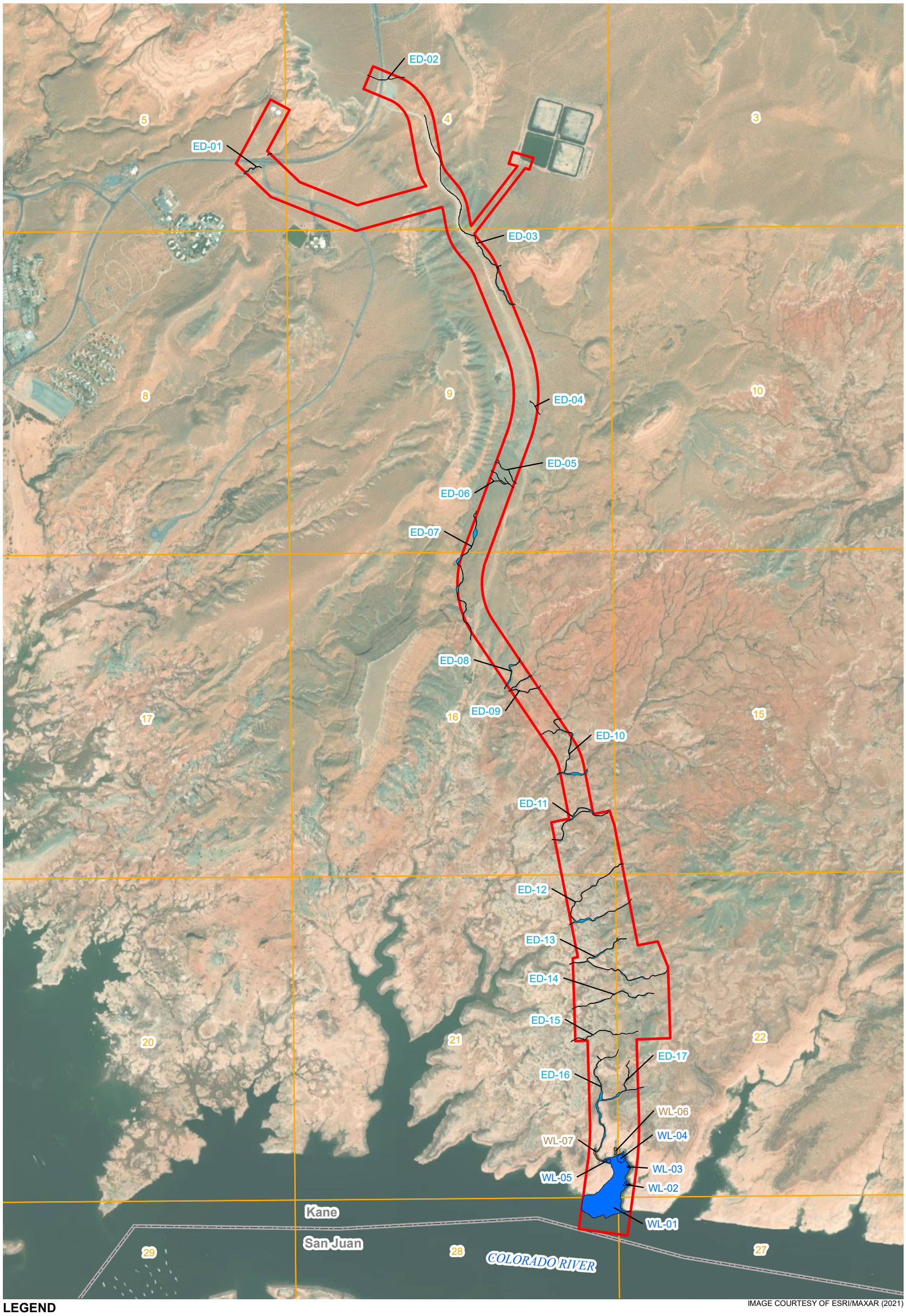


IMAGE COURTESY OF ESRI/MAXAR (2021)

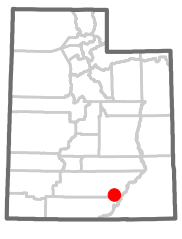
LEGEND

- AREA OF POTENTIAL EFFECT (331.43 ACRES)
- PLSS SECTION
- COUNTY

AQUATIC RESOURCE

- INTERMITTENT RIVERINE
- LITTORAL LACUSTRINE
- PALUSTRINE

UTAH



0 1,500 3,000
Feet

N

FIGURE 2
SURVEYED AQUATIC RESOURCES
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

PLSS: PUBLIC LAND SURVEY SYSTEM

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG02_SURVEYED_AR.mxd

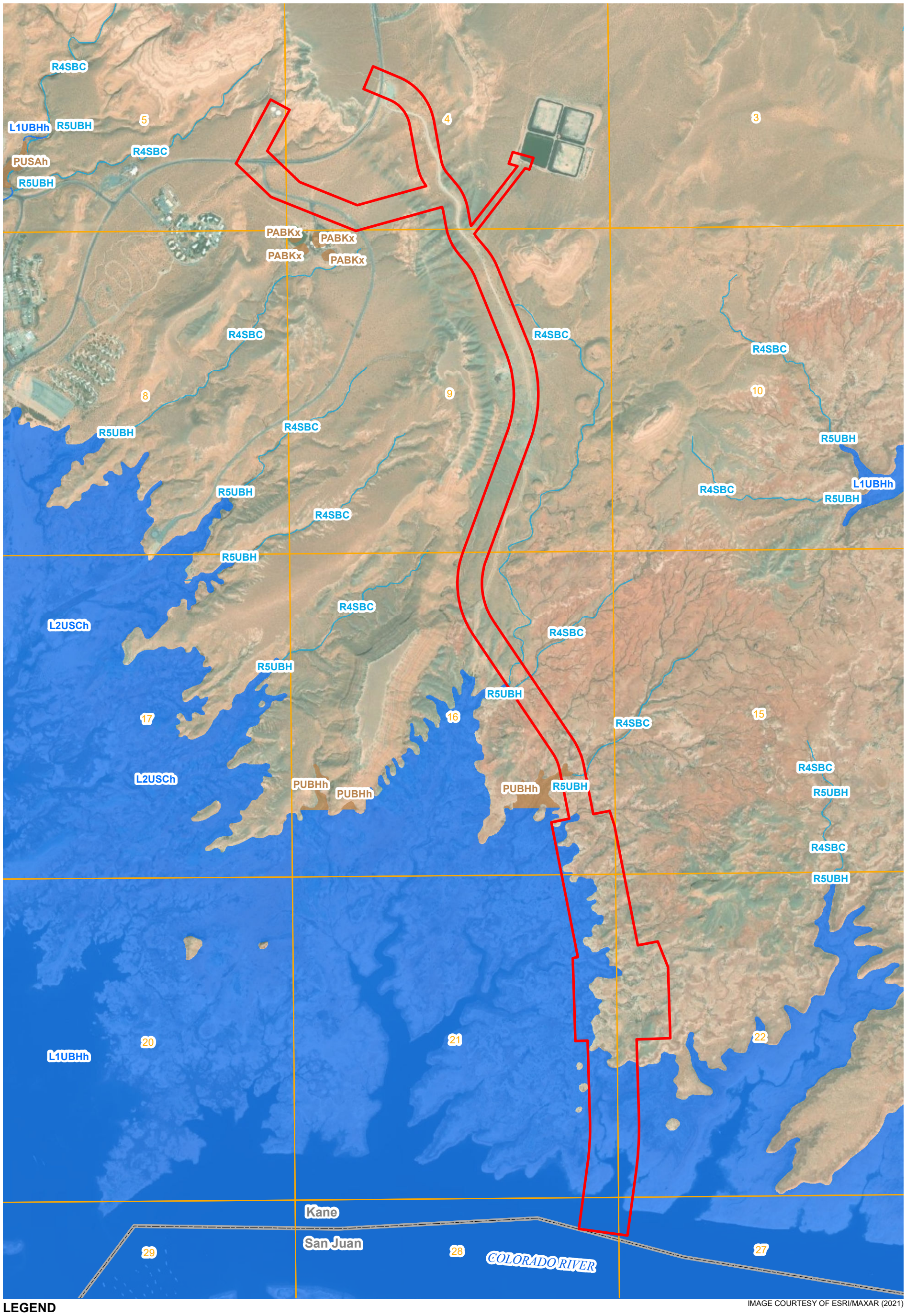


IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

AREA OF POTENTIAL EFFECT (331.43 ACRES)

PLSS SECTION

COUNTY

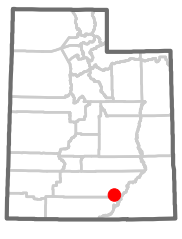
NWI DATASET

PALUSTRINE

RIVERINE

LACUSTRINE

UTAH



0 1,500 3,000

Feet

N

NWI: NATIONAL WETLANDS INVENTORY
PLSS: PUBLIC LAND SURVEY SYSTEM

FIGURE 3
NWI DATASET
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

wsp

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG03_NWI.mxd

IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

- SAMPLE LOCATION
- AREA OF POTENTIAL EFFECT (331.43 ACRES)
- CULVERT

AQUATIC RESOURCE

- INTERMITTENT RIVERINE
- LITTORAL LACUSTRINE
- PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 50 100
Feet

N

FIGURE 4.01
EPHEMERAL DRAINAGES
(ED-01)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

*ACREAGE INCLUDES AREA UNDER CULVERT CROSSING

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.01_ED-01.mxd

IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

- SAMPLE LOCATION
- AREA OF POTENTIAL EFFECT (331.43 ACRES)
- CULVERT

AQUATIC RESOURCE

- INTERMITTENT RIVERINE
- LITTORAL LACUSTRINE
- PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 50 100
Feet

N

FIGURE 4.02
EPHEMERAL DRAINAGES
(ED-02)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

*ACREAGE INCLUDES AREA UNDER CULVERT CROSSING

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.02_ED-02.mxd

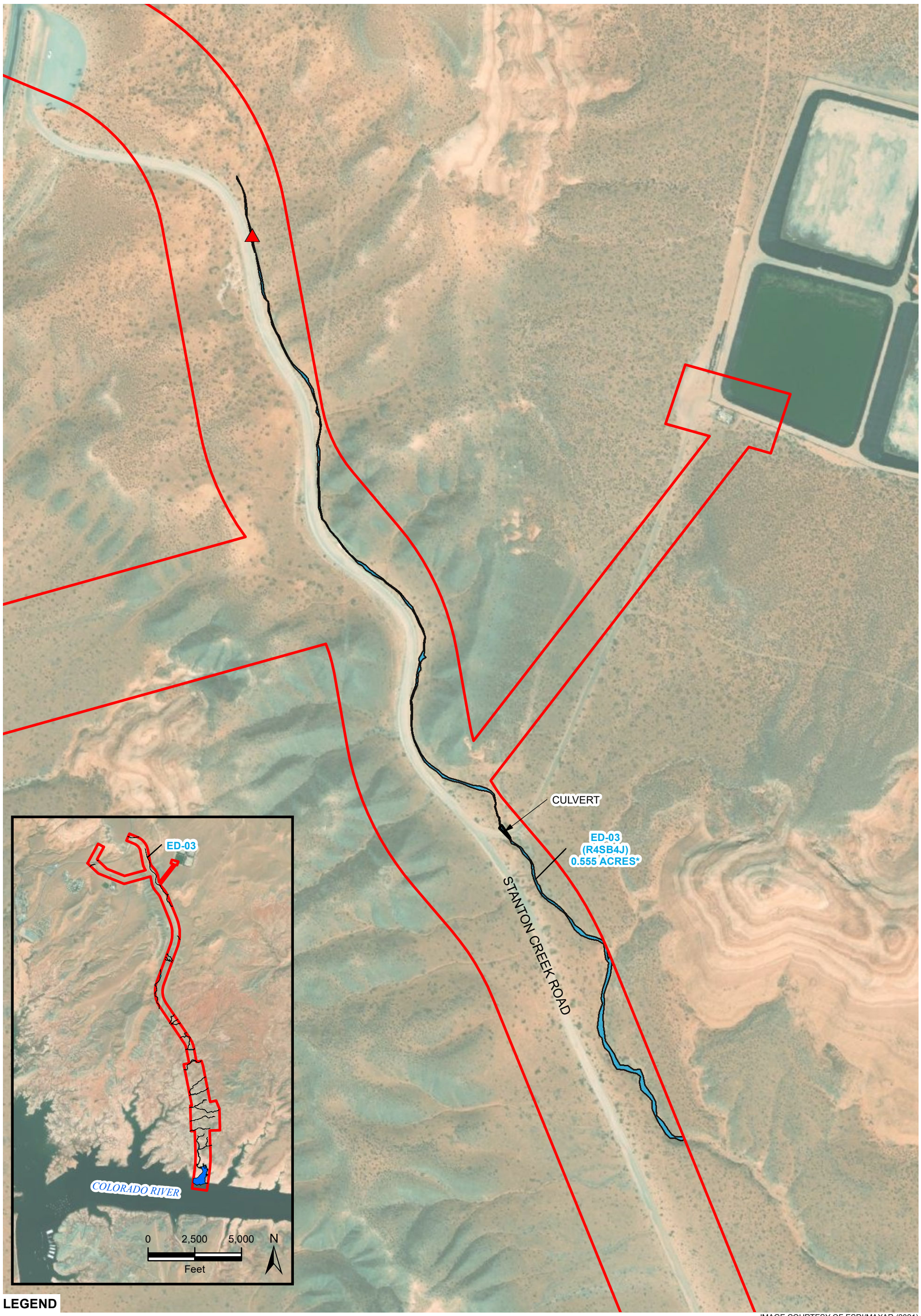


IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

- SAMPLE LOCATION
- AREA OF POTENTIAL EFFECT (331.43 ACRES)
- CULVERT

AQUATIC RESOURCE

- INTERMITTENT RIVERINE
- LITTORAL LACUSTRINE
- PALUSTRINE

0 300 600
Feet

N

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

*ACREAGE INCLUDES AREA UNDER CULVERT CROSSING

FIGURE 4.03
EPHEMERAL DRAINAGES
(ED-03)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.03_ED-03.mxd

IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

SAMPLE LOCATION

AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

INTERMITTENT RIVERINE

LITTORAL LACUSTRINE

PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 40 80
Feet

N

FIGURE 4.04
EPHEMERAL DRAINAGES
(ED-04)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.04_ED-04.mxd

IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

- SAMPLE LOCATION
- AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

- INTERMITTENT RIVERINE
- LITTORAL LACUSTRINE
- PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 50 100
Feet

N

FIGURE 4.05
EPHEMERAL DRAINAGES
(ED-05)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.05_ED-05.mxd

IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

- SAMPLE LOCATION
- AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

- INTERMITTENT RIVERINE
- LITTORAL LACUSTRINE
- PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 50 100
Feet

N

FIGURE 4.06
EPHEMERAL DRAINAGES
(ED-06)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.06_ED-06.mxd

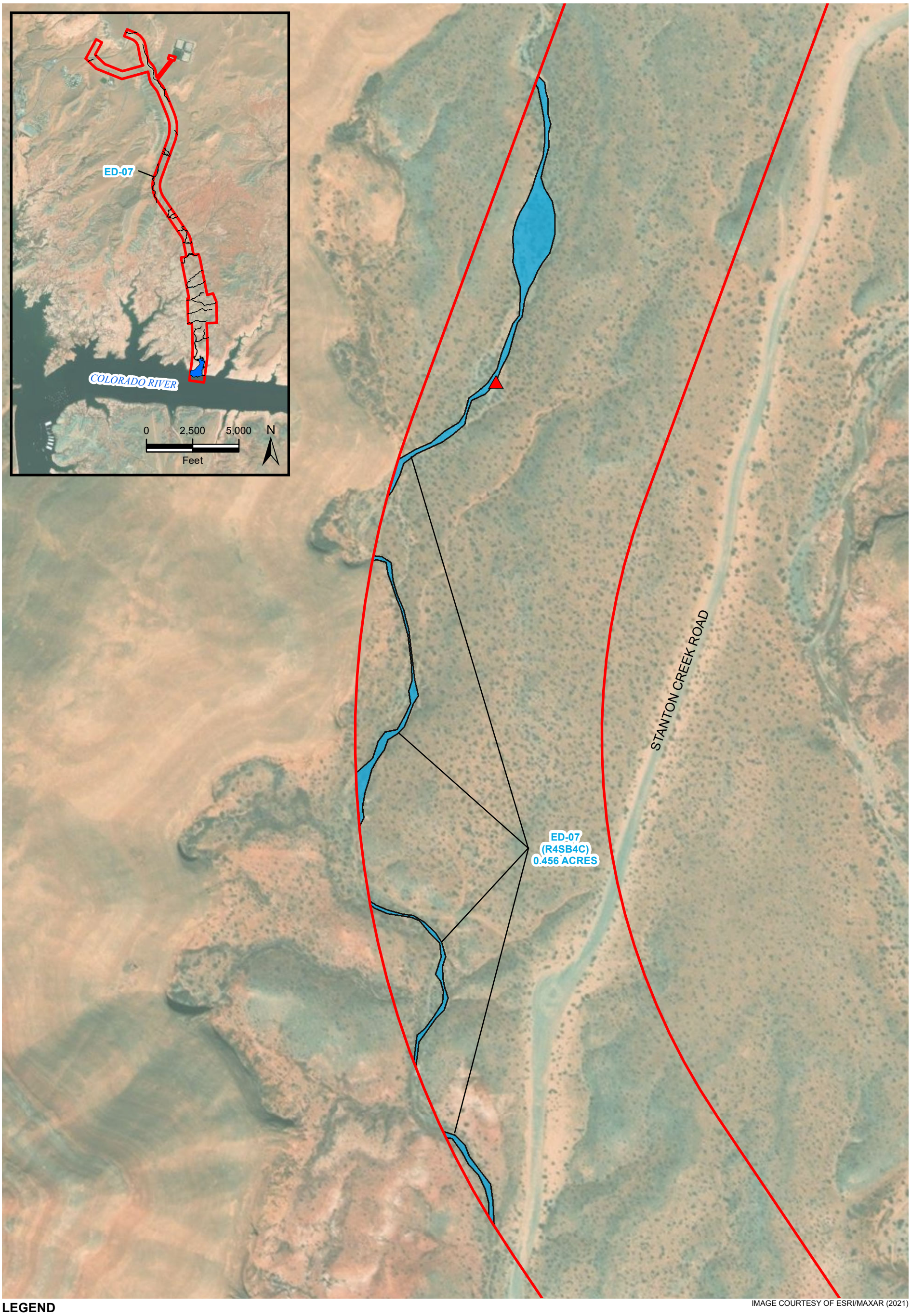


IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

SAMPLE LOCATION

AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

INTERMITTENT RIVERINE

LITTORAL LACUSTRINE

PALUSTRINE

0 150 300
Feet

N

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

FIGURE 4.07
EPHEMERAL DRAINAGES
(ED-07)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.07_ED-07.mxd

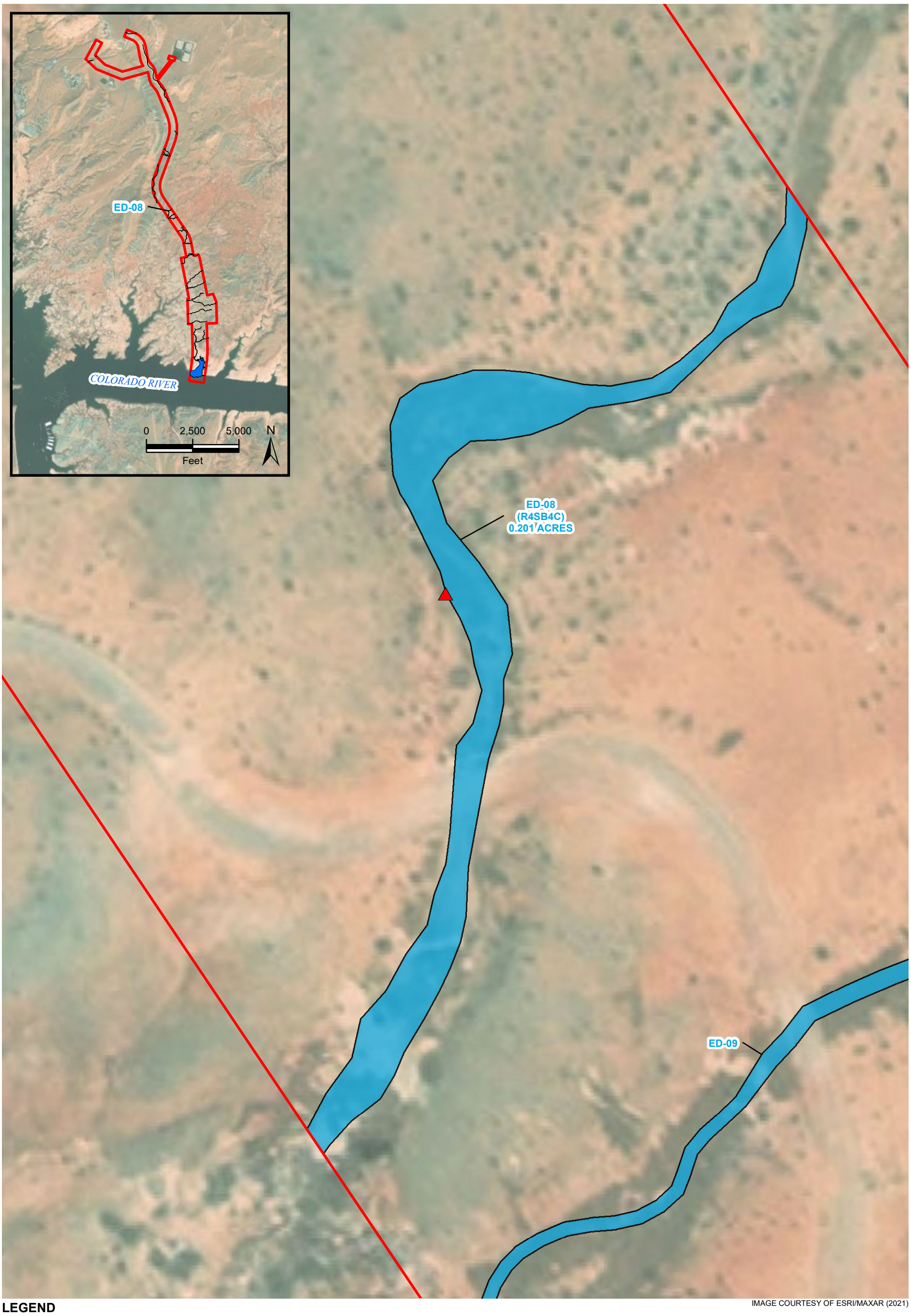


IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

SAMPLE LOCATION

AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

INTERMITTENT RIVERINE

LITTORAL LACUSTRINE

PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 40 80
Feet

N

FIGURE 4.08
EPHEMERAL DRAINAGES
(ED-08)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.08_ED-08.mxd

IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

SAMPLE LOCATION

AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

INTERMITTENT RIVERINE

LITTORAL LACUSTRINE

PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 40 80
Feet

N

FIGURE 4.09
EPHEMERAL DRAINAGES
(ED-09)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.09_ED-09.mxd

IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

SAMPLE LOCATION

AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

INTERMITTENT RIVERINE

LITTORAL LACUSTRINE

PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 100 200
Feet

N

FIGURE 4.10
EPHEMERAL DRAINAGES
(ED-10)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.10_ED-10.mxd

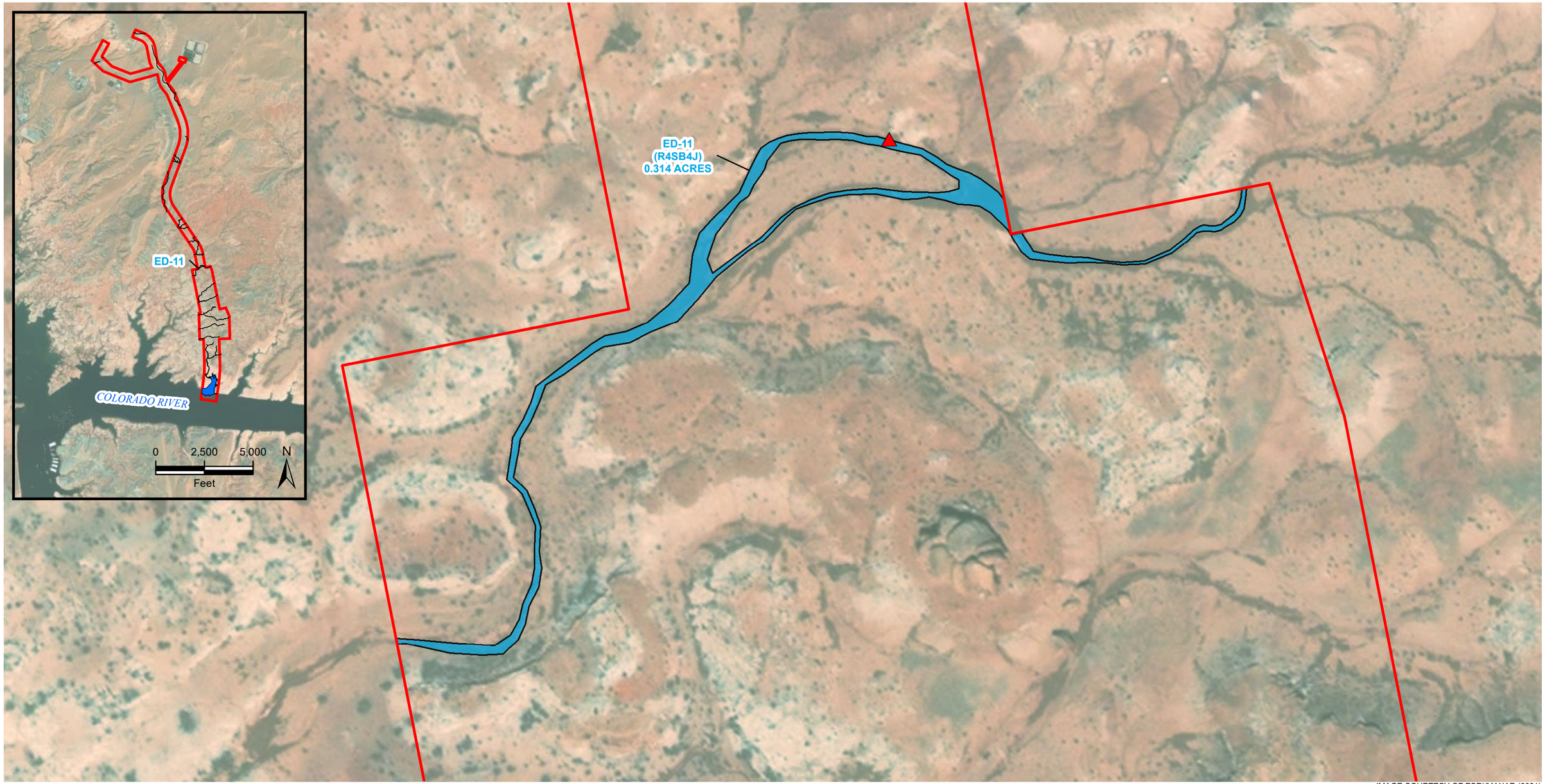


IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

- SAMPLE LOCATION
- AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

- INTERMITTENT RIVERINE
- LITTORAL LACUSTRINE
- PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 100 200
Feet

N

FIGURE 4.11
EPHEMERAL DRAINAGES
(ED-11)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.11_ED-11.mxd

IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

SAMPLE LOCATION

AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

INTERMITTENT RIVERINE

LITTORAL LACUSTRINE

PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 150 300
Feet

N

FIGURE 4.12
EPHEMERAL DRAINAGES
(ED-12)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.12_ED-12.mxd

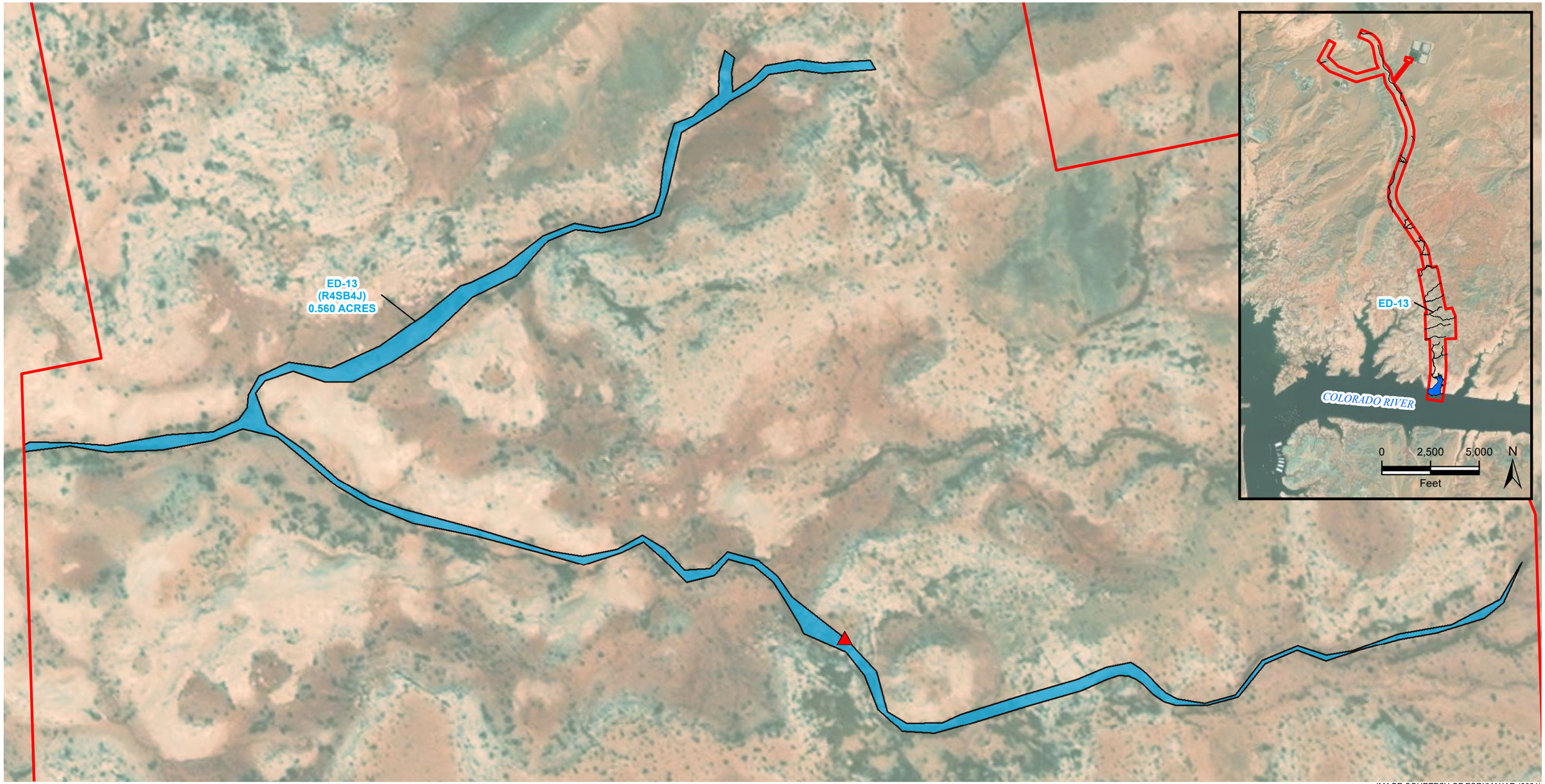


IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

- SAMPLE LOCATION
- AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

- INTERMITTENT RIVERINE
- LITTORAL LACUSTRINE
- PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 100 200
Feet

N

FIGURE 4.13
EPHEMERAL DRAINAGES
(ED-13)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.13_ED-13.mxd

IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

SAMPLE LOCATION

AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

INTERMITTENT RIVERINE

LITTORAL LACUSTRINE

PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 100 200
Feet

N

FIGURE 4.14
EPHEMERAL DRAINAGES
(ED-14)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.14_ED-14.mxd

IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

SAMPLE LOCATION

AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

INTERMITTENT RIVERINE

LITTORAL LACUSTRINE

PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 100 200
Feet

N

FIGURE 4.15
EPHEMERAL DRAINAGES
(ED-15)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.15_ED-15.mxd

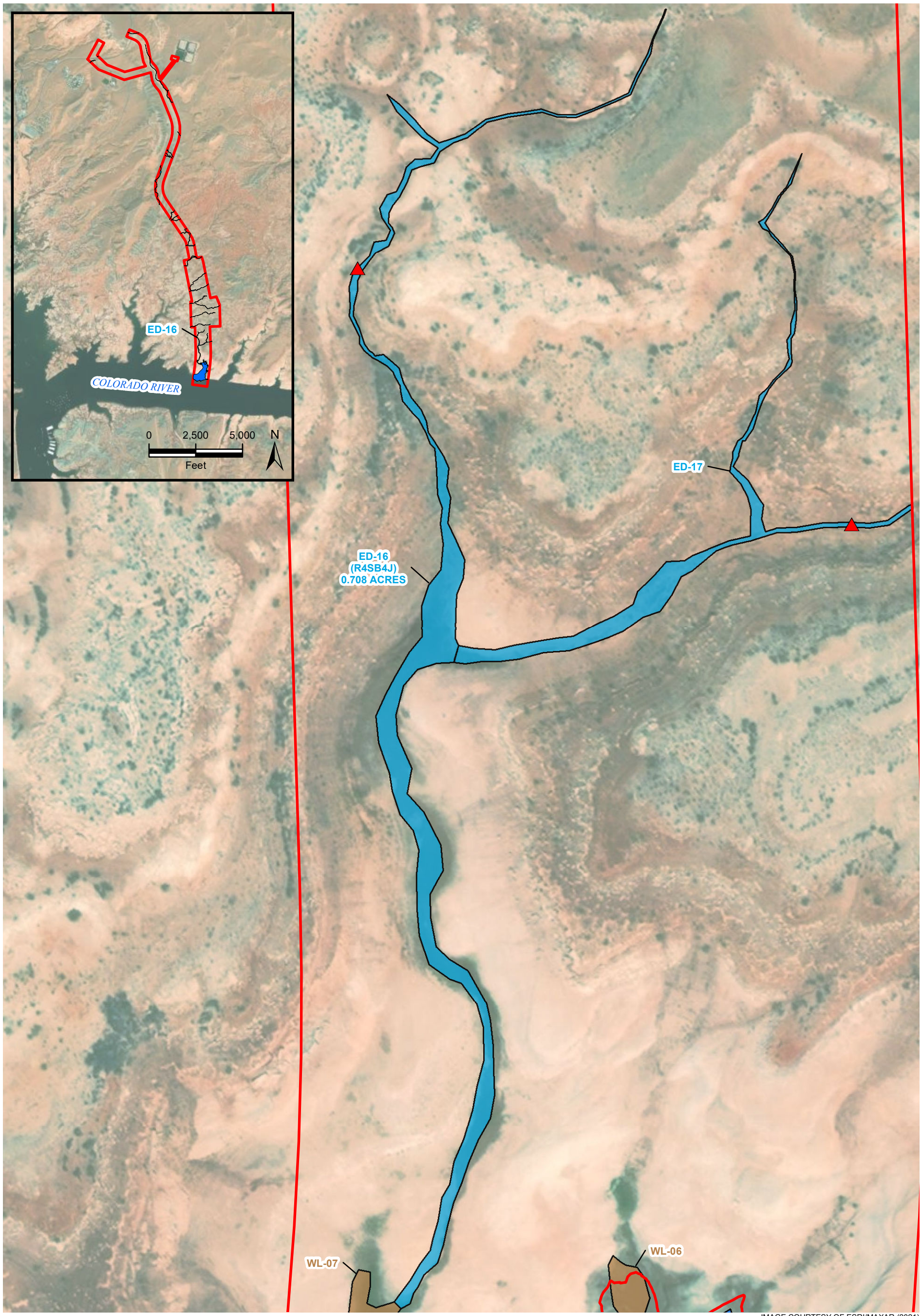


IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

SAMPLE LOCATION

AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

INTERMITTENT RIVERINE

LITTORAL LACUSTRINE

PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 120 240
Feet

N

FIGURE 4.16
EPHEMERAL DRAINAGES
(ED-16)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG04.16_ED-16.mxd

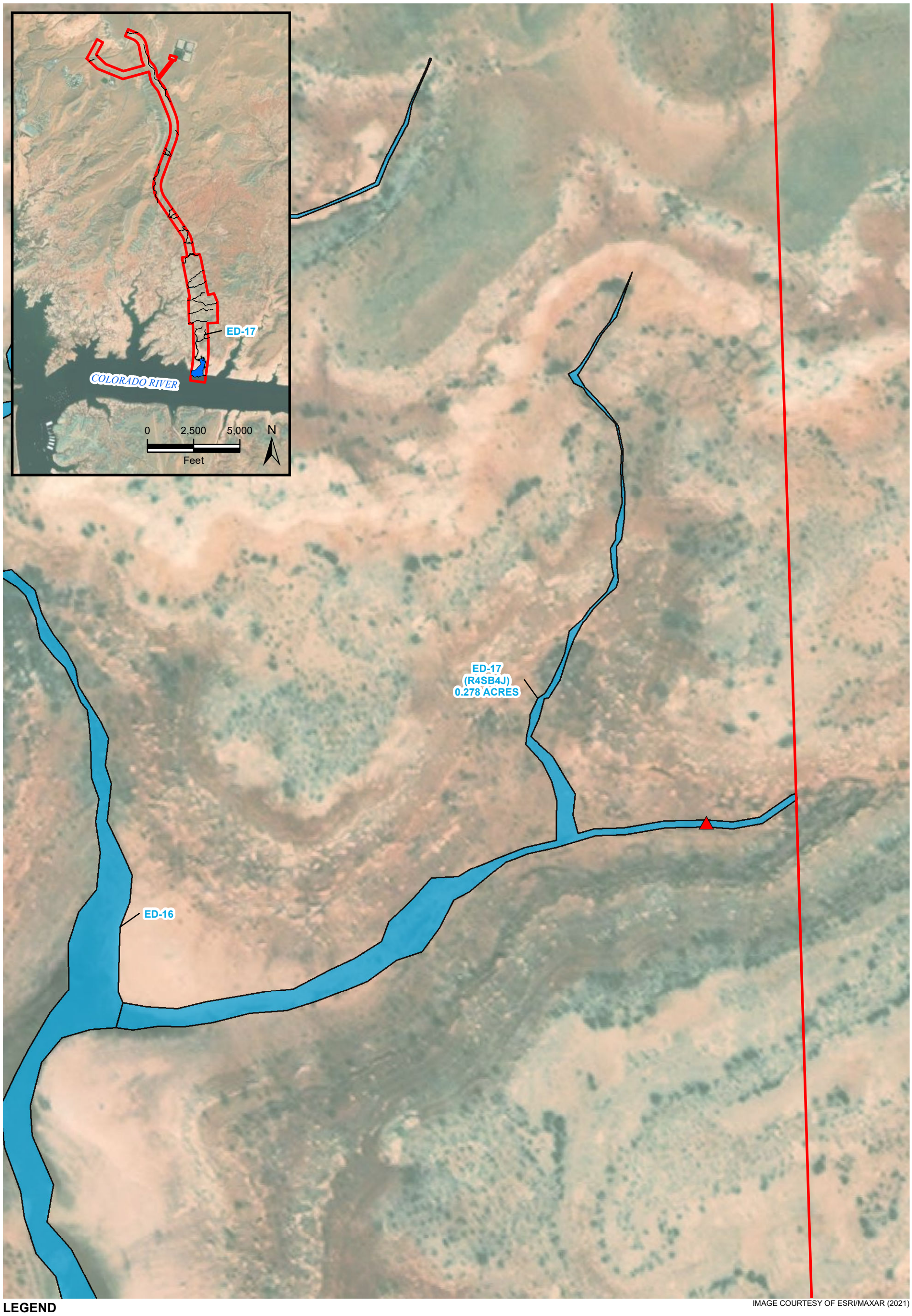


IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

SAMPLE LOCATION

AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

INTERMITTENT RIVERINE

LITTORAL LACUSTRINE

PALUSTRINE

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

0 80 160
Feet

N

FIGURE 4.17
EPHEMERAL DRAINAGES
(ED-17)
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

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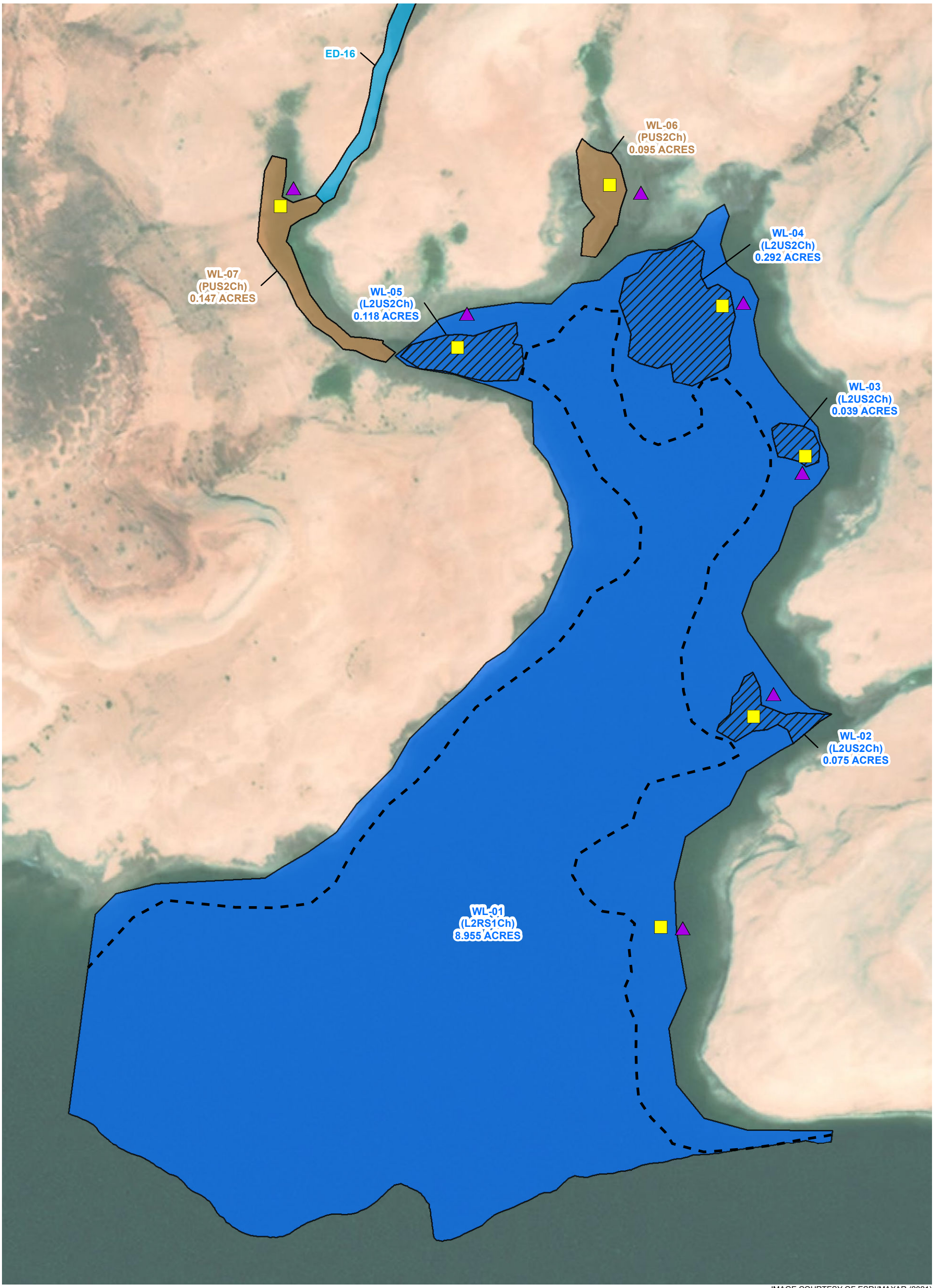

IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

- UPLAND SAMPLE
- WETLAND SAMPLE
- WATERLINE (3,461.30')
- AREA OF POTENTIAL EFFECT (331.43 ACRES)

AQUATIC RESOURCE

- INTERMITTENT RIVERINE
- LITTORAL LACUSTRINE (ROCKY SHORE)
- LITTORAL LACUSTRINE (UNCONSOLIDATED SHORE)
- PALUSTRINE

0 100 200
Feet

N

AQUATIC RESOURCE LABEL FORMAT
AQUATIC RESOURCE NAME
COWARDIN CODE
ACREAGE CONTAINED WITHIN AREA OF POTENTIAL EFFECT

FIGURE 5
WETLANDS
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG05_WETLANDS.mxd

IMAGE COURTESY OF ESRI/MAXAR (2021)

LEGEND

- USACE OHWM (3,558')
- AREA OF POTENTIAL EFFECT (331.432 ACRES)
- USACE/APE AREA OF OVERLAP (16.400 ACRES)

0 120 240
Feet

N

OHWM: ORDINARY HIGH WATER MARK
USACE: UNITED STATES ARMY CORPS OF ENGINEERS

FIGURE 6
USACE LAKE POWELL OHWM
BULLFROG LAUNCH RAMP
T38S R11E
KANE COUNTY, UTAH
NATIONAL PARK SERVICE

wsp

C:\GISWorkspace\31800221.002_GLCA_Bullfrog Marina\MXD\31800221.002_FIG06_USACE_OHWM.mxd

APPENDIX II

FIELD DATA SHEETS

STREAM DATA SHEET

Date: 10/11/2022	**Stream ID:** ED-01	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.528835°N	**y:** -110.711524°W
Team No:	**Observers:** J. Franks	**Stream Name:** Ephemeral Drainage ED-01	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☐Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__12 ft___

☐1-5 ☐6-10 ☒11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**___2 ft___

☐0-0.5 ☐0.5-1 ☐1-1.5 ☐1.5-2 ☒2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☐0-5 ☐6-10 ☐11-15 ☒16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 20 ft____

Stream Flow Direction:
____NE to SW__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☐2 ☒3 ☐3+

Gradient

☐Flat (0.5'/100') ☐Flat-Moderate ☒Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☐1-3 ☐4-6 ☐7-9 ☒10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☐31-45° (3:1) ☒46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☐1-3 ☒4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☒31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☐1-10 ☐11-25 ☐26-50 ☒51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☐1-10 ☐11-25 ☐26-50 ☒51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☒Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☐Leaf litter disturbed or washed away	☒Scour
☐Vegetation matted down, bent, absent	☐Presence of litter and debris	☒Sediment deposition
☐Water staining	☐Sediment sorting	☐Other (list): Particle size distribution
☐Presence of wrack line	☒Shelving	
☒Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☐Yes ☒No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate		Percentage of Pools, Runs, Riffles (within delineated reach)
__25_% Bedrock	_____ % Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete	_____ %Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt	__75_ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay	_____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged	☒Culverts	☐Riparian Corridor Cleared
☐Diverted	☐Drive-through/OHV crossing	☐Dammed
☐Weir or Check Dam	☒Other	

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

Recent surface disturbance adjacent the drainage on the north side of the road. Ephemeral drainage fed by precipitation events and stormwater runoff.

STREAM DATA SHEET

Date: 10/11/2022	**Stream ID:** ED-02	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.532717°N	**y:** -110.704486°W
Team No:	**Observers:** J. Franks	**Stream Name:** Ephemeral Drainage ED-02	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☐Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__2 ft___

☒1-5 ☐6-10 ☐11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**___0.5 ft___

☒0-0.5 ☐0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☒0-5 ☐6-10 ☐11-15 ☐16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 3 ft____

Stream Flow Direction:
____W to E__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☒2 ☐3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☐Changes in character of soil	☐Destruction of terrestrial vegetation
☒Clear, natural line impressed on bank	☒Leaf litter disturbed or washed away	☐Scour
☐Vegetation matted down, bent, absent	☐Presence of litter and debris	☐Sediment deposition
☐Water staining	☐Sediment sorting	☐Other (list) _____
☐Presence of wrack line	☐Shelving	
☒Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☐Yes ☒No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate		Percentage of Pools, Runs, Riffles (within delineated reach)
__25_% Bedrock	_____ % Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete	_____ %Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt	__75_ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay	_____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged	☒Culverts	☐Riparian Corridor Cleared
☐Diverted	☐Drive-through/OHV crossing	☐Dammed
☐Weir or Check Dam	☐Other	

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

Ephemeral drainage runs through culvert under Utah State Route 276. Drainage terminates into sheet flow to the east of the APE and stormwater ultimately flows to ED-03.

STREAM DATA SHEET

Date: 10/11/2022	**Stream ID:** ED-03	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.530596°N	**y:** -110.702179°W
Team No:	**Observers:** J. Franks	**Stream Name:** Ephemeral Drainage ED-03	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☐Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__2 ft___

☒1-5 ☐6-10 ☐11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**___0.5 ft___

☐0-0.5 ☒0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☒0-5 ☐6-10 ☐11-15 ☐16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 5 ft____

Stream Flow Direction:
____NW to SE__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☒2 ☐3 ☐3+

Gradient

☐Flat (0.5'/100') ☐Flat-Moderate ☒Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☐1-10 ☐11-25 ☒26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☐1-10 ☐11-25 ☒26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☒Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☒Leaf litter disturbed or washed away	☐Scour
☒Vegetation matted down, bent, absent	☐Presence of litter and debris	☐Sediment deposition
☐Water staining	☐Sediment sorting	☐Other (list) _____
☐Presence of wrack line	☐Shelving	
☒Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☐Yes ☒No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate		Percentage of Pools, Runs, Riffles (within delineated reach)
__10_% Bedrock	_____ % Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete	__10_ %Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt	__80_ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay	_____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged	☒Culverts	☐Riparian Corridor Cleared
☐Diverted	☐Drive-through/OHV crossing	☐Dammed
☐Weir or Check Dam	☒Other	

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

The drainage originates from sheet flow and stormwater from ED-02. The ephemeral drainage runs through a culvert under the access road to the water treatment facility. OHWM varies from 2-6 feet and gets wider as the drainage heads south. OHWM depth ranges from 0.5 – 1.5 feet. Large amounts of windblown Russian thistle skeletons in drainage. Bank heights also vary up to 12 feet in height in the southern reaches of the drainage within the APE.

Drainage is bound by the Stanton Creek Campground Road on the west and is fed by stormwater runoff from the road. The presence of the road concentrates flows in the drainage. As the drainage flows SW and intercepts erosional channels, OHWM indicators become more prominent. The drainage flows next to the APE and ultimately becomes ED-08.

STREAM DATA SHEET

Date: 10/11/2022	**Stream ID:** ED-04	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.518145°N	**y:** -110.696347°W
Team No:	**Observers:** J. Franks	**Stream Name:** Ephemeral Drainage ED-04	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☐Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__1 ft___

☒1-5 ☐6-10 ☐11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**___0.5 ft___

☒0-0.5 ☐0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☒0-5 ☐6-10 ☐11-15 ☐16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 5 ft____

Stream Flow Direction:
____NW to SE__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☒1 ☐2 ☐3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☐11-25 ☒26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☐11-25 ☒26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☐Destruction of terrestrial vegetation
☒Clear, natural line impressed on bank	☐Leaf litter disturbed or washed away	☐Scour
☐Vegetation matted down, bent, absent	☐Presence of litter and debris	☐Sediment deposition
☐Water staining	☐Sediment sorting	☐Other (list) _____
☐Presence of wrack line	☐Shelving	
☒Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☒Yes ☐No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate	Percentage of Pools, Runs, Riffles (within delineated reach)
__0_% Bedrock _____ % Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete __20_ %Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt __80_ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay _____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged	☐Culverts	☐Riparian Corridor Cleared
☐Diverted	☐Drive-through/OHV crossing	☐Dammed
☐Weir or Check Dam	☒Other	

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

Drainage is solely fed from stormwater flow from Stanton Creek Campground Road. OHWM indicators become more prominent and the OHWM width/depth increase after the drainage leaves the APE.

STREAM DATA SHEET

Date: 10/11/2022	**Stream ID:** ED-05	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.515473°N	**y:** -110.698320°W
Team No:	**Observers:** J. Franks	**Stream Name:** Ephemeral Drainage ED-05	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☐Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__2.5 ft___

☒1-5 ☐6-10 ☐11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**___1 ft___

☐0-0.5 ☒0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☐0-5 ☒6-10 ☐11-15 ☐16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 6 ft____

Stream Flow Direction:
____NW to SE__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☒2 ☐3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☒31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☐31-45° (3:1) ☒46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☐Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☒Leaf litter disturbed or washed away	☒Scour
☐Vegetation matted down, bent, absent	☐Presence of litter and debris	☐Sediment deposition
☐Water staining	☐Sediment sorting	☐Other (list) _____
☐Presence of wrack line	☐Shelving	
☒Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☒Yes ☐No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate	Percentage of Pools, Runs, Riffles (within delineated reach)
__0_% Bedrock _____ % Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete __30_ %Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt __70_ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay _____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged ☐Culverts ☐Riparian Corridor Cleared

☐Diverted ☐Drive-through/OHV crossing ☐Dammed

☐Weir or Check Dam ☐Other

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

Drainage begins as sheet flow and the erosional feature develops minor OHWM indicators in the project area. The drainage combines with ED-06 southeast of the APE.

STREAM DATA SHEET

Date: 10/11/2022	**Stream ID:** ED-06	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.514678°N	**y:** -110.698384°W
Team No:	**Observers:** J. Franks	**Stream Name:** Ephemeral Drainage ED-06	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☐Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__1 ft___

☒1-5 ☐6-10 ☐11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**___0.25 ft___

☒0-0.5 ☐0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☒0-5 ☐6-10 ☐11-15 ☐16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 3 ft____

Stream Flow Direction:
____NW to SE__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☒2 ☐3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☒31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☒31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☐ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☐ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☐Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☐Leaf litter disturbed or washed away	☒Scour
☐Vegetation matted down, bent, absent	☒Presence of litter and debris	☒Sediment deposition
☐Water staining	☐Sediment sorting	☐Other (list) Change in particle size dist.
☐Presence of wrack line	☐Shelving	
☐Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☐Yes ☒No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate	Percentage of Pools, Runs, Riffles (within delineated reach)
__0_% Bedrock _____ % Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete __25_ %Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt __75_ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay _____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged	☐Culverts	☐Riparian Corridor Cleared
☐Diverted	☐Drive-through/OHV crossing	☐Dammed
☐Weir or Check Dam	☐Other	

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

The drainage begins as an erosional feature from sheet flow supplied only from direct precipitation to the hills and cliffs to the northwest of the APE. The erosional feature develops minor OHWM indicators within the APE. The drainage combines with ED-05 to the southeast of the APE.

STREAM DATA SHEET

Date: 10/11/2022	**Stream ID:** ED-07	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.511682°N	**y:** -110.699909°W
Team No:	**Observers:** J. Franks	**Stream Name:** Ephemeral Drainage ED-07	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☐Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__4 ft___

☒1-5 ☐6-10 ☐11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**___0.5 ft___

☐0-0.5 ☒0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☐0-5 ☒6-10 ☐11-15 ☐16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 10 ft____

Stream Flow Direction:
____N to S__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☐2 ☒3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☒31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☒31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☐ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☐ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☒Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☐Leaf litter disturbed or washed away	☒Scour
☐Vegetation matted down, bent, absent	☒Presence of litter and debris	☒Sediment deposition
☐Water staining	☒Sediment sorting	☐Other (list) Change in particle size dist.
☐Presence of wrack line	☐Shelving	
☐Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☐Yes ☒No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate	Percentage of Pools, Runs, Riffles (within delineated reach)
__0_% Bedrock __20_ % Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete __10_ %Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt __70_ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay _____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged	☐Culverts	☐Riparian Corridor Cleared
☐Diverted	☐Drive-through/OHV crossing	☐Dammed
☐Weir or Check Dam	☐Other	

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

ED-07 is a relatively significant ephemeral drainage that runs north to south within the APE for approximately 0.35 miles. The drainage is fed by precipitation events and runoff on the cliffs and hills to the west. OHWM indicators are consistent and prominent. The drainage does develop braided channels at times which likely change after significant runoff events.

STREAM DATA SHEET

Date: 10/11/2022	**Stream ID:** ED-08	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.506182°N	**y:** -110.697781°W
Team No:	**Observers:** J. Franks	**Stream Name:** Ephemeral Drainage ED-08	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☐Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__11 ft___

☐1-5 ☐6-10 ☒11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**___0.5 ft___

☐0-0.5 ☒0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☐0-5 ☐6-10 ☐11-15 ☒16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 20 ft____

Stream Flow Direction:
____NE to SW__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☒2 ☐3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☒31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☐1-3 ☒4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☐31-45° (3:1) ☒46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☐ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☒Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☐Leaf litter disturbed or washed away	☐Scour
☐Vegetation matted down, bent, absent	☐Presence of litter and debris	☒Sediment deposition
☐Water staining	☒Sediment sorting	☐Other (list) Change in particle size dist.
☐Presence of wrack line	☐Shelving	
☐Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☐Yes ☒No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate	Percentage of Pools, Runs, Riffles (within delineated reach)
__0_% Bedrock __10_ % Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete __0__ %Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt __90_ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay _____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged	☐Culverts	☐Riparian Corridor Cleared
☐Diverted	☒Drive-through/OHV crossing	☐Dammed
☐Weir or Check Dam	☐Other	

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

ED-08 is a well-defined ephemeral drainage with consistent, distinct OHWM indicators. The drainage is fed by runoff from ED-02 – ED-06, and small erosional features to the northeast of the APE. The drainage flows southwest into Stanton Canyon. The drainage channel crosses Stanton Canyon dRoad via a low-water crossing.

STREAM DATA SHEET

Date: 10/11/2022	**Stream ID:** ED-09	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.505737°N	**y:** -110.697079°W
Team No:	**Observers:** J. Franks	**Stream Name:** Ephemeral Drainage ED-09	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☐Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__10 ft___

☐1-5 ☒6-10 ☐11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**___0.5 ft___

☐0-0.5 ☒0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☐0-5 ☐6-10 ☒11-15 ☐16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 14 ft____

Stream Flow Direction:
____E to W__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☒2 ☐3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☒31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☐ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☐ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☒Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☐Leaf litter disturbed or washed away	☐Scour
☐Vegetation matted down, bent, absent	☐Presence of litter and debris	☒Sediment deposition
☐Water staining	☒Sediment sorting	☐Other (list) Change in particle size dist.
☐Presence of wrack line	☐Shelving	
☐Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☐Yes ☒No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate	Percentage of Pools, Runs, Riffles (within delineated reach)
__0_% Bedrock __10_ % Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete __0__ %Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt __90_ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay _____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged	☐Culverts	☐Riparian Corridor Cleared
☐Diverted	☒Drive-through/OHV crossing	☐Dammed
☐Weir or Check Dam	☐Other	

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

ED-09 consists of two drainage channels that combine into one within the APE. The northern channel has distinct OHWM indicators and collects water from a relatively large, localized watershed to the northeast. The southern channel resembles an erosional channel that collects water as sheet flow during precipitation events to the east of the APE.

STREAM DATA SHEET

Date: 10/12/2022	**Stream ID:** ED-10	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.502491°N	**y:** -110.694553°W
Team No:	**Observers:** J. Franks	**Stream Name:** Ephemeral Drainage ED-10	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☐Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__13 ft___

☐1-5 ☐6-10 ☒11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**___0.5 ft___

☐0-0.5 ☒0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☐0-5 ☐6-10 ☐11-15 ☒16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 20 ft____

Stream Flow Direction:
____NE to SW__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☒2 ☐3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☒31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☐ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☒Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☐Leaf litter disturbed or washed away	☐Scour
☐Vegetation matted down, bent, absent	☒Presence of litter and debris	☒Sediment deposition
☐Water staining	☒Sediment sorting	☐Other (list) Change in particle size dist.
☐Presence of wrack line	☐Shelving	
☐Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☐Yes ☒No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate	Percentage of Pools, Runs, Riffles (within delineated reach)
__0_% Bedrock __10_ % Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete __0__ %Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt __90_ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay _____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged ☐Culverts ☐Riparian Corridor Cleared

☐Diverted ☐Drive-through/OHV crossing ☐Dammed

☐Weir or Check Dam ☐Other

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

ED-10 consists of two drainage channels that combine within the APE. Both drainages have similar, distinct, and consistent OHWM indicators. ED-10 is charged solely by precipitation events and stormwater runoff from areas immediately east of the APE.

STREAM DATA SHEET

Date: 10/12/2022	**Stream ID:** ED-11	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.499973°N	**y:** -110.693604°W
Team No:	**Observers:** J. Franks	**Stream Name:** Ephemeral Drainage ED-11	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☐Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__6 ft___

☐1-5 ☒6-10 ☐11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**___0.5 ft___

☐0-0.5 ☒0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☐0-5 ☐6-10 ☐11-15 ☒16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 20 ft____

Stream Flow Direction:
____NE to SW__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☒2 ☐3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☐ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☒Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☐Leaf litter disturbed or washed away	☐Scour
☐Vegetation matted down, bent, absent	☒Presence of litter and debris	☒Sediment deposition
☐Water staining	☒Sediment sorting	☐Other (list) Change in particle size dist.
☐Presence of wrack line	☐Shelving	
☐Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☐Yes ☒No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate	Percentage of Pools, Runs, Riffles (within delineated reach)
__0_% Bedrock __10_ % Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete __5_ %Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt __85_ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay _____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged	☐Culverts	☐Riparian Corridor Cleared
☐Diverted	☐Drive-through/OHV crossing	☐Dammed
☐Weir or Check Dam	☐Other	

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

ED-11 is an ephemeral drainage channel with consistent OHWM indicators within the APE. The drainage channel is charged solely from precipitation runoff from the drainage directly east of the APE.

STREAM DATA SHEET

Date: 10/12/2022	**Stream ID:** ED-12	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.496454°N	**y:** -110.693333°W
Team No:	**Observers:** J. Franks	**Stream Name:** Ephemeral Drainage ED-12	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☐Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__6 ft___

☐1-5 ☒6-10 ☐11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**___0.5 ft___

☐0-0.5 ☒0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☐0-5 ☐6-10 ☐11-15 ☐16-20 ☐21-25 ☒26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 28 ft____

Stream Flow Direction:
____NE to SW__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☐2 ☒3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☒Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☐ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☒Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☒Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☐Leaf litter disturbed or washed away	☐Scour
☒Vegetation matted down, bent, absent	☒Presence of litter and debris	☒Sediment deposition
☐Water staining	☒Sediment sorting	☐Other (list) Change in particle size dist.
☐Presence of wrack line	☐Shelving	
☐Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☐Yes ☒No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate	Percentage of Pools, Runs, Riffles (within delineated reach)
__0_% Bedrock __10_ % Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete __10_ %Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt __80_ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay _____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged ☐Culverts ☐Riparian Corridor Cleared

☐Diverted ☐Drive-through/OHV crossing ☐Dammed

☐Weir or Check Dam ☐Other

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

ED-12 consists of two channels that combine into a single channel within the APE. ED-12 develops into a relatively large channel and begins immediately northeast of the APE. ED-12 receives stormwater runoff from precipitation events. The northern channel receives more water and has more distinct OHWM indicators. The southern channel begins as an erosional feature and erodes down to bedrock in many areas.

STREAM DATA SHEET

Date: 10/12/2022	**Stream ID:** ED-13	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.492483°N	**y:** -110.691495°W
Team No:	**Observers:** J. Franks	**Stream Name:** Ephemeral Drainage ED-13	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☒Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__3 ft___

☒1-5 ☐6-10 ☐11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**___1 ft___

☐0-0.5 ☒0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☐0-5 ☒6-10 ☐11-15 ☐16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 7 ft____

Stream Flow Direction:
____E to W__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☐2 ☒3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☐31-45° (3:1) ☒46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☐1-10 ☐11-25 ☒26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☒Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☐ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☒Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☒Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☐Leaf litter disturbed or washed away	☐Scour
☒Vegetation matted down, bent, absent	☒Presence of litter and debris	☒Sediment deposition
☐Water staining	☐Sediment sorting	☐Other (list) Change in particle size dist.
☐Presence of wrack line	☐Shelving	
☐Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☐Yes ☒No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate	Percentage of Pools, Runs, Riffles (within delineated reach)
__10_% Bedrock _10_ % Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete ___5_ % Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt __75_ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay _____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type	Aquatic Vegetation Species
☒None ☐Rooted Floating	None
☐Rooted Emergent ☐Floating Algae	
☐Rooted Submerged ☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating _____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged ☐Culverts ☐Riparian Corridor Cleared

☐Diverted ☐Drive-through/OHV crossing ☐Dammed

☐Weir or Check Dam ☐Other

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

ED-13 consists of two channels that combine into a single channel within the APE. The two channels have similar OHWM indicators. The northern channel develops from sheet flow into an erosional channel within the APE. The southern channel develops from sheet flow just east of the APE. Both ephemeral channels are solely supported by stormwater runoff during precipitation events.

STREAM DATA SHEET

Date: 10/12/2022	**Stream ID:** ED-14	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.491535°N	**y:** -110.690567°W
Team No:	**Observers:** J. Franks	**Stream Name:** Ephemeral Drainage ED-14	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☒Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__2 ft___

☒1-5 ☐6-10 ☐11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**___1 ft___

☐0-0.5 ☒0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☒0-5 ☐6-10 ☐11-15 ☐16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 4 ft____

Stream Flow Direction:
____E to W__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☒2 ☐3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☐31-45° (3:1) ☒46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☒31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☒Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☐ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☒Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☒Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☐Leaf litter disturbed or washed away	☐Scour
☒Vegetation matted down, bent, absent	☒Presence of litter and debris	☒Sediment deposition
☐Water staining	☐Sediment sorting	☐Other (list) Change in particle size dist.
☐Presence of wrack line	☐Shelving	
☐Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☐Yes ☒No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate		Percentage of Pools, Runs, Riffles (within delineated reach)
__10_% Bedrock	___5_ % Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete	___5_ % Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt	__80_ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay	_____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged	☐Culverts	☐Riparian Corridor Cleared
☐Diverted	☐Drive-through/OHV crossing	☐Dammed
☐Weir or Check Dam	☐Other	

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

ED-14 is an ephemeral channel that originates from sheet flow within the APE. The erosional channel flows west where OHWM indicators become more evident on the west side of the APE. The ephemeral drainage only receives stormwater runoff from precipitation events.

STREAM DATA SHEET

Date: 10/12/2022	**Stream ID:** ED-15	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.489860°N	**y:** -110.691653°W
Team No:	**Observers:** B. Mays	**Stream Name:** Ephemeral Drainage ED-15	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☒Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__2 ft___

☒1-5 ☐6-10 ☐11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**__0.25 ft___

☒0-0.5 ☐0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☒0-5 ☐6-10 ☐11-15 ☐16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 4.5 ft____

Stream Flow Direction:
____E to W__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☒2 ☐3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☐31-45° (3:1) ☒46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☒31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☐ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☐Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☐Leaf litter disturbed or washed away	☐Scour
☐Vegetation matted down, bent, absent	☒Presence of litter and debris	☒Sediment deposition
☐Water staining	☐Sediment sorting	☐Other (list) Change in particle size dist.
☐Presence of wrack line	☐Shelving	
☐Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☐Yes ☒No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate		Percentage of Pools, Runs, Riffles (within delineated reach)
__0__% Bedrock	___10_% Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete	___10_% Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt	__80__ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay	_____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged	☐Culverts	☐Riparian Corridor Cleared
☐Diverted	☐Drive-through/OHV crossing	☐Dammed
☐Weir or Check Dam	☐Other	

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

ED-15 is an ephemeral channel that originates from sheet flow within the APE. The erosional channel flows west where OHWM indicators become more evident on the west side of the APE. The ephemeral drainage only receives stormwater runoff from precipitation events.

STREAM DATA SHEET

Date: 10/12/2022	**Stream ID:** ED-16	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.488244°N	**y:** -110.693236°W
Team No:	**Observers:** B. Mays	**Stream Name:** Ephemeral Drainage ED-16	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☒Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__3.5 ft___

☒1-5 ☐6-10 ☐11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**__0.5 ft___

☒0-0.5 ☐0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☐0-5 ☒6-10 ☐11-15 ☐16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 6 ft____

Stream Flow Direction:
____N to S__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☐1 ☒2 ☐3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☒61-90° (1:1)

Right Bank

Height:

☐1-3 ☒4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☐0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☒61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☐1-10 ☐11-25 ☒26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☐1-10 ☐11-25 ☐26-50 ☒51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☒Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☐Leaf litter disturbed or washed away	☒Scour
☒Vegetation matted down, bent, absent	☒Presence of litter and debris	☒Sediment deposition
☐Water staining	☐Sediment sorting	☐Other (list) Change in particle size dist.
☐Presence of wrack line	☐Shelving	
☐Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☒Yes ☐No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate	Percentage of Pools, Runs, Riffles (within delineated reach)
__10_% Bedrock ___5__% Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete ___5__% Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt __80__ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay _____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged ☐Culverts ☐Riparian Corridor Cleared

☐Diverted ☐Drive-through/OHV crossing ☐Dammed

☐Weir or Check Dam ☐Other

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

ED-16 is an ephemeral channel that originates from sheet flow within the APE. The erosional channel flows south, and the OHWM are discontinuous as the drainage moves from channel morphology, into sheet flow, and back into a channel. The drainage has a confluence with ED-17, and stormwater charged from precipitation events would flow into Lake Powell through a wetland feature near the water's edge.

STREAM DATA SHEET

Date: 10/12/2022	**Stream ID:** ED-17	**Project:** NPS GLCA Bullfrog Launch Ramp	
State: UT	**County:** Kane County	**x:** 37.487325°N	**y:** -110.691061°W
Team No:	**Observers:** B. Mays	**Stream Name:** Ephemeral Drainage ED-17	

Photos: Attachment III Photographic Log

Survey Area	HUC:	Stream Type
☐ROW ☒Access Road ☒Facility ☐ATWS/Staging Area	140700011301	☒ Natural ☐ Ditch/Canal/Other

CURRENT HYDROLOGIC CONDITIONS

Water Present ☐ Yes ☒ No

Water Quality

☐Clear ☐Discolored ☐Turbid ☐Oily Film ☐Odor

Other/Comments: N/A

OHWM Width (ft) **Width at Data point**__2 ft___

☒1-5 ☐6-10 ☐11-15 ☐16-25 ☐26-50 ☐51-75 ☐76+

OHWM Depth (ft) **Depth at Data point**__0.25 ft___

☒0-0.5 ☐0.5-1 ☐1-1.5 ☐1.5-2 ☐2-3 ☐3-5 ☐5-10 ☐10+

PHYSICAL CHARACTERISTICS

****Right vs. Left bank from the perspective of someone facing downstream**

Bankfull Width (ft): ☒0-5 ☐6-10 ☐11-15 ☐16-20 ☐21-25 ☐26-30 ☐31-40 ☐41-50 ☐51-75 ☐76-100 ☐100+

Bankfull Width (ft):
Width at Data point: 5 ft____

Stream Flow Direction:
____E to W__

Flow Type

☐TNW ☐P-RPW ☒non-RPW

FERC Classification

☒Minor (<10 ft) ☐Intermediate (10-100 ft) ☐ Major (>100 ft)

Sinuosity (bends per 200' stretch)

☐0 ☒1 ☐2 ☐3 ☐3+

Gradient

☐Flat (0.5'/100') ☒Flat-Moderate ☐Moderate (2'/100')
☐Moderate-Severe ☐Severe (10'/100')

Left Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Right Bank

Height:

☒1-3 ☐4-6 ☐7-9 ☐10-12 ☐13-15 ☐16-20 ☐21-30 ☐30+

Slope:

☒0-30° (4:1) ☐31-45° (3:1) ☐46-60° (2:1) ☐61-90° (1:1)

Left Bank

Percentage of Bank with Evidence of Erosion

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

Right Bank

Percentage of Bank with Evidence of Erosion

☐0 ☐1-10 ☒11-25 ☐26-50 ☐51-75 ☐76-100

Erosion Types

☒ Undercutting ☒Sloughing ☐Livestock/Wildlife Impacts

Percentage of Bank with Stabilizing Vegetation

☐0 ☒1-10 ☐11-25 ☐26-50 ☐51-75 ☐76-100

Stabilizing Bank Vegetation Type

☐None Present ☒Herbaceous ☐Sapling/Shrub ☐Tree

OHWM (Ordinary High Water Mark) Criteria

☒Bed and bank	☒Changes in character of soil	☒Destruction of terrestrial vegetation
☐Clear, natural line impressed on bank	☐Leaf litter disturbed or washed away	☐Scour
☒Vegetation matted down, bent, absent	☒Presence of litter and debris	☒Sediment deposition
☐Water staining	☐Sediment sorting	☐Other (list)
☐Presence of wrack line	☐Shelving	
☐Abrupt change in plant community	☐Multiple observed flow events	Discontinuous OHWM? ☒Yes ☐No

HABITAT INFORMATION

Aquatic Habitat

Percentage Substrate	Percentage of Pools, Runs, Riffles (within delineated reach)
__0_% Bedrock ___5__% Gravel	_N/A__ pools (deep, low velocity water, smooth surface) , max. depth (ft)_____
_____% Concrete ___0__% Cobbles	_N/A__ runs (fast flowing, low turbulence water)
_____ % Silt __95__ % Sand	_N/A__ riffles (shallow, fast moving water broken by rocks/boulders)
_____ % Clay _____ % Other _____	

Woody Debris and Root Masses (within delineated reach)

No. of woody debris > 6" diameter within OHWM __0__

Linear feet of overhanging root masses along banks: __0__ left bank; __0__ right bank

Aquatic Vegetation

Type		Aquatic Vegetation Species
☒None	☐Rooted Floating	None
☐Rooted Emergent	☐Floating Algae	
☐Rooted Submerged	☐Attached Algae	**Barriers to Fish Passage?** ☐Yes ☐No
☐Free Floating	_____% of reach	Explain: N/A

Canopy Cover

☒Open/full sun ☐Partially Shaded ☐Mostly Shaded ☐Full Shade

Riparian Corridor

☒None ☐Sapling/Shrub ☐Forested

Left Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Right Bank Corridor Width

☒0-10 ☐10-25 ☐26-50 ☐51-75 ☐76-100 ☐101-150 ☐150+

Riparian Species

None

Observed Riparian/Terrestrial/Aquatic Organisms

None

Anthropogenic Effects

☐Bridged ☐Culverts ☐Riparian Corridor Cleared

☐Diverted ☐Drive-through/OHV crossing ☐Dammed

☐Weir or Check Dam ☐Other

No. of Associated Features and Feature IDs

Number	Feature ID
Ponds:	
Wetlands:	
Other Streams:	
Seeps/Springs:	
Drains:	

Comments

ED-17 consists of two ephemeral channels that combine within the APE. Both channels receive flow from stormwater during precipitation events only. The aquatic feature exhibits a discontinuous OHWM and turns to sheet flow prior to reaching ED-16.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: GLCA Bullfrog Launch Ramp City/County: Kane County Sampling Date: 10/11/2022

Applicant/Owner: National Park Service State: UT Sampling Point: WL-01 Wetland

Investigator(s): Brackett Mays Section, Township, Range: Section 22, Township 38S, Range 11E

Landform (hillslope, terrace, etc.): Lake Terrace - Backslope Local relief (concave, convex, none): Concave Slope (%): 20%

Subregion (LRR): Interior Deserts - LRR D Lat: 37.482471 Long: -110.691882 Datum: NAD 1983

Soil Map Unit Name: Water Field Cowardin classification: L2RS1G

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks) NWI Cowardin classification: L1UBH

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

This wetland area is on the bedrock cliff face above the current Lake Powell waterline where saturation/flooding was present at some point during the growing/high-water season, meeting the NPS definition of a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 5-foot radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5-foot radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0% = Total Cover		
Woody Vine Stratum (Plot size: 30-foot radius)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A = 0

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ✓ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** ✓

Remarks:

Sample point is situated on bedrock with no vegetation present.

SOIL

Sampling Point: WL-01 Wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-0								Sample point on bedrock, no soil.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ ~~Vernal Pools (F9)~~

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ ~~Red Parent Material (TF2)~~
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 0 Inches

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

No soil present at sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ✓ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sampling point is under the 2022 seasonal waterline. Obvious water mark on rock surface, salt crusts, and aquatic invertebrate evidence (fingernail clam shells).

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: GLCA Bullfrog Launch Ramp City/County: Kane County Sampling Date: 10/11/2022

Applicant/Owner: National Park Service State: UT Sampling Point: WL-01 Upland

Investigator(s): Brackett Mays Section, Township, Range: Section 22, Township 38S, Range 11E

Landform (hillslope, terrace, etc.): Lake Terrace - Backslope Local relief (concave, convex, none): Concave Slope (%): 15%

Subregion (LRR): Interior Deserts - LRR D Lat: 37.482467 Long: -110.691803 Datum: NAD 1983

Soil Map Unit Name: Water Field Cowardin classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks) NWI Cowardin classification: L1UBH

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

This sampling point is on the bedrock cliff face above the current Lake Powell waterline where saturation/flooding was NOT present at some point during the growing/high-water season, NOT meeting the NPS definition of a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5-foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 5-foot radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5-foot radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0% = Total Cover		
Woody Vine Stratum (Plot size: 30-foot radius)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A = 0

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ✓ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** ✓

Remarks:

Sample point is situated on bedrock with no vegetation present.

SOIL

Sampling Point: WL-01 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-0								Sample point on bedrock, no soil.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ ~~Vernal Pools (F9)~~

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ ~~Red Parent Material (TF2)~~
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 0 Inches

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

No soil present at sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
✓ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sampling point is above the 2022 seasonal waterline. There is no obvious signs of flooding/saturation during the growing season.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: GLCA Bullfrog Launch Ramp City/County: Kane County Sampling Date: 10/11/2022

Applicant/Owner: National Park Service State: UT Sampling Point: WL-02 Wetland

Investigator(s): Brackett Mays Section, Township, Range: Section 22, Township 38S, Range 11E

Landform (hillslope, terrace, etc.): Lake Terrace Local relief (concave, convex, none): Concave Slope (%): 5%

Subregion (LRR): Interior Deserts - LRR D Lat: 37.483077 Long: -110.691539 Datum: NAD 1983

Soil Map Unit Name: Water Field Cowardin classification: L2US2[illegible]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ If no, explain in Remarks NWI Cowardin classification: L1UBH[illegible]

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes ✓ No ____**
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

This wetland area is under the OHWM elevation of the lake which USACE has identified at 3,558'. This wetland would be underwater if not for the recent reservoir water level decline.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 5-foot radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5-foot radius)			
1. Cyperus erythrorhizos	25%	Y	OBL
2. Persicaria pensylvanica	15%	Y	FACW
3. Polypogon monspeliensis	5%	Y	FACW
4. Lythrum salicaria	5%	Y	OBL
5. Xanthium strumarium	<1%	N	FAC
6. Salsola tragus	<1%	N	FACU
7. Juncus balticus	<1%	N	FACW
8. Typha domingensis	<1%	N	OBL
	50% = Total Cover		
Woody Vine Stratum (Plot size: 30-foot radius)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 50 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	20	x 2 =	40
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	50 (A)		70 (B)

Prevalence Index = B/A = 1.4

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ✓ No ____**

Remarks:

Upper portion of wetland area inhabited with thick Salsola tragus and Persicaria pensylvanica. Lythrum salicaria seedlings propogating under canopy.

SOIL

Sampling Point: WL-02 Wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
1-3	7.5YR 6/6	98	5YR 4/6	2	C	PL/M	LS	
3-14	7.5YR 3/1	96	5YR 4/6	4	C	PL/M	LS	High organics. Prominent redox concentrations.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ✓ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ ~~Vernal Pools (F9)~~

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ ~~Red Parent Material (TF2)~~
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 14 Inches

Hydric Soil Present? Yes ✓ No ___

Remarks:

Prevalent redox concentrations observed between 3-14 inches in matrix and in pore linings.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ✓ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 3.5

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland appears to be fed from precipitation events and seasonal high water levels in lake.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: GLCA Bullfrog Launch Ramp City/County: Kane County Sampling Date: 10/11/2022

Applicant/Owner: National Park Service State: UT Sampling Point: WL-02 Upland

Investigator(s): Brackett Mays Section, Township, Range: Section 22, Township 38S, Range 11E

Landform (hillslope, terrace, etc.): Lake Terrace - Shoulder Local relief (concave, convex, none): Convex Slope (%): 10%

Subregion (LRR): Interior Deserts - LRR D Lat: 37.483143 Long: -110.691465 Datum: NAD 1983

Soil Map Unit Name: Water Field Cowardin classification: L2US2[illegible]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks) NWI Cowardin classification: L1UBH

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

This sampling point is on the bedrock cliff face above the current Lake Powell waterline where saturation/flooding was NOT present at some point during the growing/high-water season, NOT meeting the NPS definition of a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 5-foot radius)			
1.			
2.			
3.			
4.			
5.			
	0%	= Total Cover	

Herb Stratum (Plot size: 5-foot radius)			
1. Persicaria pensylvanica	10%	Y	FACW
2. Salsola tragus	10%	Y	FACU
3. Tamarix chinensis	<1%	N	FAC
4.			
5.			
6.			
7.			
8.			
	20%	= Total Cover	

Woody Vine Stratum (Plot size: 30-foot radius)			
1.			
2.			
	0%	= Total Cover	

% Bare Ground in Herb Stratum 80 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	10	x 2 =	40
FAC species		x 3 =	
FACU species	10	x 4 =	40
UPL species		x 5 =	
Column Totals:	20 (A)		80 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

Large portion of upland study plot on bedrock.

SOIL

Sampling Point: WL-02 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
1-3	7.5YR 5/4	100					S	Shallow soil to bedrock restrictive layer.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ ~~Vernal Pools (F9)~~

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ ~~Red Parent Material (TF2)~~
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 3 Inches

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

Shallow soil, no hydric indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ✓ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sampling point location is below USACE OHWM of 3,558'. Water marks and fingernail clam shells indicate area is flooded at some point during the year.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: GLCA Bullfrog Launch Ramp City/County: Kane County Sampling Date: 10/11/2022

Applicant/Owner: National Park Service State: UT Sampling Point: WL-03 Wetland

Investigator(s): Brackett Mays Section, Township, Range: Section 22, Township 38S, Range 11E

Landform (hillslope, terrace, etc.): Lake Terrace Local relief (concave, convex, none): Concave Slope (%): 5%

Subregion (LRR): Interior Deserts - LRR D Lat: 37.483830 Long: -110.691343 Datum: NAD 1983

Soil Map Unit Name: Water Field Cowardin classification: L2US2[illegible]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks) NWI Cowardin classification: L1UBH[illegible]

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes ✓ No ____**
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

This wetland area is under the OHWM elevation of the lake which USACE has identified at 3,558'. This wetland would be underwater if not for the recent reservoir water level decline.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 5-foot radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5-foot radius)			
1. Cyperus erythrorhizos	25%	Y	OBL
2. Typha domingensis	25%	Y	OBL
3. Polypogon monspeliensis	10%	Y	FACW
4. Persicaria pensylvanica	5%	Y	FACW
5. Lythrum salicaria	<1%	N	OBL
6. Salsola tragus	<1%	N	FACU
7. Xanthium strumarium	<1%	N	FAC
8.			
	65% = Total Cover		
Woody Vine Stratum (Plot size: 30-foot radius)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 35 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	50	x 1 = 50
FACW species	15	x 2 = 30
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	65 (A)	80 (B)

Prevalence Index = B/A = 1.23

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ✓ No ____**

Remarks:

SOIL

Sampling Point: WL-03 Wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 5/8	98	5YR 5/6	2	C	PL	LS	
2-12	7.5YR 3/2	97	5YR 4/6	3	C	PL	SL	High organics. Shallow soil.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ✓ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ ~~Vernal Pools (F9)~~

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ ~~Red Parent Material (TF2)~~
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 12 Inches

Hydric Soil Present? Yes ✓ No ___

Remarks:

Prevalent redox concentrations observed between 2-12 inches in matrix and in pore linings.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ✓ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 3

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland fed by an active upgradient seep and precipitation events bringing stormwater through the wetland feature. Fingernail clam shells evident. Salt crusts forming where water has recently receded.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: GLCA Bullfrog Launch Ramp City/County: Kane County Sampling Date: 10/11/2022

Applicant/Owner: National Park Service State: UT Sampling Point: WL-03 Upland

Investigator(s): Brackett Mays Section, Township, Range: Section 22, Township 38S, Range 11E

Landform (hillslope, terrace, etc.): Lake Terrace Local relief (concave, convex, none): Convex Slope (%): 8%

Subregion (LRR): Interior Deserts - LRR D Lat: 37.483782 Long: -110.691354 Datum: NAD 1983

Soil Map Unit Name: Water Field Cowardin classification: L2US2[illegible]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ If no, explain in Remarks NWI Cowardin classification: L1UBH[illegible]

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

This wetland area is under the OHWM elevation of the lake which USACE has identified at 3,558'.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 5-foot radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5-foot radius)			
1. Persicaria pensylvanica	5%	Y	FACW
2. Xanthium strumarium	1%	Y	FAC
3. Salsola tragus	<1%	N	FACU
4.			
5.			
6.			
7.			
8.			
	6% = Total Cover		
Woody Vine Stratum (Plot size: 30-foot radius)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 94 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	5	x 2 =	10
FAC species	1	x 3 =	5
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	6 (A)		15 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

✓ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

Remarks:

Although hydrophytic vegetation is present, area is comprised mostly of bedrock and no other species are present in study area.

SOIL

Sampling Point: WL-03 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 5/6	100						Shallow soil to bedrock underneath.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ ~~Vernal Pools (F9)~~

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ ~~Red Parent Material (TF2)~~
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 2 Inches

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

Shallow soil present at sampling location. Area around sampling location sits on bedrock.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ✓ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sampling point location is below USACE OHWM of 3,558'. Water marks and fingernail clam shells indicate area is flooded at some point during the year.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: GLCA Bullfrog Launch Ramp City/County: Kane County Sampling Date: 10/11/2022

Applicant/Owner: National Park Service State: UT Sampling Point: WL-04 Wetland

Investigator(s): Brackett Mays Section, Township, Range: Section 22, Township 38S, Range 11E

Landform (hillslope, terrace, etc.): Lake Terrace Local relief (concave, convex, none): Concave Slope (%): 5%

Subregion (LRR): Interior Deserts - LRR D Lat: 37.484270 Long: -110.691594 Datum: NAD 1983

Soil Map Unit Name: Water Field Cowardin classification: L2US2[illegible]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks) NWI Cowardin classification: L1UBH[illegible]

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes ✓ No ____**
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

This wetland area is under the OHWM elevation of the lake which USACE has identified at 3,558'. The wetland supports all 3 wetland indicators. This wetland would be underwater if not for the recent reservoir water level decline.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 5-foot radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5-foot radius)			
1. Cyperus erythrorhizos	35%	Y	OBL
2. Lythrum salicaria	25%	Y	OBL
3. Typha domingensis	15%	Y	OBL
4. Persicaria pensylvanica	<1%	Y	FACW
5. Polypogon monspeliensis	<1%	N	FACW
6. Veronica americana	<1%	N	OBL
7. Salsola tragus	<1%	N	FACU
8.			
	75% = Total Cover		
Woody Vine Stratum (Plot size: 30-foot radius)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	75	x 1 = 75
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	75 (A)	75 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ✓ No ____**

Remarks:

SOIL

Sampling Point: WL-04 Wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 4/6	98	5YR 5/6	2	C	PL	LS	
2-12	7.5YR 2.5/1	96	5YR 4/6	4	C	PL	SL	High organics. Shallow soil.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ✓ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ ~~Vernal Pools (F9)~~

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ ~~Red Parent Material (TF2)~~
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 12 Inches

Hydric Soil Present? Yes ✓ No ___

Remarks:

Prevalent redox concentrations observed between 2-12 inches in matrix and in pore linings. Soil is dark with extremely low chroma. Redox concentrations more prevalent after soil dries out slightly.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ✓ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ✓ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 0

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland fed by an active upgradient seep. Surface water present during delineation in all areas of the wetland. Hydrogren sulfide odor detected while digging soil pits. Bacterial sheen on surface water. Fingernail clam shells evident. Salt crusts forming on soil surface.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: GLCA Bullfrog Launch Ramp City/County: Kane County Sampling Date: 10/11/2022

Applicant/Owner: National Park Service State: UT Sampling Point: WL-04 Upland

Investigator(s): Brackett Mays Section, Township, Range: Section 22, Township 38S, Range 11E

Landform (hillslope, terrace, etc.): Lake Terrace Local relief (concave, convex, none): Convex Slope (%): 8%

Subregion (LRR): Interior Deserts - LRR D Lat: 37.483782 Long: -110.691354 Datum: NAD 1983

Soil Map Unit Name: Water Field Cowardin classification: L2US2[illegible]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks) NWI Cowardin classification: L1UBH[illegible]

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

This wetland area is under the OHWM elevation of the lake which USACE has identified at 3,558'.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 5-foot radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5-foot radius)			
1. Persicaria pensylvanica	15%	Y	FACW
2. Baccharis salicifolia	15%	Y	FAC
3. Salsola tragus	5%	Y	FACU
4. Erigeron canadensis	5%	Y	FACU
5. Potentilla supina	<1%	N	FACW
6. Erodium cicutarium	<1%	N	FAC
7.			
8.			
	40% = Total Cover		
Woody Vine Stratum (Plot size: 30-foot radius)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 94 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	15	x 2 =	30
FAC species	15	x 3 =	45
FACU species	10	x 4 =	40
UPL species		x 5 =	
Column Totals:	40 (A)		115 (B)

Prevalence Index = B/A = 2.875

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ✓ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: WL-04 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR 4/6	100						Shallow soil to bedrock underneath.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ ~~Vernal Pools (F9)~~

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ ~~Red Parent Material (TF2)~~
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 8 Inches

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

Shallow soil present at sampling location. Area around sampling location sits on bedrock.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ✓ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sampling point location is below USACE OHWM of 3,558'. Water marks and fingernail clam shells indicate area is flooded at some point during the year.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: GLCA Bullfrog Launch Ramp City/County: Kane County Sampling Date: 10/11/2022

Applicant/Owner: National Park Service State: UT Sampling Point: WL-05 Wetland

Investigator(s): Brackett Mays Section, Township, Range: Section 21, Township 38S, Range 11E

Landform (hillslope, terrace, etc.): Lake Terrace Local relief (concave, convex, none): Concave Slope (%): 5%

Subregion (LRR): Interior Deserts - LRR D Lat: 37.484154 Long: -110.692602 Datum: NAD 1983

Soil Map Unit Name: Water Field Cowardin classification: L2US2[illegible]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ If no, explain in Remarks NWI Cowardin classification: L1UBH[illegible]

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes ✓ No ____**
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

This wetland area is under the OHWM elevation of the lake which USACE has identified at 3,558'. The wetland supports all 3 wetland indicators. This wetland would be underwater if not for the recent reservoir water level decline.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 5-foot radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5-foot radius)			
1. Typha domingensis	35%	Y	OBL
2. Persicaria pensylvanica	25%	Y	FAWC
3. Lythrum salicaria	15%	Y	OBL
4. Cyperus erythrorhizos	5%	Y	OBL
5. Baccharis salicifolia	<1%	N	FAC
6. Salsola tragus	<1%	N	FACU
7. Veronica americana	<1%	N	OBL
8. Juncus balticus	<1%	N	FACW
	80% = Total Cover		
Woody Vine Stratum (Plot size: 30-foot radius)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	65	x 1 =	65
FACW species	25	x 2 =	50
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	80 (A)		115 (B)

Prevalence Index = B/A = 1.44

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ✓ No ____**

Remarks:

SOIL

Sampling Point: WL-05 Wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	7.5YR 3/4	98	5YR 4/6	2	C	PL	LS	
1-17	7.5YR 2.5/1	96	5YR 4/6	4	C	PL	SL	High organics. Shallow soil.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ✓ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ ~~Vernal Pools (F9)~~

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ ~~Red Parent Material (TF2)~~
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 17 Inches

Hydric Soil Present? Yes ✓ No ___

Remarks:

Prevalent redox concentrations observed between 2-12 inches in matrix and in pore linings. Soil is dark with extremely low chroma. Redox concentrations more prevalent after soil dries out slightly.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ✓ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ✓ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 0

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland fed by an active upgradient seep. Surface water present during delineation in all areas of the wetland. Hydrogren sulfide odor detected while digging soil pits. Bacterial sheen on surface water. Fingernail clam shells evident. Salt crusts forming on soil surface.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: GLCA Bullfrog Launch Ramp City/County: Kane County Sampling Date: 10/11/2022

Applicant/Owner: National Park Service State: UT Sampling Point: WL-05 Upland

Investigator(s): Brackett Mays Section, Township, Range: Section 21, Township 38S, Range 11E

Landform (hillslope, terrace, etc.): Lake Terrace Local relief (concave, convex, none): Convex Slope (%): 20%

Subregion (LRR): Interior Deserts - LRR D Lat: 37.483782 Long: -110.691354 Datum: NAD 1983

Soil Map Unit Name: Water Field Cowardin classification: L2US2[illegible]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ If no, explain in Remarks NWI Cowardin classification: L1UBH[illegible]

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

This wetland area is under the OHWM elevation of the lake which USACE has identified at 3,558'.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 5-foot radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5-foot radius)			
1. Persicaria pensylvanica	2%	Y	FACW
2. Polypogon monspeliensis	2%	Y	FACW
3. Salsola tragus	1%	Y	FACU
4.			
5.			
6.			
7.			
8.			
	5% = Total Cover		
Woody Vine Stratum (Plot size: 30-foot radius)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 95 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	4	x 2 = 8
FAC species	1	x 3 = 2
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	5 (A)	10 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

✓ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

Remarks:

Although hydrophytic vegetation is present, area is comprised mostly of bedrock and no other species are present in study area.

SOIL

Sampling Point: WL-05 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-.5	7.5YR 4/6	100						Shallow soil to bedrock underneath.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ ~~Vernal Pools (F9)~~

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ ~~Red Parent Material (TF2)~~
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 0.5 Inches

Hydric Soil Present? **Yes** ___ **No** ✓

Remarks:

Shallow soil present at sampling location. Area around sampling location sits on bedrock.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ✓ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sampling point location is below USACE OHWM of 3,558'. Water marks and fingernail clam shells indicate area is flooded at some point during the year.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: GLCA Bullfrog Launch Ramp City/County: Kane County Sampling Date: 10/11/2022

Applicant/Owner: National Park Service State: UT Sampling Point: WL-06 Wetland

Investigator(s): Brackett Mays Section, Township, Range: Section 21, Township 38S, Range 11E

Landform (hillslope, terrace, etc.): Lake Terrace Local relief (concave, convex, none): Concave Slope (%): 5%

Subregion (LRR): Interior Deserts - LRR D Lat: 37.484621 Long: -110.692044 Datum: NAD 1983

Soil Map Unit Name: Water Field Cowardin classification: PUS2C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks) NWI Cowardin classification: L1UBH

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

This wetland feature does not meet all 3 requirements for USACE jurisdiction, however meets the NPS definition requirements for a wetland feature.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 5-foot radius)			
1. Salix gooddingii	5%	Y	FACW
2.			
3.			
4.			
5.			
	5% = Total Cover		
Herb Stratum (Plot size: 5-foot radius)			
1. Lythrum salicaria	40%	Y	OBL
2. Salsola tragus	25%	Y	FACU
3. Persicaria pensylvanica	5%	Y	FACW
4. Polypogon monspeliensis	<1%	N	FACW
5. Baccharis salicifolia	<1%	N	FAC
6. Potentilla supina	<1%	N	FACW
7.			
8.			
	60% = Total Cover		
Woody Vine Stratum (Plot size: 30-foot radius)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 35% % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	10	x 2 =	20
FAC species		x 3 =	
FACU species	25	x 4 =	100
UPL species		x 5 =	
Column Totals:	65 (A)		160 (B)

Prevalence Index = B/A = 2.46

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: WL-06 Wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 5/4	100					SL	
2-16	7.5YR 4/4	87	5YR 4/6	3	C	M/PL	SL	
2-16	7.5YR 2.5/1	10					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ ~~Vernal Pools (F9)~~

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ ~~Red Parent Material (TF2)~~
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 16 Inches

Hydric Soil Present? Yes _____ No ✓

Remarks:

Redox concentrations observed in lower soil horizon mixed with patches of very dark soil and organic matter. Soil chroma too high to be considered Sandy Redox (S5).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ✓ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Aquatic feature fed by precipitation events. Lake waterline recession may result in aquatic feature drying up and ceasing to exist. Evidence of soil cracking, salt crusts, and water marks within the aquatic feature. No saturation present in soil pit.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: GLCA Bullfrog Launch Ramp City/County: Kane County Sampling Date: 10/11/2022

Applicant/Owner: National Park Service State: UT Sampling Point: WL-06 Upland

Investigator(s): Brackett Mays Section, Township, Range: Section 21, Township 38S, Range 11E

Landform (hillslope, terrace, etc.): Lake Terrace Local relief (concave, convex, none): Convex Slope (%): 10%

Subregion (LRR): Interior Deserts - LRR D Lat: 37.484597 Long: -110.691932 Datum: NAD 1983

Soil Map Unit Name: Water Field Cowardin classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks) NWI Cowardin classification: L1UBH

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✓	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** ✓
Hydric Soil Present?	Yes ___	No ✓	
Wetland Hydrology Present?	Yes ___	No ✓	

Remarks:

This wetland area is under the OHWM elevation of the lake which USACE has identified at 3,558'.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 5-foot radius)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5-foot radius)			
1. Salsola tragus	10%	Y	FACU
2. Polypogon monspeliensis	5%	Y	FACW
3. Potentilla supina	<1%	N	FACW
4.			
5.			
6.			
7.			
8.			
	5% = Total Cover		
Woody Vine Stratum (Plot size: 30-foot radius)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 95 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	5	x 2 = 10
FAC species		x 3 =
FACU species	10	x 4 = 40
UPL species		x 5 =
Column Totals:	15 (A)	50 (B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** ✓

Remarks:

Sample point is in shallow soil next to bedrock. Little plant cover exists outside of the corresponding aquatic resource (Sample Point WL-06 Wetland).

SOIL

Sampling Point: WL-06 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	7.5YR 5/6	100						Shallow soil to bedrock underneath.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ ~~Vernal Pools (F9)~~

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ ~~Red Parent Material (TF2)~~
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 1 Inches

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Shallow soil present at sampling location. Area around sampling location sits on bedrock.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology present at sampling point.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: GLCA Bullfrog Launch Ramp City/County: Kane County Sampling Date: 10/11/2022

Applicant/Owner: National Park Service State: UT Sampling Point: WL-07 Wetland

Investigator(s): Brackett Mays Section, Township, Range: Section 21, Township 38S, Range 11E

Landform (hillslope, terrace, etc.): Lake Terrace Local relief (concave, convex, none): Concave Slope (%): 5%

Subregion (LRR): Interior Deserts - LRR D Lat: 37.484567 Long: -110.693241 Datum: NAD 1983

Soil Map Unit Name: Water Field Cowardin classification: PUS2C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks) NWI Cowardin classification: L1UBH

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

This wetland feature does not meet all 3 requirements for USACE jurisdiction, however the aquatic feature meets the NPS definition requirements for a wetland feature.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 5-foot radius)			
1. Salix gooddingii	25%	Y	FACW
2. Tamarix chinensis	10%	N	FAC
3. Populus fremontii	<1%	N	FACW
4.			
5.			
	5% = Total Cover		
Herb Stratum (Plot size: 5-foot radius)			
1. Typha domingensis	20%	Y	OBL
2. Salsola tragus	10%	Y	FACU
3. Persicaria pensylvanica	<1%	N	FACW
4. Polypogon monspeliensis	<1%	N	FACW
5. Veronica americana	<1%	N	OBL
6. Lythrum salicaria	<1%	N	OBL
7.			
8.			
	65% = Total Cover		
Woody Vine Stratum (Plot size: 30-foot radius)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 35% % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	25	x 2 =	50
FAC species	10	x 3 =	30
FACU species	10	x 4 =	40
UPL species		x 5 =	
Column Totals:	65 (A)		140 (B)

Prevalence Index = B/A = 2.15

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: WL-07 Wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 5/4	100					SL	
2-18	7.5YR 3/4	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ ~~Vernal Pools (F9)~~

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ ~~Red Parent Material (TF2)~~
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 18 Inches

Hydric Soil Present? Yes _____ No ✓

Remarks:

No redox concentrations evident in soil matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ✓ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Aquatic feature fed by precipitation events. The lake waterline recession may result in aquatic feature drying up and ceasing to exist. Evidence of soil cracking, salt crusts, and water marks within the aquatic feature. No saturation or evidence of water table in soil pit.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: GLCA Bullfrog Launch Ramp City/County: Kane County Sampling Date: 10/11/2022

Applicant/Owner: National Park Service State: UT Sampling Point: WL-07 Upland

Investigator(s): Brackett Mays Section, Township, Range: Section 21, Township 38S, Range 11E

Landform (hillslope, terrace, etc.): Lake Terrace Local relief (concave, convex, none): Convex Slope (%): 15%

Subregion (LRR): Interior Deserts - LRR D Lat: 37.484619 Long: -110.693194 Datum: NAD 1983

Soil Map Unit Name: Water Field Cowardin classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks) NWI Cowardin classification: L1UBH

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✓	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** ✓
Hydric Soil Present?	Yes ___	No ✓	
Wetland Hydrology Present?	Yes ___	No ✓	

Remarks:

This wetland area is under the OHWM elevation of the lake which USACE has identified at 3,558'.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 5-foot radius)			
1. Tamarix chinensis	<1%	N	FAC
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5-foot radius)			
1. Salsola tragus	2%	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	2% = Total Cover		
Woody Vine Stratum (Plot size: 30-foot radius)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 98% % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species	2	x 4 = 8
UPL species		x 5 =
Column Totals:	2 (A)	8 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** ✓

Remarks:

Area immediately adjacent to aquatic resource feature sits on bedrock with minimal to no vegetation cover.

SOIL

Sampling Point: WL-07 Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-0								No soil at sampling point location.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ ~~Vernal Pools (F9)~~

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ ~~Red Parent Material (TF2)~~
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 0 Inches

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Upland area adjacent to aquatic feature sits on bedrock. No soil other than within the aquatic feature.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology present at sampling point.

APPENDIX III

PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG

P1: ED-01 view south (downgradient) on north side of Utah State Road 276.

P2: ED-01 view south (downgradient) on south side of Utah State Road 276.

P3: ED-02 view southeast (downgradient) before culvert crossing under Utah State Road 276.

P4: ED-02 view southeast (downgradient) at drainage prior to dissipation into sheet flow.

P5: ED-03 view southeast (downgradient) at northern end of drainage along Stanton Creek Road.

P6: ED-03 view southeast (downgradient) prior to drainage leaving the APE.

P7: ED-04 view southeast prior to drainage leaving APE.

P8: ED-04 view northwest (upgradient) at Stanton Creek Road.

P9: ED-05 view northwest (upgradient) at beginning of drainage in APE.

P10: ED-05 view southeast (downgradient) as drainage flows through APE.

P11: ED-06 view southeast (downgradient) at beginning of drainage in APE.

P12: ED-06 view southeast (downgradient) at drainage intersection in APE.

P13: ED-07 view northwest (upgradient) of braided channels within drainage.

P14: ED-07 view southeast (downgradient) of distinct OHWM indicators in channel.

P15: ED-08 view northeast looking upgradient at drainage channel.

P16: ED-08 view southwest looking downgradient at drainage channel.

P17: ED-09 view southwest (downgradient) within southern channel.

P18: ED-09 view southwest (downgradient) within northern drainage channel.

P19: ED-10 view southwest (downgradient) within drainage channel.

P20: ED-10 view northeast (upgradient) within drainage channel.

P21: ED-11 view southwest (downgradient) within drainage channel.

P22: ED-11 view northeast (upgradient) within drainage channel.

P23: ED-12 view southwest (downgradient) from northern drainage channel.

P24: ED-12 view southwest (downgradient) from southern drainage channel.

P25: ED-13 view southwest (downgradient) from northern drainage channel.

P26: ED-13 view southwest (downgradient) from southern drainage channel.

P27: ED-14 view southwest within drainage channel.

P28: ED-14 view northeast (upgradient) from within drainage channel.

P29: ED-15 view southwest (downgradient) at beginning of drainage channel in APE.

P30: ED-15 view southwest (downgradient) at end of drainage channel in APE.

P31: ED-16 view north (upgradient) near beginning of channel within APE.

P32: ED-16 view south (downgradient) as channel dissipates to sheet flow within APE.

P33: ED-17 view southwest (downgradient) from southern drainage channel.

P34: ED-17 view south (downgradient) prior to dissipating into sheet flow.

P35: WL-01 view southeast of obvious seasonal high-water mark.

P36: WL-01 view northwest of seasonal high-water mark above wet surface.

P37: WL-01 view southwest of seasonal high-water mark.

P38: WL-01 view east of seasonal high-water mark.

P39: WL-02 view northeast of lower extent of wetland.

P40: WL-02 view northeast at upper extent of wetland.

P41: WL-02 soil pit.

P42: WL-02 redox features within low chroma soil horizon.

P43: WL-03 view northeast of *Carex erythrorhizos* dominant vegetation.

P44: WL-03 view west of wetland and vicinity to Lake Powell.

P45: WL-03 soil sample.

P46: WL-03 redox features along pore linings in soil with low chroma.

P47: WL-04 view south at predominance of hydrophytic vegetation.

P48: WL-04 view south at predominance of hydrophytic vegetation.

P49: WL-04 soil sample. Soils were saturated and required drying to identify redox features.

P50: WL-04 view of redox features in low chroma soil matrix after allowing soil to partially dry.

P51: WL-05 view southeast at predominance of hydrophytic vegetation.

P52: WL-05 view west where wetland abuts Lake Powell.

P53: WL-05 soil sample.

P54: WL-05 redox features within low chroma matrix.

P55: WL-06 view north at isolated wetland with predominance of hydrophytic vegetation.

P56: WL-06 view southeast at isolated wetland with predominance of hydrophytic vegetation.

P57: WL-06 view of soil pit with no hydric soil indicators or soil saturation.

P58: WL-06 soil after being hydrated. Black organic matter evident in matrix.

P59: WL-07 view north at hydrophytic vegetation community.

P60: WL-07 view southwest at northern extent of wetland feature.

P61: WL-07 soil pit featuring no saturation or hydric soil conditions.

P62: WL-07 soil matrix with soil color of 7.5YR 3/4.

P63: WL-07 view southwest of southern extent of wetland feature with predominance of weedy species.

P64: View southeast at WL-06 to the left, WL-04 center, and WL-02 and WL-03 in the distance.

APPENDIX IV

STATEMENT OF ACCESS