National Park Service
U.S. Department of the Interior

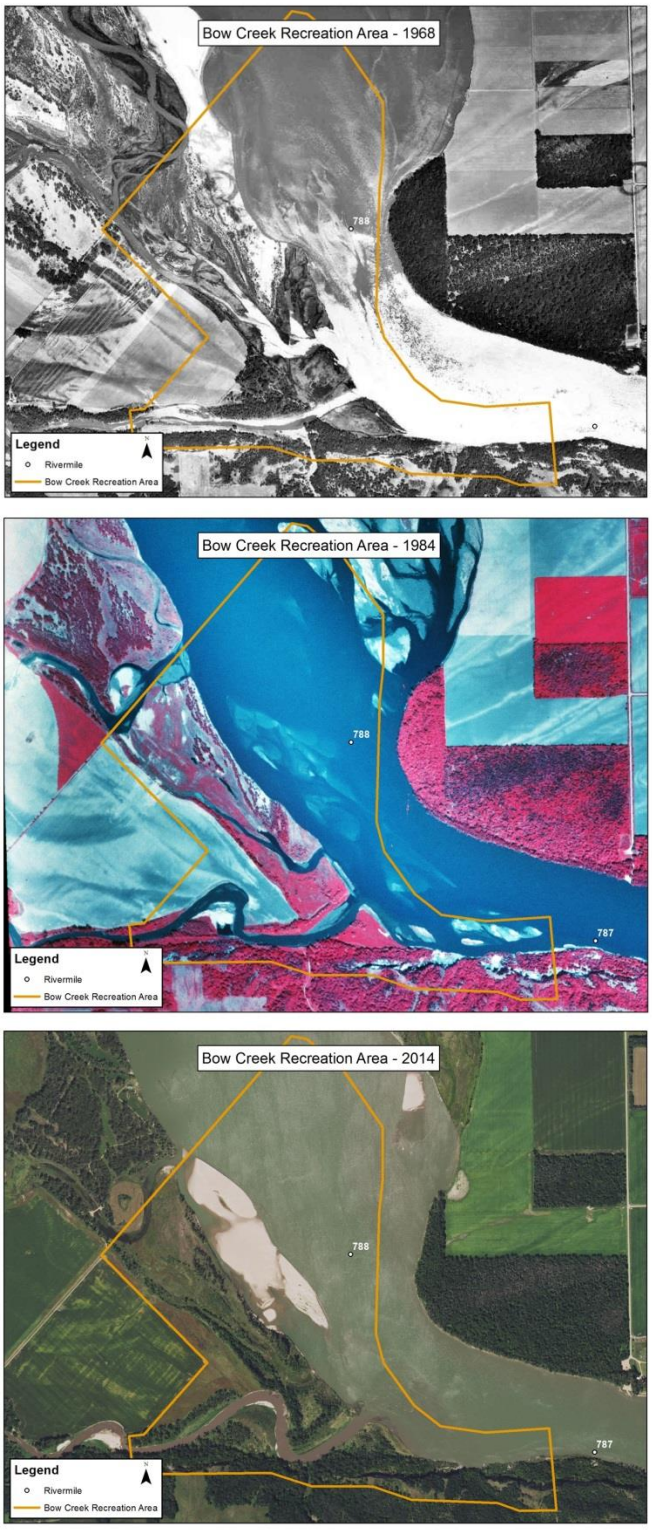
Missouri National Recreational River
South Dakota/Nebraska

Environmental Assessment

Bow Creek Recreation Area

Backwater Restoration

October 2018



Top: Several river channels and wetland areas (white and light gray) were present at Bow Creek Recreation Area in 1968.
Middle: Some remaining wetland areas and backwaters were present in 1984 at Bow Creek Recreation Area.
Bottom: By 2014, the wetland area at Bow Creek Recreation Area was drastically reduced.

Public Comment

If you wish to comment on the environmental assessment, you may mail comments to the address below or post comments online at http://parkplanning.nps.gov/MNRR. This environmental assessment will be open to public review for 7 days. Before including your address, phone number, email address, or other personal identifying information in your comments, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Superintendent
Missouri National Recreational River
508 East 2nd Street
Yankton, SD 57078

1.0 Purpose and Need

1.1 Introduction

Missouri National Recreational River (MNRR) is proposing to restore and rehabilitate a backwater channel at Bow Creek Recreation Area (located near Wynot, Nebraska). Restoration of the backwater area is ecologically important because channel incision and flow regulation has caused loss of shallow water habitats such as side channels and backwater areas. This Environmental Assessment (EA) evaluates the potential effects of the proposed action on several key resources in the area.

Project Background. The Nebraska Department of Transportation (NDOT) is seeking a U.S. Army Corps of Engineers (USACE) 404 permit for road embankment repairs and mitigation work along Nebraska Highway 12. As part of their mitigation for impacts to wetlands under the permit, NDOT has agreed to restore a Missouri River historic backwater channel at MNRR's Bow Creek Recreation Area. This is off-site, in-kind (replacement of the impacted aquatic site with one of the same hydrologic regime and plant community type), and out-of-kind (replacement of an impacted aquatic site with one of a different hydrologic regime and plant community type) mitigation for permanent wetland impacts resulting from Nebraska Highway 12 road embankment repairs (Phase I and II) which occurred within the MNRR boundary. The National Park Service (NPS) participated in the selection of the mitigation site at MNRR because of the ecological benefits available through the restoration.

MNRR History. MNRR was established by two acts of Congress which amended the Wild and Scenic Rivers Act of 1968. The first act (1978) created the 59-mile reach (also referred to as the Gavins Point Segment) from Gavins Point Dam to Ponca State Park, Nebraska. The second act (1991) established a 39-mile reach (also referred to as the Fort Randall Segment) from Fort Randall Dam to Running Water, South Dakota, 20 miles of the lower Niobrara River, and 8 miles of Verdigre Creek (NPS 2012). Bow Creek Recreation Area is located within the 59-mile reach of MNRR. The legislation adding the MNRR to the national wild and scenic rivers system gave administrative responsibility to the Secretary of the Interior, acting through NPS.

The acquisition of Bow Creek Recreation Area began in 2004 when the NPS purchased the property north of Bow Creek. The area south of the creek was added to park property through a land exchange in 2008. This floodplain and bluff top property totals approximately 205 acres and is located along Bow Creek and the Missouri River in Cedar County about 2 miles northeast of Wynot, Nebraska at river mile 787.6 (Figure 1).

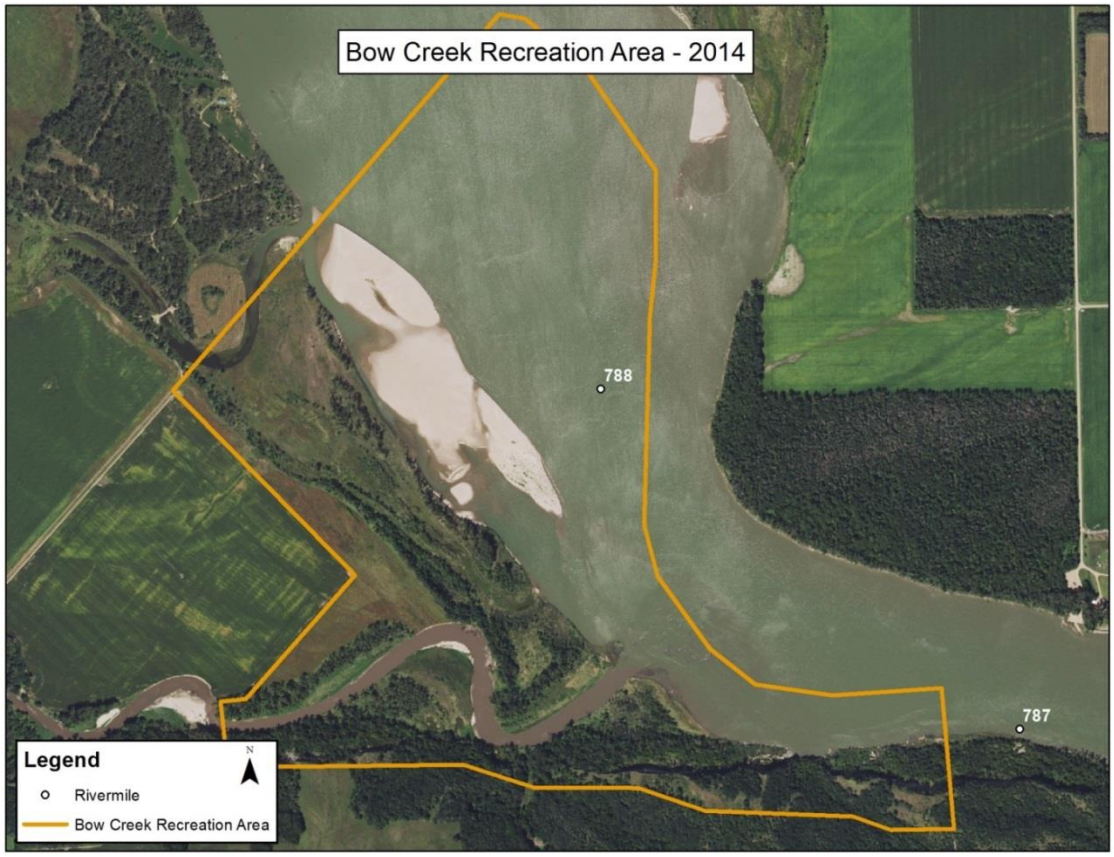


Figure 1. Bow Creek Recreation Area, owned and managed by the NPS, is located at the confluence of Bow Creek and the Missouri River.

Several purpose statements convey the reason for which MNRR was set aside as part of the national park system and as part of the national wild and scenic rivers system. Grounded in an analysis of national recreational river legislation and legislative history, purpose statements provide the primary criteria against which the appropriateness of plan recommendations, operational decisions, and actions are tested. The purpose of MNRR is to:

- Preserve the river in a free-flowing condition and protect it for the enjoyment of present and future generations;
- Provide streambank protection compatible with the river's significant natural and cultural resources;
- Preserve the significant recreational, fish and wildlife, and historic and cultural resources of the Missouri River corridor; and
- Provide for a level of recreation and recreational access that does not adversely impact the river's significant natural and cultural resources.

1.2 Purpose of and Need for Action

The underlying **purpose** of the proposed action is to revive a degrading wetland into a more fully functioning wetland habitat at Bow Creek Recreation Area. The NPS management objective for the backwater is to restore and rehabilitate 6.23 acres of backwater wetland. Backwaters are

parts of a river system not reached by the current, where the water is stagnant. Backwater ecosystems are rare, even in the free-flowing MNRR, and provide a habitat characterized by slower water velocities and greater productivity. Research has shown these features to be crucial to the river's ecosystem. Once abundant, these habitats have been in decline within the MNRR since Gavins Point Dam and Fort Randall Dam, both main stem Missouri River dams, were completed and flow regulation within the MNRR began. Three other backwater ecosystems have been restored within the 59-Mile District of MNRR with success. The "Ponca backwater" is located within Ponca State Park near Ponca, Nebraska. This 30.5 acre backwater was originally reconstructed in 2004 and was restored again in 2016 after the Missouri River flood of 2011 changed the functionality of the feature. Suitable soils from the original backwater creation were used to create a sandbar within the Missouri River. The "Gunderson backwater" was reconstructed in 2008. This feature is 13.5 acres in size and is located near Vermillion, South Dakota. Suitable soils from excavation were used to create a sandbar within the Missouri River. The "Green Island backwater" was reconstructed in 2009. This feature was 10.5 acres in size and is located near Yankton, South Dakota. The Missouri River flood in 2011 altered this backwater feature to a flow-through side channel feature.

NDOT conducted an extensive review of potential mitigation sites for a road repair project along Nebraska Highway 12. The Bow Creek site was chosen based on a recommendation from the NPS that this type of restoration is critical to replace lost Missouri River backwater habitat. The mitigation site selection was based on the following criteria: located in Missouri National Recreational River, located in same watershed (hydrologic unit code or HUC), and a preferred Missouri River backwater restoration site of the NPS. The proposed mitigation would address local watershed needs by restoring important wetlands and backwater areas along the Missouri River that would attenuate flood water, create aquatic organism and fish habitat, increase organic matter production, and create warmer water areas.

Additional qualities of this site consist of the following:

- It is expected to have adequate and available hydrology for backwater and wetland development (based on site investigations).
- It is located within the Missouri River floodplain adjacent to existing wetlands which increases the likelihood of creating an ecologically, self-sustaining aquatic resource.
- Suitable spoil can be used to create sandbar habitat in the Missouri River for threatened and endangered interior least tern (*Sterna antillarum athalassos*) and piping plover *(Charadrius melodus)* habitat.

The **need** for the proposed action is strongly linked to the park purpose statements given above. The off-site Missouri River backwater area restoration is ecologically important because channel incision and flow regulation has caused loss of shallow water habitats such as side channels and backwater areas. Research conducted by the University of South Dakota on an unchannelized portion of the Missouri River downstream of Gavin's Point Dam showed that the mean length and area of side channels from 1941 to 2008 decreased by 42% and 37%, respectively. The total mean backwater area decreased by 36% (Yager, et al., 2011). These side channel and backwater areas provide many benefits to aquatic ecosystems including productive spawning and nursery areas for fish (Junk, et al., 1989; Price and Townshend, 2004; USACE 2008; NRC 2002 and 2011), productive habitat for aquatic organisms as they provide a refuge away from high river

velocities (Shaeffer, and Nickum, 1986, Price and Townshend, 2004, USACE 2008), and warmer water for temperature diversity (Shaeffer, and Nickum, 1986, USACE 2008).

Secondary management objectives include using the backwater as an educational tool and potential recreational area for the general public. Alongside resource preservation and enhancement, interpretation and education is a cornerstone of the NPS and this backwater would have great potential for educational programs and learning experiences for members of the public. Recreational opportunities include fishing, paddling, wildlife viewing, and more.

1.3 Issues and Impact Topics

Issues can be defined as the relationships between the proposed action and the human, physical, and natural environment. Issues are used to define which environmental resources may experience either negative or beneficial consequences from an action. Issues are usually problems caused by the proposed action or an alternative, but may be other questions or concerns.

Impact topics were used to define and focus the discussion of resources that could be affected by the alternatives, and are the focus in the evaluation of the potential environmental consequences of the alternatives. Potential impact topics were identified based on legislative requirements, executive orders (EOs), topics in DO #12 and the 2015 NEPA Handbook, NPS Management Policies (NPS 2006), guidance from NPS, input from other agencies, public concerns, and resource information specific to the recreational river. An interdisciplinary team discussed each resource topic and how the proposed project would either benefit or adversely impact the resource. A brief rationale for the selection of each impact topic is given below as well as rationale for dismissing specific topics from further consideration. In general, if negligible or only minimal impacts would result from the proposed project, the impact topic was dismissed from further analysis.

1.3.1 Impact Topics Retained for Further Analysis

The following impact topics have the potential to be affected by the proposed action and are evaluated in detail in this EA.

Hydrology and Water Quality – Hydrology of Bow Creek Recreation Area would be altered due to the restoration of the backwater. Hydrological models were generated to better understand the potential impacts and to successfully achieve the benefits desired. To eliminate the potential for impacts to water quality during construction activities, best management practices (BMPs) to control soil erosion and sedimentation would be implemented, and the NDOT would acquire all necessary permits for construction activities.

Soils/Geology – The geology within MNRR comprises sedimentary formations (Petsch 1946) of Cretaceous origin and much more recent Pliestocene deposits. During the Cretaceous period, the Western Interior Seaway infiltrated the center of the United States, including Nebraska and South Dakota, depositing marine sediments consisting of chalks, clays, and sandstones. During the Pliestocene, glacial advances brought gravels, sand, and unconsolidated erratics (Petsch 1946) to the area. The soils at the site consist of fine sand and loamy fine sand deposited by the Missouri River (https://websoilsurvey.sc.egov.usda.gov). Potential impacts on soil resources were assessed based on the extent of disturbance to soils, including natural undisturbed soils, the potential for soil erosion resulting from disturbance, and limitations associated with the soils.

Under the alternatives, including the no action alternative, soil compaction and an alternation of soil chemistry would occur from recreational use and management activities. Under the preferred alternative soil compaction would occur in limited areas during construction activities. Sand removed from the backwater site would be placed in the Missouri River to create a sandbar. Any clays and silts not suitable for the sandbar would be removed to an off-site location outside of the MNRR authorized boundary.

Wetlands – EO 11990, "Protection of Wetlands," directs all federal agencies to avoid to the maximum extent possible the long- and short-term adverse impacts associated with the occupancy, destruction, or modification of wetlands, and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. Based on NPS DO #77-1, Wetland Protection and Procedural Manual #77-1, if a preferred alternative would have adverse impacts on wetlands, a Statement of Findings (SOF) must be prepared that documents the rationale for choosing an alternative that would have adverse impacts on wetlands.

Wetland delineation surveys were conducted at Bow Creek Recreation Area in May of 2015. During the survey, 11.74 acres wetlands were identified, including 3.47 acres within the project area. The project would enhance approximately 3 acres of existing wetland and create approximately 3.23 acres of additional wetland in a former wetland area for a total of 6.23 acres of wetland involved in the project (Figure 2).

Per NPS DO #77-1, because the compensatory wetland mitigation in this project is designed to restore wetlands, it is an excepted action and a wetland statement of findings is not needed.

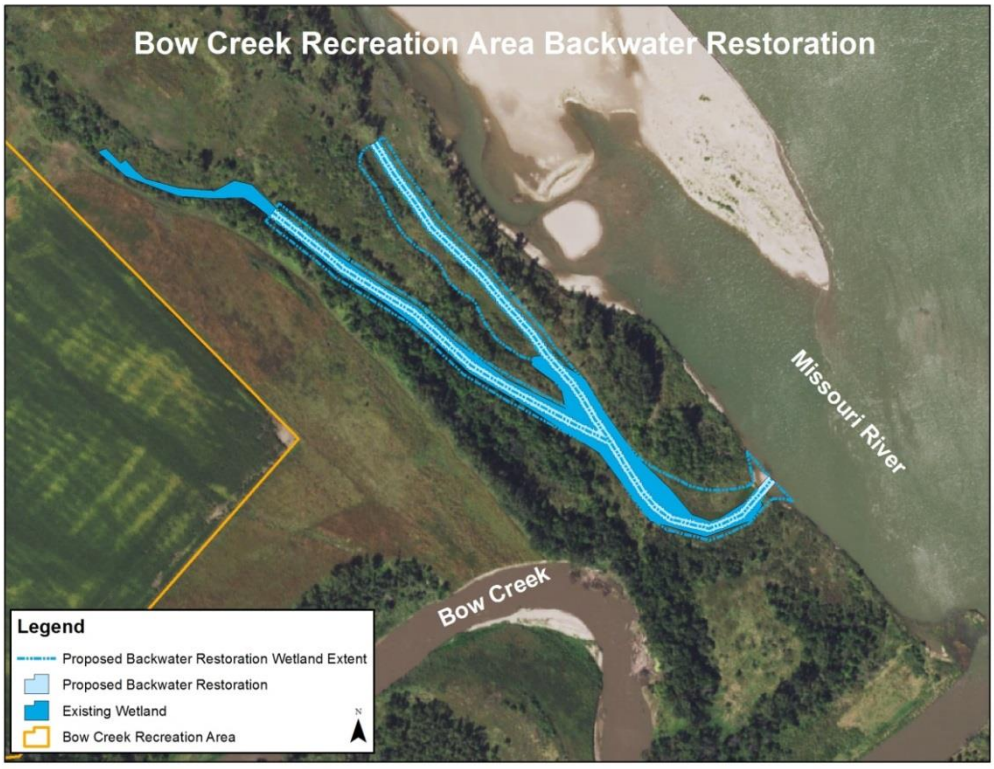


Figure 2. The existing wetlands at Bow Creek Recreation Area are shown in solid dark blue. The proposed backwater channel to be restored is shown in solid light blue and the proposed wetland extent is shown in dashed blue outline.

Vegetation – Impacts to vegetation were analyzed, and potential impacts were determined based on the anticipated extent of vegetation removal needed for project construction. Impacts to vegetation from the proposed action included adverse impacts from site development and construction, as well as beneficial impacts from invasive species management and establishment of native species and of aquatic plant species.

1.3.2 Impact Topics Dismissed from Further Analysis

A summary of impact topics dismissed from analysis is provided below, along with the rationale for the dismissal.

Air Quality – MNRR is subject to federal, Nebraska, and South Dakota air regulations. National ambient air quality standards have been established by U.S. Environmental Protection Agency (EPA). Current standards are set for sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone, particulate matter equal to or less than 10 microns in size, fine particulate matter equal to or less than 2.5 microns in size, and lead. All of Nebraska and South Dakota are currently in attainment for all criteria air pollutants (USEPA 2018). The proposed project would contribute trace amounts of criteria air pollutants during construction activities, resulting in overall negligible impacts; therefore, this topic was dismissed.

Archeological Resources – Pursuant to Section 5.3.5 of the NPS Management Policies 2006, archeological resources will be protected against human agents of destruction and deterioration whenever practicable (NPS 2006). Archeologists from the NPS Midwest Archeological Center (MWAC) carried out an archeological survey at Bow Creek Recreation Area on April 29, 2015. As stated in the site visit report, historic aerial images of Bow Creek from the mid-twentieth century show that this entire landform is quite new and, therefore, cannot not contain historic cultural deposits anywhere near the surface (NPS 2015). Shovel tests were placed in the general area by MWAC archeologists and only accretion sands were found in 2015. This topic was dismissed after consultation with the MWAC archeologist assigned to MNRR.

Floodplains – Bow Creek Recreation Area lies within the 100-year floodplain. NPS DO #77-2, Floodplain Management and Procedural Manual provides NPS policies and procedures for complying with EO 11988, "Floodplain Management." If the preferred alternative in an EA would result in adverse impacts on a regulatory floodplain, a SOF documenting compliance with DO #77-2 and its implementation procedures is required to be completed. This project is considered an excepted action according to DO #77-2 as the project would not put life or property at risk or adversely affect the natural resources or functions of the floodplain. A Floodplain SOF is not needed and this topic was dismissed.

Soundscape – Section 4.9 of NPS Management Policies 2006 states that the NPS, "will preserve, to the greatest extent possible, the natural soundscapes of the park, including both biological and physical sounds. Natural sounds are intrinsic elements of the environment that are vital to the functioning of ecosystems and can be used to determine the diversity and interactions of species within communities. Soundscapes are often associated with parks and are considered important components of natural wildlife interactions, as well as visitor experience" (NPS 2006). Additionally, NPS Management Policies 2006 and DO #47, Sound Preservation and Noise Management, provide guidance for operational policies that help protect natural soundscapes in NPS park units. A soundscape is the human perception of acoustic resources present in a park unit's acoustical environment.

Acoustic resources often include natural sounds (water, wildlife, wind, etc.), cultural and historic sounds (battle reenactments, tribal ceremonies, etc.), and non-natural human-caused sounds (vehicles, boats, etc.). Neither of the alternatives would result in greater than negligible impacts from construction and maintenance activities. Changes in the soundscape would be temporary and would not result in impacts beyond what visitors would expect to experience at the site. As a result, soundscape was dismissed as a resource from further analysis.

Scenic Resources –The river valley provides scenic vistas of a variety of natural landscapes such as bottomlands, cottonwood forests, wooded draws, forested hills, sand dunes, high-bank islands, wetlands, and chalkrock bluffs. Beneficial impacts to the scenic vistas at Bow Creek would occur as a result of the proposed action. Since adverse impacts are not expected to this resource, scenic resources was dismissed from further analysis.

Fish and Wildlife – Section 4.4.1 of the NPS Management Policies 2006 states that NPS "will minimize human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them" (NPS 2006). Fish and wildlife are abundant along MNRR. The varied river habitat and island complexes provide ideal feeding, nesting, and breeding areas for many species of birds, mammals, reptiles, amphibians, and fish. Impacts on wildlife were analyzed using existing NPS data on the project area. Habitat restoration under the proposed action would have beneficial impacts on fish (especially fish passage and habitat within the backwater wetlands), wildlife, and habitats over the long term. While site development would have some temporary adverse impacts on wildlife in the project area, these impacts would be negligible. As a result, this resource was dismissed from further analysis.

Special Status Species – Special status species are those that have been identified by the U.S. Fish and Wildlife Service, South Dakota Department of Game, Fish, and Parks, or Nebraska Game and Parks Commission as needing special protection. The Endangered Species Act of 1973, as amended, requires impacts on all federally listed threatened or endangered species be considered in planning for federal actions. NPS policy also requires examination of the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species. Nineteen federal and state listed species are known in the vicinity of the project area.

Federally listed aquatic species potentially occurring at Bow Creek Recreation Area include:

- Higgins eye mussel (*Lampilis higginsii*): This mussel prefers deep water and a moderate current and is unlikely to use or be impacted by the backwater restoration. No discharge of water or spoil into the river would take place from April 1 to July 31.
- Scaleshell mussel (*Leptodea leptodon*): This mussel is unlikely to use or be impacted by the backwater restoration. No discharge of water or spoil into the river would take place from April 1 to July 31.
- Pallid sturgeon (*Scaphirhynchus albus*): The project would benefit pallid sturgeon that may use the restored backwater after construction. Pallid sturgeon are not currently present within the wetland areas. No discharge of water or spoil into the river would take place from April 1 to July 31.
- Topeka shiner (*Notropis topeka*): The Topeka shiner is a small minnow that lives in pool and run areas of small to medium size prairie streams, including Missouri River tributary

watersheds. It is unlikely to use or be impacted by the backwater restoration. No discharge of water or spoil into the river would take place from April 1 to July 31.

Federally listed terrestrial species occurring at Bow Creek Recreation Area include:

- Piping plover (*Charadrius melodus*) and interior least tern (*Sterna antillarum*): The sandbar to be created with removed sand would benefit both species by providing additional nesting habitat. Nesting has occurred on the sandbar adjacent to Bow Creek Recreation Area. For construction activities that begin prior to April 15 and continue beyond April 15, surveys would be conducted starting on April 8 and continue through the end of construction or August 15, whichever comes first. A qualified biologist would conduct surveys according to protocol. If species are present, the contractor would be notified to top work within ¼ mile of nesting activities. Nighttime work with lights would not take place from April 15 to August 15.
- Northern long-eared bat (*Myotis septentrionalis*): Potential roosting areas include live and dead trees (≥3 inches dbh) in riparian forests and hibernacula may include cracks or crevices in Missouri River cretaceous bluff outcroppings. Grading and restoration activities would not remove large trees. If removal of large trees becomes necessary, these trees will be removed from October 1 to March 31 to avoid impacts to the northern long-eared bat roosting period.
- Whooping crane (*Grus americana*): The whooping crane may use MNRR sandbars, wetland areas, and agricultural fields as a migratory stopover. The project would likely benefit the whooping crane by providing more wetland habitat for migratory stopover. Construction activities would not take place during migration periods (March 10 to May 10 and September 16 to November 16). If construction is necessary during these time frames, a qualified biologist would monitor and stop work occurring within ½ mile of whooping cranes.
- Western prairie fringed orchid (*Platanthera praeclara*): The western prairie fringed orchid is not expected to be at the property or within the project area and it is unlikely to be impacted by the backwater restoration.

While some of these listed species have the potential to be present in the project area, the proposed project would have no adverse impact or negligible impacts on any of these species. Beneficial impacts to terrestrial state and federally listed species would occur from management of invasive exotic plants and from re-establishment of native vegetation. These negligible and beneficial impacts would correspond to a "may affect, not likely to adversely affect" impact under section 7 of the ESA for the federally listed species. As a result, special status species was dismissed from further analysis.

Historic Structures and Districts – Park resources classified as historic structures may be listed as buildings, structures, districts, or objects in the National Register of Historic Places (NRHP). Historic structures also may be included in the NRHP as contributing elements of historic districts, either as components of developed areas or as landscape features. During the cultural resources survey completed in April 2015, no historic resources were documented in the project area at Bow Creek Recreation Area. There would be no adverse effect to historic structures and districts.

Cultural Landscapes –NPS defines cultural landscapes as geographic areas associated with historic events, activities, or people that reflect that park's history, development patterns, and the relationship between people and the park. No cultural landscapes have been designated within or near Bow Creek Recreation Area. Therefore, this topic was dismissed from further analysis.

Ethnographic Resources – Ethnographic resources are defined as the natural and cultural materials, features, and places that are linked by a subject community to the traditional practices, values, beliefs, history, and/or ethnic identity of that community. Native Americans from some tribes have long been associated with the areas along the Missouri River. Because there are no known ethnographic resources on MNRR lands, and no issues or concerns were raised by associated tribes during scoping, ethnographic resources was dismissed as an impact topic.

Wild and Scenic Rivers – In 1968, Congress passed the Wild and Scenic Rivers Act. The act "declared to be the policy of the United States that certain selected rivers of the Nation, which with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations." Under the Wild and Scenic Rivers Act, designated rivers are classified as wild, scenic, or recreational. In 1978 and 1991, Congress designated portions of the Missouri River (the 59 Mile District and the 39 Mile District, respectively), and parts of two of its tributaries in Nebraska (Niobrara River and Verdigre Creek), as components of the national wild and scenic river system. Outstandingly remarkable values (ORVs) are defined by the Wild and Scenic Rivers Act as the characteristics that make a river worthy of special protection. Thus, the foundation for wild and scenic river management is a clearly defined set of ORVs. The Interagency Wild and Scenic Rivers Coordinating Council issued criteria for identifying and defining these values. The criteria guidance states that:

- An ORV must be river related or dependent. This means that a value must be located in the river or on its immediate shoreline (generally within 0.25 mile on either side of the river).
- Contribute substantially to the functioning of the river ecosystem.
- Owe its location or existence to the presence of the river.
- An ORV must be rare, unique, or exemplary at a comparative regional or national scale. Such a value would be one that is a conspicuous example from among a number of similar values that are themselves uncommon or extraordinary.

Based on these criteria and a careful analysis of the designated reaches of the Missouri and Niobrara rivers, and Verdigre Creek, NPS has determined that several ORVs are present within MNRR. The analysis concluded that MNRR contains the following ORVs: cultural, ecological, fish and wildlife, geological, recreational, and scenic. The 59-Mile District of MNRR has been divided into eight separate segments for the purposes of defining ORV river reaches or segments. Bow Creek Recreation Area is located within Segment 6, Rush Island to Myron Grove (river mile 804-787) and contains cultural, ecological, fish and wildlife, geological, recreational, and scenic values (NPS 2012). Each value is discussed and briefly analyzed below.

- Cultural: There are no known cultural sites, features, or landscapes within the Bow Creek Recreation Area. More information can be found within Section 1.3.2 "Impact Topics Dismissed from Further Analysis". No adverse impacts would be expected.

- Ecological: Bow Creek Recreation Area hosts several unique habitats including prairie, cottonwood forest, and wetland areas. The existing wetland area would be modified and enhanced by the project and former wetland areas would be restored to wetland. The overall impact would be positive and beneficial to the ecological functioning at Bow Creek Recreation Area. No adverse impacts would be expected.
- Fish and Wildlife: Bow Creek Recreation Area hosts many species of wildlife within the property and many species of fish within the river adjacent to the property. This ORV is described more fully within Section 1.3.2 "Impact Topics Dismissed from Further Analysis". No adverse impacts would be expected.
- Geological: Bow Creek Recreation Area has exposed bluff outcroppings and actively accreting and eroding sandbars adjacent to the property. The project would create a new sandbar in the Missouri River adjacent to the property. This action would benefit the geological ORV within this river segment by adding another sandbar feature to the main channel of the Missouri River. No adverse impacts would be expected.
- Recreational: Bow Creek Recreation Area offers several opportunities for public recreation, including hiking, camping, hunting, wildlife viewing, and others. The lower floodplain portion of Bow Creek Recreation Area would be closed to the public during the period of active construction for the safety of visitors and contractors completing the work. The bluff top portion of Bow Creek Recreation Area will remain open during this time as it is isolated from construction activities. This impact on recreation would be temporary. Recreational opportunities would increase after the backwater restoration is complete by increasing fishing opportunities and enhancing wildlife viewing. No adverse impacts would be expected.
- Scenic: Bow Creek Recreation Area offers picturesque views of the Missouri River channel, exposed bluff outcroppings, and floodplain forest and prairie habitats. Temporary visual impacts, including views of large construction equipment, haul roads, and exposed soil, would be present during construction of the backwater. These impacts would be minor and limited to the active construction period. No adverse impacts would be expected.

The proposed action would not degrade the values for which the MNRR was established and would result in the enhancement of ORV's at the project location. This is consistent with the anti-degradation policy under section 10(a) of the Wild and Scenic Rivers Act, which states: "Each component of the national wild and scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values." Elements of the project meet the criteria of a water resources project and are subject to a determination of effect under section 7(a) of the Wild and Scenic Rivers Act at the time of permitting - no direct and adverse effects are expected. See Section 5.0, Coordination and Consultation for more information regarding the Wild and Scenic Rivers Act Section 7(a) determination for this project.

Health and Safety– Safety is a top priority at MNRR, and safety concerns include trip and slip hazards, sharp objects in beach areas, contact with venomous or potentially hazardous species, biting insects, poisonous plants, and other hazards. Weather can present another safety hazard at MNRR. Recreational activities along the Missouri River present safety concerns for visitors

including navigation difficulties, high flows associated with flood conditions and rapidly changing conditions, and hazards such as holes, submerged rocks, and snags. MNRR does not have any visitor safety information related to the Bow Creek Recreation Area, as no incidents have been reported. The proposed action would not influence NPS employee or visitor safety; therefore, this topic was dismissed from further analysis.

Visitor Use and Experience – The NPS Management Policies 2006 states that "[t]he fundamental purpose of all parks also includes providing for the enjoyment of park resources and values by the people of the United States" (NPS 2006). Although some adverse impacts to visitor use and experience may occur during the construction period, beneficial impacts to MNRR visitors would occur because of the new educational opportunities available following the development. As a result, this topic was dismissed from further analysis.

Environmental Justice – EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires federal agencies to make achieving environmental justice part of its mission. Specifically, each agency must identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations." The intent is to prevent minority and low-income populations from being disproportionately affected by adverse human health and environmental impacts of federal actions. The minority population is defined as the nonwhite and multiracial population of a given area and includes African American, Asian, American Indian, Native Alaskan, Native Hawaiian, Pacific Islander, persons reporting some other race, and persons reporting two or more races. The standards of analysis for environmental justice require that these populations are present in the vicinity of the project, and that the potential for disproportionate effects to these populations is present. The proposed action would not result in disproportionate impacts on minority populations; therefore, this topic was dismissed from further analysis.

2.0 Alternatives

2.1 Alternative A – No Action

Under the no action alternative, the site at Bow Creek Recreation Area would remain in its current condition. No backwater or wetland restoration would be completed.

2.2 Alternative B – Restore Bow Creek Backwater and Wetlands

The overall concept is to restore and rehabilitate 6.23 acres of Missouri River backwater habitat by reconnecting former river chutes and wetlands to the river. The mitigation would restore and rehabilitate 3,182 feet (2.18 acres) of backwater channel. The backwater channel would be approximately 30 feet wide and six feet deep with three, 10 foot deep pools within the backwater. Adjacent to the backwater channel would be 4.05 acres of riverine floodplain wetlands created on a 15-35 foot wide shelf on either side of the backwater. The backwater would be hydrologically connected to the Missouri River year round. Standard excavation equipment would be used within the project area in constructing the backwater mitigation site. Appropriate sand fill from the excavation would be transported by truck to the adjacent Missouri River to create an approximately 4.7 acre sandbar. Unsuitable spoil materials (e.g., silts and clays) would be hauled off-site. Additional project details can be found in the project design and final mitigation plan (Appendix A) and in Figures 3 and 4.

To create a backwater habitat that has water several feet deep most of the year the backwater chute bottom elevation is proposed to be at 1,134.0 feet MSL (mean seal level) which would provide 2.9 feet of water depth during the lowest average water surface and 5.7 feet during the highest average water surface. Fish habitat pools would have 7.9 feet deep and 10.7 feet deep, respectively. The wetland shelf, at elevation 1139.0, would be flooded approximately half of the year under normal conditions, to a depth of zero to eight inches. Groundwater level is assumed to have the same level as surface water this close to the river.

2.2.1 Location

The proposed mitigation area is located at the Bow Creek Recreation Area, near the village of Wynot, in Cedar County, NE. 42°.773328 N, -97°.139149 W. The area is located in the Missouri River floodplain in HUC 10170101 (Figure 1). The project latitude and longitude is 42°.902463 N, -98°.372308 W. The Public Land Survey System (PLSS) description for the mitigation area is as follows: a portion of Section 1, Township 32 North, Range 2 East, Cedar County, Nebraska.

2.2.2 Timing

Grading is tentatively scheduled to begin in 2019. Vegetation planting would be completed immediately after construction during the growing season, likely 2020. The Wetland Mitigation and Monitoring Plan document (Appendix A) provides a tentative schedule to complete tasks necessary to develop the mitigation site.

2.2.3 Grading

Standard excavating and/or dredging equipment would be used to remove soil from the former chute areas to an elevation of 1,134.00 which is approximately 6.5 feet below the current surface. The 10 foot wide chute bottom would have 2:1 slopes up to the wetland shelf, at elevation 1,139.00. The wetland shelf on each side of the chute varies in width from 15-35 feet. The

wetland shelf would have 4:1 slopes to existing ground surface. See Figure 4 for a typical cross section of propose chute and wetlands. See grading plans in Figures 5, 6, and 7 for additional details about grading activities.

Figure 3. Sheet 2-A from the 60% Plan Set provided by the Nebraska Department of Transportation for the Bow Creek Mitigation depicts the proposed backwater and wetland areas as well as the sandbar placement within the Missouri River.

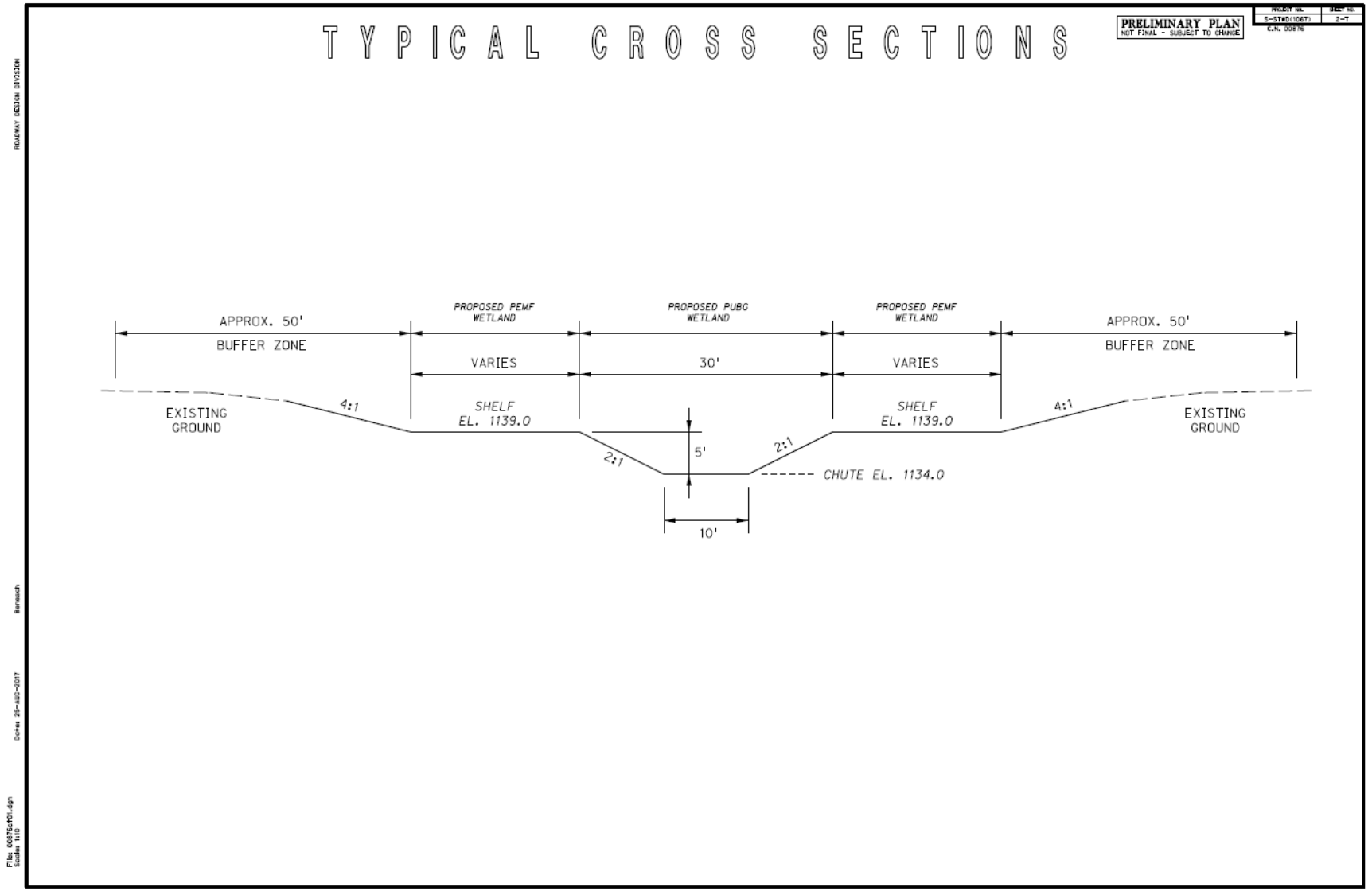


Figure 4. A typical cross section of the proposed backwater wetland restoration from the 60% Plan Set Sheet 2-T provided by the Nebraska Department of Transportation.

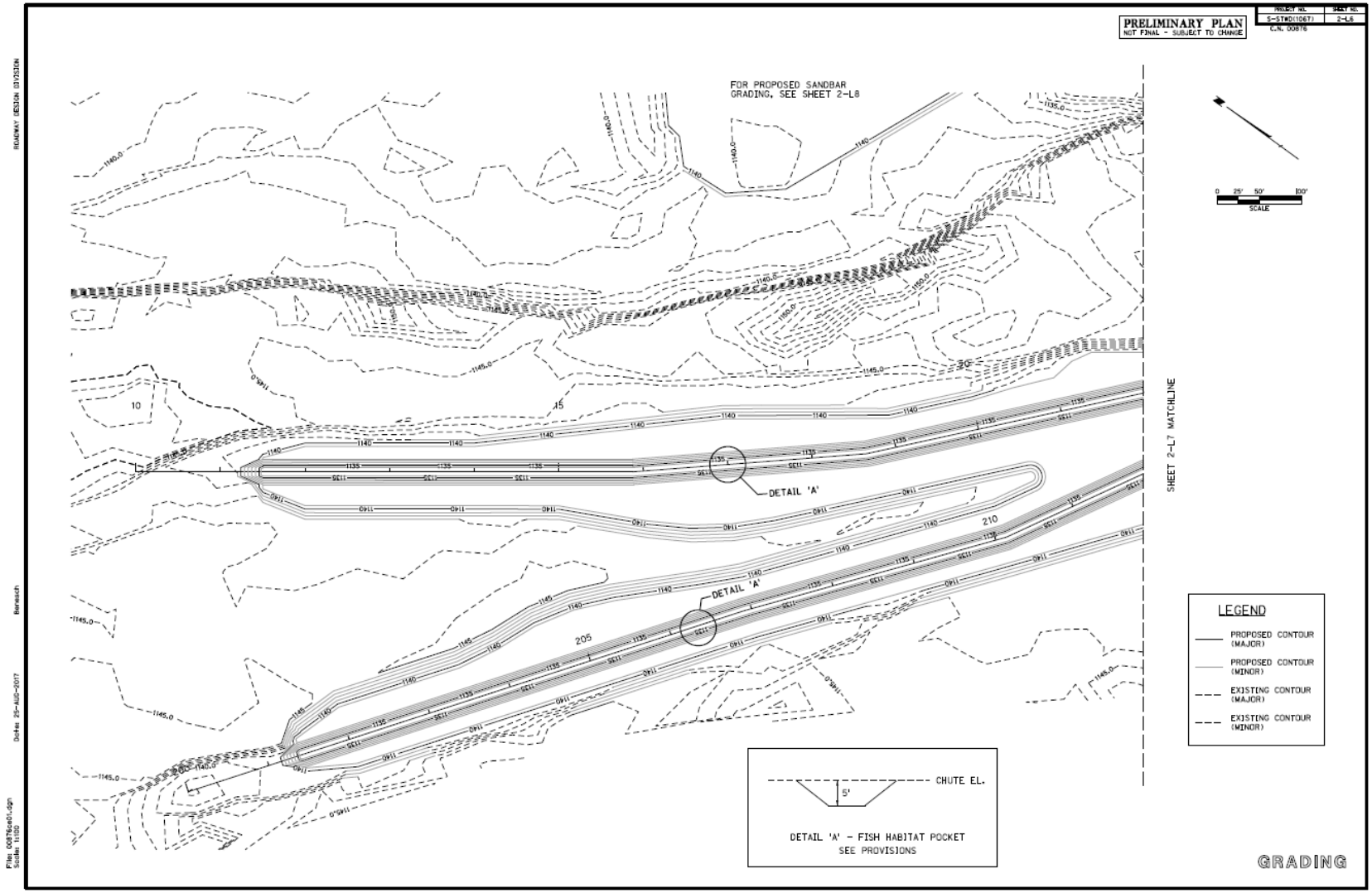


Figure 5. Grading plans for the backwater from Sheet 2L-6 from the 60% Plan Set provided by the Nebraska Department of Transportation.

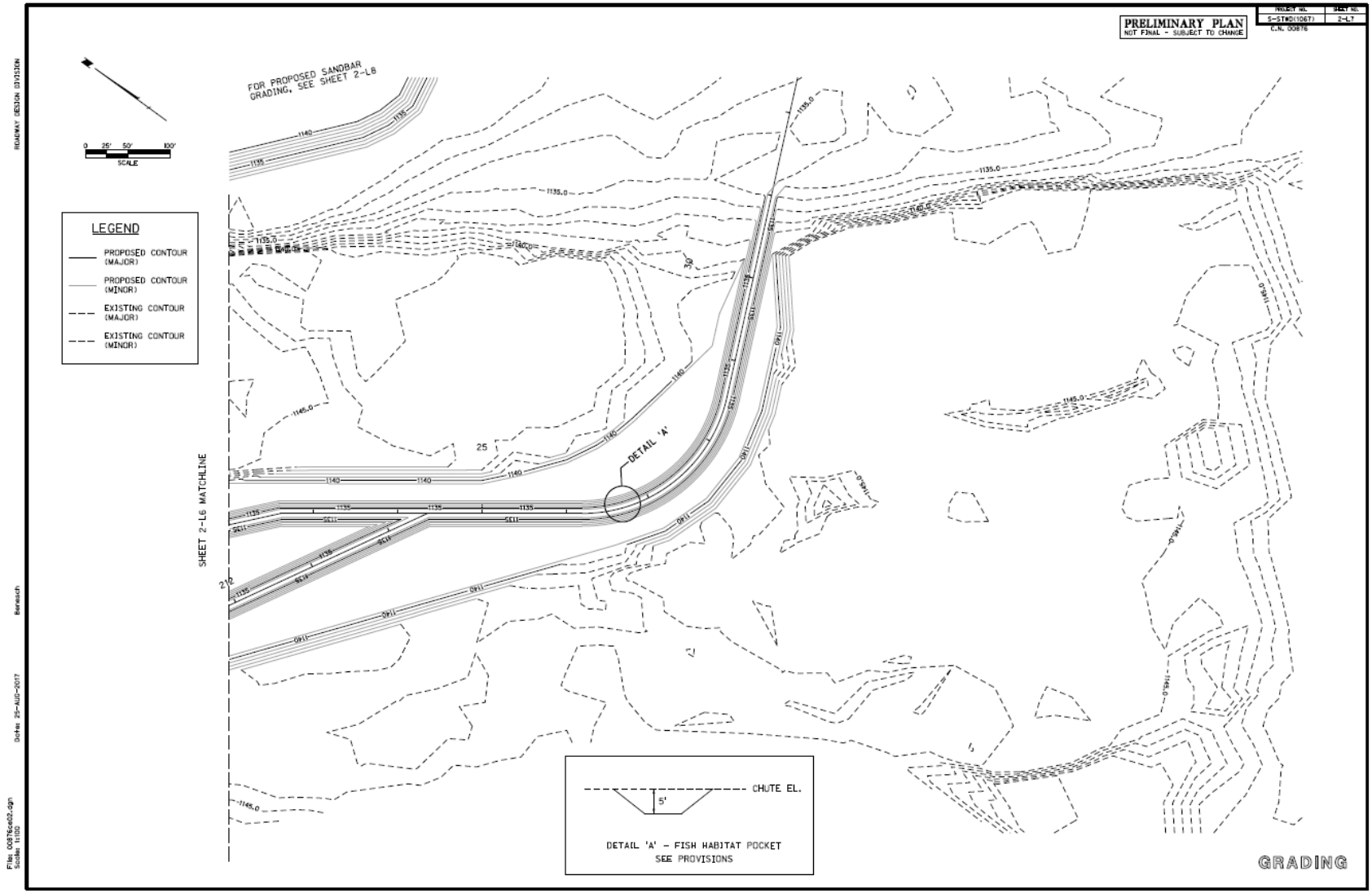


Figure 6. Grading plans for the backwater from Sheet 2L-7 from the 60% Plan Set provided by the Nebraska Department of Transportation.

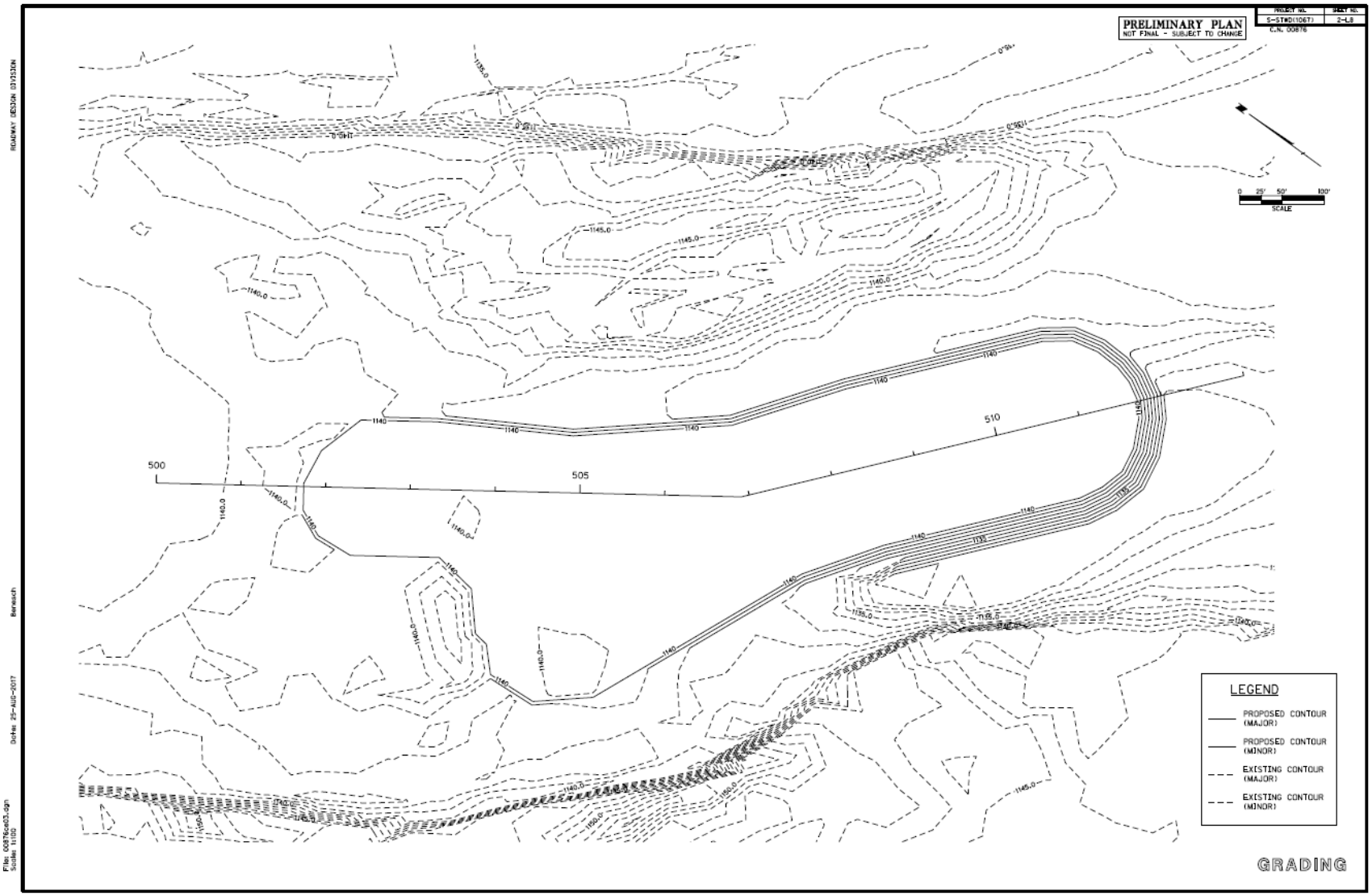


Figure 7. Grading plans for the sandbar from Sheet 2L-8 from the 60% Plan Set provided by the Nebraska Department of Transportation.

2.2.4 Vegetation Removal

Prior to excavation/dredging existing vegetation would be stripped and removed from site. After vegetation is removed the top soil would be stripped and stockpiled for use on the wetland shelf. The current vegetation consists of a combination of native and non-native grasses, forbs, and shrubs. No large trees would be removed.

2.2.5 Spoil Material

Spoil material consisting of sand would be transported to the Proposed ESH area along the south side of Missouri River channel. The 4.75 acre island would be built up to and elevation of 1,140.00 with 4:1 side slopes. Figure 3 shows a conceptual view of the sandbar area and Figure 7 shows the grading plan. Unsuitable spoil material consisting of clays and silts would be hauled off-site.

2.2.6 Seeding and Drilling

Wetland vegetation would be incorporated within the wetland mitigation area on each side of chute by drilling or broadcasting native wetland seed. The seed mix consists of species adapted to seasonally and semi-permanently flooded water regimes that are native to Nebraska. A vegetation planting plan is shown on Figures 8 and 9. The wetland seed mix is provided in Appendix B of the Wetland Mitigation and Monitoring Plan document (Appendix A).

In addition to the specification of a diverse seeding list, the mitigation site would be graded to provide an undulating bottom in an effort to maintain diversity. This effort should provide various hydrological regimes and encourage the growth of all hydrophytic indicator levels, and thus prevent undesirable species from becoming a monoculture. The seed mixture would be composed of hardy native species that would have a chance of withstanding invasion.

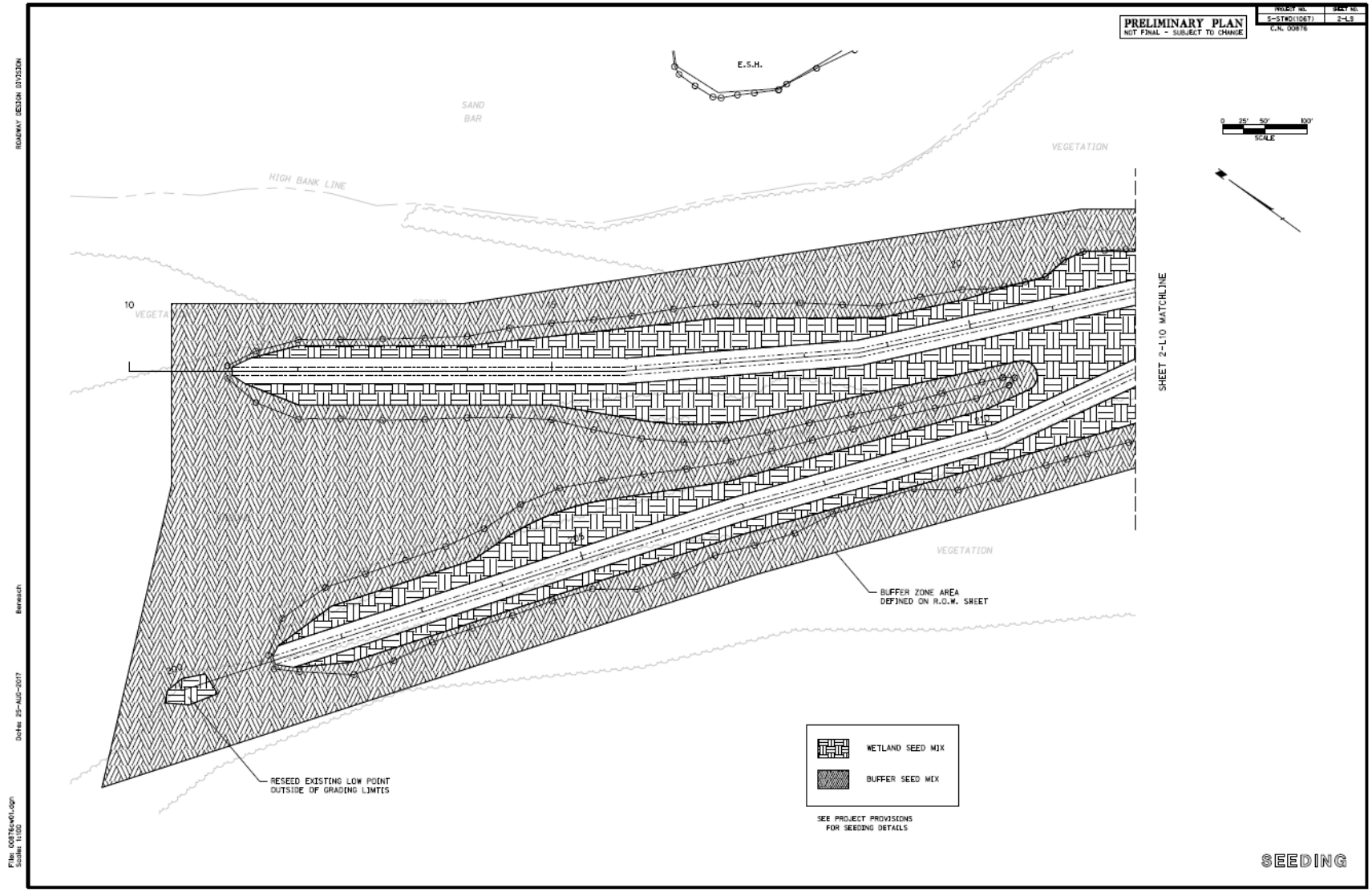


Figure 8. Site seeding plan sheet 2-L9 from the 60% Plan Set provided by the Nebraska Department of Transportation.

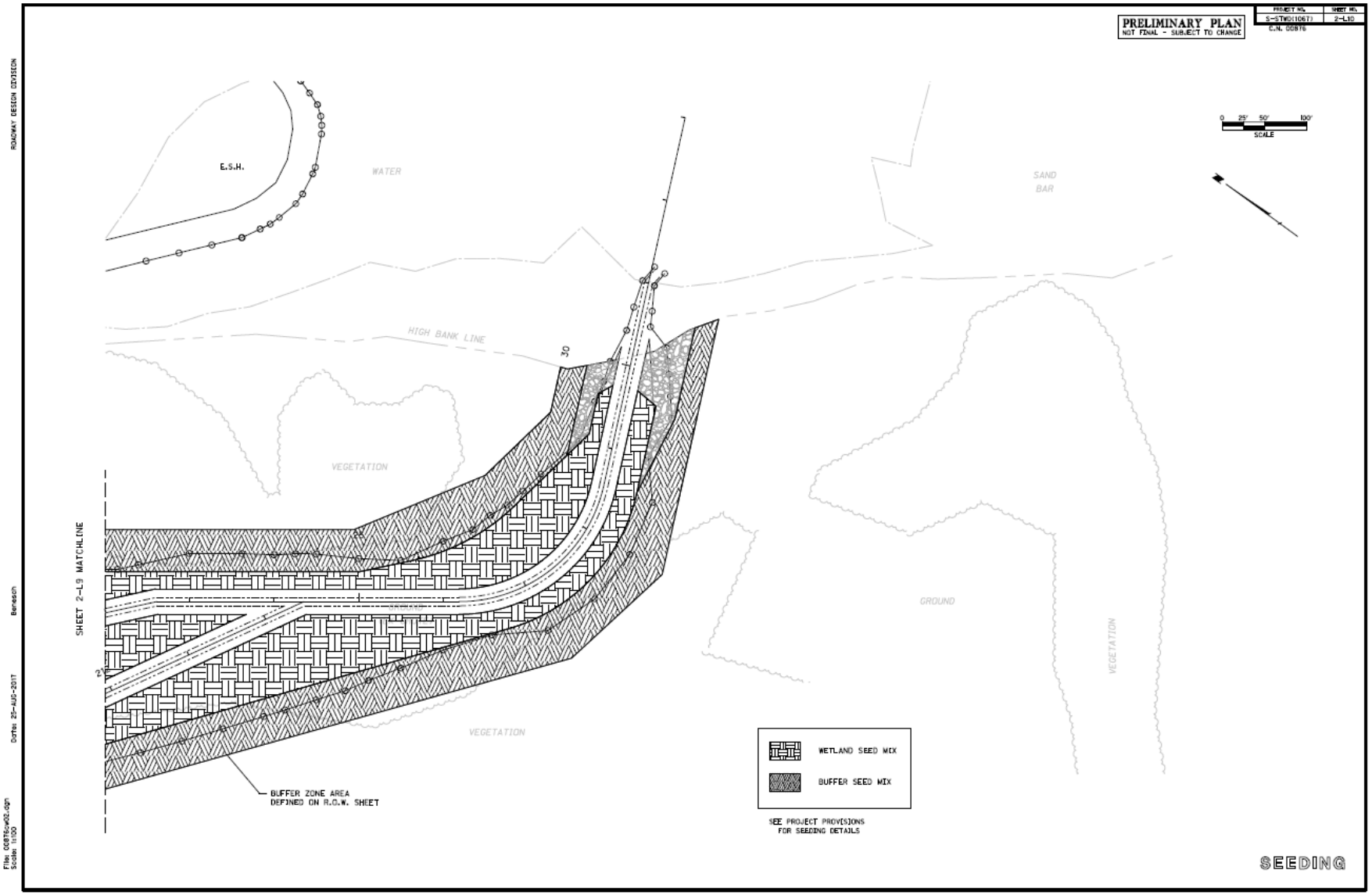


Figure 9. Site seeding plan sheet 2-L10 from the 60% Plan Set provided by the Nebraska Department of Transportation.

2.2.7 Buffer

A 50 foot wide buffer would be created around the perimeter of the restoration site. This area is already comprised of native vegetation and would not be disturbed or reseeded. See Figure 4 for a conceptual view.

2.2.8 Best Management Practices and Mitigation measures.

Impacts to adjacent existing wetlands would be avoided during the construction and post construction. Existing wetlands would be protected by erosion control barriers and post grading BMPs. Silt fencing would be strategically placed around the mitigation area as needed to prevent migration of sediment onto or off the site. The silt fence that is necessary would remain in place during construction and until vegetation is established in the disturbed areas.

2.3 Adaptive Management Strategy

An adaptive management strategy would be implemented as part of the USACE Section 404 permit, under which the NDOT would be required to ensure the success of the wetland restoration actions.

2.3.1 Short-Term Management

If monitoring results show that a site is not on a trajectory to meet performance criteria or permit requirements, NDOT would prepare an analysis of the cause(s) of failure and, if determined necessary by the regulatory agencies, propose remedial action for approval. Potential management activities include but are not limited to: re-grading, re-vegetation, weed management, invasive species management, and correcting erosion problems. Short-term management activities may occur in the restored backwater or the constructed sandbar. Sand excavated then used to form a sandbar may contain seeds of exotic invasive plants that may require management. Otherwise natural plant succession will be allowed to take place without active management or manipulation of the sandbar vegetation.

Specific management techniques are described below.

- Woody Species - Large colonization of woody species, such as *Populus deltoides* or *Salix spp*., in areas not intended for woody plants would be controlled by cutting or herbicide application.
- Invasive Species - Invasive species such as Purple loosestrife (*Lythrum salicaria),* reed canary grass (*Phalaris arundinacea),* and common reed (*Phragmites* australis ssp. Australis) would be controlled by physical removal or chemical application with an appropriate aquatic herbicide
- Low vegetation cover/undesirable species - In the event undesirable species or inadequate vegetation cover exists, the area would be reseeded with appropriate seed mix.
- Erosion, bank failure, etc. - Any significant erosion issues would be repaired and reseeded.

2.3.2 Long-Term Maintenance

After the mitigation site is certified, stewardship responsibility of the site would be the responsibility of the NPS and NDOT. This mitigation wetland site has been designed to be self-

maintaining. However, periodic site management may be required. Property management activities such as noxious weed management or prescribed fire, would be the responsibility of the NPS. Repair or reconstruction activities such as removal of sediment are part of the need to compensate for lost wetlands is a responsibility of NDOT.

2.3.3 Monitoring

Monitoring of the mitigation area would occur at least annually for five years starting after the first growing season. One monitoring event would be conducted each year to monitor wetland hydrology and vegetation. During monitoring event, the overall condition of the mitigation area, including noxious weeds, erosion concerns, sedimentation, silt fence condition, etc., would be noted. Wetland characteristics would be documented at several points within the mitigation site at established transects. Wetland boundaries and photo stations would be documented using GPS technology. The monitoring would be done in accordance with Part IV, Section E, of the USACE 1987 Wetland delineation Manual. A wetland monitoring report would be submitted to the USACE by December 1 each year. NDOT would be responsible for all monitoring and submissions to the USACE. All data and reports would be shared with the NPS.

Wetland Vegetation Sampling

Vegetation would be sampled in each plant community type using the plot (quadrat) based method along transects. Data for all Cowardin classification wetland types would be gathered. Transects would be located perpendicular to a baseline at intervals consistent with Part IV, Section E, in the 1987 USACE Manual. Vegetation composition would be identified in each of the following vegetation stratums: herbs, shrubs, woody vines and trees. Absolute percent cover of species would be determined at each plot.

Hydrology

Surface water of the chute and wetlands would be measured at several locations within the mitigation wetland. The bottom elevation would also be recorded every other year to compare against baseline elevation. Observations of wetland hydrology indicators would also be recorded during annual monitoring events. Hydrology data would be presented in the annual monitoring report.

Wetland Soils

Soil observations would be made at representative transect points to assess development of hydric soils at the site. Hydric soils present prior to mitigation construction are expected to persist. Soils without hydric characteristics may take many years to develop. The success of the mitigation would not depend on the development of hydric soils during the monitoring period.

Photo Stations

Photo stations would be located at various locations on the site to show temporal change of vegetation and hydrology in the wetland. Specific locations would be determined in the field.

2.3.4 Mitigation Performance Standards

All wetlands within the mitigation site which are counted towards compensation must meet performance standards for and be monitored for the three parameters defined in the 1987 USACE Wetland Delineation Manual and associated Regional Supplement guidance. Defined performance standards would be used as a guideline to measure the overall success of the

mitigation area annually and at the end of five years. NDOT would be responsible for compliance with the mitigation plan and with any required remediation, repair, maintenance, or management work.

3.0 Affected Environment and Environmental Consequences

3.1 General Site Conditions

The proposed mitigation site is located on the floodplain of the Missouri River. The topography of the proposed mitigation site is relatively flat with elevations around 1,145 feet MSL. See Figures 5 and 6 for actual field survey at 1 ft. contour intervals. The proposed site is a former river channel and wetland area consisting of several chutes traversing east along the floodplain at the base of the south bank of Missouri River.

3.2 Hydrology and Water Quality

3.2.1 Affected Environment

Surface water runoff at the proposed mitigation site originates from floodplain to the north and west. The historic United States Geological Survey (USGS) topographic map shows Bow Creek to the south and the former backwater area to be restored as a river chute with water. The National Wetlands Inventory/National Hydrography Dataset also show water in this area. On-site reconnaissance in 2015 between NPS and NDOT revealed that there was not an active chute or open water area within the former chute.

The site also receives floodwater from the Missouri River. The Missouri River flow is regulated from Gavins Point Dam which is approximately 23 river miles upstream. The river water flow regulation is dependent on the climatic conditions so the water control at the dam varies depending on the situation, i.e. drought, heavy precipitation, snow melt, etc. In 2015, the Missouri River water level gage height near the site (USGS gage below Yankton, SD) from June to September varied between 11 and 12 feet. Exhibit 1 within the Wetland Mitigation and Monitoring Plan Final document (Appendix A) shows this hydrograph. Gage heights over a one year period from Sept. 1, 2014 to Sept. 1, 2015 range from 10.1 to 14.8 feet. See Exhibit 2 within the Wetland Mitigation and Monitoring Plan Final document (Appendix A).

The flow of the Missouri River at this location is highly dependent upon the release rates from Gavins Point Dam, upstream. Hydraulic modeling of the river was performed based upon average monthly flows to determine how the water surface elevations at this location would fluctuate during a typical year. The average monthly flows were developed from flow records dating back to the construction of Gavin's Point Dam in 1954. Exhibit 5 within the Wetland Mitigation and Monitoring Plan Final document (Appendix A) shows the inflows and outflows of Gavin's Point Dam from 1954 - 1997, detailing the variation in release rates throughout each year, as well as how wet and dry years affect the release rates.

The average monthly flows were analyzed in a hydraulic model of the Missouri River to determine the water surface elevations along the river for the average monthly flow rates. Over the summer months, the hydraulic model produces an average water surface elevation between 1,136.9-1,139.7 feet MSL with an elevation above 1139.0 feet MSL for 6 months.

3.2.2 Impacts Analysis

Impacts of Alternative A

Under the no action alternative, the hydrology and water quality at Bow Creek Recreation Area would remain in its current condition, and continue to be shaped by natural hydrological

processes over the long term. The no action alternative would not have direct or indirect effects on the hydrology or water quality at Bow Creek Recreation Area.

Cumulative Impact Analysis

No cumulative impacts have been identified for this alternative.

Impacts of Alternative B

Suitable sediment spoils would be transported to the main channel of the Missouri River to create a sandbar. This sandbar would be subject to erosion or accretion within the main channel of the river. BMPs would be implemented by the contractor during construction to protect water quality.

Local river hydrology would change at the site by adding wetland area and the backwater channel. The overall impacts to water quality and hydrology represent a positive change and an overall beneficial impact by creating a backwater and associated wetland areas that will hold water year-round. The hydraulic connectivity that would be created is increasingly rare, even in this relatively natural segment of the Missouri River, and would add valuable hydraulic function and provide habitat to many fish and wildlife species.

Cumulative Impact Analysis

The USACE permits a variety of activities within the MNRR under Clean Water Act Section 404 which regulates the discharge of dredged or fill material into waters of the United States. Under an ESA Section 7 consultation with USFWS, USACE has in the recent past and in the foreseeable future constructed sandbars to create habitat for ESA-listed bird species. The actions proposed in this alternative will construct one sandbar on the Missouri River in addition to those that form naturally or are constructed by the USACE. The addition of one sandbar will not affect hydrological processes or water quality along the river in substantial ways. Three backwater areas have also been restored within this reach of the river, adding valuable floodplain connection and overall benefit to the local river ecosystem. When added to these past, present, and reasonably foreseeable actions, the incremental impacts of alternative B on hydrology and water quality would be beneficial in the ways described above. Cumulative impacts under alternative B for hydrology and water quality would include the addition of a fourth restored backwater within the reach.

3.3 Soils/Geology

3.3.1 Affected Environment

The soils at the site consist of fine sand and loamy fine sand deposited by the Missouri River (https://websoilsurvey.sc.egov.usda.gov). Potential impacts on soil resources were assessed based on the extent of disturbance to soils, including natural undisturbed soils, the potential for soil erosion resulting from disturbance, and limitations associated with the soils.

3.3.2 Impact Analysis

Impacts of Alternative A

Under the no action alternative, soil compaction and an alternation of soil chemistry would occur from existing recreational use and management activities. The no action alternative would not have direct or indirect effects on the soils or geology at Bow Creek Recreation Area.

Cumulative Impacts

No cumulative impacts have been identified for this alternative.

Impacts of Alternative B

Under the preferred alternative, soil compaction would occur in limited areas during construction activities. Routes used for transporting large equipment in and out of the project area would be temporary in nature and would be restored as much as possible to their original condition when the project is completed. These temporary roadways would be designed to have a minimal footprint and to support safe construction practices. Sand removed from the backwater site would be placed in the Missouri River to create a sandbar. Any clays and silts not suitable for the sandbar would be removed to an off-site location outside of the MNRR authorized boundary.

Cumulative Impacts

The USACE permits a variety of activities within the MNRR under Clean Water Act Section 404 which regulates the discharge of dredged or fill material into waters of the United States. Under an ESA Section 7 consultation with USFWS, USACE has in the recent past and in the foreseeable future constructed sandbars to create habitat for ESA-listed bird species. The actions proposed in this alternative will construct one sandbar on the Missouri River in addition to those that form naturally or are constructed by the USACE. The addition of one sandbar will not affect soils/geology along the river in substantial ways. Three backwater areas have also been restored in this reach of the river. These activities will not affect soils/geology along the river in substantial ways. When added to these past, present, and reasonably foreseeable actions, the incremental impacts of alternative B on soils/geology would limited to the impacts described above. No cumulative impacts have been identified under alternative B for Soils/Geology.

3.4 Wetlands

3.4.1 Affected Environment

Wetland delineation surveys were conducted at Bow Creek Recreation Area in May of 2015. During the survey, 11.74 acres wetlands were identified, including 3.47 acres within the project area. These wetlands are slowly degrading in quality and reducing in size as the main channel of the Missouri River decreases the ground water level at the location. The wetlands within the project area are not connected to the main channel of the Missouri River under normal or average flow conditions.

3.4.2. Impact Analysis

Impacts of Alternative A

Under the no action alternative, the wetlands at Bow Creek Recreation Area would remain in the current condition and would continue to degrade in quality and size as channel incision continues and dewatering of the wetlands continue. The no action alternative would have indirect effects by allowing the existing wetlands to further degrade and by not restoring the wetlands that have already transitioned into non-wetland status.

Cumulative Impacts

No cumulative impacts have been identified for this alternative.

Impacts of Alternative B

The project would enhance approximately 3 acres of existing wetland and create approximately 3.23 acres of additional wetland in a former wetland area for a total of 6.23 acres of wetland involved in the project (Figures 2, 3, and 4). The restoration would connect the existing wetlands and the former wetland areas on the property to the main channel of the Missouri River, restoring fish use and maintaining water year round within the backwater. Existing wetland vegetation would be removed within the excavation process and the disturbed area reseeded with native wetland plants (Figures 8 and 9, Section 2.2.6).

Impacts on the existing wetlands would be offset by the benefit and net positive increase in the area and quality of wetlands at the project area.

Cumulative Impacts

The USACE permits a variety of activities within the MNRR under Clean Water Act Section 404 which regulates the discharge of dredged or fill material into waters of the United States. Under an ESA Section 7 consultation with USFWS, USACE has in the recent past and in the foreseeable future constructed sandbars to create habitat for ESA-listed bird species. The actions proposed in this alternative will construct one sandbar on the Missouri River in addition to those that form naturally or are constructed by the USACE. The addition of one sandbar will not affect wetlands along the river in substantial ways. When added to these past, present, and reasonably foreseeable actions, the incremental impacts of alternative B on wetlands would limited to the impacts described above. As described in the introduction, this project would also restore and create wetlands as compensation under a USACE Section 404 permit, resulting in a net positive for cumulative impacts to wetlands on regional scale. The restored backwater also would be the fourth restored backwater within this reach of river, adding valuable floodplain connection and overall benefit to the local river ecosystem.

3.5 Vegetation

3.5.1 Affected Environment

The historic vegetation within the MNRR was comprised of grassland (63 percent), deciduous forests (25 percent), shrubs (11 percent), and a mix of marsh, open woodland, and orchard (1 percent) (Dixon et al. 2010). Today, willow/cottonwood floodplain forest and elm/oak woodlands are the two major plant communities present within the MNRR. Sandbars and floodplains in MNRR contain a mix of annual weeds, short-lived grasses, sedges, and seedling willow and cottonwood.

The current vegetation at the site consists of a combination of native and non-native grasses, forbs, and shrubs.

3.5.2 Impact Analysis

Impacts of Alternative A

Under the no action alternative, the vegetation at Bow Creek Recreation Area would remain in its current condition. These wetlands have become drier since the former chute subsided as an open water feature. The vegetation at the site would continue to shift from wetland species, such as spike rush, softstem bulrush, rice cutgrass, and needle spikerush and become dominated by

upland plants such as grasses, thistles, and sunflowers. The no action alternative would not have direct or indirect effects on the current vegetation at Bow Creek Recreation Area.

Cumulative Impact Analysis

No cumulative impacts have been identified for this alternative.

Impacts of Alternative B

Under the preferred alternative transition of the site to an upland habitat would cease and the vegetation at the site would return to wetland species. Seed of native species of wetland plants would be sown. Vegetation is also expected to establish passively from adjacent wetland vegetation. These species would have a distinct competitive advantage and may tend to out-compete the diverse planting in the mitigation site. The resulting vegetation community would consist of diverse community of facultative or obligate wetland species. Undesirable species, such as purple loosestrife, reed canary grass, common reed and other exotic invasive plants would be less than 10% cover of the site. This alternative is expected to result in sustainable and functioning wetland community that would restore ecological integrity, natural structure and function to the backwater at Bow Creek Recreation Area.

Cumulative Impact Analysis

The USACE permits a variety of activities within the MNRR under Clean Water Act Section 404 which regulates the discharge of dredged or fill material into waters of the United States. Under an ESA Section 7 consultation with USFWS, USACE has in the recent past and in the foreseeable future constructed sandbars to create habitat for ESA-listed bird species. The actions proposed in this alternative will construct one sandbar on the Missouri River in addition to those that form naturally or are constructed by the USACE. The addition of one sandbar will not affect vegetation along the river in substantial ways. As described in the introduction, this project would also restore and create wetlands as compensation under a USACE Section 404 permit, resulting in a net positive for wetlands and wetland vegetation on regional scale. The restored backwater also would be the fourth restored backwater within this reach of river, adding valuable floodplain connection and overall benefit to the local river ecosystem. There could be a small incremental benefit with respect to wetland vegetation when added to these other past, present, and reasonably foreseeable actions.

4.0 Environmentally Preferable Alternative and Agency Preferred Alternative

4.1 Environmentally Preferable Alternative

According to the CEQ regulations implementing NEPA (43 CFR 46.30), the environmentally preferable alternative is the alternative "that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified upon consideration and weighing … of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative."

The environmentally preferable alternative is Alternative B. While backwater restoration would have short-term impacts to the environment, the improvements to the ecosystem would be beneficial in the long term.

4.2 Agency Preferred Alternative

The agency-preferred alternative is Alternative B. The advantages outweigh the minimal impacts to the environment under this alternative.

5.0 Coordination and Consultation

5.1 Project Partner Agency Coordination

This project would be a joint effort between the NPS and NDOT with permitting through the U.S. Army Corps of Engineers. The overall project includes both the highway repair work along Nebraska Highway 12 (Project name: Highway 12 Verdel to Santee Spur Road Embankment Repair, Phases I and II) and the backwater restoration and wetland creation described in this document, which is the mitigation necessary to offset wetland impacts associated with the highway repairs. A Public Notice for the entire project was issued on October 25, 2017 (application number 2011-0895-WEH).

This environmental assessment pertains to the mitigation site only and is necessary before NPS and NDOT can enter into an official agreement for the project. The signed agreement between NPS and NDOT is necessary for the Clean Water Act Section 404 permit application process. The NPS would draft one Wild and Scenic Rivers Act Section 7a determination in response to the Clean Water Act Section 404 permit application and associated public notice. This Wild and Scenic Rivers Act Section 7a determination would include both the backwater restoration and the highway repairs which required the mitigation. USACE would then grant the Clean Water Act Section 404 permit for construction to begin on the roadway repair work and the backwater restoration.

5.2 Government to Government Consultation with American Indian Tribes

Various laws, executive orders, and policies direct the National Park Service to consult with recognized American Indian Tribes in the development of park management plans. The tribes Missouri National Recreational River routinely consults with are:

Ponca Tribe of Nebraska
Ponca Tribe of Oklahoma
Santee Sioux Tribe
Yankton Sioux Tribe

Governments of the four listed tribes will be sent a copy of this document and will be asked to consult in regards to this environmental assessment.

5.3 U.S. Fish and Wildlife Service

A copy of this document will be provided to the U.S. Fish and Wildlife Service. The park has determined that the actions described in this environmental assessment may have a “may affect, not likely to adversely effect” on listed species.

5.4 Nebraska State Historic Preservation Office

A copy of this document will be provided to the Nebraska State Historic Preservation Office. The park has determined that the actions described in this environmental assessment of effects would have no adverse effect on historic structures or districts, archeological resources, cultural landscapes, or ethnographic resources.

6.0 References

Dixon, M. D. Johnson, W. C., Scott, M. L., and D. Bowen. 2010. "Status and Trend of Cottonwood Forests along the Missouri River" (2010). US Army Corps of Engineers. 78. http://digitalcommons.unl.edu/usarmyceomaha/78

Junk, W.J., P.B Bayley, and R.E. Sparks, 1989. The flood pulse concept in river floodplain systems. Canadian Special Publication of Fisheries and Aquatic Sciences. 106:110-127.

NPS. 2006. Management Policies. https://www.nps.gov/policy/MP_2006.pdf

NPS. 2012. Outstandingly Remarkable Values Report. https://www.nps.gov/mnrr/learn/management/upload/FINAL_MNRR_OVR-06-01-12.pdf

NPS. 2015. Midwest Archeology Center Missouri National Recreational River Trip Report.

National Research Council. 2002. The Missouri River Ecosystem: Exploring the Prospects for Recovery. Washington, DC: The National Academies Press. 188p. https://doi.org/10.17226/10277.

National Research Council. 2011. Missouri River Planning: Recognizing and Incorporating Sediment Management. Washington, DC: The National Academies Press. 164p. https://doi.org/10.17226/13019.

Petsch, B.C. 1946. Geology of the Missouri Valley in South Dakota, University of South Dakota, Vermillion, S.D. 78p.

Price, K.H., and S.L. Townsend. 2004. Dealing with Change: Recreating Missouri River Backwater Habitat. World Water Congress. 2004.

Shaeffer, W. A., and J.G. Nickum. 1986. Backwater areas as nursery habitats for fishes in Pool 13 of the Upper Mississippi River. Hydrobiologia. 136:131-140.

United States Army Corps of Engineers (USACE). 2008. Draft Boyer Chute Backwater and Chute Restoration. Missouri River Fish and Wildlife Recovery Project: Washington County, Nebraska.

United States Environmental Protection Agency (USEPA). 2018. The Green Book Nonattainment Areas for Criteria Pollutants. https://www.epa.gov/green-book /. Accessed on October 19, 2018.

Yager, L.A., M.D. Dixon, T.C. Cowman and D.A. Soluk. 2011. Historic Changes (1941-2008) in Side Channel and Backwater Habitats on an Unchannelized Reach of the Missouri River. River Research and Applications. 29:493-501.