



United States Department of the Interior

NATIONAL PARK SERVICE
423 Forest Resources Building
State College, PA 16803

July 2019

Memorandum

To: Richard A. Clark, Superintendent MNRR
From: Peter Sharpe Ph.D., PWS, Northeast Region/WRD
Subject: Wetland Delineation Report, Missouri National Recreational River – Goat Island
EA Management Plan – 13-18 May, 2019

Summary

The objective of this investigation was to respond to a request for technical assistance for a comprehensive delineation of wetland habitats subject to jurisdiction under Section 404 of the Clean Water Act (CWA) and all wetlands subject to National Park Service (NPS) procedures for implementing *Director's Order #77-1: Wetland Protection* for National Park Service lands within the proposed trail and camping areas of Goat Island, NE located within the limits of the Missouri River. This work utilized the U.S Army Corps of Engineers (USACE) Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (August 2010) as the primary methodology for making wetland determinations in the field. A total of 1 palustrine wetland encompassing 0.04 ac of land was identified and delineated within the EA study boundary of Goat Island (227 acres) (Fig. 1). The wetland habitat was primarily a sparsely vegetated concave depression which was classified as a palustrine, emergent, persistent, seasonally saturated, managed wetland (PEM1Bm). The wetland feature had high clay content soils and was completely within an existing ATV social trail that the MNRR team is planning on converting into a formal hiking/campground access trail. The wetland system appeared to be “isolated” in terms of meeting the U.S. Army Corps of Engineers criteria for potential jurisdiction, but this system would fall under NPS policy jurisdiction under DO #77-1, therefore the park is encouraged to share this report and recommendations with our service wide wetland leads (Joel Wagner and Kevin Noon). With regards to recommendations, the park should explore the possibility of re-routing the existing social trail to avoid the mapped wetland (Wetland-1). Should a trail re-route not prove possible, then any impacts to the wetland may qualify as an excepted action under our DO. #77-1 guidelines and no formal Wetland Statement of Findings may be necessary. Kevin Noon or Joel Wagner will be able to provide an official determination of DO #77-1 requirements upon receipt of this report, mapping, and supporting data. It is recommended that the park also make this report and any formal coordination with the NPS Wetlands Program leads available to the Omaha Army Corps Regulatory Branch for CWA compliance.

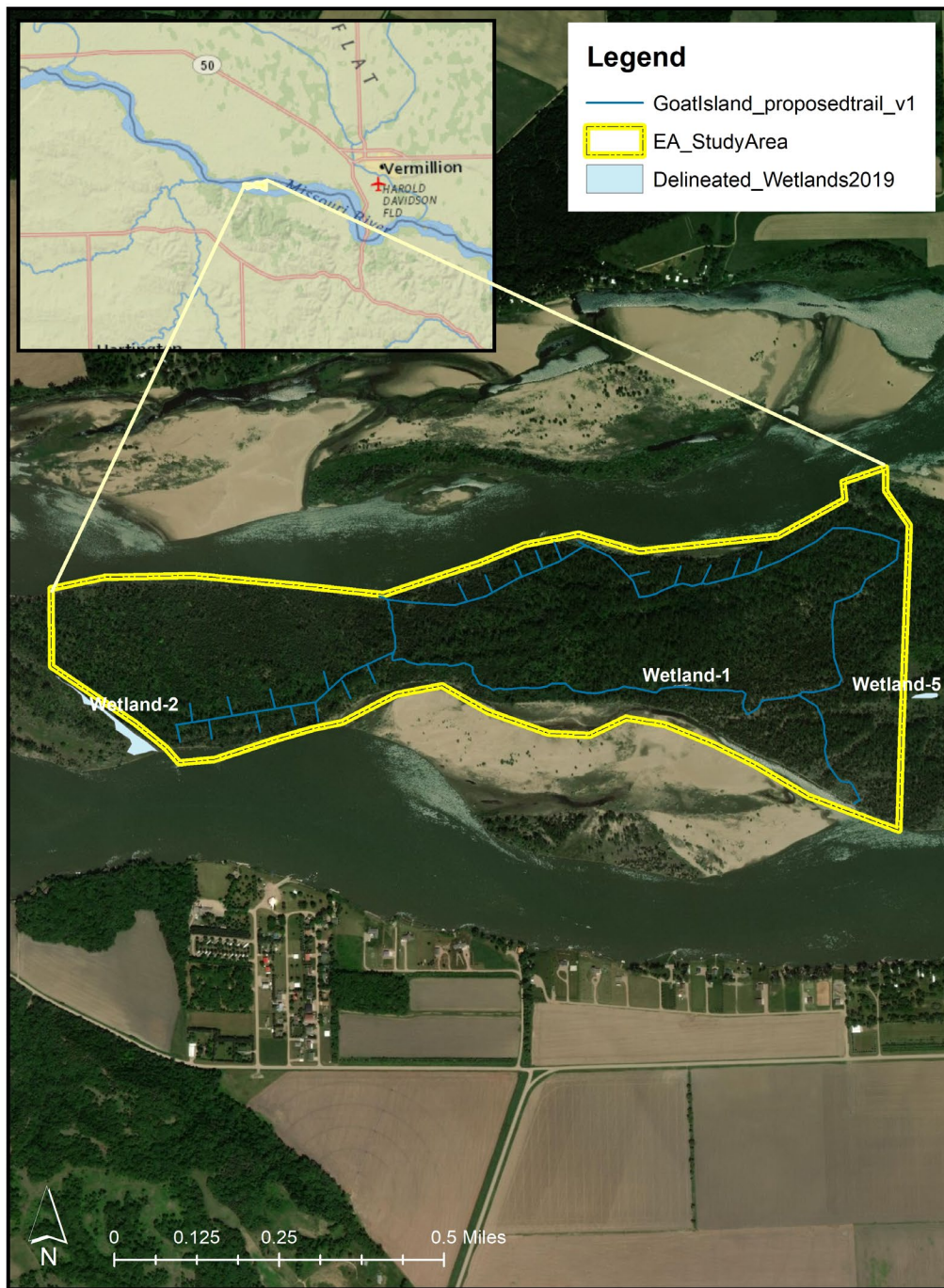


Figure 1. MNRR – Goat Island EA study area map, showing the location of the palustrine wetland feature identified and delineated in May 2019. Wetlands-2 and 5 also shown on this figure fell outside of the EA boundary and will be described in greater detail in a supplemental wetland inventory for the entire island.

Study Objectives

The purpose of this effort was to provide detailed wetland/aquatic resource identification and boundary information for the Goat Island Management Plan EA study area located within the Missouri River in Nebraska. The information may be utilized for park compliance purposes if MNRR proceeds with plans to construct camping, trail, and interpretative wayside panels and signs within the limits of the study boundary shown in Figure 1.

Field Participants

Peter J. Sharpe, NE Region – The National Park Service
Milton Haar, MNRR – The National Park Service
Lisa Yager, MNRR – The National Park Service
Brandon Boehm, MNRR - The National Park Service
Chris Langland, MNRR – The National Park Service

Introduction

It is the mission of the National Park Service to preserve and maintain the natural and cultural resources of the Missouri National Recreational River (MNRR) and to interpret those same resources to the visiting public and the scientific and scholarly community.

The NPS through Director's Order #77-1 requires mapping of wetlands and all other "waters of the United States" via a slightly different criteria than the USACE 1987 manual and associated regional supplements, thus the two types of wetland determination methods employed at MNRR were: (1) the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual Midwest Region (August 2010) and (2) the revised 1979 USFWS *Classification of Wetlands and Deepwater Habitats of the United States* (FGDC, 2013).

The NPS recognizes that most wetlands on NPS lands will have all three parameters. Therefore, D.O. #77-1 provides procedures for field biologists to follow so that wetland delineation and mapping projects on NPS lands will satisfy both US Army Corps criteria and the NPS standard for identifying wetlands which is the revised 1979 USFWS *Classification of Wetlands and Deepwater Habitats of the United States* (FGDC, 2013). For brevity, only the standards applicable for MNRR within the state of Nebraska are described below for a more detailed treatment of the other standards the reader is directed to D.O #77-1 (NPS, 2016).

It should be noted that the Sioux Falls, SD area experienced above average rainfall totals for the month of May when this investigation was performed (NWS Climate Data - <https://www.weather.gov/fsd/climategraphs>). Non-normal (excessively wet or dry) climatic conditions can make effective wetland delineations difficult as the areas investigated in this case may have exhibited soil saturation or flooding in non-wetland habitats. False positives were ruled out in these instances by focusing on primary indicators of wetland vegetation, soils, and hydrology.

Interim Regional Supplement USACE Method (3-Parameter Approach)

The USACE method for identifying the wetland / upland boundary uses the definition as outlined in the U.S. Army Corps of Engineers *Wetlands Delineation Manual, 1987*, which defines a wetland as:

“Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

Wetland boundaries were primarily determined by establishing a series of transects from a known wetland into known upland locations surrounding the area under examination. At suspected boundary locations along the transect investigators looked for evidence of hydric soils, hydrophytic vegetation, and wetland hydrology. The wetland/upland boundary line was thus delineated and any obvious topographic changes (e.g. abrupt toe-of-slope line) along the wetland/upland perimeter that might occur. In many cases at MNRR abrupt toe-of-slope boundaries, standing water, and hydrophytic plants were present and thus served as reliable indicators of wetland/upland boundaries. No new waterway features (classified as riverine wetlands by Cowardin et al. 1979) identified or delineated within the project study area.

Parameter 1- Hydrophytic Vegetation Criteria

For determining the presence of hydrophytic vegetation, plant species within each community were visually identified by strata (e.g. trees, saplings/shrubs, herbs and woody vines) and listed in descending order of dominance. The USACE defined sampling stratum has 5 percent or more total plant cover. If a stratum had less than 5 percent cover during the growing season, then those species and their cover values were recorded on the data form, assuming application of Indicator 3 (Prevalence Test) was necessary. However, these species were not generally included on the data sheets if the wetland determination could be made via Indicator 1 (Rapid Test) or Indicator 2 (Dominance Test). For Indicators 1 and 2 only those species that comprised 5% or more of a given strata were assessed.

Vegetation survey plots conformed to current USACE interim supplement guidelines and involved the use of a series of nested circular plots radiating outward from the soil/hydrology test pit (Fig. 2). Plot sizes were as follows:

1. Tree stratum – 30 ft (9.1 m) radius
2. Woody vines – 30 ft (9.1 m) radius
3. Herb stratum – 5 ft (1.5 m) radius

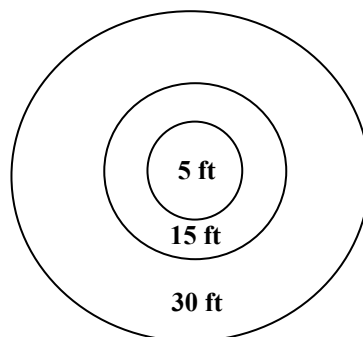


Figure 2. Typical wetland vegetation survey plot conforming to USACE interim regional supplement Great Plains Region (2010) guidelines.

4. Sapling/shrub stratum – 15 ft (4.6 m) radius

The wetland indicator status of observed dominant plant species was determined using the 2016 National Wetland Plant List for the Great Plains Region contained within a new apple based application for use with ipad and iphone products (Sharpe et al., 2015):

- **OBL** (Obligate Wetland Plants) occur greater than 99 percent of the time in wetlands under natural conditions.
- **FACW** (Facultative Wetland Plants) occur between 67 and 99 percent of the time in wetlands under natural conditions.
- **FAC** (Facultative Plants) occur between 33 and 67 percent of the time in wetlands under natural conditions.
- **FACU** (Facultative Upland Plants) occur between 1 and 33 percent of the time in wetlands under natural conditions.
- **UPL** (Obligate Upland Plants) occur less than 1 percent of the time in wetlands under natural conditions.

Plant species dominance was determined as the most abundant species that individually or collectively accounted for more than 50 percent of the total absolute coverage of vegetation in the stratum, plus any other species that, by itself, accounts for at least 20 percent of the total (i.e. the 50/20 Rule).

The interim regional supplement to the original 1987 USACE manual identifies 4 primary indicators of hydrophytic vegetation, any of which, when met, signifies that the community indicates a wetland plant community. For purposes of brevity this section will only cover the two most commonly encountered indicators at MNRR (e.g. Indicators 1 and 2). For a complete description of all of the indicators the reader is directed to view the U.S Army Corps of Engineers (USACE) Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (August 2010).

For a plant community to meet the vegetation criteria under Indicator 1 the following description must be met: “All dominant species across all strata are rated OBL or FACW, or a combination of these two categories, based on a visual assessment.” Under Indicator 2 (a commonly employed indicator at MNRR) more than 50 percent of the dominant plant species across all strata must be rated OBL, FACW, or FAC.

Parameter 2 - Hydrology Criteria

Wetland hydrology indicators provide evidence that episodes of inundation or soil saturation lasting more than a few days during the growing season have occurred repeatedly over a period of years and that the timing, duration, and frequency of wet conditions have been sufficient to produce a characteristic wetland plant community and hydric soil morphology. The growing season begins when two or more non–evergreen vascular plant species growing within the study area exhibit one or more of the following biological indicators:

1. Emergence of herbaceous plants from the ground
2. Appearance of new growth from vegetative crowns (e.g., in graminoids, bulbs, and corms)
3. Coleoptile/cotyledon emergence from seed
4. Bud burst on woody plants (i.e., some green foliage is visible between
5. spreading bud scales)
6. Emergence or elongation of leaves of woody plants
7. Emergence or opening of flowers

Growing season conditions can also be met if soil temperatures measured at 12 in. (30 cm) depth is 41 °F (5 °C) or higher. Hydrologic indicators of wetland conditions are based on the direct observation of surface water or groundwater during a site visit (Group A indicators), evidence that the site is subject to flooding or ponding, although the inundation need not be directly observed at the time of the investigation (Group B indicators). The inundation (Group B) indicators include water marks, drift deposits, sediment deposits, and similar features. Other hydrologic indicators consist of evidence that the soil is saturated currently or was saturated recently such as oxidized rhizospheres and the presence of reduced iron or sulfur in the soil profile (Group C indicators), which indicate that the soil has been saturated for an extended period. The final group of hydrologic indicators (Group D) consists of landscape, vegetation, and soil features that indicate contemporary rather than historical wet conditions. Wetland hydrology indicators are intended as one–time observations of site conditions that are sufficient evidence of wetland hydrology in areas where hydric soils and hydrophytic vegetation are present. For a site to meet the wetland hydrologic criteria it need only possess one primary indicator or two secondary indicators from one of the aforementioned groups.

Parameter 3 - Hydric Soil Criteria

The National Technical Committee for Hydric Soils defines a hydric soil as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA Soil Conservation Service 1994). One of the most significant changes to the original 1987 USACE manual with regards to wetland boundary determinations is in the area of hydric soil recognition and characterization. The new regional supplement still requires low chroma color soils and the presence of redoximorphic features, however, the revised indicators are much more specific and cover a broader range of potential wetland types than the original 1987 manual criteria.

Soil pits were excavated to a maximum depth of 20 inches (45.72 cm) using a sharp-shooter shovel, unless on-site conditions such as shallow bedrock prohibited excavation or one or more of the hydric soil indicators were met. The data sheets for each mapped wetland include information on the soil profile colors, presence/absence of redoximorphic features, texture, and presence/absence of any shallow confining layers and their depths on-site.

GPS Survey of Wetland Boundaries

Pink wetland delineation flags were marked with a unique alpha numeric code and hung at regular intervals around the perimeter of each identified wetland habitat and located using a sub-meter accurate GPS system. Representative wetland test pits were also similarly flagged and located. GPS-based coordinates were collected for wetland test pit and boundary flags from 13-18 May 2019, using a Trimble Geo7X receiver with an external Hurricane antenna in datum WGS 1984 (Data were later projected into NAD83 UTM Zone 14N), meter coordinates and TerraSync software. A minimum of 4 satellite vehicles were tracked. Where possible a maximum Position Dilution of Precision (PDOP) of 6 was maintained for each set and a minimum of 50 positions were taken at each point feature wherever possible. The data were post-processed and differentially corrected using Pathfinder Office 5.85 and base data downloaded from the CORS, Hartington (NEHA) – Nebraska base station. The corrected data were then exported to shapefile format for polygon creation in ARCMAP 10.5. No tests were done to confirm the X/Y direction accuracy during this investigation. Table 1 below shows a complete breakdown the GPS data's horizontal precision for the wetland boundary mapping. Please note that these data reflect all of the boundary points collected for the entirety of Goat Island which includes wetlands not described in this report but will be in supplement planned for submission in FY20.

Table 1. Estimated accuracies for the 8246 corrected GPS positions for the Goat Island EA Management Plan

Horizontal Precision	Percentage of GPS Positions within Range
0 - 2 in	-
2 - 6 in	81.02%
6 - 12 in	4.94%
12 - 20 in	7.28%
20 - 40 in	5.77%
40 - 79 in	0.81%
79- 197 in	0.18%
>197 in	-

Wetland Descriptions

Wetland 1 (Size – 0.04 ac): This habitat is the only palustrine wetland within the EA study area boundaries (See Fig. 1). The wetland is a sparsely vegetated concave depression (Photo 1) that falls completely within the limits of an existing ATV social trail that predates NPS ownership (Personal Communication M. Haar, May 2019). Due to the disturbed nature of the

wetland a hydrophytic plant community was not immediately evident, however, its landscape position and presence of high clay content soils strongly suggested that this area retains precipitation and local runoff, which appears to provide enough hydrology to promote reducing soil conditions. The habitat is classified as a palustrine, emergent, persistent, seasonally saturated, managed system Cowardin Class wetland (PEM1Bm). Wetland soils exhibited high clay content textures with color characteristics indicative of a F3 hydric soil type. As stated previously and can be seen in Photo 1 – vegetative cover was relatively sparse, however, *Poa pratensis* (FAC) and *Equisetum hyemale* (FACW) were observed in sparse pockets throughout the site.



Photograph 1 (42.76522 N, -97.07060 W) – Wetland 1 view is 74° East looking at the habitat and existing ATV trail. Photo Date 14 May 2019 – P. Sharpe.

Wetland 1 Functions and Values

A post-hoc qualitative function and value analysis utilizing the US Army Corps of Engineers – New England District (*The Highway Methodology Workbook Supplement*, September 1999) was conducted following the field investigation. Assessed principal function and values associated with Wetland 1 are primarily some minor floodflow alteration and sediment retention.

Recommendations

If the park were to proceed with plans to convert the existing social trail that Wetland-1 resides within into a formal park trail this would create a permanent impact to the palustrine wetland system identified and delineated in May 2019. In keeping with NPS policy of no net loss of wetland habitat (DO #77.1: Wetland Protection Revised June 2016), it is my recommendation that the park attempt to re-route the proposed trail around Wetland-1 to completely avoid any permanent impacts.

Should a trail re-route not prove feasible then the park is advised to contact Kevin Noon or Joel Wagner our NPS wetlands program leads and share this report along with any data here-in. Because Wetland-1 is under 0.1 acre in size and lies within an existing trail any permanent impacts to Wetland-1 may qualify for an exception under our DO #77.1 policies specifically:

“Scenic overlooks and foot/bike trails or boardwalks, including signs, where primary purposes include public education, interpretation, or enjoyment of wetland resources and where total wetland impacts from fill placement are 0.1 acre or less (Parking lots, access roads, borrow sites, and other associated facilities can not be excepted.)”

The NPS program leads previously mentioned will work with the park staff to determine if the proposed project qualifies as an excepted action for permanent wetland impacts or not under our DO #77.1 policy. Additionally, a copy of this report and any official guidance from our NPS service wide wetland leads should be made available to the regulatory branch of the Army Corps of Engineers (Omaha District) for Section 404 Clean Water Act compliance purposes. Dr. Kevin Noon and/or Joel Wagner would be your principal point of contacts for guidance related to the development of a formal Wetland and Floodplain Statement of Findings should any proposed projects proceed and it is determined that such documentation and mitigation measures are deemed necessary.

If you have any questions regarding this report please call Peter Sharpe (267) 858-1001. Wetland data sheets and supporting GIS data will be provided to MNRR, and posted to the NPS IRMA site. A comprehensive wetland inventory that covers the entire island will be provided as a supplement to this effort in FY20 for MNRR planning purposes. The wetland boundary data provided with this report and the upcoming supplement will supersede the vegetation mapping currently under development for the sections of Goat Island covered in this report.

cc: (by e-mail only)

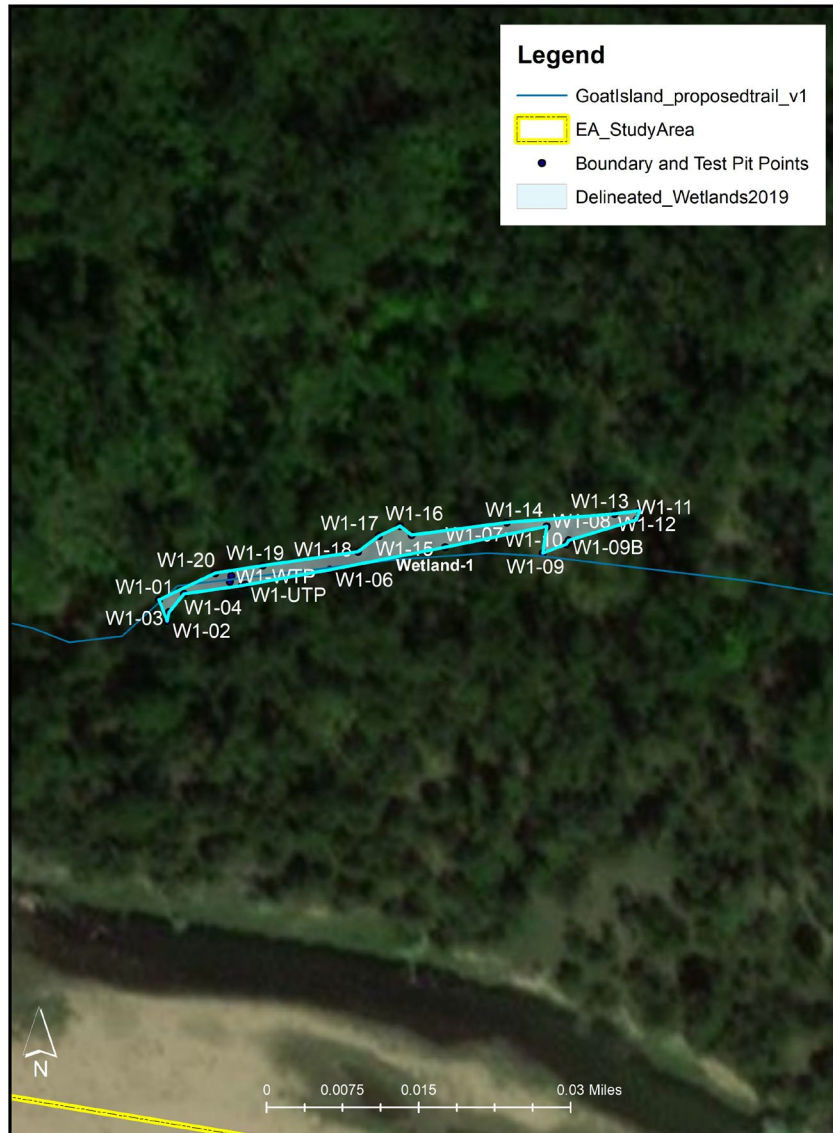
WRD - K. Noon, J. Wagner, P. Mangan

NER – C. Chapin, K. Painter-Green

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<https://irma.nps.gov/DataStore/Reference/Profile/2220340>.
- U. S. Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
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Appendix A – Detailed Project Mapping



Wetland-1 showing the individual boundary points and data collection locations relative to the existing ATV social trail. The trail line shown in the map was collected using a GPS system that was less accurate than the Trimble unit used to collect the wetland boundary data. The entire boundary of Wetland-1 falls within the existing trail prism, the reader should refer to Photo 1 for additional spatial reference.

Appendix B – Wetland Delineation/Function and Value Data Sheets

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Goat Island City/County: Cedar Co. Sampling Date: 5/16/2019
 Applicant/Owner: NPS State: NE Sampling Point: W1-WTP
 Investigator(s): P. Sharpe, M. Harr Section, Township, Range: St. Helena
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave
 Slope (%): 1% Lat: 43.781891 Long: -97.070640 Datum: WGS 84
 Soil Map Unit Name: 7180 - Sarpy lo, fine sand NWI or WWI Classification: PEM1Bm

Are climatic / hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in Remarks.)

Are ☒ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "Normal Circumstances" present? ☒ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ 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: Site lies in a topographic lowpoint which was/is used as a social trail with some ATV use.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	☐ Yes ☐ No	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	☐ Yes ☐ No	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
_____ = Total Cover			
Herb Stratum (Plot size: <u>79</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Equisetum hyemale</u>	<u>1.5</u>	☐ Yes ☒ No	<u>FACW</u>
2. <u>Poa pratensis</u>	<u>1.5</u>	☐ Yes ☒ No	<u>FAC</u>
3. <u>Slough grass</u>	<u>7.5</u>	☐ Yes ☒ No	_____
4. <u>Carex spp. (Veg)</u>	<u>1.5</u>	☐ Yes ☒ No	_____
5. <u>Bare ground</u>	<u>87.5</u>	☒ Yes ☐ No	_____
6. <u>Juniperus virginiana</u>	<u>0.5</u>	☐ Yes ☒ No	<u>FACU</u>
7. _____	_____	☐ Yes ☐ No	_____
8. _____	_____	_____	_____
_____ = Total Cover			
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	☐ Yes ☐ No	_____
2. _____	_____	_____	_____
_____ = Total Cover			

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: 0.000 % (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species 0 x 1 = 0
 FACW species 1.5 x 2 = 3
 FAC species 1.5 x 3 = 4.5
 FACU species .5 x 4 = 2
 UPL species 0 x 5 = 0
 Column Totals: 3.5 (A) 9.5 (B)
 Prevalence Index = B/A = 2.714

Hydrophytic Vegetation Indicators:
☐ Dominance Test is >50%
☐ Morphological Adaptations* (Explain in Remarks)
☒ Prevalence Index is ≤3.0*
☒ Problematic Hydrophytic Vegetation* (Explain)

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

Hydrophytic Vegetation Present? ☒ Yes ☐ No

Remarks: (Include photo numbers here or on a separate sheet.)
 Wetland occurs within preexisting ATV trail.

SOIL

Sampling Point: W1-WTP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox		Type ¹	Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
0-3	10YR 3/1	95					Clay sand	
10-16	10YR 5/1	70	5YR 4/4	30	C	M	Clay	
3-10	10YR 5/2	60	7.5YR 5/8	40	C	M	Cl, Sa	

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

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils:
☐ Histosol (A1) ☐ Histic Epipedon (A2) ☐ Black Histic (A3) ☐ Hydrogen Sulfide (A4) ☐ Stratified Layers (A5) ☐ 2 cm Muck (A10) ☐ Depleted Below Dark Surface (A11) ☐ Thick Dark Surface (A12) ☐ Sandy Mucky Mineral (S1) ☐ 5 cm Mucky Peat or Peat (S3) ☐ Sandy Gleyed Matrix (S4) ☐ Sandy Redox (S5) ☐ Stripped Matrix (S6) ☐ Loamy Mucky Mineral (F4)	☐ Loamy Gleyed Matrix (F2) ☒ Depleted Matrix (F3) ☐ Redox Dark Surface (F6) ☐ Depleted Dark Surface (F7) ☐ Redox Depressions (F8) ☐ Coast Prairie Redox (A16) ☐ Iron-Manganese Masses (F12) ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? ☒ Yes ☐ No
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
☐ Surface Water (A1) ☐ High Water Table (A2) ☐ Saturation (A3) ☐ Water Marks (B1) ☐ Sediment Deposits (B2) ☐ Drift Deposits (B3) ☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☒ Sparsely Vegetated Concave Surface (B8) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13) ☐ True Aquatic Plants (B14) ☐ Hydrogen Sulfide Odor (C1)	☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Presence of Reduced Iron (C4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Thin Muck Surface (C7) ☐ Gauge or Well Data (D9) ☐ Other (Explain in Remarks)	☐ Surface Soil Cracks (B6) ☐ Drainage Patterns (B10) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ FAC-Neutral Test (D5)	
Field Observations:		Wetland Hydrology Present? ☒ Yes ☐ No	
Surface Water Present? ☐ Yes ☒ No Depth (inches): _____ Water Table Present? ☐ Yes ☒ No Depth (inches): _____ Saturation Present? ☐ Yes ☒ No Depth (inches): _____ (includes capillary fringe)	Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:			

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Goat Island City/County: Cedar Co. Sampling Date: 5/16/2019
 Applicant/Owner: NPS State: NE Sampling Point: W1-UTP
 Investigator(s): P. Sharpe, M. Harr Section, Township, Range: St. Helena
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Slope
 Slope (%): 30 degree Lat: 42.765176 Long: -97.070492 Datum: WGS 84
 Soil Map Unit Name: 7180 - Sarpy lo, fine sand NWI or WWI Classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in Remarks.)

Are ☒ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "Normal Circumstances" present? ☒ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ 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 Hydric Soil Present? ☐ Yes ☒ No Wetland Hydrology Present? ☐ Yes ☒ No	Is the Sampled Area within a Wetland? ☐ Yes ☒ No
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>2827</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50.000</u> % (A/B)
1. <u>Juniperus virginiana</u>	<u>87.5</u>	☒ Yes ☐ No	<u>FACU</u>	
2. <u>Populus deltoides</u>	<u>17.5</u>	☐ Yes ☒ No	<u>FAC</u>	
3. _____		☐ Yes ☐ No		
4. _____				
<u>105</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>707</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>26.5</u> x 3 = <u>79.5</u> FACU species <u>95</u> x 4 = <u>380</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>121.5</u> (A) <u>459.5</u> (B) Prevalence Index = B/A = <u>3.782</u>
1. <u>Cornus drummondii</u>	<u>7.5</u>	☒ Yes ☐ No	<u>FAC</u>	
2. <u>Juniperus virginiana</u>	<u>7.5</u>	☒ Yes ☐ No	<u>FACU</u>	
3. _____		☐ Yes ☐ No		
4. _____				
5. _____				
<u>15</u> = Total Cover				
Herb Stratum (Plot size: <u>79</u>)				Hydrophytic Vegetation Indicators: ☐ Dominance Test is >50% ☐ Morphological Adaptations* (Explain in Remarks) ☐ Prevalence Index is ≤3.0* ☐ Problematic Hydrophytic Vegetation* (Explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Poa pratensis</u>	<u>1.5</u>	☒ Yes ☐ No	<u>FAC</u>	
2. _____		☐ Yes ☐ No		
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
<u>1.5</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Present? ☐ Yes ☒ No
1. _____		☐ Yes ☐ No		
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

Sampling Point: W1-UTP

HYDROLOGY

US Army Corps of Engineers

Wetland Function-Value Evaluation Form

Total area of wetland 0.04 Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No
 Adjacent land use E. Red Cedar, Cottonwood Forest Distance to nearest roadway or other development >1000 ft
 Dominant wetland systems present PEM1Bm Contiguous undeveloped buffer zone present Yes
 Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Floodplain
 How many tributaries contribute to the wetland? 0 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland -1
 Latitude 42.76522 Longitude -97.07060
 Prepared by: NPS Date 6/12/2019
 Wetland Impact:
 Type NA Area NA
 Evaluation based on:
 Office X Field X
 Corps manual wetland delineation completed? Y X N

Function/Value	Suitability Y N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
 Groundwater Recharge/Discharge	X			
 Floodflow Alteration	X	5,6,9	5	
 Fish and Shellfish Habitat	X			
 Sediment/Toxicant Retention	X	1,2,5,9	5	
 Nutrient Removal	X			
 Production Export	X			
 Sediment/Shoreline Stabilization	X			
 Wildlife Habitat	X			
 Recreation	X			
 Educational/Scientific Value	X			
 Uniqueness/Heritage	X			
 Visual Quality/Aesthetics	X			
ES Endangered Species Habitat	X			
Other				

Notes:

* Refer to backup list of numbered considerations.