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MEMORANDUM

TO: Darren Olsen

FROM: Robert Thomas

DATE: February 12, 2015

SUBJECT: Provo River Delta Restoration Wetland Functional Assessment

The following is a summary of the process undertaken to complete the wetlands functional assessment for the Provo River Delta Restoration project.

In 2010 BIO-WEST staff completed a delineation of wetlands located on accessible private properties within the project area. A large portion of the project area known as the Despain Property was not accessible at this time and was delineated in 2011. An assessment of the function of the delineated wetlands was required to determine the wetland restoration potential resulting from the project. Bob Thomas was given verbal approval by Mr. Tim Witman with the U.S. Army Corps of Engineers (USACE) on August 15, 2011 to use the Utah Department of Transportation (UDOT) Wetland Functional Assessment Method for this project. Input from the U.S. Fish and Wildlife Service and Utah Department of Natural Resources was required to complete the wildlife habitat portions of the assessment. A report summarizing the vegetation composition and general condition, including photographs of each wetland assessment area was provided to the agencies for their review. Because BIO-WEST did not have access to the Despain property this initial summary report includes a preliminary assessment of Despain property wetlands as observed from the adjacent properties. BIO-WEST received scoring input for the initial assessment from the agencies on November 17, 2011. In 2012 BIO-WEST was granted access to the Despain property and completed a delineation and assessment of the wetlands at that time. Following the Despain property delineation, a summary report detailing the Despain property wetlands was forwarded to agency personnel. The agency scoring responses regarding these wetlands was received on May 29, 2013. The scoring was then incorporated into the wetland assessment spreadsheet from the initial assessment to provide a complete record of existing wetland function on the project area. Following a site visit and subsequent input from the USACE, some of the Despain property wetland polygons were combined or otherwise slightly modified. The overall changes to wetland community types were minimal. The modified Despain wetland map was used in the scoring spreadsheet included with this memo.



An additional revision to the functional assessment was performed in February 2015. This revision was done because the post restoration emergent vegetation wetland communities were lumped into one type, “emergent wetlands”. This allowed for numerous wetland types exhibiting emergent wetland vegetation in the previous functional assessment results to be combined into one wetland type for the revised results. In addition the approximately 16.7 acre Provo City Wetland Mitigation Bank on the project area was delineated and approved by the USACE. This mapping revision is also reflected in the updated spreadsheet and the revised assessment map. These revisions had an effect on the results of the functional assessment. The revised spreadsheet is included in this memo.

The wetland functional assessment was performed using the methods described in the UDOT Wetland Functional Assessment Manual. BIO-WEST conducted field data collection for the functional assessment concurrently with the field delineation of wetlands within the project area. Vegetation, soils, and hydrology data were collected in association with wetland sampling points and supported by biologist’s observations within each delineated wetland. Each wetland was scored using the assessment method handbook matrix. The level of disturbance within the wetland was assessed relative to the level of disturbance immediately surrounding the wetland and within the wetland boundary. Types of disturbance include grazing, drainage ditches, mowing, crop cultivation, and construction of roads and buildings. The rating of disturbance increases both with the level of disturbance to the wetland itself and the level of disturbance within the surrounding area.

The plant community composition of each wetland was assessed via three categories: presence of expected layers of vegetation; percent of ground cover dominated by native vegetation; and the percent of native wetland plants to non-native or non-wetland plants. The wetlands were scored according to type, with the sum of each category resulting in a numerical score representative of the quality of the vegetation composition in the wetland.

Habitat for federal and state listed species was assessed following consultation with U.S. Fish and Wildlife Service and Utah Division of Wildlife Resources biologists. Agency biologists determine the listed species with documented occurrences or suspected occurrences within the project area. Additionally, the habitat within the project area was determined to be primary, secondary, or incidental habitat for each species. BIO-WEST biologists applied the agency input to each wetland within the project area. The combination of habitat use and species occurrence resulted in the functional score for this variable.

The quality of general wildlife habitat was assessed relative to the level of disturbance within the wetland and the plant community composition; the combined ratings provide the functional score. General fish and aquatic habitat was assessed by evaluating the level of cover and shading available as well as the permanence of the wetland. This variable was not applicable to the majority of the wetlands within the project area. The assessment of general amphibian habitat was dependent upon documented presence of amphibians within the project area. This information was provided from the agency consultation.

The hydrological and biophysical portion of the assessment included an evaluation of flood attenuation. This variable only applied to one wetland within the project area. A more typical assessment for this project was the short and long term surface water storage. Sediment, nutrient, and toxicant retention and removal was assessed by evaluating the percentage of ground with high to moderate surface roughness and any disturbance to the wetland's natural ability to store water compared to the surrounding land uses contribution of sedimentation, nutrients, or toxicants. Lastly, the assessment of sediment and shoreline stabilization was evaluated for ground surface roughness and the duration of surface water adjacent to rooted vegetation.

Each of these variables was given a score for its existing condition to provide a baseline functional assessment score for the project area in its current state. In order to determine the potential effect of the restoration project on the existing wetlands predictive models were developed for each project alternative. These models depict the type, extent, and size of wetlands created by the project alternatives. Assumptions associated with the project are that natural hydrology will be restored to the project area, that non-native and weedy vegetation will be reduced as a result of the project, and that wetlands unaffected by the project will remain in their existing condition. Each wetland type under each project alternative was scored for its expected post restoration condition.

The total number of points given for each assessment variable for an evaluated wetland were summed and divided by the total number of possible points. Variables that were not applicable to the wetland evaluated were omitted from the actual total and the total possible points. The result was a functional percentage. This percentage represents the complete functionality or the amount of functional loss for each wetland. A wetland with a functional percentage of 65 has lost 35% of its functionality, representing a system that has been negatively impacted through some type of disturbance. Conversely, a wetland with a functional score of 95% is relatively undisturbed and retains a high level of ecological functionality.

The difference in the total existing condition score and the post restoration score for each alternative provides the functional change in the project area wetlands under each alternative. The results of the functional assessment show a lift, or net improvement, in the functionality of the project area wetlands.

The results of the functional assessment are detailed in the attached functional assessment spreadsheet. The scoring of the wetlands in their current condition showed a decreased function for the majority of wetlands. This decreased function is indicative of wetlands that have been historically altered due to agricultural and other anthropomorphic changes. Each alternative was evaluated for its projected effect on project wetlands. The post restoration wetland scores reflect higher functionality over existing conditions. The difference in the functional scores shows an overall functional lift in the project area wetland system.

Attached are the following:

The functional assessment scoring sheet (updated February 12, 2015);
October 28, 2011 Summary Report Including Wetland Maps for Agencies;



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March 13, 2013 Despain Property Summary Report Including Wetland Map for Agencies;
Revised Despain Property Functional Assessment Map (matches the functional assessment
scoring sheet below).

POST RESTORATION - Alternative A																				
	2.4	2.4	Riverine	2	1	L	0.9	0.9	0.9	1.0	0.6	0.2	0.8	N/A	0.9	0.8	7.0	8.0	16.8	88%
	404.4	404.4	Emergent Wetland (Lacustrine Fringe)	2	1	L	1.0	0.7	0.6	1.0	0.7	0.2	N/A	1.0	0.6	1.0	6.8	8.0	2749.9	85%
	4.2	4.2	Forested Wetland	1	1	L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	24.8	98%
	11.4	11.4	Raised Peat Mounds	2	1	L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	67.3	98%
	35.7	35.7	Lacustrine Vegetated Aquatic Bed	3	1	L	1.0	0.7	0.6	1.0	0.7	0.2	N/A	1.0	0.6	1.0	6.8	8.0	242.8	85%
	2.6	2.6	Depressional	3	2	H	1.0	0.0	0.7	0.6	N/A	0.2	N/A	0.8	0.9	N/A	4.2	6.0	10.9	70%
TOTAL POST RESTORATION FUNCTIONAL UNITS																			3112.4	

TOTAL NET GAIN OF FUNCTIONAL UNITS, POST RESTORATION UNITS (3112.4) - EXISTING UNITS (1235.7) = 1876.7

POST RESTORATION - Alternative B																				
	0.2	0.2	Riverine	2	1	L	0.9	0.9	0.9	1.0	0.6	0.2	0.8	N/A	0.9	0.8	7.0	8.0	1.4	88%
	258.3	258.3	Emergent Marsh (Lacustrine Fringe)	2	1	L	1.0	0.7	0.6	1.0	0.7	0.2	N/A	1.0	0.6	1.0	6.8	8.0	1756.4	85%
	1.1	1.1	Depressional	1	3	H	0.2	0	0.7	0.2	N/A	0.2	N/A	0.8	0.9	N/A	3.0	6.0	3.3	50%
	4.5	4.5	Depressional	1	3	H	1.0	0.0	0.1	0.6	N/A	0.2	N/A	0.4	0.9	N/A	3.2	6.0	14.4	53%
	4.2	4.2	Forested Wetland	1	1	L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	24.8	98%
	11.4	11.4	Raised Peat Mounds	2	1	L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	67.3	98%
	28.9	28.9	Lacustrine Vegetated Aquatic Bed	3	1	L	1.0	0.7	0.6	1.0	0.7	0.2	N/A	1.0	0.6	1.0	6.8	8.0	196.5	85%
	2.6	2.6	Depressional	3	2	H	1.0	0.0	0.7	0.6	N/A	0.2	N/A	0.8	0.9	N/A	4.2	6.0	10.9	70%
TOTAL POST RESTORATION FUNCTIONAL UNITS																			2075.0	

TOTAL NET GAIN OF FUNCTIONAL UNITS, POST RESTORATION UNITS (2075) - EXISTING UNITS (1235.7) = 839.3

POST RESTORATION - Alternative C																			
0.7	0.7	Depressional	1	3	L	0.8	0.0	0.0	1.0	N/A	0.2	N/A	1.0	0.9	N/A	3.9	6.0	2.7	65%
7.0	7.0	Raised Peat Mounds	2	1	L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	41.3	98%
7.3	7.3	Depressional	2	1	L	1.0	0.0	0.8	1.0	N/A	0.2	N/A	1.0	0.9	N/A	4.9	6.0	35.8	82%
2.6	2.6	Depressional	3	2	H	1.0	0.0	0.7	0.6	N/A	0.2	N/A	0.8	0.9	N/A	4.2	6.0	10.9	70%
2.6	2.6	Slope	1	3	H	0.2	0.3	0.7	0.2	N/A	0.2	N/A	0.4	0.9	N/A	2.9	6.0	7.5	48%
20.9	20.9	Slope	1	3	H	0.2	0.9	0.7	0.2	N/A	0.2	N/A	0.4	0.9	N/A	3.5	6.0	73.2	58%
1.1	1.1	Raised Peat Mounds	2	3	H	1.0	0.0	0.7	0.6	N/A	0.2	N/A	0.4	0.9	N/A	3.8	6.0	4.2	63%
2.3	2.3	Depressional	0	3	H	0.4	0.0	0.8	0.2	N/A	0.2	N/A	0.6	0.7	N/A	2.9	6.0	6.7	48%
4.1	4.1	Slope	1	2	H	1.0	0.7	0.7	0.6	N/A	0.2	N/A	0.4	0.9	N/A	4.5	6.0	18.5	75%
1.1	1.1	Slope	1	3	H	0.2	0.0	0.7	0.2	N/A	0.2	N/A	0.4	0.9	N/A	2.6	6.0	2.9	43%
13.6	13.6	Slope	1	3	H	0.4	0.9	0.7	0.2	N/A	0.2	N/A	0.4	0.9	N/A	3.7	6.0	50.3	62%
1.5	1.5	Riverine	2	3	H	0.5	0.3	0.7	0.2	0.3	0.2	0.4	N/A	0.3	0.3	3.2	8.0	4.8	40%
2.4	2.4	Slope	1	3	H	0.2	0.7	0.7	0.2	N/A	0.2	N/A	0.4	0.9	N/A	3.3	6.0	7.9	55%
1.2	1.2	Raised Peat Mounds	0	3	H	0.2	0.9	0.0	0.2	N/A	0.0	N/A	0.8	0.9	N/A	3.0	6.0	3.6	50%
1.2	1.2	Raised Peat Mounds	1	1	H	1.0	0.9	0.6	0.6	N/A	0.2	N/A	0.8	0.9	N/A	5.0	6.0	6.0	83%
2.4	2.4	Depressional	1	2	H	1.0	0.9	0.1	0.6	N/A	0.2	N/A	0.8	0.9	N/A	4.5	6.0	10.8	75%
70.5	70.5	Emergent Marsh not restored	0	1	H	1.0	0.9	0.8	0.6	N/A	0.2	N/A	0.8	0.9	N/A	5.2	6.0	366.6	87%
49.0	49.0	Wet Meadow not restored	0	2	H	0.2	0.9	0.6	0.6	N/A	0.2	N/A	0.8	0.9	N/A	4.2	6.0	205.8	70%
0.2	0.2	Depressional	0	3	H	0.2	0.9	0.1	0.2	N/A	0.2	N/A	0.8	0.9	N/A	3.3	6.0	0.7	55%
1.1	1.1	Riverine	1	1	L	0.9	0.9	0.9	1.0	0.6	0.2	0.8	N/A	0.9	0.8	7.0	8.0	7.7	88%
214.9	214.9	Emergent Marsh (Lacustrine Fringe)	2	1	M	1.0	0.7	0.6	1.0	0.7	0.2	N/A	1.0	0.6	1.0	6.8	8.0	1461.3	85%
0.6	0.6	Forested Wetland	1	1	L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	3.5	98%
22.2	22.2	Lacustrine Vegetated Aquatic Bed	3	1	L	1.0	0.7	0.6	1.0	0.7	0.2	N/A	1.0	0.6	1.0	6.8	8.0	151.0	85%
0.9	0.9	Raised Peat Mounds	2	1	L	1.0	0.9	0.9	1.0	N/A	0.2	N/A	1.0	0.9	N/A	5.9	6.0	5.3	98%
TOTAL POST RESTORATION FUNCTIONAL UNITS																	2488.9		
TOTAL NET GAIN OF FUNCTIONAL UNITS, POST RESTORATION UNITS (2488.9) - EXISTING UNITS (1235.7) =1253.2																			

Proposed Provo River Delta Restoration Project

Utah County, Utah

**Draft Summary for Agency Review and Scoring using the
Utah Department of Transportation, Wetland Functional Assessment Method**

October 28, 2011

Personnel: Bob Thomas (Wetland Scientist, BIO-WEST, Inc.)
Travis Taylor (Vegetation Technician, BIO-WEST, Inc.)
Steve Ripple (Botanist, Independent Contractor)
John Rice (Wetland Scientist, Utah Mitigation Commission)

Field Work Performed: September and October, 2011

Summary Prepared by BIO-WEST, Inc.

Introduction

The Utah Reclamation Mitigation and Conservation Commission (URMCC) is proposing to restore approximately 734-acres of the historic Provo River Delta at Utah Lake in Utah County, Utah. The project area has been heavily altered through the construction of the Utah Lake levee, the installation of a large scale drainage system behind the levee, the channelization of the Provo River, and intensive agricultural activities. The project would involve restoring the natural meandering Provo River channel through the historic river delta (project area), and removal of the existing flood control levee on the Utah Lake shoreline. The completed project would allow the restored river and Utah Lake to resume the natural flood cycles within the project area. The purpose of the project is the restoration of critical habitat for the federally endangered June Sucker (*Chasmistes liorus*).

Despite the existing alterations, the project area contains extensive existing wetlands that are supported by a high groundwater table and slope drainage. These altered wetlands continue to provide a measurable amount of ecological function to the existing ecosystem. The U.S. Army Corps of Engineers (USACE) has requested that the URMCC evaluate and quantify the ecological function provided by the project area wetlands as they currently exist. The existing ecological functions can then be compared to the post-project level of the restored ecological functions, allowing for an estimate of the expected change.

The Utah Department of Transportation (UDOT) developed a Wetland Functional Assessment Method and published a handbook of the method for public use in April 2006. The UDOT assessment is commonly used in Utah and has been approved by the USACE regional office in Bountiful, Utah. BIO-WEST, Inc. on behalf of the URMCC has delineated the project area wetlands and gathered the necessary field data to perform a wetland functional assessment of the project area using the UDOT method. In addition to the field data that has been gathered, the UDOT manual requires site specific input from the U.S. Fish and Wildlife Service and the Utah Department of Wildlife Resources for completion of the functional assessment. This summary is intended to provide these agencies with the information required to complete applicable sections of the project area functional assessment.

The information provided within this summary includes;

- a photograph and brief description of each assessed wetland within the project area,
- a location map of the assessed wetlands,
- selected pages from the UDOT assessment handbook for use in agency responses to questions 12, 15c, 15d, and 15g.
- a spreadsheet summary of the assessed wetland scoring with the agency required response columns highlighted.

October 27, 2011

Wetland A1.

Wetland Size: 38.2 acres

Wetland Classification: Lacustrine Fringe



Summary: Wetland A1 is a lacustrine fringe wetland located below the ordinary high water mark along the eastern shore of Utah Lake. This wetland is adjacent to the Utah lake levee and a state park campground. The vegetation is dominated by a monoculture of common reed (*Phragmites australis*). The disturbance level is high due to the adjacent campground and levee. The wetland is permanently flooded. Wetland A1 was likely open water or a rooted aquatic lacustrine fringe wetland prior to construction of the Utah Lake levee. Wetland A1 did not appear to contain suitable habitat for Ute lady's tresses.

October 27, 2011

Wetland B1.

Wetland Size: 1.1 acres

Wetland Classification: Depressional



Summary: Wetland B1 is a drainage ditch containing open water and emergent wetland vegetation. The wetland is dominated by mixture of native and non-native species including reed canary grass (*Phalaris arundinaceae*), narrowleaf willow (*Salix exigua*), Russian olive (*Elaeagnus angustifolia*), Siberian elm (*Ulmus pumila*), crack willow (*Salix fragilis*), annual ragweed (*Ambrosia artemisiifolia*), hardstem bulrush (*Schoenoplectus acutus*), cattail (*Typha latifolia*), mountain rush (*Juncus arcticus*), and annual rabbitsfoot grass (*Polypogon monspeliensis*). The disturbance level is high due to heavy grazing and drainage of the ditch to an automated pumping system. The soils are mineral and hydrology is permanent freshwater. Wetland B1 was likely a marshy emergent lacustrine fringe wetland or rooted aquatic bed prior to construction of the Utah Lake levee. Wetland B1 did not appear to contain suitable habitat for Ute lady's tresses.

October 27, 2011

Wetland C1.

Wetland Size: 4.5 acres

Wetland Classification: Depressional



Summary: Wetland C1 is a saline emergent depression wetland dominated by salt grass (*Distichlis spicata*), red swampfire (*Salicornia rubra*), fivehorn smotherweed (*Bassia hyssopifolia*), and marshland goosefoot (*Chenopodium rubrum*). The disturbance level of the wetland is high due to heavy grazing, an adjacent drainage ditch, and a drainage ditch that bisects the wetland and effectively prevents inundation. The soils are mineral and hydrology is seasonal ephemeral. The dominant vegetation suggests highly saline conditions within the wetland. Wetland C1 was likely a marshy emergent lacustrine fringe wetland prior to construction of the Utah Lake levee. Wetland C1 did not appear to contain suitable habitat for Ute lady's tresses.

Wetland E1.

Wetland Size: 2.6 acres

Wetland Classification: Depressional



Summary: Wetland E1 is a depressional oxbow wetland that has been cut off from the Provo River. The wetland contains elements of open water, rooted aquatics, shrub/scrub, and emergent areas. The dominant vegetation includes reed canary grass, narrowleaf willow, Russian olive, Siberian elm, and crack willow. Soils are organic silt and hydrology is permanent surface water. The disturbance level is high due to the presence of a paved recreational trail around the entire wetland. The wetland has been separated from Provo River flooding and anaerobic conditions are typical in the open water areas of the wetland. Wetland E1 did not appear to contain suitable habitat for Ute lady's tresses.

October 27, 2011

Wetland F1.

Wetland Size: 2.6 acres

Wetland Classification: Slope



Summary: Wetland F1 is an emergent wetland dominated by introduced forage species such as strawberry clover (*Trifolium fragiferum*), red clover (*Trifolium pratense*), annual bluegrass (*Poa annua*), and a combination of native and introduced species including bushy knotweed (*Polygonum ramosissimum*), redtop (*Agrostis gigantea*), quack grass (*Elymus repens*), and various wheat grasses. Wetland species such as hardstem bulrush, wooly sedge (*Carex lasiocarpa*), Nebraska sedge (*Carex nebrascensis*), mountain rush, and common spikerush (*Eleocharis palustris*) are less predominate but present in small depressions throughout the sloping terrain. The disturbance level is high due to heavy grazing and alterations to the natural wetland hydrology including ditches and a drainage pumping station. The soils are organic and hydrology is seasonal freshwater. This wetland is near known habitat (wetlands F2 and F6) for Ute lady's tresses (*Spiranthes diluvialis*), however; two years of surveys were performed and the plant was not observed within wetland F1.

October 27, 2011

Wetland F2.

Wetland Size: 20.9 acres

Wetland Classification: Slope



Summary: Wetland F2 is an emergent wetland with a mix of native and non-native species, dominated by annual ragweed, Joe-pye weed (*Eupatorium maculatum*), hardstem bulrush, meadow fescue (*Schedonorus pratensis*), Nuttall's sunflower (*Helianthus Nuttallii*), common three square (*Schoenoplectus pungens*), field mint (*Mentha arvensis*), spearmint (*Mentha spicata*), lady's thumb (*Polygonum persicaria*), water knotweed (*Polygonum amphibium*), redtop, and quack grass. The disturbance level is high due to heavy grazing, several drainage ditches, and other structures. The soils are organic and hydrology is seasonal freshwater. A documented Ute lady's tresses population occurs in this assessment area.

October 27, 2011

Wetland F3.

Wetland Size: 1.1 acres

Wetland Classification: Slope (Raised Fen)



Summary: Wetland F3 is a raised fen surrounded by weedy uplands and emergent wet meadow areas. Wetland F3 contains mostly native vegetation including stinging nettle (*Urtica dioica*), western aster (*Symphyotrichum ascendens*), western goldenrod (*Solidago occidentalis*), common three square, mountain rush, common spikerush, swamp verbena (*Verbena hastata*), seaside arrowgrass (*Triglochin maritima*), rough bugleweed (*Lycopus asper*), and annual ragweed on the fringes. The disturbance level is characterized as high due to heavy grazing and nearby drainage ditches. The soils are organic and hydrology is persistent freshwater. This wetland is near known habitat (wetlands F2 and F6) for Ute lady's tresses, however; two years of surveys have been performed and the plant was not observed within wetland F3.

October 27, 2011

Wetland F4.

Wetland Size: 4.1 acres

Wetland Classification: Slope



Summary: Wetland F4 is a grazed emergent wetland. The dominant vegetation consists of native species including common three square, common spikerush, mountain rush, wooly sedge, Nebraska sedge, meadow hawksbeard (*Crepis runcinata*), swamp pricklegrass (*Crypsis schoenoides*), and scratchgrass (*Muhlenbergia asperifolia*). The upland grass squirreltail (*Elymus elymoides*) is also present and was probably planted in the meadow as a forage species or is propagating from bordering areas. The disturbance level is high due to heavy grazing and adjacent drainage ditches. Soils are organic and hydrology is seasonal and persistent freshwater. This wetland is near known habitat (wetlands F2 and F6) for Ute lady's tresses, however; two years of surveys have been performed and the plant was not observed within wetland F4.

Wetland F5.

Wetland Size: 1.1 acres

Wetland Classification: Slope



Summary: Wetland F5 is a disturbed pasture with saturated soils. The wetland is dominated by non-native and native vegetation including annual bluegrass, bushy knotweed, annual ragweed, spiny cocklebur (*Xanthium spinosum*), marshland goosefoot, and hardstem bulrush. The disturbance level is high due to heavy grazing, drainage ditches, and structures. The soils are organic and hydrology is seasonal freshwater. This wetland is near known habitat (wetlands F2 and F6) for Ute lady's tresses, however; two years of surveys have been performed and the plant was not observed within wetland F5.

Wetland F6.

Wetland Size: 13.6 acres

Wetland Classification: Slope



Summary: Wetland F6 is a disturbed emergent wetland. The wetland is dominated by a mix of native and non-native vegetation including common three square, mountain rush, Nuttall's sunflower, Joe-pye weed, common spikerush, and western aster. The disturbance level is considered high due to heavy grazing and an adjacent drainage ditch that hinders inundation. The soils are organic and hydrology is seasonal freshwater. A documented Ute lady's tresses population occurs in wetland F6 and a single plant was observed during the wetland assessment.

October 27, 2011

Wetland F7.

Wetland Size: 1.5 acres

Wetland Classification: Riverine



Summary: Wetland F7 is a riverine wetland with a small stream discharging from an upslope culvert into the project area. The banks of the water course and the floodplain bench are characterized by a combination of native and non-native wetland and aquatic plants including common spikerush, common three square, reed canary grass, watercress (*Nasturtium officinale*), annual rabbitsfoot grass, common reed, and Russian olive. The disturbance level is high due to heavy grazing, several culvert stream crossings, a straightened stream channel, fill material within the natural floodplain bench, and the stream outflow into a drainage canal. The soils are organic and hydrology is permanent freshwater. Wetland F7 lacks a native riparian shrub community and a natural floodplain bench. This wetland is near known habitat (wetlands F2 and F6) for Ute lady's tresses, however; two years of surveys have been performed and the plant was not observed within wetland F7.

October 27, 2011

Wetland F8.

Wetland Size: 2.4 acres

Wetland Classification: Slope



Summary: Wetland F8 is an emergent grazed pasture bordering the floodplain bench of wetland F7. The wetland is dominated by a mixture of native and non-native vegetation including intermediate wheatgrass (*Thynopyrum intermedium*), annual bluegrass, redtop, reed canary grass, and Nuttall's sunflower. The northern margins of the wetland contain annual ragweed and Russian olive. The disturbance level is high because of heavy grazing and a large adjacent drainage canal. The soils are organic and hydrology is seasonal freshwater. This wetland is near known habitat (wetlands F2 and F6) for Ute lady's tresses, however; two years of surveys have been performed and the plant was not observed within wetland F8.

October 27, 2011

Wetland H1.

Wetland Size: 1.9 acres

Wetland Classification: Slope



Summary: Wetland H1 is a weedy agricultural field supporting wetland vegetation in a depression. The vegetation is characterized by a mix of non-native and native weedy species such as prickly Russian thistle (*Salsola tragus*), lambsquarters (*Chenopodium album*), lady's thumb, annual blue grass, and reed canary grass. The wetland is surrounded by upland weedy vegetation. The disturbance level is high due to agricultural cultivation and grazing, fill material, the adjacent paved highway, and an adjacent ditch. The soils are mineral and hydrology is seasonal freshwater. Wetland H1 did not appear to contain suitable habitat for Ute lady's tresses.

October 27, 2011

Wetland I1.

Wetland Size: 135.8 acres

Wetland Classification: Depressional



Summary: Wetland I1 is an emergent wet meadow and emergent marsh complex. The vegetation is dominated by a mixture of native and non-native plants including reed canary grass, mountain rush, common three square, water sedge (*Carex aquatilis*), Nebraska sedge, saltgrass, cattail (*typha latifolia*), strawberry clover, spiny cocklebur, and curly dock (*Rumex crispus*). The disturbance level is high due to heavy grazing and a drainage ditch surrounding the wetland. The soils are organic and hydrology is seasonal freshwater and permanent freshwater. A known Ute lady's tresses population has been documented within wetland I1 but the exact location is unknown. A Provo City wetland mitigation area is located within wetland I1, however; this mitigation area was not assessed due to a lack of site access. The mitigation area is fenced off to prevent grazing. Wetland I1 was likely emergent and rooted aquatic lacustrine fringe wetland prior to construction of the Utah Lake levee.

October 27, 2011

Wetland I2.

Wetland Size: 65.3 acres

Wetland Classification: Depressional



Summary: Wetland I2 is a grazed pasture with some wet meadow characteristics transitioning to upland areas. The vegetation is dominated by a mixture of native and non-native species including salt grass, intermediate wheatgrass, strawberry clover, red top, and mountain rush. The disturbance level is high due to heavy grazing and drainage ditches surrounding the wetland. The soils are organic and hydrology is ephemeral and seasonal. Wetland I2 was likely emergent and rooted aquatic lacustrine fringe wetland prior to construction of the Utah Lake levee. Wetland I2 did not appear to contain suitable habitat for Ute lady's tresses.

U T A H L A K E

Wetland mitigation area
not assessed

Detail

I2
65.3 ac

I1
135.8 ac

A1
38.2 ac

B1
1.1 ac

C1
4.5 ac

H1
1.9 ac

E1
2.6 ac

D1
0.3 ac

G1
0.1 ac

F1

F2

F3

F4

F5

F6

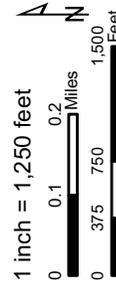
F7

F8

Spring

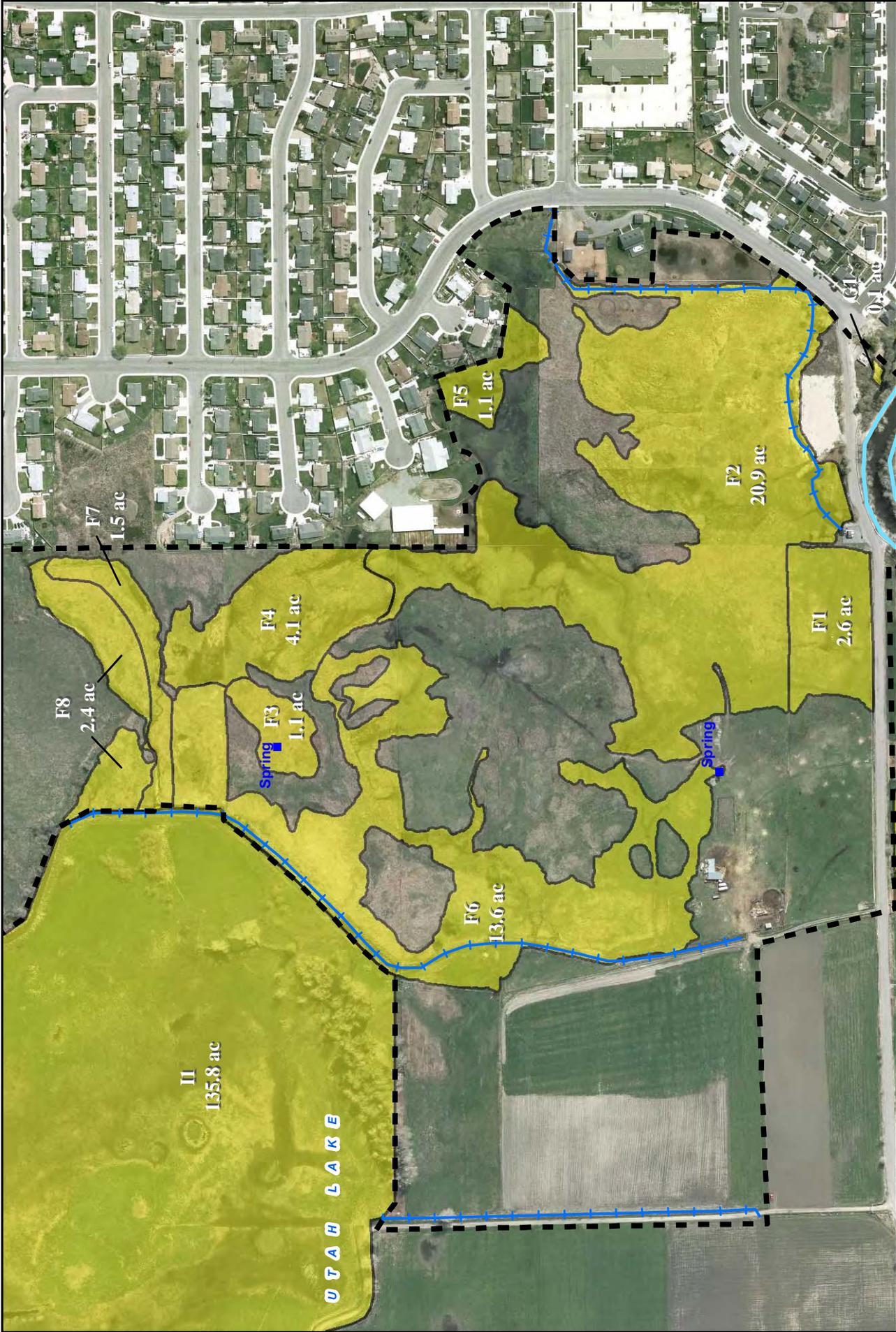


- Project Boundary
- Ordinary High Water Mark
- Irrigation Canals
- Spring
- Wetlands



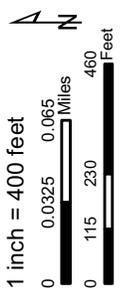
Basemap: 2009 HRO 1" Color
Orthophotography, Utah AGRC
Projection: State Plane, Utah Central,
FIPS 4302
Map dated Oct 25, 2011

Draft Wetland Functional Assessment Map



Draft Wetland Functional Assessment Map Detail

Basemap: 2009 HRO 1' Color
 Orthophotography, Utah AGRC
 Projection: State Plane, Utah Central,
 FIPS 4302
 Map dated Oct 25, 2011



- Project Boundary
- Spring
- Ordinary High Water Mark
- Irrigation Canals
- Wetlands



Proposed Provo River Delta Restoration Project

Utah County, Utah

Summary for Agency Review and Scoring Using the Utah Department of Transportation Wetland Functional Assessment Method

March 12, 2013

Personnel: Bob Thomas (Wetland Scientist, BIO-WEST, Inc.)
Kari Coy (Botany Technician, BIO-WEST, Inc.)

Fieldwork Performed: August 22 and 23, 2012

Summary Prepared by BIO-WEST, Inc.

Introduction

The Utah Reclamation Mitigation and Conservation Commission (URMCC) is proposing to restore the historic Provo River Delta at Utah Lake (project area) in Utah County, Utah. The project area has been altered through the construction of the Utah Lake levee, installation of a large-scale drainage system behind the levee, channelization of the Provo River, and intensive agricultural activities including grazing. The project would involve restoring the natural meandering Provo River channel through the historic river delta and removing the existing flood control levee on the Utah Lake shoreline. The completed project would allow the restored river and Utah Lake to resume natural flood cycles within the project area. The purpose of the project is to restore critical habitat for the federally endangered June sucker (*Chasmistes liorus*).

Despite existing alterations, the project area contains wetlands that are supported by a high groundwater table and slope drainage. These altered wetlands continue to provide a measurable amount of ecological function to the existing ecosystem. The U.S. Army Corps of Engineers (USACE) requested that the URMCC evaluate and quantify the ecological function provided by project area wetlands as they currently exist. The existing ecological functions can then be compared with the post-project level of the restored ecological functions, to quantify the expected change.

The Utah Department of Transportation (UDOT) developed a Wetland Functional Assessment Method and published a handbook of the method for public use in April 2006. The UDOT assessment is commonly used in Utah and has been approved by the USACE regional office in Bountiful, Utah. BIO-WEST, Inc., on behalf of the URMCC, delineated the project area wetlands and gathered the necessary field data to perform a wetland functional assessment of the project area using the UDOT method. In addition to the field data that was gathered, the UDOT manual requires site-specific input from the U.S. Fish and Wildlife Service (USFWS) and Utah Department of Wildlife Resources (UDWR) for completion of the functional assessment. This summary is intended to provide these agencies with the information required to complete applicable sections of the project area functional assessment.

Approximately 248 acres of the project area were evaluated in 2011. This evaluation included consultation with USFWS and UDWR. At the time of the 2011 evaluation BIO-WEST personnel were not allowed access to approximately 265 acres of the project area known as the Despain parcel. Evaluation of the Despain parcel was completed by observing conditions in the parcel from adjacent lands. The 2011 summary report to the agencies described 201 acres of wetlands within the Despain parcel and identified those wetlands as I1 and I2. In August 2012 BIO-WEST was allowed access to the Despain parcel for the purposes of delineating and performing a functional assessment of those wetlands. As a result of the 2012 site visit, it was determined that the Despain parcel contains 181.2 acres of wetlands that were divided into 21 separate areas for the functional assessment evaluation. The evaluation did not include 7.9 acres of excavated drainage ditches on the Despain parcel. This summary report describes the Despain parcel wetlands.

March 12, 2013

The information provided in this summary includes:

- a photograph (when available) and brief description of each assessed wetland area;
- a location map of the assessed wetlands;
- selected pages from the UDOT assessment handbook for use in agency responses to questions 12, 15c, 15d, and 15g;
- a spreadsheet summary of the assessed wetland scoring with the agency-required response columns highlighted.

Should you have questions about this summary or require additional information, please contact Mr. Mark Holden of the URMCC.

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March 12, 2013

Wetland I1.

Wetland Size: 32.3 acres

Wetland Classification: Depressional



Summary: Wetland I1 is a depressional wetland disconnected from Utah Lake by the Utah lake levee. The vegetation is dominated by chairmaker's bulrush (*Schenoplectus americanus*), common spikerush, (*Eleocharis palustris*), and spotted ladysthumb (*Polygonum persicaria*). The disturbance level is high due to frequent grazing activity and hydrologic alterations. The wetland is semi-permanently flooded. The hydrology of the wetland is controlled via a system of irrigation canals and, during high water years, the wetland is drained by pumping excess water into Utah Lake. Wetland I1 was likely a marshy lacustrine fringe wetland prior to construction of the Utah Lake levee. Wetland I1 did not appear to contain suitable habitat for Ute lady's tresses (*Spiranthes diluvialis*).

March 12, 2013

Wetland I2.

Wetland Size: 24.7 acres

Wetland Classification: Depressional



Summary: Wetland I2 is a depressional wetland disconnected from Utah Lake by the Utah lake levee. Wetland I2 is separated from Wetland I1 by a drainage ditch. The vegetation is dominated by chairmaker's bulrush, water sedge (*Carex aquatilis*), and saltgrass (*Distichlis spicata*). Other species found in the wetland include lambsquarters (*Chenopodium album*) and scratchgrass (*Muhlenbergia asperifolia*). The disturbance level is high due to frequent grazing activity and hydrologic alterations. The hydrology of the wetland is controlled via a system of irrigation canals and, during high water years, the wetland is drained by pumping excess water into Utah Lake. Wetland I2 was likely a marshy lacustrine fringe wetland prior to construction of the Utah Lake levee. Wetland I2 did not appear to contain suitable habitat for Ute lady's tresses.

March 12, 2013

Wetland I3.

Wetland Size: 15.9 acres

Wetland Classification: Depressional



Summary: Wetland I3 is a depressional, ephemeral wet meadow. The wetland is located adjacent to a canal along the Utah Lake levee. It is dominated by saltgrass and foxtail barley (*Hordeum jubatum*). Additional species include lambsquarters and western wheatgrass (*Pascopyrum smithii*). The disturbance level is high due to frequent grazing activity within the wetland. The hydrology is controlled by a series of irrigation pumps and canals and the area is frequently drained for agricultural use. Wetland I3 was likely a marshy lacustrine fringe prior to construction of the Utah Lake levee. Wetland I3 did not appear to contain suitable habitat for Ute lady's tresses.

March 12, 2013

Wetland I3B.

Wetland Size: 0.1 acre

Wetland Classification: Depressional (No Photo Available)

Summary: Wetland I3B is a depressional, ephemeral wet meadow. The wetland is located within the restored 16.85-acre Provo City mitigation area. It is dominated by reed canarygrass (*Phalaris arundinacea*), saltgrass, and foxtail barley. Wetland I3B is a restored wetland that is isolated from the Despain parcel by a fence. The fence prevents grazing and the disturbance level is low. The hydrology of the wetland has been altered and the surrounding wetlands are drained through a series of irrigation canals. During high water years water is pumped out of the wetland to Utah Lake to limit flooding and allow grazing of the surrounding Despain parcel. Wetland I3 did not appear to contain suitable habitat for Ute lady's tresses.

March 12, 2013

Wetland I4.

Wetland Size: 28.0 acres

Wetland Classification: Depressional



Summary: Wetland I4 is a depressional, ephemeral wet meadow. The wetland is located adjacent to a canal along the Utah Lake levee. It is dominated by lambsquarters, saltgrass, and foxtail barley. Additional species include western wheatgrass. The disturbance level is high due to frequent grazing activity within the wetland. The hydrology is controlled by a series of irrigation pumps and canals and the area is frequently drained for agricultural use. Wetland I4 was likely a marshy lacustrine fringe wetland prior to construction of the Utah Lake levee. Wetland I4 did not appear to contain suitable habitat for Ute lady's tresses.

Wetland I5.

Wetland Size: 30.2 acres

Wetland Classification: Depressional



Summary: Wetland I5 is a depressional, seasonally flooded wet meadow. The vegetation is dominated by common spikerush and rough cocklebur (*Xanthium strumarium*). Additional species include chairmaker's bulrush and lambsquarters. The disturbance level within this wetland is high due to frequent grazing activity and significant infestation of invasive species. The hydrology is controlled by a series of irrigation pumps and canals and the area is frequently drained for agricultural use. Wetland I5 was likely a wet meadow or forested lacustrine fringe prior to construction of the Utah Lake levee. Wetland I5 did not appear to contain suitable habitat for Ute lady's tresses due to the high cover of rough cocklebur.

March 12, 2013

Wetland I6.

Wetland Size: 7.6 acres

Wetland Classification: Depressional



Summary: Wetland I6 is an emergent wetland with a mix of native and nonnative species dominated by annual ragweed (*Ambrosia artemisiifolia*), spotted joe pye weed (*Eupatorium maculatum*), hardstem bulrush (*Schoenoplectus acutus*), meadow fescue (*Schedonorus pratensis*), Nuttall's sunflower (*Helianthus nuttallii*), common threesquare (*Schoenoplectus pungens*), wild mint (*Mentha arvensis*), spearmint (*Mentha spicata*), spotted ladythumb, water knotweed (*Polygonum amphibium*), reedtop (*Agrostis gigantea*), and quackgrass (*Elymus repens*). The disturbance level is high due to heavy grazing, several drainage ditches, and other structures. The hydrology is controlled by a series of irrigation pumps and canals and the area is frequently drained for agricultural use. The soils are organic and hydrology is seasonal freshwater. Wetland I6 does appear to contain suitable habitat for Ute lady's tresses; however, the species has not been documented here and was not observed during the site visit.

Wetland I7.

Wetland Size: 2.4 acres

Wetland Classification: Depressional



Summary: Wetland I7 is an ephemeral forested wetland. The dominant vegetation consists of eastern cottonwood (*Populus deltoides*), rough cocklebur, and water sedge, along with common spikerush, arctic rush (*Juncus arcticus*), and lambsquarters. The disturbance level is high due to heavy grazing and adjacent drainage ditches. The hydrology is controlled by a series of irrigation pumps and canals and the area is frequently drained for agricultural use. This wetland is near known Ute lady's tresses habitat (Wetlands I14 and I8); however, 2 years of surveys were performed in the area and the plant was not observed within wetland I7.

March 12, 2013

Wetland I8.

Wetland Size: 0.5 acre

Wetland Classification: Slope (Raised Fen)



Summary: Wetland I8 is representative of two seasonally persistent raised fen wetlands with peat soils. The vegetation is dominated by beaked spikerush (*Eleocharis rostellata*), water sedge, arctic rush, and chairmaker's bulrush. Additional species include rough cocklebur, small flower paintbrush (*Castilleja exilis*), and common threesquare. The disturbance level is high due to grazing and hydrologic alteration. The hydrology is controlled by a series of irrigation pumps and canals and the area is frequently drained for agricultural use. This wetland is documented habitat for Ute lady's tresses.

Wetland I9.

Wetland Size: 0.4 acre

Wetland Classification: Slope (Raised Fen)



Summary: Wetland I9 is a seasonally persistent raised fen with peat soils. The vegetation is dominated by beaked spikerush, chairmaker's bulrush, and common spikerush. Additional species include spearmint, creeping bentgrass (*Agrostis stolonifera*), and water sedge. The disturbance level is high due to grazing activity and hydrologic manipulation from irrigation pumps and associated ditches. A documented Ute lady's tresses population occurs in Wetland I9 with one individual observed during 2012 surveys.

March 12, 2013

Wetland I10.

Wetland Size: 0.4 acre

Wetland Classification: Slope (Raised Fen)



Summary: Wetland I10 is a seasonally persistent raised fen with peat soils. The vegetation is dominated by beaked spikerush and clustered field sedge (*Carex praegracilis*). Additional species include common spikerush, water sedge, annual rabbitsfoot grass (*Polypogon monspeliensis*), and marsh verbena (*Verbena hastata*). The disturbance level is high due to grazing activity and hydrologic manipulation from irrigation pumps and associated ditches. Ute lady's tresses populations have been documented within this habitat type. No occurrences of Ute lady's tresses were documented within Wetland I10 in 2012.

Wetland I11.

Wetland Size: 1.1 acres

Wetland Classification: Depressional



Summary: Wetland I11 is an ephemeral forested wetland with peat soils located adjacent to the Utah Lake levee. The vegetation consists solely of a stand of mature eastern cottonwood trees. There is little to no ground cover within the wetland due to extensive trampling by cattle. The disturbance level is high as a result of hydrologic manipulation and heavy grazing activity. The hydrology is controlled by a series of irrigation pumps and canals and the area is frequently drained for agricultural use. Wetland I11 does not contain suitable habitat for Ute lady's tresses.

Wetland I12.

Wetland Size: 1.2 acres

Wetland Classification: Slope (Raised Fen)



Summary: Wetland I12 is a seasonally persistent raised fen with peat soils. The vegetation is dominated by Canada thistle (*Cirsium arvense*). Additional species include spearmint, spotted joe pye weed, reed canarygrass, and broadleaved pepperweed (*Lepidium latifolium*). The wetland is located immediately adjacent to an irrigation canal and the Utah Lake levee. The disturbance level is high due to heavy grazing and hydrologic manipulation. The wetland is drained for agricultural purposes. Wetland I12 did not appear to contain suitable habitat for Ute lady's tresses due to heavy weed infestation.

Wetland I13.

Wetland Size: 0.9 acre

Wetland Classification: Slope (Raised Fen)



Summary: Wetland I13 is a seasonally persistent raised fen with peat soils. The vegetation is dominated by annual ragweed and Canada thistle. Additional species include spearmint, spotted joe pye weed, reed canarygrass, and broadleaved pepperweed. The wetland is located immediately adjacent to the Utah Lake levee. The disturbance level is high due to heavy grazing and hydrologic manipulation. The wetland is regularly drained for agricultural purposes. Wetland I13 did not appear to contain suitable habitat for Ute lady's tresses due to the high percent cover of tall weedy species.

March 12, 2013

Wetland I14.

Wetland Size: 18.8 acres

Wetland Classification: Depressional



Summary: Wetland I14 is a depressional marsh wetland disconnected from Utah Lake by the Utah lake levee. The vegetation is dominated by water sedge and creeping bentgrass. Other species found in the wetland include arctic rush, jointleaf rush (*Juncus articulatus*), strawberry clover (*Trifolium fragiferum*), annual ragweed, and Ute lady's tresses. The disturbance level is high due to frequent grazing activity. The wetland is semi-permanently flooded. However, the hydrology of the wetland is controlled via a system of irrigation pumps and canals and is often drained for agricultural use. A population of Ute lady's tresses was documented in I14 during the 2012 field survey.

Wetland I15.

Wetland Size: 0.2 acre

Wetland Classification: Depressional



Summary: Wetland I15 is an ephemeral wet meadow isolated by cultivated farm fields. The vegetation is dominated by a mixture of native and nonnative species including western wheatgrass, foxtail barley, strawberry clover, and western seapurslane (*Sesuvium sessile*). The disturbance level is high due to cultivation and grazing associated with the property surrounding the wetland. Wetland I15 did not appear to contain suitable habitat for Ute lady's tresses.

March 12, 2013

Wetland I16.

Wetland Size: 0.1 acre

Wetland Classification: Depressional (No Photo Available)

Summary: Wetland I16 is a depressional marsh located at the corner of Boat Harbor Drive and the Despain parcel driveway. The vegetation is dominated by cattail (*Typha* spp.) and reed canarygrass. The wetland is accessible to cattle but does not appear to be heavily impacted by grazing. Hydrology for this wetland may be tied to an irrigation ditch but is not connected to a natural water body. Wetland I16 does not appear to contain suitable habitat for Ute lady's tresses.

Wetland I17.

Wetland Size: 3.1 acres

Wetland Classification: Slope (Raised Fen)



Summary: Wetland I17 is a series of restored seasonally persistent raised fens with peat soils located in the Provo City mitigation area. The vegetation is dominated by Canada goldenrod (*Solidago canadensis*), arctic rush, common spikerush, small flower paintbrush, and spearmint. There is very little disturbance within the wetland as it is fenced off to prevent grazing and other agricultural impacts. The surrounding wetland hydrology is controlled by a series of pumps and canals in an effort to drain wetlands and allow grazing on the Despain parcel. Wetland I17 is documented habitat for Ute lady's tresses.

Wetland I18.

Wetland Size: 1.9 acres

Wetland Classification: Depressional



Summary: Wetland I18 is an ephemeral wet meadow located within the Provo City mitigation area. The vegetation is dominated by reed canarygrass. The disturbance in the wetland is minimal as it is surrounded by a low berm and fenced to prevent grazing activity. The surrounding wetland hydrology is controlled by a series of pumps and canals in an effort to drain wetlands and allow grazing on the Despain parcel. Wetland I18 did not appear to contain suitable habitat for Ute lady's tresses due to the high cover of reed canarygrass.

March 12, 2013

Wetland I19.

Wetland Size: 7.3 acres

Wetland Classification: Depressional



Summary: Wetland I19 is a restored depressional marsh located within the Provo City mitigation area. The vegetation is dominated by hardstem bulrush, cattail, common duckweed (*Lemna minor*), arctic rush, and common spikerush. The disturbance level is minimal as the wetland is surrounded by a low berm and fenced off from the adjacent grazing pastures. The wetland is semi-permanently flooded. The surrounding wetland hydrology is controlled by a series of pumps and canals in an effort to drain wetlands and allow grazing on the Despain parcel. Wetland I19 does not appear to contain suitable habitat for Ute lady's tresses.

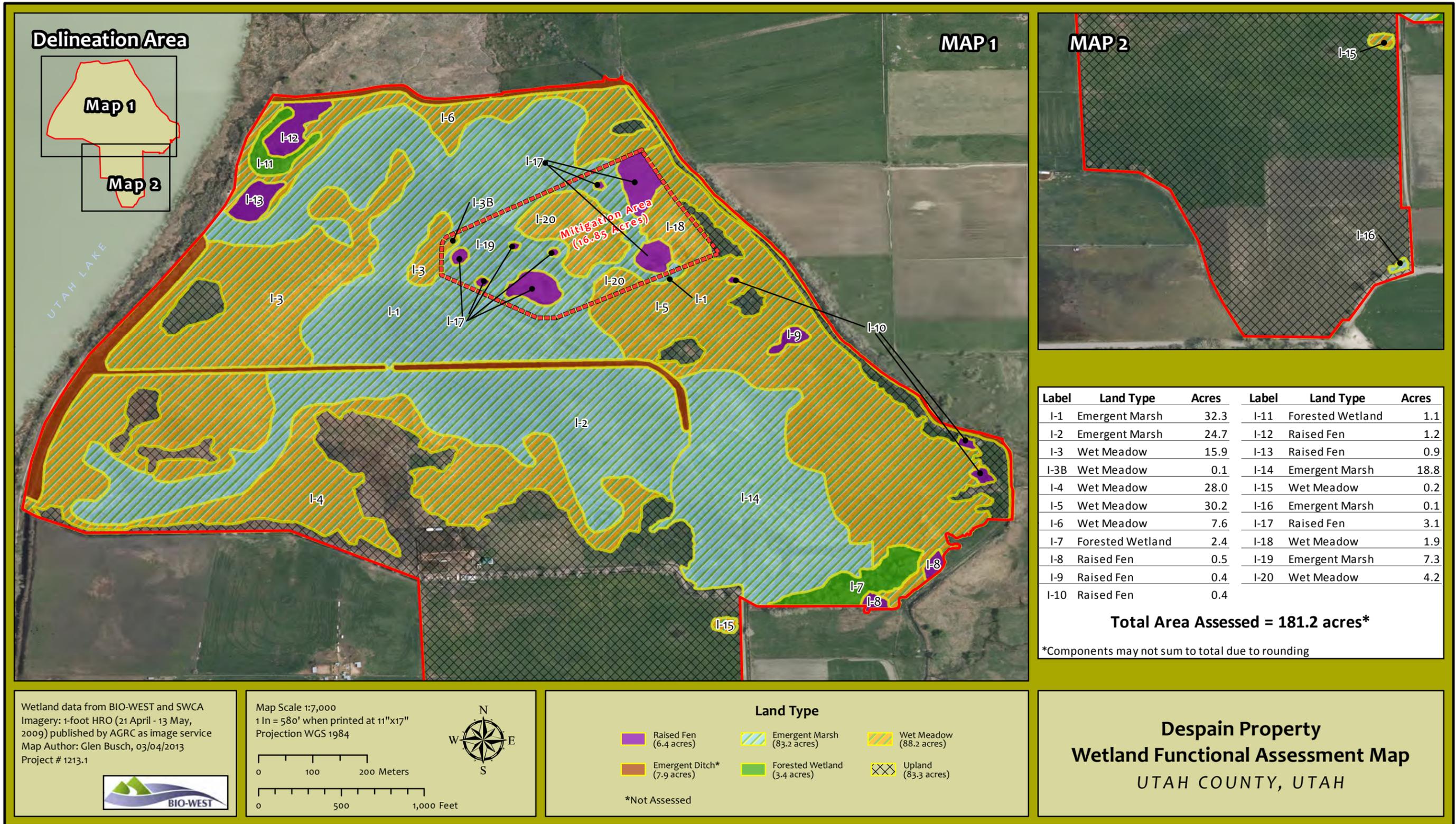
Wetland I20.

Wetland Size: 4.2 acres

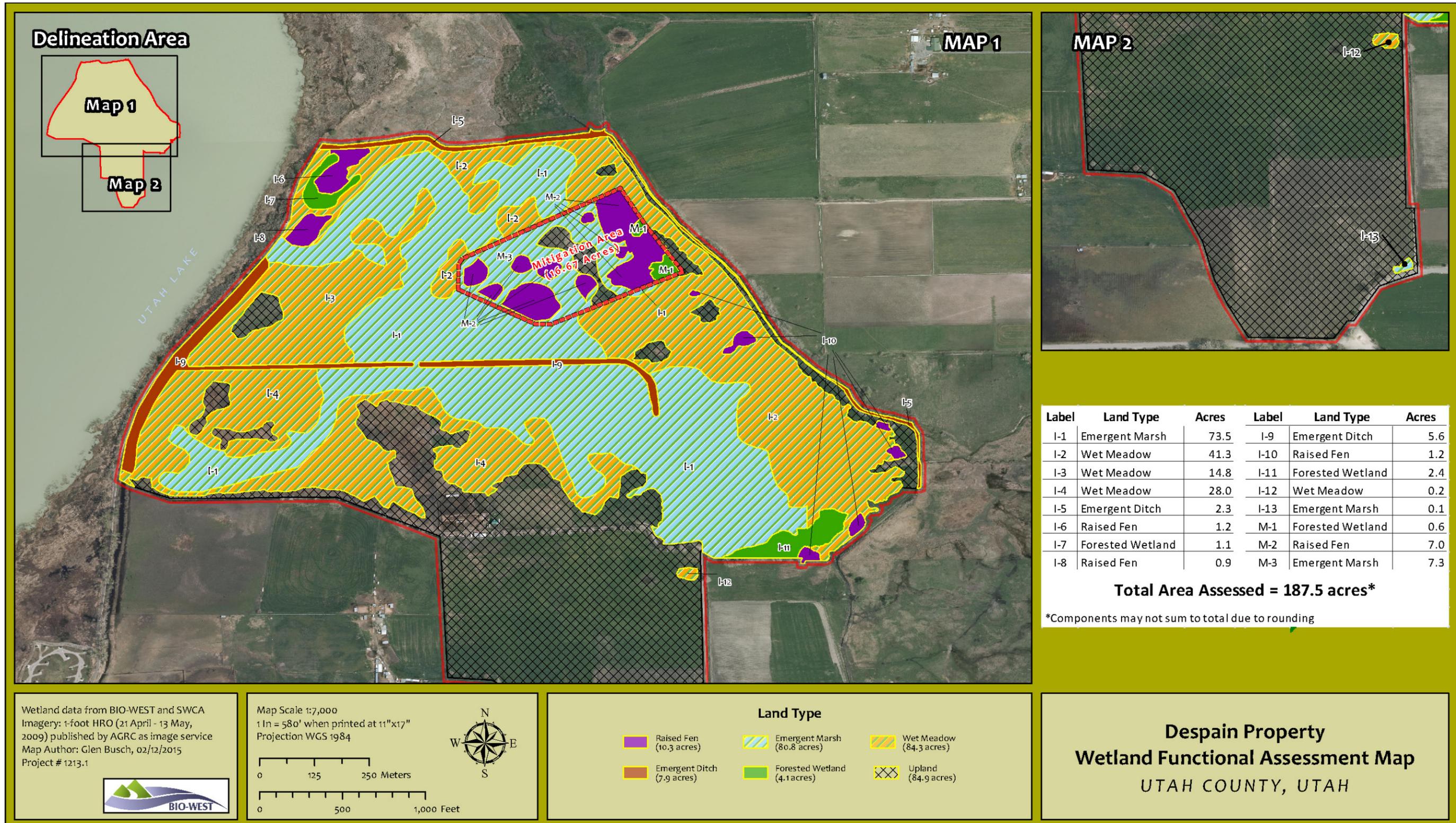
Wetland Classification: Depressional



Summary: Wetland I20 is an ephemeral wet meadow located within the Provo City mitigation area. It is dominated by reed canarygrass with some western wheatgrass. Disturbance within the wetland is minimal as the entire mitigation area is surrounded by a low berm and fenced off from adjacent grazing pastures. The surrounding wetland hydrology is controlled by a series of pumps and canals in an effort to drain wetlands and allow grazing on the Despain parcel. Wetland I20 does not appear to contain suitable habitat for Ute lady's tresses.



Assessment Map Used For Agency Scoring



Revised Assessment Map (Matches Scoring Sheet Included in this Memo Above)

UDOT

Utah Department of Transportation

Wetland Functional Assessment Method

Prepared for Utah Department of Transportation



April 2006



UDOT

Utah Department of Transportation

Wetland Functional Assessment Method

Prepared for Utah Department of Transportation

April 2006

Prepared by
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THE ASSESSMENT FORM

1. Project Name

Enter the appropriate project name.

2. Project Number

Enter the appropriate project number, if applicable.

3. USCOE Permit Number and Project Pin Number: Enter the appropriate control numbers, if applicable.

4. Evaluation Date

Enter the date(s) that the field evaluation was conducted.

5. Evaluating Agency

Fill in the appropriate agency (for UDOT projects, this will generally be "UDOT")

6. Evaluator(s)

Enter the names and/or affiliation of the personnel conducting the evaluation.

7. Purpose of Evaluation

Check the appropriate project category.

8. Wetland/ Site Number(s)

Enter the wetland identification number(s) e.g., Fish Creek), if applicable.

9. Wetland Location(s)

Enter the appropriate ecoregion, watershed, county, legal description, stationing or mileposts and the eight-digit watershed descriptor (U.S. Department of the Interior, U.S. Geological Survey 2002, <http://ut.water.usgs.gov/gis/hub.html>), global positioning satellite (GPS) reference number (if available, not required), and other desired location information for the evaluated wetlands.

10. Wetland Size

Enter the estimated or measured (not required) size of the entire wetland that includes the assessment area (AA). If the AA is delineated such that the entire wetland is included, the responses to 8 and 9 will be the same. If evaluating more than one AA on a single data form, enter the average wetland size or the range of wetland sizes.

11. Assessment Area (AA)

Indicate the estimated or measured (not required) acreage within the boundaries of the AA using the guidance below. If splitting a wetland into more than one AA, indicate the AA boundaries on the wetland

delineation map. Wetlands bisected by roads are considered as a single AA. If evaluating more than one AA another data form will be needed. Several example Assessment Areas relative to highway projects are provided in Appendix B.

The AA includes only the portion of delineated jurisdictional wetland that is within a proposed project zone, right-of-way, construction easement, permit area, known detour area, etc.

11a Expanded Assessment Area (EAA)

This area is determined by extending all boundaries of the AA (the portion of the delineated jurisdictional wetland that is within a proposed project zone, right-of-way, construction easement, permit area, known detour area, etc. to a distance of 600 feet. Wetlands with open water that have not been delineated as jurisdictional wetland, apply A or B to determine the EAA.

A contiguous up and downstream from the project to physical points of significant hydrologic change (natural [geomorphic] or man made constrictions or expansions, points where the gradient changes rapidly, points of significant inflow) [e.g., tributaries] or places where other factors limit hydrologic interaction *or*

B contiguous up and downstream from the project to a maximum distance of 600 feet if no points of significant hydrologic change (including termination of the wetland) occur within this radius.

This "expanded" area is used to evaluate contextual factors such as level of disturbance that may affect wetland function. For riverine wetlands the EAA is extended 600 feet perpendicular to the stream channel and is extended upstream and downstream as determined by A or B.

12. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals and State Listed S1 Species

A "red flag" attribute, this field assesses habitat for species receiving protection under provisions of the Endangered Species Act; that is, listed or proposed threatened or endangered species. Potential effects to threatened and endangered species are examined by the COE during 404 permit application reviews. According to the COE general conditions for Nationwide 404 permits, "no activity is authorized which is likely to jeopardize the continued existence of a threatened or endangered species or a species

proposed for such designation, as identified under the Endangered Species Act or which is likely to destroy or adversely modify the critical habitat of such species". The most current list of threatened and endangered species for Utah and state listed S1 species can be found at: <http://dwrcdc.nr.utah.gov/ucdc/> Presence must be observed and recorded by a qualified observer. State listed S1 (although S1 species do not receive protection by statute they should be given special consideration) species should also be considered in Step 12. It is recommended that the evaluator contact the U. S. Fish and Wildlife Service with regard to presence or absence of threatened or endangered species and UDWR for presence or absence of state listed S1 species.

Primary Habitat: Habitat essential to the short or long-term viability of individuals or populations. The presence of traditional breeding, spawning, nesting, denning or critical migratory habitat, large seasonal congregations (including communal roosts, staging habitat, traditional foraging congregations, etc.), or USFWS or UDWR - designated critical habitat or core areas in the AA indicates primary habitat, as does any occurrence of a T&E plant or S1 species. If T&E or S1 species habitat is documented at the AA, indicate the source of the documentation.

As previously noted, if the project site is documented habitat for TorE species or state listed S1 species it is assigned to the Red Flag Category. In cases where threatened or endangered species are involved and formal consultations are required, the FWS will respond to the action agencies Biological Assessment with their own Biological Evaluation. The Biological Evaluation will identify "reasonable and prudent" conservation alternatives from which UDOT or the consulting agency can select, or serve as a basis for negotiating an alternative amenable to all parties. If the AA is not documented primary habitat for threatened or endangered species or state listed S1 species and the AA is not automatically classified in the Red Flag Category, it may nevertheless be an important habitat component for them. Thus in question 15c, the evaluator will be asked to determine whether the AA is primary suspected habitat, secondary documented or suspected habitat, or incidental habitat for threatened or endangered species or S1 species.

13. Selecting a Wetland Classification

Wetland classes found in Utah are riverine, slope, depressional, mineral flats, and lacustrine. A classification hierarchy showing systems, subsystems, classes and subclasses for Utah Wetland Classification (UWC) is provided in Keate (2004) Appendices D and E.

For number 13, enter the UWC that applies to the AA using the UWC (Keate 2004) classification system.

Note: topographic maps and aerial photographs should be studied prior to field evaluation to assist in determining wetland classification.

- ❑ **Riverine wetlands:** Occur in floodplains and riparian corridors in association with stream channels. Water source is river or stream flow or overbank flow at peak hydrological periods. (Overbank flow should occur once every two years or 50% of the time. If flooding does not occur at this minimal rate, it is probably not a riverine based wetland). Dominant hydrodynamics are unidirectional and horizontal. A subsurface hydraulic connection between the wetland and stream does not necessarily indicate a riverine system.
- ❑ **Slope wetlands:** Occur at points of surface changes, breaks in slope or stratigraphic changes. Surface water runoff and groundwater outflow (i.e. – spring or seep) are the primary water sources. Water flow is unidirectional (down slope/gradient). Water may discharge to a stream, lake or depression. Wetland complexes can be comprised of a slope wetland with several depressions or low-points interspersed throughout. Relying on topographic maps, aerial photographs, and field evaluation will help determine which classification is dominant and or most appropriate.
- ❑ **Depressional wetlands:** Occur in topographic depressions with closed contours. Water sources are precipitation, runoff and groundwater. Water flow vectors are toward the center of the depression. Dominant hydrodynamics are vertical. May or may not have inlets or outlets. Depressions that are full, may release water down slope/gradient and tend to be a part of a larger slope complex. Relying on topographic maps, aerial photographs, and field evaluation will help determine which classification is dominant and or most appropriate.
- ❑ **Mineral Flat wetlands:** Occur on large relict lakebeds. Dominant water source is precipitation. Dominant hydrodynamics are

vertical. Typically are large features in the landscape, associated with old Lake Bonneville bottom deposits with close proximity to GSL or other large permanent, semi-permanent or ephemeral water bodies. (e.g. – Sevier Lake) Only found in basin and range ecoregions. Example: Great Salt Lake mud flats and salt flats. Subclasses are not known.

- **Lacustrine Fringe wetlands:** Occur adjacent to large lakes and reservoirs. Dominant water source is lake water level. Hydrodynamics are bi-directional. Subject to waves and seiches.
- **Roadside Ditch Wetland:** Any non-jurisdictional wetland <30 feet in width that exists in its entirety within the highway ROW, is an excavated upland and is not connected to any other jurisdictional wetland. Its primary source of hydrology is runoff from the road surface, irrigation overflow, irrigation ditch leakage or non-point surface runoff from an adjacent urbanized area. In addition, to qualify as a roadside ditch wetland the wetland of concern must **not** convey water to any adjacent natural stream, spring or natural or created wetland outside the ROW and must not contain any threatened or endangered species.

14. Subclassification

Identify the subclass, soil type, pH range and water salinity if applicable to the particular wetland class. For detailed subclass information for see Appendices D and E.

15a Level of Disturbance

Disturbance: This field assesses the level of disturbance within the wetland (AA) and the level of disturbance within the expanded assessment area (EAA). The EAA is a 600 foot buffer around the perimeter of the AA. Disturbance at the AA is defined based on land use both at the AA and in the surrounding area (EAA). Land use in surrounding areas can provide a measure of disturbance within AAs and negatively influence their habitat quality even though the AAs themselves may be relatively undisturbed.

Circle the description of the level of disturbance that most closely reflects conditions observed within the AA and the EAA.

Comments: Provide a brief (1 to 2 sentence) descriptive summary of the AA and surrounding area. The description may include dominant species, adjacent land use, proximity to other wetlands, etc.

15b Plant Community Composition

Using the table provided in Appendix G to determine plant community composition for the AA. Plant community composition is defined as layers of vegetation (riverine and lacustrine only), percent ground coverage dominated by native wetland vegetation within the entire AA, and the percent of native wetland to non-native or non-wetland plant species. Observation is used determine layers of vegetation (riverine and lacustrine only) as well as to estimate percent ground cover dominated by native wetland species in the AA. Estimates of each of these factors are compared with reference standard sites with subclasses as described by Keate (2004) for slope, depressional, and mineral flat wetland classes. (see Appendices D, E and F for lists of dominant native vegetation, photographs, plans and cross sections). Reference standard sites for riverine and lacustrine were developed from research by Pagette et al. (1989). For riverine and lacustrine wetlands, first determine site elevation then reference Appendix F.

The native wetland to non-native or non-wetland plant percent is obtained by using transect sampling procedures detailed in Appendix G. The evaluator divides the total number of native wetland plant species by the total number of plants observed.

It is important to note that in some circumstances it may not be possible to conduct a transect protocol as described in Appendix G. For example, heavily wooded areas along a riverine corridor, small size of the AA or fragmented pieces of jurisdictional wetland scattered over the project site. In these circumstances the evaluator(s) should visually assess the vegetation and use their best professional judgment.

15c Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals

This field assesses primary suspected, secondary documented or suspected or incidental documented or suspected use of the AA by federally listed or proposed threatened or endangered species, or documents the AA as unsuitable habitat for threatened or endangered species.

i. Circle S to indicate whether habitat for listed or proposed TorE species is suspected within the AA at the ascertained level using the definitions provided below. It may be appropriate to indicate more than one use level for multiple species. For example, an AA may contain secondary habitat for bald eagles and incidental habitat for peregrine falcons. List the

species that correspond to each habitat level determined to apply to the AA.

Secondary Habitat:

Habitat that is occasionally or semi-regularly used by a given species, but that is not necessarily essential to the short or long-term viability or individuals or populations. Examples would include non-specific migration areas and occasional forage or perch sites. Primary habitat, as defined above, may occur in the general vicinity (e.g., within the project area, EAA, section, drainage, watershed, etc.), but not in the AA.

Incidental Habitat:

Habitat that receives chance, inconsequential use by a given species or habitat conditions or the known distribution of the species would indicate this level of use. This term implies that, while it may be conceivable that a given species may occur at an AA at a given point in time, the chance is remote and the use is not likely to be repeated.

ii. Rating: Use the highest level habitat (e.g., the level that corresponds to the highest functional point value) determined under **i** to determine the functional point value for the AA. If the AA is not documented Primary Habitat for threatened or endangered species and the AA is not automatically classified as a Category I, it may nevertheless be an important habitat component for them. Thus in question 15c, the evaluator will be asked to determine whether the AA is secondary or incidental habitat for threatened and endangered species.

15d Habitat for Plants or Animals Rated S1, S2, or S3 by the Utah Natural Heritage Program

This field assesses use of or existence in the AA by species rated S2 (imperiled), or S3 (vulnerable) by the UNHP (not including “watch list” species). S1 (critically imperiled) species would have been placed in the Red Flag Category in Step 12. Species within these UNHP categories are inclusive of U.S. Forest Service-listed sensitive species and FWS candidate species that are not subject to the provisions of the Endangered Species Act. To avoid duplication, do not include species listed above under 12 and 15c. Evaluators are encouraged to contact the Utah State University Herbarium (435) 797-1584 if they have T or E plant identification questions. Contact UDWR (801) 538-4700 for plant and wildlife questions and documentation.

i. Circle D or S to indicate whether habitat for these species is documented or suspected within the AA at the ascertained level using the definitions provided

above under 12 and 15c or in the glossary. As discussed in 12, it may be appropriate to indicate more than one habitat level for multiple species. List the species that correspond to each habitat level applying to the AA.

ii. Rating: Use the highest level habitat (e.g., the level that corresponds to the highest functional point value) determined under **i** to determine the functional point value for the AA. If sensitive species habitat is documented at the AA, indicate the source of the documentation.

15e General Wildlife Habitat

This field assesses general wildlife habitat potential within the AA based upon documentation of wildlife use and habitat features. The combination of these two variables is considered to more accurately assess this function than if habitat features alone were used. A site may contain what are perceived to be outstanding habitat features for wildlife, but for reasons difficult to detect (such as presence of toxins, etc.) may only receive minimal to moderate use. Opportunities for enhancement may exist if such a situation were correctable. Conversely, a site may contain few desirable habitat features, but may receive significant use due to a general lack of habitat in the area or other factors and may be under-rated for this function if documented wildlife use was not considered.

Degree of disturbance at a wetland and in the adjacent landscape can greatly influence its use by wildlife. Examples of disturbance include direct conversion, conversion of upland supporting habitats, and encroachment and fragmentation by human activity sources, such as buildings, trails, roads, canals and ditches.

Plant community composition relates to the number of niches in a wetland class as well as its vertical and horizontal structural characteristics as described in the reference standard site. More niches are potentially available as more layers of habitat occur within the range of expected layers for native vegetation and structural characteristics in a given wetland class, so more wildlife species potentially are supported by more structurally complex habitats.

ii. Wildlife Habitat Features: Working from top to bottom within the double vertical lines, circle the appropriate AA attributes in the matrix provided on the data form to arrive at a high (H), moderate (M), or low (L) rating. The first variable considered is the

level of disturbance. The second variable is plant community composition.

Modified Habitat Quality Rating: Consult with the UDWR regional wildlife biologist to determine the level of wildlife use in the AA.

Circle “high” “moderate” or “low” level of use based on the data collected and following consultation with the UDWR regional biologist. For further guidance, refer to the definitions of high, moderate or low to no use provided below. Evidence of use is considered to be indicative of level of use.

High use:

AA is regularly used in high numbers relative to local or transient populations.

Moderate use:

AA is regularly used in small to moderate numbers relative to local populations, or infrequently or sporadically used in any numbers relative to local or transient populations.

Low to No use:

AA regularly, infrequently or sporadically used by extremely small numbers relative to local populations, or receives chance, inconsequential use in any numbers relative to local or transient populations.

iii. Rating: Determine and circle the general wildlife habitat rating and functional points for the AA by applying the results of **i** and **ii** to the matrix provided in the data form.

15f General Fish/ Aquatic Habitat

This field assesses general fish and aquatic habitat at the AA based upon the presence of certain groups of fish and habitat features. In Utah this only applies to riverine and lacustrine wetlands. Assess this function only if the AA is used by fish or the existing situation is “correctable” such that the AA could be used by fish (e.g., fish use is precluded by perched culvert or other barrier, etc.). If the AA is not or was not historically used by fish due to lack of habitat (including duration of surface water), excessive gradient, etc. (e.g., the AA does not have the opportunity to provide habitat for fish), circle **NA** where indicated on the data form and proceed to the next function. The maximum duration of surface water (any water above the ground surface that is available to wildlife; not necessarily open water) covering at least 10% of the AA. The 10 percent criterion should be considered a rule of thumb and is

intended to be applied primarily at smaller (e.g., less than 1 or 2 acres), rather than larger sites. For example, 9 acres of surface water should not be dismissed at a 100-acre AA simply because this 10 percent guidance is not met. The intent of this criterion is to allow consideration of significant surface water amounts within an AA relative to fish habitat, while disallowing insignificant surface water amounts. The final call will depend on the specific situation at hand, and is therefore left to the evaluator. Abbreviations for surface water durations are as follows: P/P = permanent/ perennial; S/I = seasonal/ intermittent; T/E = temporary/ ephemeral; and A = absent where:

Permanent/ perennial:

Surface water is present throughout the year except during years of extreme drought.

Seasonal/ intermittent:

Surface water is present for extended periods, especially early in the growing season, or may persist throughout the growing season, but may be absent at the end of the growing season; or surface water does not flow continuously, as when water losses from evaporation or seepage exceed the available stream flow.

Temporary/ ephemeral:

Surface water is present for brief periods during the growing season, but the water table is well below the surface for most of the year; or surface water flows briefly in response to precipitation in the immediate vicinity and the channel is above the water table.

Variables assessed to determine a rating for habitat quality include duration of surface water, structural cover, shading, and habitat availability. Presence of surface water is an obvious critical component of fish habitat. Seasonally flooded areas can be important nursery and foraging areas for fish (and can result in “high” habitat quality ratings using this assessment); however, longer duration of surface water generally results in higher ratings because surface waters of such duration are available to fish for greater periods and varieties of life stages. Flow or water level stability is an important habitat component for a variety of fish species.

Abundant structural cover and well-vegetated stream banks and shorelines are also important habitat components for several fish species. Structural cover such as submerged logs and vegetation, other woody debris, floating-leaved vegetation, and large rocks provides resting areas, refuge from predators, hiding areas from predators, and functions as a substrate for

insect larva; an important food source for many fish species. High water temperatures that result from removal of streamside vegetation can render habitat as unsuitable for fish that are sensitive to higher temperatures, such as Bonneville cutthroat trout. Vegetation along streams, ponds, and lakes also provides insect habitat, an important food source for many fish species.

Although the physical habitat attributes of a site may be attractive to fish, use of the area may be significantly reduced or precluded due to the presence of inadequately sized culverts, dikes, continual sources of degradation, or other causes. Consequently, potential "habitat modifiers" are also considered in the assessment.

The presence of certain groups of fish in the AA is considered along with habitat features to derive an overall fish/ aquatic habitat rating. UDWR seeks to preserve and enhance all desirable aquatic species and their supporting ecosystems. To accomplish this UDWR continues to develop and implement policies and programs that foster sound management of wild fish populations and their habitats, at the same time that it monitors and regulates angler harvests, maintains recreational activities for anglers, and provides improved access to fisheries.

Given these management priorities (managing for wild fish populations **and** recreational opportunities), the following groups of fish are considered in the assessment in order of descending "rank:" native game sport fish; introduced game fish; non-game fish; and no fish.

As listed in the 2004 Utah Fishing Proclamation, Utah native sport fish include: Mountain, Bonneville and Bear Lake Whitefish, Bonneville Cisco and four subspecies of Cutthroat Trout, Bear Lake, Bonneville, Colorado and Yellowstone. Non-native coldwater sport species include: Rainbow Trout, Lake Trout, Brook Trout, Arctic Grayling, Kokanee Salmon and Brown Trout. Cool and warm water sport fish include: Walleye, Yellow Perch, Striped Bass, White Bass, Smallmouth Bass, Largemouth Bass, Bullhead, Channel, Catfish, Black Crappie, Green Sunfish and Bluegill. Hybrid sport fish include: Tiger Muskelunge, Tiger Trout and Splake. Non-game fish include: Carp, Utah Sucker and Utah Chub. The June Sucker is an endangered species. Threatened species and state species of concern can be found at <http://dwr.cdc.nr.utah.gov/ucdc/>.

i. Habitat Quality: Working from top to bottom within the double vertical lines, circle the appropriate AA attributes in the matrix provided on the data form to arrive at a high (H), moderate (M), or low (L) rating. The first variable considered is the maximum duration of surface water in the AA. Use the definitions provided above. The second variable is structural cover. Estimate the percentage of the waterbody within the AA that contains cover objects such as submerged logs, large rocks and boulders, overhanging banks, and submerged and floating-leaved vegetation. The final variable is shading, as determined by estimating the percent of stream bank or shoreline within the AA that contains wetland or riparian scrub-shrub or forested communities. This will determine the rating for habitat quality.

ii. Modified Habitat Quality: Circle the appropriate response to the following question: Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity **or** is the waterbody included on the UDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support? If the answer is yes, then reduce the habitat quality rating determined in **i** above by .1. If the answer is no, then do not modify the habitat quality rating determined in **i**.

iii. Rating: Determine and circle the general fish/ aquatic rating and functional points for the AA by applying the results of **i** and **ii** to the matrix provided in the data form. The term "native" implies a species indigenous to Utah; not necessarily to a given drainage or water body. The evaluator is referred to *Fishes of Utah* (Sigler and Miller 1963) for the status (native vs. introduced) of fish species known or suspected to occur in the AA.

15g Amphibian Habitat

This field assesses general amphibian habitat potential at the AA. The assessment is based upon the presence of water quality and habitat characteristics that could support amphibians or document amphibian use of the AA. The level of amphibian use of the AA or the potential of the AA to support amphibians is determined through consultation with a UDWR regional biologist. If amphibians are present in the AA or habitat and water quality characteristics are such that they could support amphibians add .2 under the functional points rating column in the Functional Assessment Rating section.