Draft Environmental Impact Statement and Land Protection Plan

Niobrara Confluence and Ponca Bluffs Conservation Areas

Nebraska and South Dakota

March 2013

Prepared by

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CITATION

U.S. Fish and Wildlife Service and National Park Service. 2013. Draft Environmental Impact Statement and Land Protection Plan—Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota. Lakewood, CO: U.S. Department of the Interior, Fish and Wildlife Service, Mountain–Prairie Region. 200 p.

Abstract

Draft Environmental Impact Statement and Land Protection Plan

Niobrara Confluence and Ponca Bluffs Conservation Area, Nebraska and South Dakota

Type of Action: Administrative
Lead Agencies: U.S. Fish and Wildlife Service and National Park Service
Responsible Officials: Noreen Walsh, Regional Director, Region 6, U.S. Fish and Wildlife Service; Michael Reynolds, Regional Director, Midwest Region, National Park Service

This draft environmental impact statement and land protection plan identifies the purpose and need for a joint conservation effort along the Missouri River in northeast Nebraska and southeast South Dakota and describes and evaluates four alternative plans for managing wildlife, habitat, recreational access, and protection of historic sites. This process has involved the development of a vision, goals, objectives, and strategies that meet the legal directives of the U.S. Fish and Wildlife Service (FWS) and National Park Service (NPS) and has considered the input of interested groups and the public.

Under the no-action alternative (alternative A), the proposed conservation areas would not be established and FWS and NPS would continue to operate as under current conditions—that is, continuing to manage the Missouri River and portions of the Niobrara River and Verdigre Creek as the Missouri National Recreational River. FWS would continue to work with private landowners on restoration efforts with no option for conservation easements or fee-title acquisition.

Alternatives B–D evaluate a range of conservation goals that include a mix of 80 percent conservation easements and 20 percent fee-title acquisition. Conservation easements are the preferred method of conservation action because they keep the land in private ownership and on local tax bases. The proposed action (alternative C) for the Niobrara Confluence Conservation Area sets forth a conservation goal of 80,000 acres, with 64,000 acres of that goal being acquired through easements. For the Ponca Bluffs Conservation Area, the proposed action sets forth a goal of 60,000 acres, with 48,000 acres being conserved through conservation easements.

The alternatives considered were developed using a prioritization matrix that included:

- important habitats for Federal trust species (bald eagles, least terns, piping plovers, and pallid sturgeon);
- areas that are important for overall river health and functionality (confluences, historical floodplain, and large islands);
- areas in which to improve or maintain recreational access sites to the Missouri River;
- historically significant sites;
- areas with high-quality scenic attributes.

Commenting: Comments are due 60 days after the notice of availability of this document is published in the Federal Register. Comments should be mailed to U.S. Fish and Wildlife Service, Attention: Nick Kaczor, Division of Refuge Planning, 134 Union Boulevard, Suite 300, Lakewood, CO 80228. Comments can also be submitted online at http://parkplanning.nps.gov/niob-ponca or by email to niobrara_ponca@fws.gov. All comments received from the public and interested groups will be placed in the administrative record for this planning process. Comments will be made available for inspection by the public, and copies may also be provided to the public. For further information, contact Nick Kaczor at 303/236 4387.

Cooperating Agencies: Nebraska Natural Resources Conservation Service; South Dakota Natural Resource Conservation Service; National Oceanic and Atmospheric Administration; U.S. Army Corps of Engineers; U.S. Environmental Protection Agency; Nebraska Game and Parks Commission; South Dakota Department of Game, Fish and Parks.

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Summary

NPS

The Bow Creek Recreation Area, located along Bow Creek and the Missouri River, is a rich riparian community supporting a diverse group of species.

We, the U.S. Fish and Wildlife Service and the National Park Service, have developed this draft environmental impact statement and land protection plan for the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas. These conservation areas would build on existing conservation efforts along the Missouri River in northeast Nebraska and southeast South Dakota. In creating these areas, we would work with willing private landowners, local communities, and other conservation entities to conserve important wildlife habitats, increase quality recreational opportunities, preserve sensitive cultural sites, and maintain sustainable farming and ranching operations in the region.

Proposed Conservation Areas

The proposed Niobrara Confluence and Ponca Bluffs Conservation Areas lie within the Missouri River system. The Missouri River is one of the major arteries of America's heartland, coursing its way 2,341 miles from its headwaters to its confluence with the Mississippi River at St. Louis, Missouri. Along the way it runs through the scenic landscapes of the Great Plains to the sprawling deciduous forests of the eastern United States. Its watershed, encompassing more than 500,000 square miles, drains one-sixth of the United States and is home to thousands of fish, wildlife, and plant species. The river and its environs provide seemingly unlimited recreational opportunities for visitors and support traditional historical, tribal, and rural lifestyles critical to the local communities.

Niobrara Confluence Conservation Area

The proposed Niobrara Confluence Conservation Area lies between Fort Randall Dam and Lewis and Clark Lake and includes reaches of the Missouri and Niobrara Rivers. This area contains one of the last segments of the middle Missouri River that remains unchannelized, undeveloped, and relatively free-flowing. The surrounding old, wide river valley contains important habitat for at least 60 native and 26 sport fishes. In addition, the area's riparian woodlands and island complexes are important for approximately 25 resident bird species and 115 migratory bird species including piping plovers, least terns, and bald eagles.

Ponca Bluffs Conservation Area

The proposed Ponca Bluffs Conservation Area lies between Gavins Point Dam and Sioux City. This area is a diverse, relatively unaltered, riverine–floodplain ecosystem characterized by a main channel, braided channels, wooded riparian corridor, pools, chutes,

sloughs, islands, sandbars, backwater areas, wetlands, natural floodplain and upland forest communities, pastureland, and croplands. The area also supports a wide variety of wildlife and fisheries resources.

Concept

We would work with willing landowners, communities, tribes, and other agencies to conserve valuable natural, recreational, scenic, and cultural resources in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas. Specifically, we aim to enhance conservation; enhance recreation; increase tourism; contribute to local economies; improve quality of life through healthy air, water, and ecosystems; and increase the appreciation and awareness of the area's natural resources.

For acquiring conservation lands from willing landowners, we would use fee-title acquisition wherever public access or extensive rehabilitation is needed to improve the ecological function and natural meander of the river. In other cases, we would purchase conservation easements from willing landowners.

Conservation easements are remarkable tools that allow the concurrent preservation of habitat along with working landscapes like farmlands and rangelands—an approach that can be both cost effective and socially and politically acceptable. Furthermore, conservation easements allow lands to remain privately owned and on local tax rolls while still providing lifelong conservation value to the public. Landowners would be compensated for perpetually conserving the biological, ecological, and cultural values on their properties by promoting the growth of native grasses, shrubs, and trees; eliminating or reducing invasive species; and protecting culturally significant sites. In return, these landowners would be compensated for their contribution to regional conservation goals, and the money would eventually enter the local economy.

Collaboration is key to this undertaking. By combining agency resources and funds, we can streamline and improve the delivery of actions outlined in the land protection plan. Furthermore, by partnering with willing landowners, communities, tribes, and other entities, we can often achieve a level of conservation that helps not only fish and wildlife but also the surrounding human communities.

Alternatives

With input from other agencies and the public, we developed four alternatives for management of the proposed conservation areas:

- "Alternative A—No Action"
- "Alternative B—Minimal Conservation Action"
- "Alternative C—Moderate Conservation Action" (preferred alternative)
- "Alternative D—High Conservation Action"

The action alternatives, alternatives B–D, call for 80 percent of acquisitions to be through easements and 20 percent through fee-title acquisition. All easement conditions would be mutually agreed upon by the landowner and us.

In developing the alternatives, we focused on the overall ecological function of the Missouri River and identified areas that are important for native fish and wildlife species like bald eagles and pallid sturgeon. In addition, we prioritized areas that offer opportunities to increase access to the river, conserve scenic areas like chalkstone bluffs, and maintain culturally significant sites.

Next Steps

As part of the environmental review process, we will be requesting your comments on the draft environmental impact statement and land protection plan. After issuing a notice of availability in the Federal Register and releasing the draft environmental impact statement and land protection plan, we will hold public meetings in the project area (expected in April 2013).

Following the 60-day public comment period, we will incorporate any substantive changes and issue a final environmental impact statement and record of our decision. The record of decision will:

- determine whether we should establish the proposed conservation areas;
- if yes, determine whether to approve the land protection plan, which details the preferred management approach identified in the environmental impact statement.

Abbreviations

Administration Act	National Wildlife Refuge System Administration Act of 1966
B.P.	before present
BMP	best management practice
CCP	comprehensive conservation plan
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Federal Endangered Species Act of 1973
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information System
GS	General Schedule (pay)
Improvement Act	National Wildlife Refuge System Improvement Act of 1997
Interior	Department of the Interior
LCC	Landscape Conservation Cooperative
LPP	land protection plan
MNRR	Missouri National Recreational River
MRERP	Missouri River Ecosystem Restoration Plan
MRRP	Missouri River Recovery Program
NA	not available
NCCA	Niobrara Confluence Conservation Area
NEPA	National Environmental Policy Act of 1969
NFHP	National Fish Habitat Partnership
NGPC	Nebraska Game and Parks Commission
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
ORV	Outstandingly Remarkable Value
PBCA	Ponca Bluffs Conservation Area
PILT	Payment in Lieu of Taxes
PPJV	Prairie Pothole Joint Venture

Refuge System	National Wildlife Refuge System
RRS	Refuge Revenue Sharing
SDGFP	South Dakota Department of Game, Fish and Parks
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
WG	Wage Grade (pay schedule)
WRP	Wetlands Reserve Program

Chapter 1—Introduction

NPS

Fog settles on the Missouri River.

We—the U.S. Fish and Wildlife Service (FWS) and the National Park Service (NPS)—have developed this draft environmental impact statement (EIS) and land protection plan (LPP)[1] to provide alternatives for and identify impacts of increased conservation efforts along the Missouri River in northeast Nebraska and southeast South Dakota (figure 1). These conservation efforts would be undertaken in collaboration with willing landowners.

We have prepared these documents in compliance with the National Wildlife Refuge System Administration Act of 1966 (Administration Act), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act); the National Park Service Organic Act of 1916, as amended; and the National Environmental Policy Act of 1969 (NEPA) and its implementing regulations.

We have formulated four draft alternatives; these are the result of reviewing public comments and working closely with cooperating agencies. The core planning team of representatives from several FWS and NPS programs prepared this draft EIS and LPP ("Appendix A–Preparers and Contributors"). The following cooperating agencies have also participated on the planning team:

- Nebraska Natural Resources Conservation Service (NRCS)
- South Dakota NRCS
- National Oceanic and Atmospheric Administration
- U.S. Army Corps of Engineers (USACE)
- U.S. Environmental Protection Agency (EPA)
- Nebraska Game and Parks Commission (NGPC)
- South Department of Dakota Game, Fish and Parks (SDGFP)

Public involvement in the planning process is discussed in "Section 1.6—Planning Process"; public input is provided in detail in "Appendix B—Public Scoping Report."

After reviewing a wide range of management needs and public comments received during five public scoping meetings, the planning team developed alternatives, objectives, and strategies for manage-

[1] The LPP immediately follows the EIS and its appendixes.

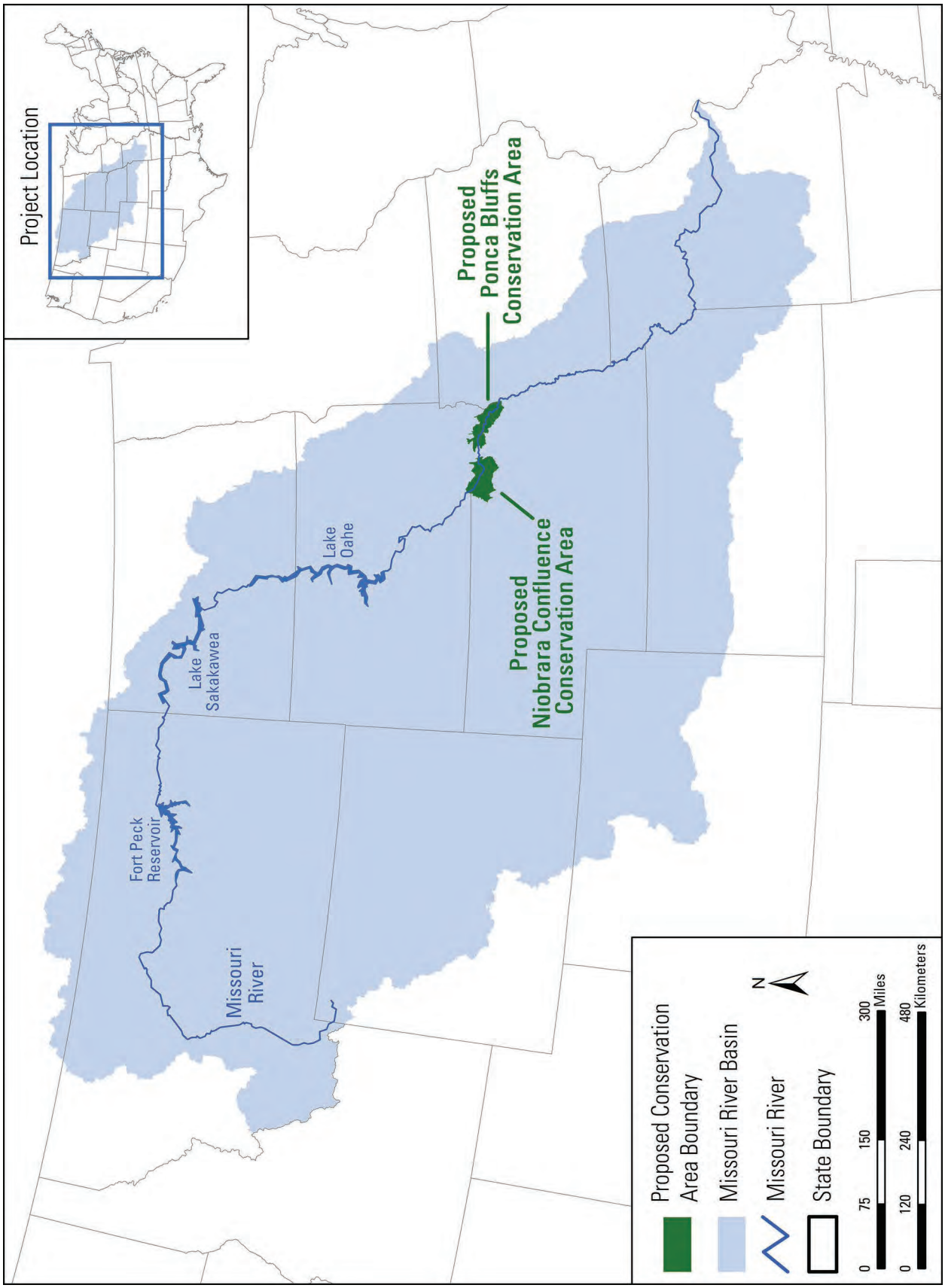

Figure 1. Location map for the Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

ment of the proposed conservation areas. Details of the no-action alternative and three action alternatives are presented in "Chapter 3—Alternatives," and the predicted effects of the alternatives are described in "Chapter 5—Environmental Consequences." We have identified one alternative as the preferred alternative.

1.1 Purpose and Need for Action

The Missouri River has experienced significant alterations and modifications over the past 100 years. These changes, outlined in detail in chapters 2 and 3, have had both positive and negative effects on the environment and local communities. Main-stem dams and other river management practices have regulated Missouri River flows, decreasing the severity of flood events; but they have also had both beneficial and adverse effects on native fish and wildlife species, recreational opportunities, historical resources, and overall river functionality.

The proposed Niobrara Confluence Conservation Area (NCCA) and Ponca Bluffs Conservation Area (PBCA) are two remarkable areas along the Missouri River that still exhibit pre-dam conditions and function much as such areas did under historical conditions. The LPP for NCCA and PBCA will aid us in outlining the landscape-level strategic habitat conservation initiative we plan to undertake in partnership with willing landowners to protect wildlife and fishery resources and habitat in the Missouri River ecosystem in northeast Nebraska and southeast South Dakota. These areas have been identified as supporting or linking important habitats for trust species (for example, pallid sturgeon, least tern, piping plover, and migratory birds).

We have the responsibility to manage for the survival of Federal trust species (defined as migratory birds, species listed as threatened or endangered under the Federal Endangered Species Act of 1973 [ESA], and certain fisheries). In addition, we have the responsibility to manage the Missouri National Recreational River (MNRR) under the direction of the Wild and Scenic River Act as a recreational river for public use and recreation while preserving and protecting important cultural and wildlife resources. The need for this action is to identify and conserve high-priority sites for trust Federal trust species, recreation, historic areas, and river functionality. This plan will also provide us with the authority to develop conservation easements with or buy land in fee title from willing landowners.

The purpose of this draft EIS is to identify the role we will play in supporting the mission of the National Wildlife Refuge System (Refuge System) and the National Wild and Scenic Rivers System. FWS and NPS have similar missions, both of which address the need for conservation while maintaining environmental resources for future generations. This draft EIS describes the physical environment affected by the proposed action, analyzes the impacts associated with each alternative, and guide decision-makers in selecting an alternative for implementation.

Proposed Project Areas

The 790,873-acre NCCA encompasses the river, neighboring 6th order watersheds (the smallest unit of the Hydrologic Unit Code system), and the 6th order watersheds of the Niobrara River below Spencer Dam. We have identified various goals for conservation easements and fee-title acquisition under each alternative based on biological goals, logistics, the extent of potentially available lands, and the desired ratio of fee-title to easement acreage described above.

Nick Kaczor / FWS

The Missouri River is popular among visitors of all ages.

The 623,921-acre PBCA comprises a mix of private property and local, Federal, and State jurisdictions. As with NCCA, we have identified various goals of conservation easements and fee-title acquisition in each alternative based on biological goals, logistics, the extent of potentially available lands, and the desired ratio of fee-title to easement acreage.

The neighboring 6th order watersheds were used to define the boundaries of the project areas because they are the smallest mapped hydrologic units and ideally reflect the processes (soil, hydrology, and wildlife) that characterize the project area. In addition, the 6th order watersheds are easily correlated to small streams and drainages on the landscape that landowners and managers can identify.

1.2 Decision to be Made

The Regional Director of Region 6 of the FWS will make the final decision for the FWS. The Regional Director of the Midwest Region of the NPS will make the final decision for the NPS. Based on the analysis provided in the draft EIS, the following decisions will be made:

- Determine the feasibility and suitability of establishing the conservation areas.
- If the conservation areas are deemed feasible and suitable, determine whether to approve the LPP, which details the preferred management approach identified in the EIS.

The Regional Directors' decisions will be based on the legal responsibility of each agency (including the mission of each agency), other legal and policy mandates, and the vision and goals in the LPP. In addition, the Regional Directors will consider input from the cooperating agencies, Native American tribes, and the public about the draft EIS and LPP. Other considerations include land uses in the surrounding areas and other parts of the ecosystem, the environmental effects of the alternatives, and future budget projections.

Our final decisions will be documented in a record of decision that is published in the Federal Register, no sooner than 30 days after filing the final EIS and LPP with the EPA and distributing it to the public. We will begin to carry out the selected alternative immediately upon publication of the decision in the Federal Register.

1.3 The U.S. Fish and Wildlife Service and the Refuge System

The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, the restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

The NCCA and PBCA would be monitored partly under the Refuge System in accordance with the Administration Act as amended by the Improvement Act and other relevant legislation, Executive Orders, regulations, and policies. Conservation of wildlife habitat along the Missouri River in Nebraska and South Dakota would continue to be consistent with the following:

- Land and Water Conservation Fund Act of 1956
- Migratory Bird Conservation Act of 1929
- Migratory Bird Hunting and Conservation Stamp Act of 1934
- Migratory Bird Treaty Act of 1918
- Administration Act
- Improvement Act
- North American Wetlands Conservation Act of 1968
- ESA
- Bald and Golden Eagle Protection Act of 1940
- Fish and Wildlife Act of 1956

The basic considerations in acquiring an easement interest in private lands are the biological significance of the area, biological needs of the wildlife species of management concern, existing and anticipated threats to wildlife resources, and landowner interest in the program. On approval of the conservation areas, habitat protection would occur through the purchase of conservation easements or acquisition in fee title if deemed necessary. It is the FWS's long-established policy to acquire the minimum interest in land from willing sellers that is necessary to achieve habitat protection goals.

1.4 The National Park Service and the Wild and Scenic Rivers System

As required by the 1916 Organic Act, these special places must be managed in a special way—a way that allows them to be enjoyed not just by those who are here today, but also by generations that follow. Enjoyment by present and future generations can be assured only if these special places are passed on to them in an unimpaired condition.

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.

The MNRR was established by Congress to protect the natural, cultural, and recreational resources of two remaining free-flowing segments of the Missouri River in the most natural state possible and to keep them available for the public, both now and in the future. The park was established under the Wild and Scenic Rivers Act with an amended mandate—hence the word "Recreational" in place of "Wild" or "Scenic" in the park's name. The park was established by two distinct pieces of legislation more than a decade apart. It is the park staff's responsibility to preserve, protect, interpret, restore, and enhance the Recreational River's exceptional natural and cultural resources for the enjoyment of present and future generations.

The two legislative acts provide the following descriptions that pertain to the proposed action:

- 1978 designation
  - Missouri River: "The segment from Gavins Point Dam, South Dakota, fifty-nine miles downstream to Ponca State Park, Nebraska"
- 1991 designation
  - Missouri River: "The 39-mile segment from the headwaters of Lewis and Clark Lake to the Ft. Randall Dam"
  - Niobrara River and Verdigre Creek: "The 25-mile segment [of the Niobrara River] from the western boundary of Knox County to its confluence with the Missouri River, including that segment of the Verdigre Creek from the north municipal boundary of Verdigre, Nebraska, to its confluence with the Niobrara"

The national river boundary defines the area where the NPS has regulatory authority under the Wild and Scenic Rivers Act and where the NPS may buy easement or fee-title interest in lands. The boundary encompasses roughly 78,000 acres within the proposed conservation areas. The NPS owns 350 acres within the proposed PBCA.

Although affected by reservoirs, flow regulation, and human-altered channels in some areas, the ever-changing Missouri River has a diverse mosaic of channel habitats, including floodplains, side channels, backwaters, sandbars, pools, islands, and oxbow lakes. Accordingly, both the 59-mile segment and the 39-mile segment of the Missouri River were designated under the Wild and Scenic Rivers Act for their free-flowing condition, water quality, and outstanding recreational, fish and wildlife, scenic, historic,

geologic, and cultural values. The Wild and Scenic Rivers Act applies the recreational river classification to those rivers or sections of rivers that are readily accessible by road, that may have some shoreline development, and that may have undergone some impoundment or diversion in the past, but that still exhibit characteristics that represent the values embodied by wild and scenic rivers. The classification establishes a baseline condition of the river and describes the level of development at the time of designation. The proposed LPP is consistent with the Department of the Interior's (Interior's) charge under section 10(a) of the Wild and Scenic River Act to protect and enhance the values for which the river was designated as part of the Wild and Scenic River System.

1.5 Contributions to National and Regional Plans

Landscape Conservation Cooperatives

As the primary land, water, and wildlife manager for the Nation, Interior has an obligation to address the impacts that climate change is having on America's resources by developing integrated adaptation and mitigation strategies. Secretarial Order 3289 established a Climate Change Response Council, chaired by the Secretary of the Interior, which is coordinating activities within and across the bureaus to develop and implement an integrated strategy for climate change response by Interior. Working at the landscape, regional, and national scales through the establishment of Climate Science Centers and Landscape Conservation Cooperatives (LCCs), Interior is defining and implementing a vision that integrates Interior science and management expertise with that of its partners, providing information and best management practices (BMPs) to support strategic adaptation and mitigation efforts on both public and private lands across the United States and internationally.

This vision supports individual bureau missions while creating synergies with other Interior agencies and both governmental and nongovernmental partners to carry out integrated climate change science, adaptation, and mitigation strategies across broad landscapes. The Climate Change Response Council promotes collaboration among LCCs and develops mechanisms for managing data and information, setting national priorities, and ensuring consistency and preventing duplication of effort among the national network of LCCs.

The proposed conservation areas lie within the recently established Plains and Prairie Pothole LCC. The work of the LCC will greatly benefit any conservation measures including the proposed NCCA and PBCA by providing high quality scientific data and information.

The State of Nebraska Natural Legacy Project

The flora and fauna of Nebraska, along with the natural habitats they occupy, are the State's natural heritage. Populations of many once-common species have declined because of a variety of stresses, including habitat loss, habitat degradation, diseases, and competition and predation from invasive species. The goals of the Nebraska Natural Legacy Project are to reverse the decline of at-risk species, recover listed species and allow for their delisting, maintain common species, and conserve natural communities.

The Nebraska Natural Legacy Project seeks to create new opportunities for collaboration among farmers, ranchers, communities, private and governmental organizations, and others for conserving Nebraska's biological diversity. The Nebraska Natural Legacy Project is a nonregulatory, voluntary, incentive-based conservation effort that would support the proposed conservation areas by offering added help to landowners in the management of natural areas.

The State of South Dakota Wildlife Action Plan

The South Dakota Wildlife Action Plan seeks to strategically address the needs of all fish and wildlife species, with priority on species of greatest concern and in need of conservation. The South Dakota Wildlife Action Plan takes a broad view of landscapes from a fish and wildlife perspective. The plan considers the location of essential habitats, changes since settlement, species at risk, and habitat improvement. The purposes and goals of the proposed conservation areas are compatible with the South Dakota Wildlife Action Plan.

Natural Resources Conservation Service—Wetlands Reserve Program

The NRCS provides national leadership in the conservation of soil, water, and related natural resources. As part of the U.S. Department of Agriculture (USDA), the NRCS provides balanced technical help and cooperative conservation programs to landowners and land managers throughout the United States.

In the Nebraska portions of the proposed conservation areas, the NRCS has an active Wetlands Reserve Program (WRP)—a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their properties. NRCS aims to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program. Through the WRP, NRCS provides technical and financial support to help landowners with their wetland restoration and long-term conservation efforts. As of 2011, approximately 11,000 acres have been protected through wetland easements in the proposed conservation areas. The proposed conservation areas would not conflict with any NRCS programs; moreover, our role in buying easements could help the NRCS achieve WRP goals and objectives.

Species Recovery Plans

Species recovery plans are discussed in the species descriptions in "Chapter 4—Affected Environment."

U.S. Army Corps of Engineers—Master Water Control Manual

The reservoir system on the main stem Missouri River is operated by the USACE in accordance with the "Missouri River Master Manual." Last updated in 2004, this manual includes a water control plan that guides how much water should be released, when, and for how long from the six reservoirs that make up the system. The plan is based on hydrologic models that consider variables such as volume, timing, and the distribution of snow and rainfall runoff; these models have been built on more than 100 years of historical runoff records (1898–2004). The water control plan provides management guidance to support the purposes for which Congress authorized construction of the system: flood control, navigation, water supply, water quality, hydropower, irrigation, recreation, and fish and wildlife. The USACE strives to balance operation of the system to serve these purposes.

NPS

A clutch of eggs lies in a piping plover nest.

The USACE's operation of the main stem dam system has caused numerous ecosystem changes as well as impacts on individual species. The proposed conservation areas would seek to mitigate these impacts by providing more habitat and protecting floodplain lands important to species recovery as well as river and floodplain ecology.

U.S. Fish and Wildlife Service—Lake Andes National Wildlife Refuge Complex Comprehensive Conservation Plan

A comprehensive conservation plan (CCP) was recently completed for the three units of the refuge complex: Lake Andes National Wildlife Refuge, Lake Andes Wetland Management District, and Karl E. Mundt National Wildlife Refuge, all in South Dakota. This CCP describes the management and use of these three units of Lake Andes National Wildlife Refuge Complex for the next 15 years. The proposed conservation areas would be managed, in part, by the same staff who manage the refuge complex. It is expected that the issues and conservation management direction of the proposed conservation areas would be compatible with those of the Lake Andes National Wildlife Refuge Complex.

U.S. Fish and Wildlife Service—Partners for Fish and Wildlife Program, Mountain–Prairie Region Strategic Plan, Eastern Tallgrass Prairie and Prairie Pothole Focus Areas

The Nebraska Partners for Fish and Wildlife Program will continue to work with its partners to control invasive species, restore and improve native grassland conditions, and promote biodiversity by restoring and enhancing important habitats. Additional opportunities may arise to work with its partners to restore riverine wetlands and wet meadow habitats along the confluence of the lower Niobrara and Missouri Rivers.

The Mountain–Prairie Region Strategic Plan identifies focus areas throughout the region for the Partners for Fish and Wildlife Program to prioritize its efforts. The NCCA and PBCA are within the following focus areas.

The northern portion of the Eastern Tallgrass Prairie focus area, encompassing the Missouri River and its associated habitats, has been expanded recently to include land at the confluence of the Verdigre-Bazile, Lower Niobrara, and Missouri Rivers; the focus area now includes a portion of eastern Boyd County.

The southern portion of the Prairie Pothole focus area also includes the Missouri River. This focus area contains the glaciated portion of the state, which is characterized by a documented potential to support at least 20 breeding duck pairs per square mile. Preserving this focus area as a viable "recruitment source" for all suites of prairie-nesting birds has been identified as an urgent priority for FWS, Delta Waterfowl, and Ducks Unlimited. While many of the habitat actions in this focus area are designed to conserve waterfowl breeding habitat, they also have direct benefits for the entire spectrum of ground-nesting birds. These mutual conservation benefits are especially vital to grassland-nesting passerines—widely considered to be one of the most imperiled bird guilds in North America (Peterjohn and Sauer 1999).

NPS

Tallgrass prairie is found in the proposed project area.

National Park Service—General Management Plans, Missouri National Recreational River

The general management plans for the MNRR were written in 1997 (for the 39-mile segment) and 1999 (59-mile segment). The plans describe the goals and management activities anticipated for the national recreational river. The management described in the plans is consistent with the basic goals and principles of the proposed conservation areas.

North American Waterfowl Management Plan

Enacted in 1986, the "North American Waterfowl Management Plan" addresses declining waterfowl populations. The plan relies on the actions of joint ventures, of which there are 17 in the United States. The Prairie Pothole Joint Venture (PPJV) coordinates conservation efforts in North Dakota, South Dakota, Minnesota, Iowa, and Montana. Many PPJV projects are active within the proposed conservation areas and use funding partnerships with many entities. The proposed conservation areas are home to ducks, geese, sandhill cranes, tundra swan, as well as many other nonresident waterfowl species. Accordingly, activities under this international plan will aid in protecting, restoring, and enhancing high-priority wetland and grassland habitat to help sustain populations of waterfowl, shorebirds, waterbirds, and terrestrial prairie birds in the proposed conservation areas.

National Fish Habitat Partnership Action Plan

The National Fish Habitat Partnership (NFHP) was born in 2001 when an ad hoc group supported by the Sport Fishing and Boating Partnership Council

explored the notion of developing a partnership effort for fish on the scale of what was done for waterfowl in the 1980s through the North American Waterfowl Management Plan. The waterfowl plan has worked wonders in the past 2 decades to boost waterfowl populations by forming strong local and regional partnerships to protect key habitats.

The mission of the "National Fish Habitat Partnership Action Plan" is to protect, restore, and enhance the Nation's fish and aquatic communities through partnerships that foster fish habitat conservation and improve the quality of life for Americans. The NFHP is compatible with the goals and purposes of the proposed conservation areas.

U.S. Army Corps of Engineers—Missouri River Recovery Program

The aim of USACE's Missouri River Recovery Program (MRRP) is to restore the Missouri River ecosystem to its natural form and function through habitat creation and flow modifications by using science, public involvement, and collaboration with agency partners and stakeholders. Although the river will never be the wild, dynamic, and uncontrolled system it once was, portions of the ecosystem can be revitalized to meet the needs and interests of all the area's inhabitants. Accordingly, the primary goal of the MRRP—which applies to the proposed conservation areas—is to create a sustainable ecosystem that supports thriving populations of native species while considering current social and economic values. Numerous plans have been written in support of the MRRP, such as a cottonwood management plan, an emergent sandbar habitat plan, and a spring pulse plan. The program is compatible with the goals and purposes of the proposed conservation areas.

Missouri River Ecosystem Recovery Plan

The USACE's MRRP, in partnership with the FWS, is conducting a collaborative long-term study authorized by the Water Resources Development Act of 2007. The study, known as the Missouri River Ecosystem Restoration Plan (MRERP) and EIS, will identify the actions required to mitigate losses of aquatic and terrestrial habitat, recover federally listed species under the ESA, and restore the ecosystem to prevent further decline of native species. When completed, the plan will guide USACE's mitigation, restoration, and recovery efforts on the Missouri River for the next 30–50 years. The plan is a multiyear effort; however it was not funded in 2012. The proposed conservation areas would be consistent with implementation of the MRERP.

Migratory Bird Program

The FWS has a legal mandate and a trust responsibility to maintain healthy migratory bird populations for the benefit of the American public. The FWS is authorized by primary conventions, treaties, and laws to ensure the conservation of more than 800 species of migratory birds and their habitats. The FWS works with many foreign governments, State and other Federal agencies, tribes, nonprofit organizations, academic institutions, industries, and private individuals, both within the United States and abroad, to meet these mandates. To meet the migratory bird conservation challenges of the 21st century, the Migratory Bird Program adheres to the principles of sound science and collaborative partnerships in its migratory bird conservation and management activities. Summer nesting habitat for two federally listed endangered migratory bird species—least tern and piping plover—occurs within the proposed conservation areas. The proposed conservation areas would strongly support the goals of the Migratory Bird Program.

The Nature Conservancy Ecoregional Portfolio

The NCCA is primarily located in The Nature Conservancy's Dakota Mixed Prairie Ecoregion, while the PBCA is split between the Northern and Central Tallgrass Prairie Ecoregions. A terrestrial ecoregion is a regional landscape that supports recognizably distinctive groupings of plants, animals, and natural communities associated with regional patterns of climate, landform, soil, and hydrology. The Nature Conservancy has prioritized portions of the Missouri River ecosystem downstream of Gavins Point Dam as well as Verdigre Creek and the Niobrara River as important terrestrial habitats.

Nebraska Surface Water Quality Standards (Title 117)

The Nebraska Department of Environmental Quality has a legal mandate to maintain and protect

the existing quality of surface waters designated as Class A State Resource Waters. Much of the surface water in the proposed project areas is considered Class A. In addition to Class A, there are also Class B waters in the project area. The proposed LPP would be consistent with the regulations outlined in Title 117 of the State's Antidegradation Clause.

South Dakota Antidegradation of Waters of the State (74:51:01:34)

Similar to Nebraska, the State of South Dakota has enacted legislation that states "No further reduction of water quality may be allowed for surface waters of the state that do not meet the water quality levels assigned to their designated beneficial uses as a result of natural causes or conditions, and all new discharges must meet applicable water quality standards." The proposed LPP would be consistent with the regulations outlined under this State regulation.

1.6 Planning Process

In 2000, the FWS issued guidance on land protection planning. This guidance directs the FWS to identify areas of significant biological value and recommend those areas to be analyzed in more detail. Figure 2 outlines the steps of the LPP and environmental analysis process.

On September 27, 2010, we submitted a preliminary project proposal for the NCCA and PBCA to the Director of the FWS. On December 16, 2010, the Director approved our request to conduct further planning on the NCCA and PBCA. We began planning the NCCA and PBCA in January 2011 with the establishment of a core planning team comprising FWS and NPS staff. Appendix A lists the planning team members, cooperating agency team members, and contributors for this planning process.

The core team is responsible for the analysis, writing, and production of the draft and final versions of the LPP and EIS. The core team also developed a preliminary vision and set of goals. The cooperating agencies (section 1.7) are part of the larger planning team, which has met throughout the process to develop and review the alternatives and to review drafts of the LPP and EIS. While developing the LPP and EIS, the planning team collected information about the resources of the proposed conservation areas and surrounding region. This information is summarized in chapter 4 and served as a baseline for analyzing the predicted effects of alternatives documented in chapter 5.

Table 1 lists these and other planning activities that have occurred to date.

Subsequent Planning Activities

If the proposed conservation areas are approved, the following planning activities would occur:

- We will jointly develop an interim conceptual management plan for managing fee-title lands until a CCP can be completed. The conceptual management plan will help guide the management of acquired parcels in the short term and include items such as interim compatibility determinations. It will also outline how we will comanage those parcels as well as areas under conservation easement.

- A CCP will be developed for the conservation areas once adequate properties have been acquired and there is a need for a more detailed management plan; ideally this will be within five to ten years after the project has been approved. The CCP will describe the management and use of these areas for the following 15 years. It will outline the management needs and the necessary staff to implement these actions.

1.7 Public Involvement

Public scoping began February 15, 2012, when we published a notice of intent to prepare an LPP and EIS in the Federal Register. We conducted five public meetings during scoping, mailed a planning update, posted information on the LPP Web page, and coordinated with Federal, State, and local agencies as well as Native American tribes.

Important considerations in the development of the NCCA and PBCA—including the vision, goals, objectives, and strategies—are the opinions, perspectives, and values of all interested citizens, agencies, and organized groups. While there are no requirements to base management decisions on public opinion, we value and consider public input. As detailed in appendix B, we have consulted with Native American tribes and actively involved Federal and State agencies, local governments, organizations, and private citizens throughout the process.

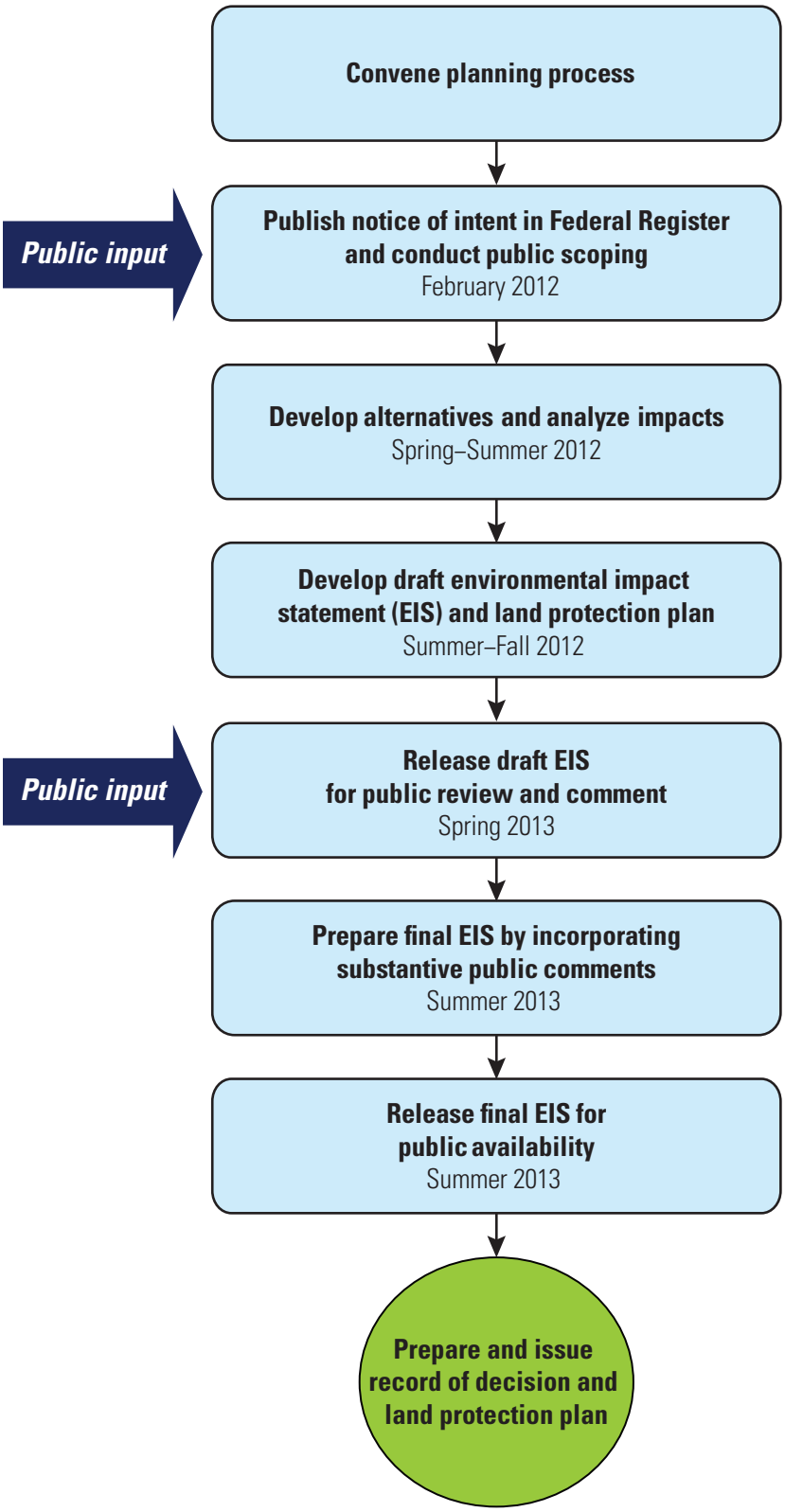

Figure 2. Process for land protection planning and environmental analysis for the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

Table 1. Summary of the planning activities to date for the Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

Date	*Planning activity*	*Outcome*
September 27, 2010	Preliminary project proposal	Submitted initial project proposal to the FWS's office in Washington, DC, to begin public outreach.
December 16, 2010	Preliminary project proposal	Director of the FWS approved preliminary project proposal. Public involvement period began.
January 2011	Initial site meeting	Established final core planning team. Identified initial list of issues and qualities. Developed LPP overview and mailing list.
April 27, 2011	Congressional briefing	Conducted initial meeting with congressional and gubernatorial staff to outline project proposal.
June 13, 2011	Tribal outreach	Sent formal letters to 21 Native American tribes with tribal or aboriginal interest informing them of the project and offering government-to-government consultation.
August 26, 2011	Meeting and workshop for vision and goals	Core team members met to outline project vision, goals, and objectives. Refined mailing list and interested parties list.
January 12, 2012	Cooperating agency team invitation	Sent invitations to 13 prospective cooperating agencies with jurisdiction or expertise on the proposed action.
January 30, 2012	Tribal outreach	Sent formal letters to 21 Native American tribes with tribal or aboriginal interest informing them of the project and offering government-to-government consultation and informing them of the public scoping period.
February 6, 2012	Scoping	Issued and mailed press releases and 4-page factsheets announcing the public scoping period.
February 15, 2012	Notice of intent in Federal Register	Published notice of intent to develop LPP and EIS and a request for comments in the Federal Register (scoping comments accepted until March 16, 2012).
February 21–24, 2012	Public meetings	Held 5 public meetings in Nebraska and South Dakota. A total of 108 individuals attended the 5 meetings.
March–April 2012	Scoping report	Documented public comments from the comment period and identified significant issues.
April 17–19, 2012	Planning team meeting	Developed draft alternatives with core planning team and cooperating agencies.
January 31–February 15, 2013	Internal review of draft EIS and LPP	Conducted an internal review of the EIS and LPP with the cooperating agency team.

Cooperating Agencies

We sent letters of notification about the planning process, including an invitation to take part in the planning team, to 13 agencies with jurisdiction or expertise in relation to the proposed action. The agencies listed below agreed to be a part of the cooperating agency team: National Oceanic and Atmospheric Administration, Nebraska Game and Parks Commission, Nebraska Natural Resource Conservation Service, South Dakota Department of Game, Fish and Parks, South Dakota Natural Resource Conservation Service, U.S. Army Corps of Engineers, and the U.S. Environmental Protection Agency.

Tribal Coordination

We sent letters of notification about the planning process, including an invitation to take part in the planning team, to 21 tribes with tribal or aboriginal interest in the proposed conservation areas. We have continued to communicate with the tribes and encourage participation in the LPP process. We formally consulted with the Yankton Sioux Tribe in March 2012.

Involvement of Interested Groups and the Public

Many interested groups and private citizens have participated in the LPP process by attending public meetings, submitting comments, or obtaining information about the plan from the LPP Web page or other outreach methods. The project has been discussed on numerous occasions at the quarterly Missouri River Recovery Implementation Committee meetings and presented to each county commission or county supervisor in the project vicinity.

1.8 Scope of the Document

This planning process considers different geographic designations, as described below.

Decision Area

Also referred to as the proposed conservation areas or project area, the decision area is the area within the proposed boundaries for the NCCA and PBCA (figure 3). Where other agencies or organizations (for example, the USACE or NRCS) hold primary jurisdiction, we would work with those entities and the associated landowner (if applicable) to develop conservation efforts. Chapter 2 provides a complete description of the proposed conservation areas.

Analysis Area

The analysis area includes the decision area and surrounding areas where most of the direct, indirect, or cumulative effects could occur as a result of implementing the alternatives. The analysis area includes the area used in the socioeconomic analysis (chapters 4 and 5). Additionally, the foreseeable activities in this area that could result in cumulative effects are described in detail in chapter 3.

1.9 Significant Issues to Address

Through the scoping process, we identified many qualities of the Missouri River along with issues and recommendations. Based on this information as well as guidance from NEPA and planning policies, we identified the following significant issues to address in the final LPP and EIS:

- local economies and tourism (socioeconomics)
- partnerships and collaboration
- ecological and river functionality
- cultural resources
- recreational opportunities
- wildlife, fisheries, and their habitats

The planning team considered every comment received during the public scoping process. These comments were grouped into related topics and subtopics as described in the public scoping report (appendix B). Significant issues are those that suggest different actions or alternatives and that will influence the decisionmakers.

Local Economies and Tourism (Socioeconomics)

It is important to manage resources and public uses in ways that protect the resources, are financially responsible, and are integrated with the economic viability of the surrounding communities. The LPP and EIS address the following socioeconomic issues:

- increased public use of and visitation to the analysis area and the resulting increased economic activity in the area
- introduction of public money to the local community through the payment of conservation easements
- Refuge Revenue Sharing (RRS) and Payment in Lieu of Taxes (PILT) payments to local counties if fee-title acquisition is used

Partnerships and Collaboration

Numerous Federal, State, tribal, and nongovernmental agencies and organizations manage land and implement laws associated with the Missouri River.

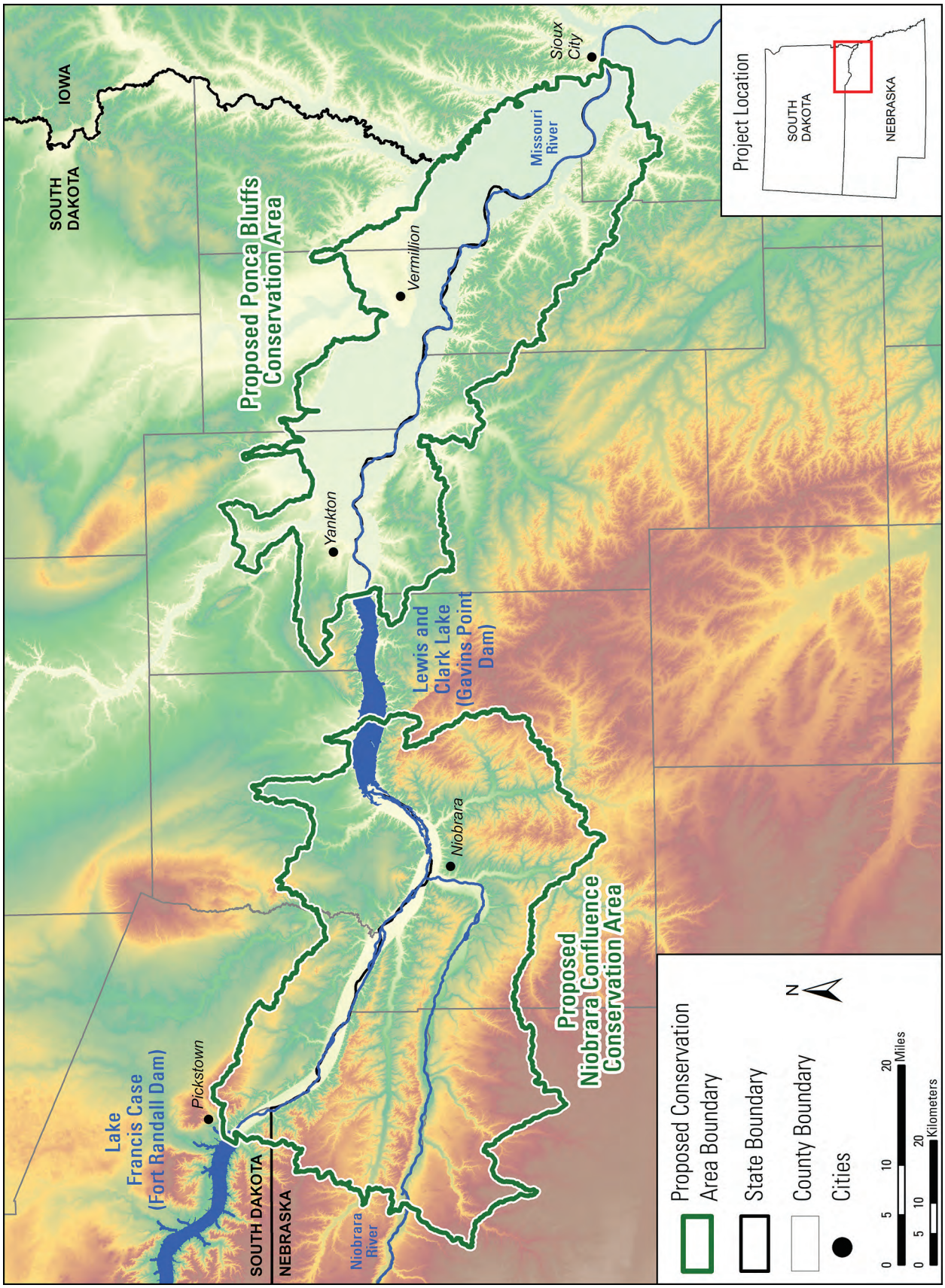

Figure 3. Boundaries of the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

Besides the FWS and NPS, some of the key Federal agencies are the NRCS, the USACE, the U.S. Geological Survey (USGS), EPA, and the Bureau of Indian Affairs. Additionally, 3 tribes are also located on the main stem of the river and 17 other tribes have ancestral interest in the area. The NRCS works with numerous private landowners on conservation actions and holds easements in both proposed project areas. The NGPC and SDGFP manage several properties along the river. In addition, local organizations such as Nebraska's Natural Resource Districts manage water resources, and the Northern Prairie Land Trust works with landowners on conservation efforts. The LPP and EIS address the following issues:

- description and clarification of overlapping jurisdictions and opportunities for landowners
- identification of where agencies and organizations can combine efforts and work collaboratively
- consultation and coordination with Federal, State, and local partners

Ecological and River Functionality

The Missouri River system as a whole has experienced significant alterations through anthropogenic changes such as large main stem dams inundating significant stretches of river and channelization in the lower third of the river. Flows are highly regulated by six major impoundments and three smaller impoundments built to generate electricity and provide flood control. Because hydrogeomorphic processes have been so altered, the floodplain has become more accessible to other human activities, especially agriculture and urbanization. Such activities have led to fragmentation of corridors both longitudinally (along the river) and laterally (across the valley). These corridors are important to the many plants and animals that rely on the Missouri River ecosystem.

Nevertheless, outside the areas of these impoundments and other alterations, the Missouri River has shown resiliency, exhibiting numerous historical characteristics witnessed by Lewis and Clark during their explorations in the early 1800s. This project is designed to allow the Missouri River to flow and meander naturally to the extent possible, keeping those habitat characteristics important to Federal trust species such as pallid sturgeon, least tern, and piping plover. The LPP and EIS address the following:

- altered main stem flows (water and sediments) and their impact on resources
- prior and ongoing conservation efforts by landowners and agencies to improve habitat conditions

Cultural Resources

Humans have lived in the middle Missouri River region for more than 12,000 years. The sites, buildings, structures, and objects left by these people provide an irreplaceable record that reflects their stories, lives, and legacies. These cultural resources consist of prehistoric and historic places of local, state, or national significance and include those that have been placed on the National Register of Historic Places and others that have yet to be formally documented. The LPP and EIS address the following aspects of cultural resources:

- identification, documentation, and evaluation of cultural resources
- consultation with State agencies, Indian tribes, and the public concerning the location, importance, and preservation of these resources
- preservation and interpretation of significant individual resources, such as Spirit Mound and the Yankton Sioux Treaty Monument, and cultural landscapes, including those experienced by Lewis and Clark
- encouragement and support for ongoing research and interpretation of these resources

Recreational Opportunities

The proposed NCCA and PBCA and their surrounding areas provide recreational opportunities for many residents of the four-state region of South Dakota, Nebraska, Iowa, and Minnesota, while also attracting visitors from across the United States and other countries. Recreational opportunities are widely varied and consist of, but are not limited to, hunting, fishing, boating, camping, paddling, and photography. These resources are not only extremely

important to the recreationists but the local communities as well. The LPP and EIS address the following aspects of public use and access:

- availability of safe public access points to the Missouri River
- availability of public hunting and fishing areas
- motorized and nonmotorized access and law enforcement
- impact of users of public lands on neighboring private landowners
- location of interpretation sites such as visitor centers, historic monuments, and wildlife viewing stations

Wildlife, Fisheries, and Their Habitats

The Missouri River and its surrounding riparian, grassland, and woodland habitats provide an exceptional resource for a wide variety of wildlife and fish including the following:

- 249 species of migratory birds
- 50 species of mammals
- 21 species of reptiles
- 10 species of amphibians
- 94 fish species (72 native and 22 introduced)
- 704 plant species
- Up to 10 threatened or endangered species (including the focal species for this project: piping plover, least tern, and pallid sturgeon)

The proposed action is designed to work with others to maintain and build on existing areas important for the above-mentioned species while also improving habitat conditions. The LPP and EIS address the following aspects:

- habitat requirements for successful productivity of migratory bird species—especially bald eagles, piping plovers, and least terns
- habitat needs for the endangered pallid sturgeon, other fish species of concern, and game fish
- role surrounding grasslands and forestlands play in supporting river-dependent species while also providing habitat for other species
- opportunities to improve habitat conditions for all species

1.10 Issues Not Addressed

Several issues identified during public scoping and alternatives development were not selected for detailed analysis in the LPP and EIS. In accordance with requirements of NEPA, we have identified and eliminated from detailed study those issues that are not significant or are beyond the scope of this planning process. These issues and the rationales for not selecting them as significant issues are briefly described below.

Modification of Missouri River Water Flows and Authorized Purposes

Section 9 of the 1944 Flood Control Act, as amended, authorized the USACE to manage the Missouri River system for water control—flood control, navigation, power generation, water supply, irrigation, recreation, and fish and wildlife. The USACE's management approach included the construction of six dams and their reservoirs and the alteration of 1,100 miles of the natural river system to Gavins Point Dam (the lowermost of the six dams). Management activities authorized by the Flood Control Act also included channelization and bank stabilization of the lower Missouri River from Sioux City, Iowa, to St. Louis, Missouri, to accommodate navigation activities.

Authorized purposes were directed to the USACE by Congress through various public laws. We have no jurisdictional authority over the USACE nor possess the authority to change public law. Accordingly, the proposed action will not revise authorized purposes or water flows as determined through the "Master Water Control Manual."

Use of Emergent Sandbar Habitats along the Missouri River

USACE implements the Emergent Sandbar Habitats Program that mechanically creates quality sandbar habitat for two federally listed species of birds, the endangered interior population of least tern and the threatened northern Great Plains piping plover. Habitat quantity goals are established for the program in the FWS's 2003 "Amended Biological Opinion on the Operation of the Missouri River Mainstem System." The historical hydrograph of the Missouri River has been permanently altered as a result of the construction of the six main stem dams. Because the system is permanently altered, the historical flow regime that existed before construction of the dams has changed dramatically. Before construction of the dams, the mountain snowmelt and the plains snowmelt would create two separate influxes of water into the system each spring. These snowmelt events coupled with spring rains would annually erode and deposit sand, resulting in the creation of barren sandbars. Least terns and piping plovers prefer sparsely vegetated sandbars that are not connected to adjacent banks as nesting and foraging habitat.

The USACE prepared the "Programmatic Environmental Impact Statement for the Mechanical and Artificial Creation and Maintenance of Emergent Sandbar Habitat in the Riverine Segments of the Upper Missouri River" that analyzes the environmental, cultural, cumulative, and socioeconomic effects of implementing the biological opinion acreage targets. In its record of decision for that document, the USACE selected an adaptive management implementation process as its preferred alternative with a construction ceiling of acres associated with alternative 3.5 as the selected plan.

The NEPA process for this project was completed with publication of the record of decision in August 2011.

Designation of Missouri National Recreational River

The designation of the MNRR by Congress occurred in two phases (1978 and 1991). These designations were made by Congress and directed the NPS to manage portions of the river as a recreational river under the Wild and Scenic Rivers Act.

The proposed action does not have the authority to change the decision to designate these areas as a recreational river.

Placement and Approval of the Keystone XL Pipeline

On May 4, 2012, the Department of State received a new application from TransCanada Corporation for a proposed pipeline that would run from the Canadian border to an existing pipeline in Steele City, Nebraska. The new application included proposed routes through the State of Nebraska, primarily west of the decision area for this project. The Department of State is preparing a supplemental EIS to evaluate the new Keystone XL pipeline permit application. That document will include thorough analysis of the new route in Nebraska, as well as analysis of any significant new information and circumstances relevant to environmental concerns that have become available since the final EIS was completed in August 2011 on the original Keystone XL project.

As with the Missouri River water flows issue discussed above, we have no jurisdictional authority over the placement or approval of this pipeline. Accordingly, this analysis will only discuss the Keystone XL Pipeline as a reasonably foreseeable action in the cumulative effects analysis (chapter 5).

Chapter 2—History, Vision, and Goals

NPS

Sandbars and riparian forests are important components of undeveloped reaches of the Missouri River.

This chapter describes the history and special values of the area in which the proposed conservation areas lie. It also presents the vision and goals we have developed for the conservation areas.

2.1 A Portrait of the Missouri River

This discussion is a compilation from several authoritative sources: Blevins 2006; University of Nebraska Press, University of Nebraska–Lincoln Libraries–Electronic Text Center 2005; Galat 2005; Galat et al. 1996; NRC 2002; and Schneiders 1999.

History of the Missouri River Basin

The Missouri River—flowing 2,341 miles from its headwaters at the confluence of the Gallatin, Madison, and Jefferson Rivers in Three Forks, Montana, to its confluence with the Mississippi River in St. Louis, Missouri—is the longest river in the United States. With a watershed encompassing 529,350 square miles, the Missouri drains one-sixth of the United States.

For thousands of years, the upper Missouri River area provided a home for many Native American tribes such as the Blackfeet, Gros Ventre, Assiniboine, and Crow. Other tribes traveled through and used the area, including Shoshone, Cheyenne, Sioux, and Nez Perce. The Missouri River landscape, although sparse in appearance, provided many resources the tribes needed for daily living, including many types of plant and animal life. These tribes lived by following the tremendous herds of bison that roamed the prairie; other game species like elk and deer also provided sustenance. Plants along the Missouri, such as willow and snowberry, were used to meet nutritional and medicinal needs. For millennia, Native Americans were the only people living in this area.

In 1673, Jacques Marquette and Louis Joliet passed the mouth of the Missouri River on their way down the Mississippi River. During the first half of the 1700s, French and Spanish explorers—Bourgmont, La Vérendrye and his sons, Villasur, the Mallet brothers, and others—penetrated the lower part of the basin, both by following the river and by journeying overland. The basin was acquired by the United States in 1803 as part of the Louisiana Purchase, and the first full exploration and account of the Missouri came with the Lewis and Clark expedition, 1804–06.

Settlers poured into the area in ever-increasing numbers. Some remained; others continued west along the Santa Fe and Oregon Trails, which began

NPS

The Missouri River was a principal transportation and commerce route for the paleo-Indians and later tribes; the importance of the river continued through Euro-American westward migration and trade, including the Lewis and Clark expedition and the fur trade and steamboat eras.

near Kansas City. En route to Utah, members of the Church of Latter-day Saints—widely known as Mormons—passed through the area on the Mormon Trail. After 1819, steamboats brought increased trade to the basin.

The predevelopment Missouri River was one of North America's most diverse ecosystems, with its abundant braided channels, riparian lands, chutes, sloughs, islands, sandbars, and backwater areas. These riverine and floodplain habitats were created and maintained by erosion and deposition that continuously reshaped the channel and floodplain. Historically, the Missouri carried high sediment loads, earning it the nickname "Big Muddy."

The basin is now home to about 10 million people and 28 Native American tribes. It spreads across 10 states (Colorado, Iowa, Kansas, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota, and Wyoming) and a small part of Canada.

Management of the River

Historically, the Missouri River regularly changed course. The channel shifted more than 2,000 feet per year in some places and deposited huge amounts of silt in other places. It is estimated that 11 billion cubic feet of sediment were carried past St. Charles, Missouri, in 1879—enough to cover a square mile of ground 200 feet deep. Banks along the river would erode 200–300 feet during a single rise of the river. It was the movement of this sediment that created braided channels in the meandering river, hampering navigation and the permanency of bottomland farms and river towns.

From bluff to bluff, the river's floodplain below Sioux City, Iowa, encompasses 1.9 million acres. Historically, the river meandered across more than one-fourth of this floodplain acreage. This "meander belt" contained a variety of fish and wildlife habitats including wetlands, sandbars, wet prairies, and bottomland forests. Seasonal floods provided the water needed to replenish shallow-water habitats that were so important for fish and wildlife breeding and growth.

The Rivers and Harbors Acts of the following years each affirmed the desire of the floodplain occupants, elected officials, and the Federal Government to tame the river for navigation, development, and flood control:

- 1912—authorized a 6-foot channel
- 1917—extended the authorization from Kansas City to Quindaro Bend
- 1927—extended navigation to Sioux City
- 1929—bank protection projects at Niobrara and Yankton
- 1935—Fort Peck Reservoir authorized
- 1938—Flood Control Act authorized main stem reservoirs
- 1941—Flood Control Act authorized Harlan County Reservoir and other tributary projects authorized
- 1944—Pick-Sloan Act passed
- 1945—authorized a 9-foot channel from St. Louis to Sioux City

Extensive flooding during World War II along the Missouri prompted Congress to take action to regulate the river. The Pick–Sloan Plan (1944) and the Missouri River Bank Stabilization and Navigation Project (1945) transformed the river from a free-flowing, self-sustaining ecosystem into what we see today. On the upper river above Sioux City, a system of main-stem reservoirs was built to regulate flows to the lower basin. In the lower reaches below Sioux City, channelization and bank stabilization projects straightened and constrained the big river. Today, 35 percent of the Missouri River is inundated under reservoirs, 32 percent has been channelized, and 33 percent is unchannelized.

The Missouri River Navigation Project (Sioux City, Iowa to the rivermouth) created one stabilized channel from the numerous small channels. The project concentrated the river's flow and shaped it in smooth, easy bends so that the energy of the flowing

water scoured out a deeper, more efficient navigation channel. Officially completed in 1981, the project channelized or stabilized 735 miles of the Missouri River from Sioux City to St. Louis, allowing urban and agricultural development of the floodplain.

Channelization shortened the river by 72 miles between the years of 1912 and 1980, resulting in a loss of 127 miles of river shoreline habitat. Aquatic habitat was lost as 168,000 acres of sediment accumulated behind the wing dikes, forming new land. Nearly 354,000 acres of meander-belt habitat were lost to urban and agricultural floodplain development. Levees, built to protect against flooding, allowed investments in floodplain property, leading to further development. Levees isolated riverine, off-channel habitats and wetlands from the river. Besides the main stem modifications, the river is influenced by construction of levees along the lower river and major tributaries, channelization of floodplain tributaries, and an extensive reservoir system in the large tributary basins of the Platte, Kansas, and Osage Rivers.

These changes have significantly altered the Missouri River ecosystem. In the upper river, a new ecosystem has been created with the deep water reservoirs replacing the free-flowing river and inter-reservoir reaches affected by lower water temperatures and reduced sediment loads. In the lower river, channelization has eliminated sandbars, depth diversity, and river connections with off-channel side channels and backwaters. The historical flow regime has been transformed with spring high flows now captured in reservoirs and low summer and fall flows augmented with reservoir releases.

With a storage capacity of 74 million acre feet and a surface area exceeding 1 million acres, the Missouri River reservoir system is the largest in the United States. The six dams built in Montana, Nebraska, North Dakota, and South Dakota transformed one-third of the Missouri River ecosystem into lake environments. Great quantities of sediment and organic materials flow into the reservoirs and are trapped behind the dams, reducing reservoir storage capacity and sediment transport below the dams. Dams block native fish migration to spawning grounds and change the flow regime in the river system.

Deltas form at the reservoir headwaters from sediment mobilized in the inter-reservoir reaches and arriving from upstream tributaries. Deltas reduce reservoir storage and channel carrying capacity. Extensive wetlands have developed in these reservoir headwaters, providing excellent waterfowl and waterbird habitat and spawning areas for fishes.

All these changes have led to decreasing populations of many river fish and bird species—some to the extent that they are now federally or State-listed as endangered or threatened or designated as species of special concern.

2.2 Special Values

The planning team has identified numerous outstanding qualities and values that distinguish the proposed NCCA and PBCA and make them worthy of conservation. These are discussed below.

Landscape Attributes

In 2012, the NPS completed an Outstandingly Remarkable Values (ORVs) document as required by the Wild and Scenic Rivers Act. This effort led to the identification and assessment of scenic qualities of eight segments of the MNRR. The following describes the scenic importance of these segments:

> The area provides a unique perspective on one of the greatest waterways in America through a contrast of natural textures and colors, rural farmsteads, meandering channels, shifting sandbars, and sheer chalkstone bluffs…The variety of scenery along the Missouri River evokes the stories of our past. As described in the journals of the Lewis and Clark Expedition, the river retains a semblance of the original western landscape, which has long inspired generations of artists. Spirit Mound, Old Baldy, and Fort Randall are a few of the scenic features that not only provide visual contrast to the rolling, grass-covered hills, farmlands, and woodlands, but bring to mind the powerful influence of the Missouri River on the rich history of the area. (NPS 2012)

To this day, visitors can experience one of our Nation's great rivers, where the natural sounds of water and wildlife still dominate. The river provides visitors with unforgettable opportunities to view dark nighttime skies or witness a thunderstorm sweeping across the prairie.

The proposed conservation areas encompass remnants of the historical Missouri River, with meandering, snag-laden, braided channels; riparian forests; islands; and sandbars. In these reaches, paddlefish, pallid sturgeon, interior least tern, piping plover, and many other native species hold on as vestiges of the predevelopment Missouri River ecosystem. These stretches of the Missouri River can allow future generations to connect with the area, experiencing the scenery, backwaters, shifting channels, muddy main stem waters, and range of changing habitats that generations before them also experienced.

Culture

Humans have been in contact with the Missouri River for more than 12,000 years, beginning with initial forays and habitation by Native Americans and followed by exploration by early Euro-Americans and then by an influx of homesteaders. Much like today's interstate highways, the river was a principal transportation and commerce route for the paleo-Indians (the earliest inhabitants of North America) and later tribes including the Mandans, Sioux, Omahas, and Poncas. The importance of the river for travel and commerce continued through Euro-American westward migration and trade, including the Lewis and Clark expedition and the fur trade and steamboat eras. Written along the banks of the Missouri River is a narrative linking visitors to the rich history of the people who have for centuries made their homes in the river valley and surrounding bluffs.

The significant prehistoric and historic sites along the river provide remarkable educational and interpretive opportunities. Four sites are listed in the National Register of Historic Places (NRHP): Ponca Agency, Spirit Mound, Old Baldy, and Fort Randall. The North Alabama steamboat site and the earth lodge at Mulberry Bend are eligible for listing in the NRHP, and there are likely numerous other prehistoric and historic sites along the river that have yet to be discovered. These sites highlight the significance of the river to a diversity of cultures over time.

Dugan Smith / NPS

American Indian cultural practices remain a vital part of the tapestry of the Missouri River's heritage.

Flora and Fauna

The distinctive ecosystem found in the proposed conservation areas comprises majestic geologic features, dynamic river processes, diverse ribbons of riparian vegetation, and nationally important fish and wildlife species. The landforms, stream channels, and native plant and animal communities provide a rare glimpse of the natural conditions experienced and encountered by early inhabitants. Although affected by reservoirs, flow regulation, and human-altered channels in some areas, the ever-changing Missouri still supports a diverse mosaic of channel habitats, including floodplains, side channels, backwaters, sandbars, pools, islands, and oxbow lakes. The river's diverse habitats are ecologically important both individually and collectively. Channel habitats are important for the interior least tern and pallid sturgeon and may provide habitat for the scaleshell mussel (all of which are federally listed as endangered) as well as the threatened piping plover and numerous other aquatic and terrestrial species.

The proposed conservation areas contain remnant wetlands, riparian cottonwood forests, bluff forests, and native prairies that provide habitat for many mammal and bird species. The continually changing banks and bluff faces exposed by the river provide nesting opportunities for darting bank and cliff swallows. Cottonwood forests—some more than 100 years old—provide key nesting and migratory stopover habitats in the expanse of the Great Plains for a diversity of rare woodland songbird species, as well as nesting and wintering habitat for our national bird, the bald eagle. These cottonwood forests tower over grasses, forbs, and shrubs teeming with insects, small mammals, and other wildlife. Delta deposits near the confluence of the Missouri and Niobrara Rivers provide regionally important habitat for a wide variety of nesting and migrating waterfowl and marshbirds, reptiles, and amphibians. Together, these natural features and qualities within the proposed NCCA and PBCA provide a valuable opportunity to study the ecological effects of a regulated river on channel processes, disturbance regimes, and plant communities in a natural and rural setting.

The waters and neighboring lands of the proposed NCCA and PBCA host an exceptional abundance and biodiversity of species—704 plant species and 424 fish and wildlife species. The NCCA and PBCA provide one of the last remaining examples of diverse, high-

quality, shallow-water habitat in a large river system. This rare assemblage is characterized by aquatic habitat in and around sandbar pools, braided channels, large woody debris, and backwater and oxbow areas where native fish species still occur and reproduce.

More specifically, this collection of shallow-water habitat features is home to one of the Nation's few populations of the endangered pallid sturgeon—a population that is particularly critical because it carries some genetic traits that do not occur outside the Missouri River. These reaches of the Missouri River system also host one of the best self-sustaining, healthy paddlefish populations in the Nation and a self-sustaining population of sauger, both of which are becoming uncommon throughout the country. The river is also home to shovelnose sturgeon (federally listed as threatened), various State-listed chub species, and the American eel, a species that is under review as a proposed candidate for Federal listing under the ESA. Also of note, the Missouri River within the proposed NCCA provides shallow-water habitat free of the invasive Asian carp, a condition that is unfortunately becoming highly uncommon in the region. Besides providing habitat for rare fish species, this assemblage of aquatic habitat is home to one of the highest diversities of mussel species in the region. Some of these reaches of the Missouri River provide prime habitat for sustaining healthy mussel populations and may be habitat for rare native species such as the scaleshell mussel, which is federally listed as endangered.

Flowing relatively unrestricted through the rural landscape between Nebraska and South Dakota, the Missouri River within the NCCA and PBCA supports an abundance of birds, mammals, amphibians, reptiles, and insects in a diverse riparian community that does not exist in artificially channelized sections of the river or around reservoirs. These reaches of the river provide one of the most important remaining complexes of natural sandbar and shallow foraging habitats on the Missouri River for the interior least tern and piping plover, which are federally listed as endangered and threatened, respectively. These in-river features host a multitude of other migrating and nesting waterfowl, marshbirds, and shorebirds. The sandbars serve as a migration stopover for many bird species, providing an integral component of their migratory flyway. The riparian woodlands along both banks are equally important to a great diversity of songbirds and raptors, including the bald eagle. In fact, the woodland and open-water habitats of these Missouri River reaches have proven essential for the recovery and sustainability of a healthy, vigorous bald eagle population in the United States. In addition, the diverse shallow-water and riparian habitats within the proposed NCCA and PBCA also support several rare amphibians and reptiles.

The river in this area is the Nation's only stronghold for false map turtles (listed as threatened in South Dakota) and supports healthy populations of eastern hognose snakes (listed as threatened in South Dakota), as well as populations of the increasingly rare spiny and smooth softshell turtles and northern leopard frogs (a species being studied for Federal listing). The Nebraska side of the river supports abundant cricket frogs, a species considered critically imperiled in South Dakota.

Water

The valuable aquatic habitat conditions of these reaches of the Missouri River are generated by dynamic river processes that continue to shape the landscape and waterscape. The resulting mosaic of high-quality habitat is exemplary because of the persistence of large islands, extensive river width, open river connectivity for aquatic species, natural exposed bedrock for spawning, and many important characteristics contributed by unaltered tributaries (such as water temperature, sediment loading, and spawning grounds). Despite regulated flow by the dams in the main stem of the Missouri River, natural flow variability still exists in tributaries such as the Niobrara, James, and Vermillion Rivers.

Geology

The Missouri River marks the boundary between glaciated ice age terrain and sediments deposited by an ancient sea. Distinctive geologic features occur along the Missouri River—for example, the majestic chalk bluffs, unusual marine fossils such as the "Ponca Monster," the culturally important Spirit Mound, the exemplary oxbow Burbank Lake, and the rare Ionia Volcano.

The dynamic Missouri is the central feature of the proposed conservation areas. The river's behavior of flooding and extensive migration across the valley bottom exposed magnificent bluffs and marine fossils. Constantly changing channel conditions create the numerous habitat features, described above, that combine to create the rich fish and wildlife habitat of the area. Erosion and deposition create braided channels, cutbanks, and highly mobile streambeds that expose old sediment deposits and cause large trees to fall into the river, adding to habitat complexity. The wide floodplain contains numerous channel migration scars, wetlands, oxbow lakes, and abandoned chutes

attesting to a dynamic history of channel change. The James and Vermillion Rivers occupy former Missouri River channels, and the 1881 flood created a meander cutoff that allowed the Vermillion River to flow into the old Missouri River channel. Sanctuary and Goat Islands were created by the Missouri River long ago—they hold remnant, old-growth cottonwood forests that provide habitat for bald eagles, migrating songbirds, and other wildlife.

The underlying geology of the Missouri tributaries varies considerably, and the tributaries influence the river in different ways. The Niobrara River, fed by groundwater from the Nebraska Sandhills, releases an abundance of sandy sediment into the Missouri, causing extensive channel braiding at their confluence down to the delta above Lewis and Clark Lake. Farther downstream, the James and Vermillion Rivers flow through glacial terrain, carrying silt and clay into the Missouri River to create murky, turbid waters that are important to aquatic species such as the pallid sturgeon.

Recreation

The proposed conservation areas provide a multitude of recreational opportunities that are regionally significant, including numerous types of motorized and nonmotorized boating as well as unparalleled birding, fishing, biking, hiking, hunting, and photographic and artistic opportunities. Recreational activities on the Missouri and Niobrara Rivers range from highly challenging paddlefish archery to simply floating with the current.

Because of the wide, meandering, and braided channels of this large river system, significant numbers of visitors can participate in a variety of recreational activities while still finding opportunities for solitude that a smaller river could not afford. The uncrowded natural setting provides a sense of isolation, yet it is easily accessible from a number of urban areas in the region. The ready accessibility, along with the highly dynamic river processes, allows visitors to frequently re-explore the river's new channel features and conditions.

These many recreational opportunities connect people to the river, its history, and its setting. Their experiences are further enriched by the variety of access points, interpretive facilities, and land and water trails. The Missouri River Water Trail provides marked access points and self-guided paddling trips throughout the recreational river. Clean air and water; varied and dynamic natural landscapes; and dispersed, multiseason recreational opportunities distinguish the Missouri and Niobrara Rivers from other rivers in the region.

Nick Kaczor / FWS

Nick Kaczor / FWS

Wayne Nelson-Stastny / FWS

Recreational opportunities connect people to the river, its history, and its setting.

Besides providing abundant recreational opportunities, these stretches also provide residents with the opportunity to maintain a working landscape in scenic settings unlike any remaining in the lower half of the intensively altered Missouri River. Chalkstone bluffs, rolling river valley hills, riparian forests, and weaving braided channels provide the setting for memorable Missouri River experiences.

The accessibility of these reaches provides opportunities for visitors to connect with the Missouri River, whether they are in a canoe, on a trail, or in a

duck blind. Without the conservation efforts described in the LPP, future generations may not have the opportunity to experience the wild Missouri River.

2.3 Project Vision

The purpose of the NCCA and PBCA is to provide for the long-term viability and function of the Missouri River and its tributaries through the conservation of existing habitats or through restoration of those habitats. This will benefit threatened and endangered species, recreational access, migratory birds, cultural sites, scenic vistas, and geologic formations all while contributing to the local economy and supporting working landscapes. The vision for this project is stated below.

Through collaboration with landowners, communities, tribes, and other agencies, the Niobrara Confluence and Ponca Bluffs Conservation Areas will provide sustainable ecological and economic benefits within the middle Missouri River basin by maintaining native riparian and upland habitats that increase river functionality and recreational opportunities.

2.4 Project Goals

To accomplish this purpose and vision outlined above, the following goals have been established for the proposed NCCA and PBCA:

- *Local economies and tourism*—help sustain local economies through preserving working farm and ranch landscapes and conserving lands, both of which will attract tourists from across the Nation.
- *Partnerships and collaboration*—develop and foster partnerships with local landowners, communities, tribes, and others by offering financial incentives, sharing knowledge, or collaborating on projects with ecological benefits.
- *Ecological and river functionality*—increase river and ecological functionality by improving water and air quality, maintaining healthy native plant communities such as cottonwood galleries, increasing floodplain connectivity, promoting active channel processes, and reducing flood risk.
- *Cultural resources*—in consultation with our partners, locate, document, and evaluate cultural resources and encourage preservation and interpretation when appropriate.
- *Recreational opportunities*—increase recreational opportunities for residents and visitors.
- *Wildlife, fisheries, and their habitats*—support the recovery and protection of threatened and endangered species and reduce the likelihood of future listings under the ESA, while continuing to provide migration habitats for millions of migrating birds and habitats for resident fish and wildlife populations.

Chapter 3—Alternatives

FWS

Whooping cranes are a spectacular sight in the Missouri River basin.

This chapter describes the management alternatives for the proposed NCCA and PBCA. These alternatives are different approaches to management that are designed to achieve project purposes, vision, and goals; the mission of the Refuge System; the legislated mandates of the Wild and Scenic Rivers Act; the mission of the FWS; and the mission of the NPS. Alternatives are formulated to address significant issues, concerns, and problems that we identified with input from cooperating agencies, interested groups, tribal governments, and the public during public scoping and throughout the development of the LPP. Chapter 1 provides a summary of these issues.

3.1 Criteria for Alternatives Development

Following the initial public scoping process in the winter of 2012, we held meetings and workshops with the cooperating agencies and identified a reasonable range of preliminary alternatives. Some ideas were eventually dismissed; those are discussed below in section 3.6. We carried forward the following four alternatives and analyzed them in detail in this EIS:

- "Alternative A—No Action"
- "Alternative B—Minimal Conservation Action"
- "Alternative C—Moderate Conservation Action" (preferred alternative)
- "Alternative D—High Conservation Action"

These alternatives provide different levels of permanent protection and restoration for fish, wildlife, plants, habitats, culturally significant sites, recreation access, and other resources and different opportunities for the public to engage in compatible wildlife-dependent recreation. The action alternatives—alternatives B through D—incorporate spe-

cific actions intended to achieve the goals described in chapter 2. However, the no-action alternative—alternative A—represents the current management direction, which may not meet future goals and objectives. The no-action alternative provides a baseline against which to compare alternatives B, C, and D.

Protection Priorities and Ranking Criteria for Alternatives B–D

To identify and rank sites in the project areas, we worked in consultation with internal FWS divisions (Migratory Birds, Fisheries, Ecological Services) and the cooperating agency team and chose to develop protection priorities based on a prior extensive group effort to determine and quantify the ORVs of the MNRR (NPS 2012). The ORVs were developed in fall 2011 by a group of more than 60 subject matter experts, interested stakeholders, and other river partners to help guide the management of the MNRR. The ORVs that were identified are listed below:

- Cultural
- Ecological
- Fish and Wildlife
- Geological
- Recreational
- Scenic

We used a two-pronged approach to landscape prioritization. The first component was to investigate a suite of focal fish and wildlife species, their habitats, and overall river function (Ecological and Fish and Wildlife ORVs). The second component was to investigate recreational access, scenic qualities, and the potential for sites to contain culturally significant sites (Cultural, Geological, Recreational, and Scenic ORVs).

Focal Species Prioritization

We selected a suite of fish and wildlife species that we felt were representative of a functional river ecosystem. Each of these focal species represents a group of species that are vulnerable to the same threat processes (Caro and O'Doherty 1999). The selected species are the bald eagle, pallid sturgeon, least tern, and piping plover.

All four species are Federal trust species or have State or regional conservation status, making them worthy of protection on their own; however, conserving habitat for these species would also protect habitat for other species with similar habitat requirements. In this way, these species serve as indicators of overall river functionality and health. In addition, species like the bald eagle are significant to many American Indian tribes.

Point data (such as capture locations or nest sites) for the four species were available from various research or monitoring studies conducted within the proposed conservation areas (figures 4, 5, and 6); however, no conceptual models or species-specific models have been developed for the action area in its entirety. Accordingly, we chose to identify the habitats those species were using and extrapolate to the entire action area. Using the finest scale available land cover dataset that covered the entire action area (LANDFIRE 2006), we identified the vegetation community (or land cover) types that correlated to the extensive point data for these species. We then ranked the land cover data relative to the species locations, with land cover classes in red and yellow representing 79.6 percent of bald eagle nest locations, 97.4 percent of pallid sturgeon capture locations, and 97.6 percent of least tern and piping plover nest sites (figure 7). We then classified the remaining land cover types according to their biological significance for the focal species, with grasslands and forestlands ranked as medium priority and row-crop agricultural lands and developed areas (roads and cities) ranked as the lowest priority.

In addition, we mapped characteristics that support or inhibit overall river function as shown in figure 8. These characteristics were:

- the historical floodplain of the Missouri River and its tributaries;
- confluences of tributaries with the Missouri River;
- large islands;
- areas with artificially stabilized banks that do not protect river management infrastructure (tailraces), major highways, cities, or private residences.

Historical floodplains were mapped because that characteristic is a key attribute necessary to support the processes associated with hydrology, sediment transport, and the transformation of organic and inorganic materials in river and riparian systems—for example, up and down channels, between chan-

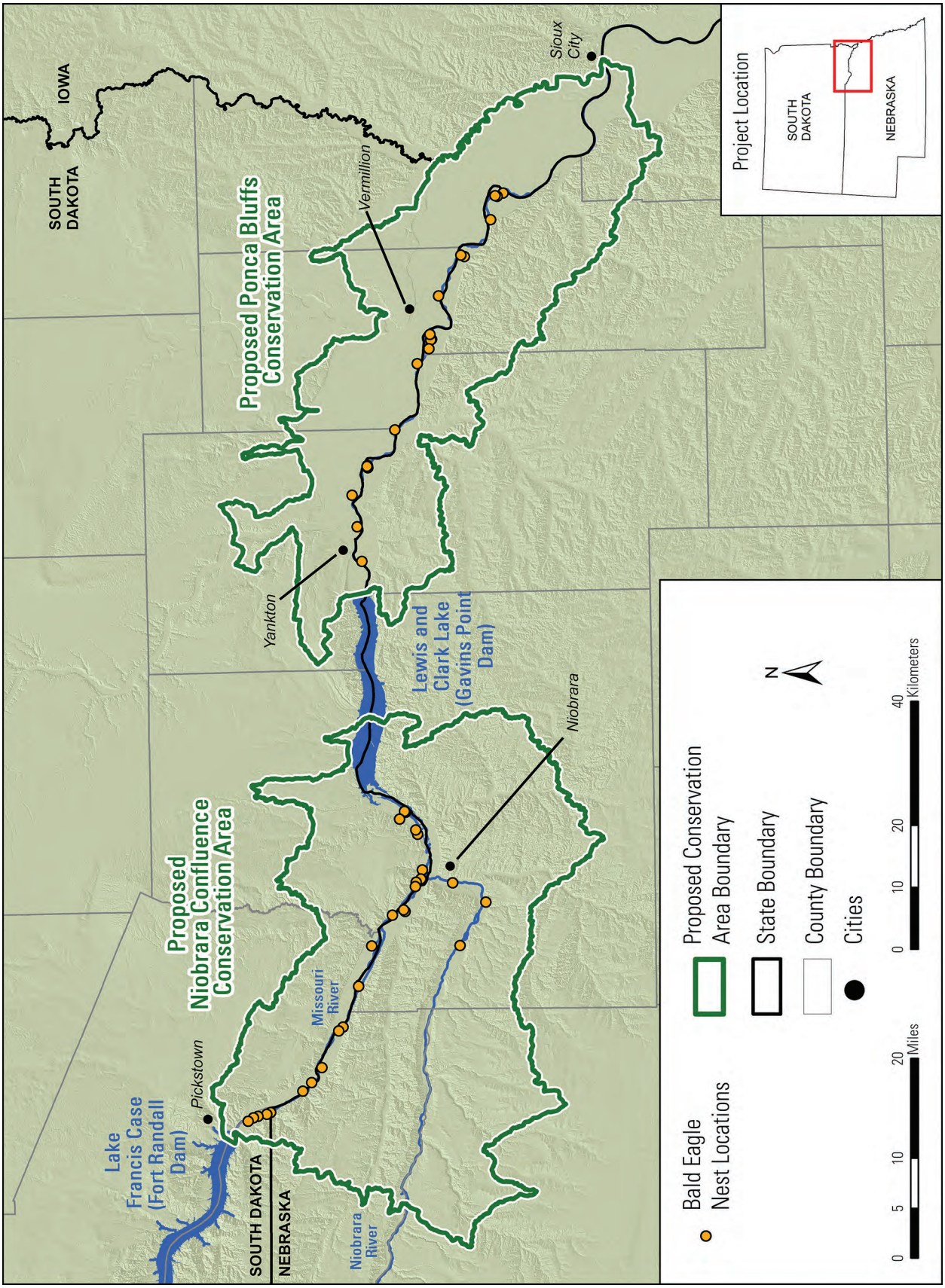

Figure 4. Bald eagle nest locations in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

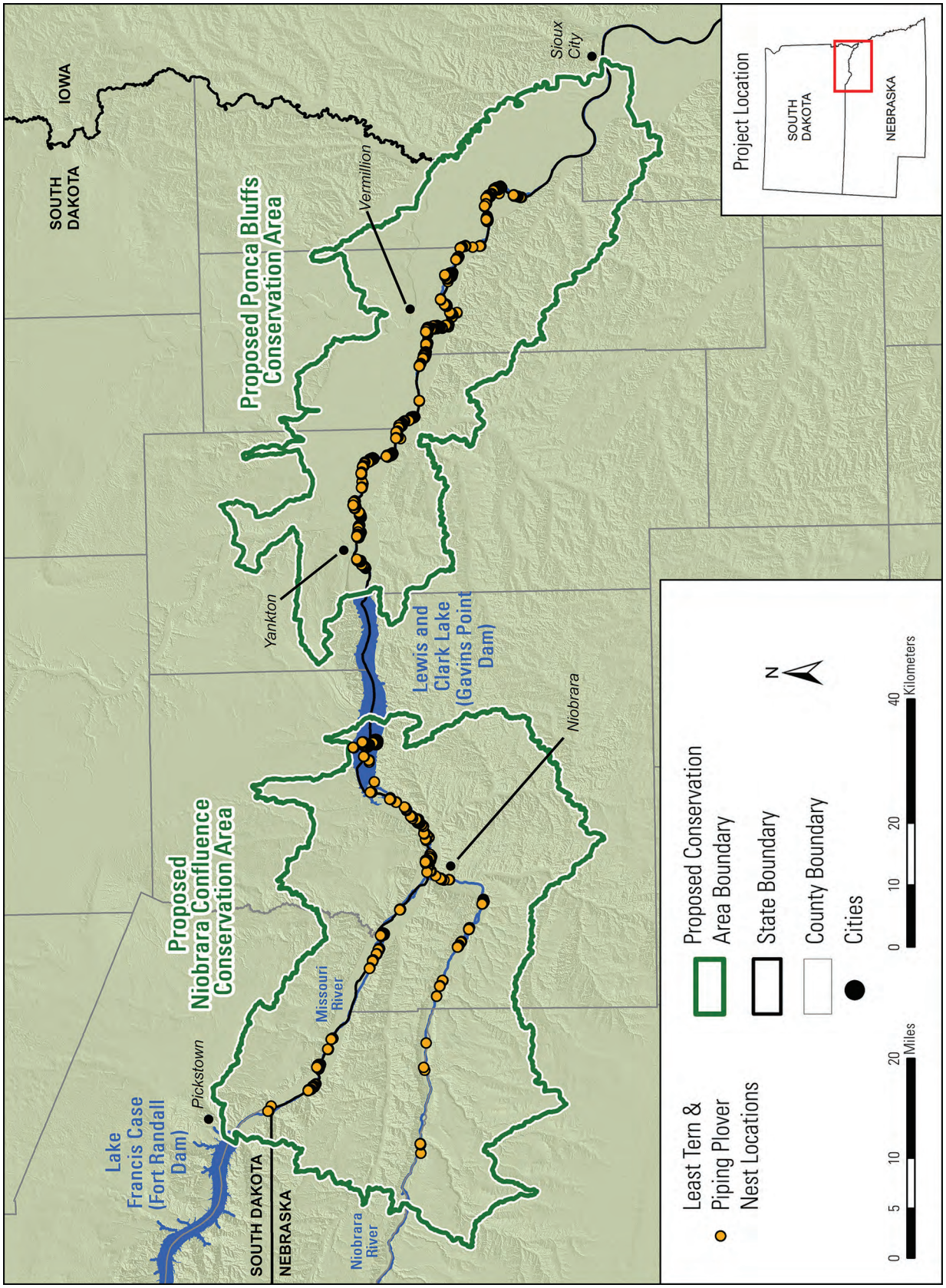

Figure 5. Least tern and piping plover nest locations in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

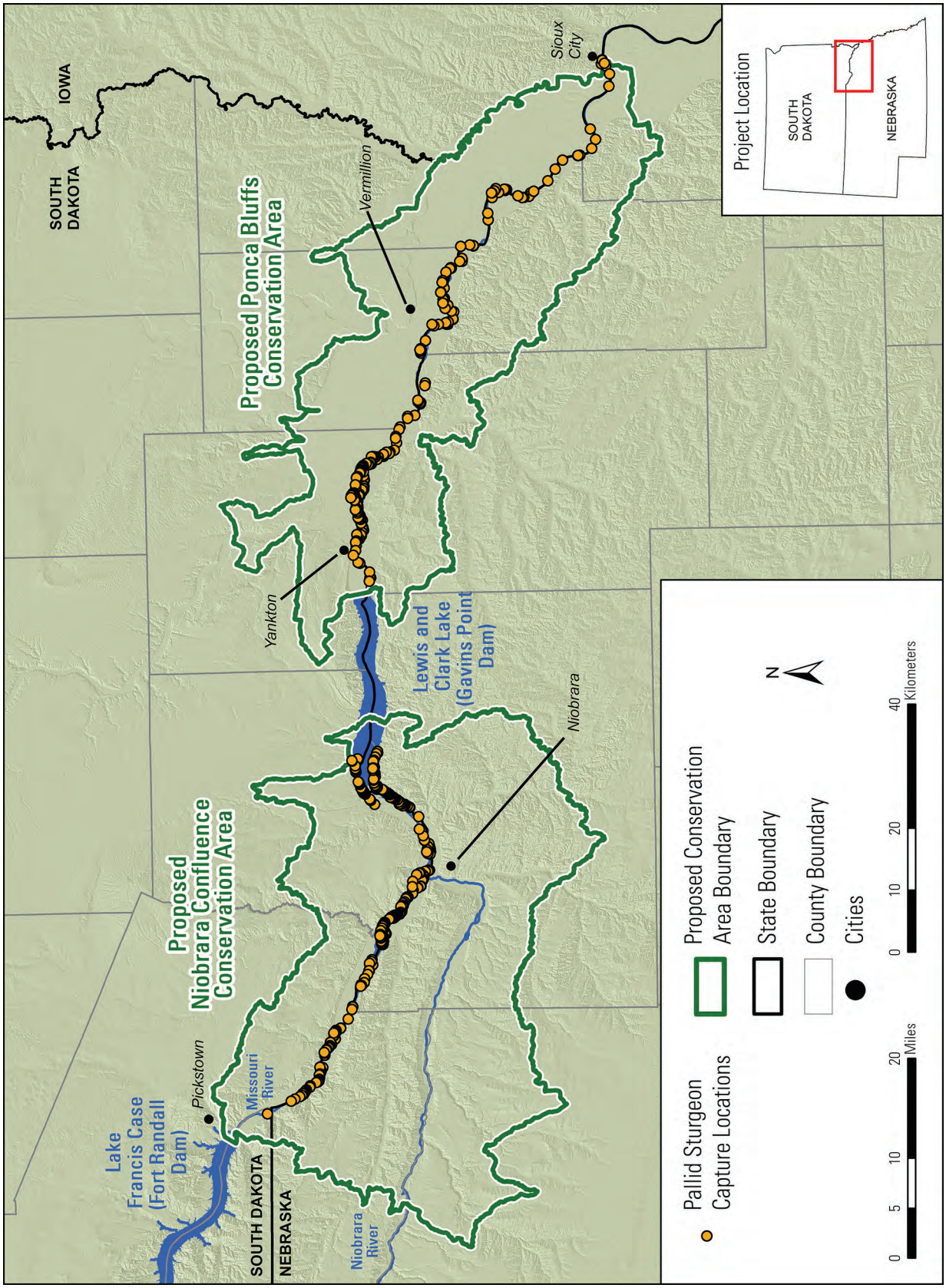

Figure 6. Pallid sturgeon capture locations in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

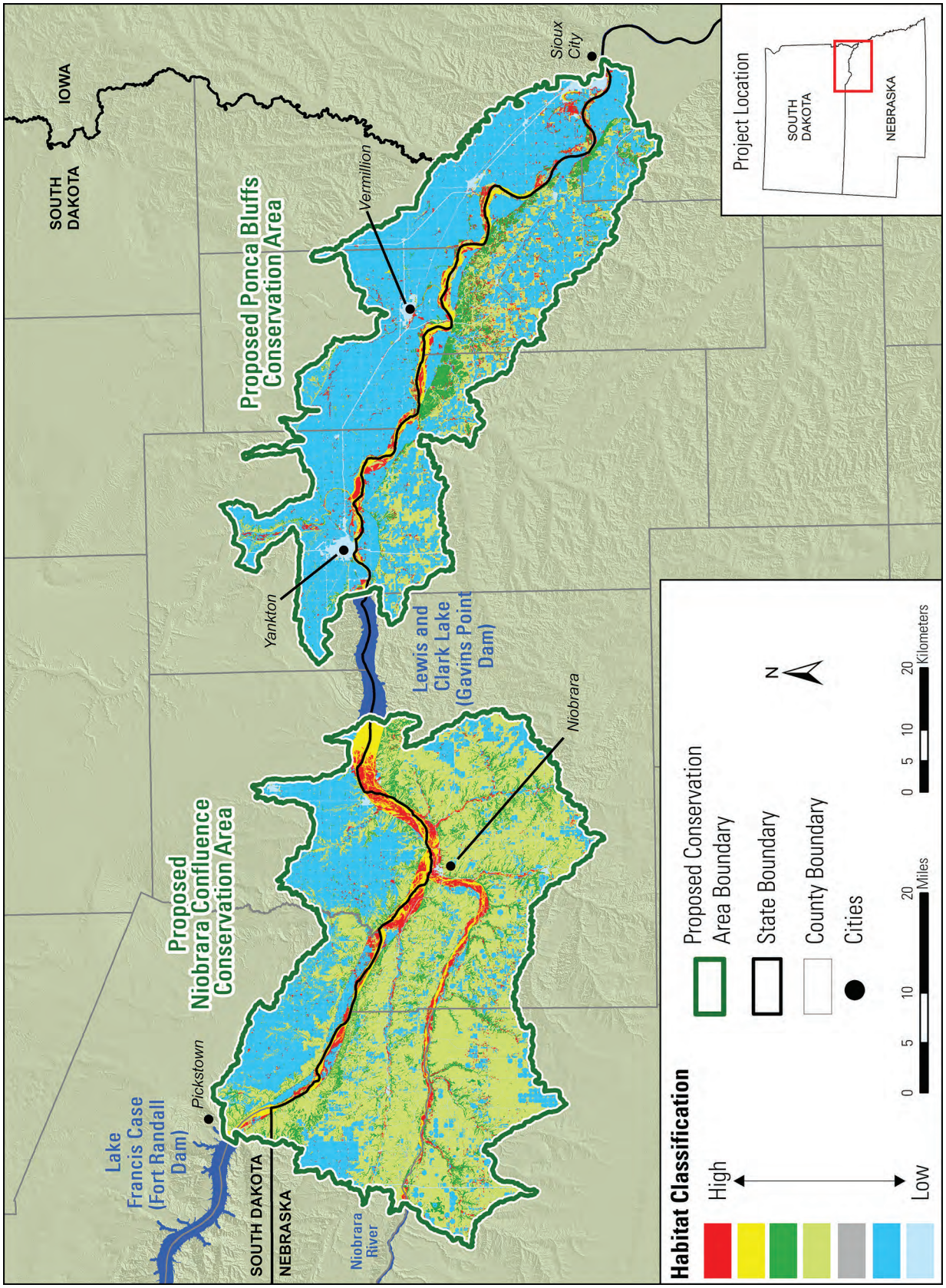

Figure 7. Focal species habitat prioritization in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

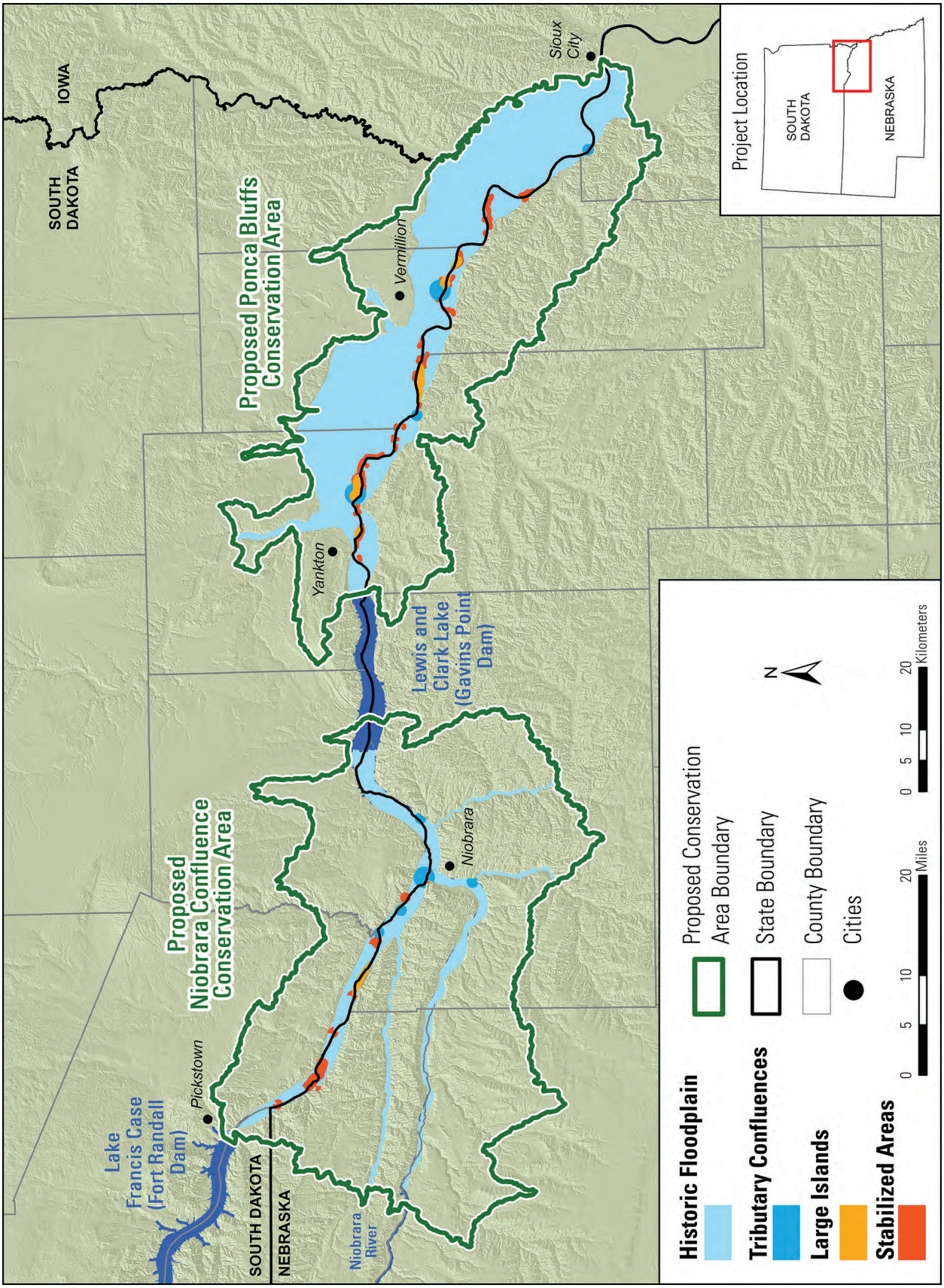

Figure 8. River features in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

nels, and between riparian areas and floodplains (The Nature Conservancy 2008).

Confluences were mapped because they contribute organic and inorganic materials and physical habitat features that may be locally important in the watershed (The Nature Conservancy 2008). Moreover, the Niobrara River confluence is a unique site where a sediment-rich river (the Niobrara) meets a river that is generally considered to be sediment-hungry (the Missouri). The confluence, because of these characteristics, provides optimal habitat conditions for species like the pallid sturgeon.

Large islands were mapped because many of them provide dynamic habitat conditions ranging from barren sandbars to old-growth cottonwood galleries and mature lowland forests of ash and elm. These sites are also known for supporting nesting colonies of turtles, an important indicator of overall river function (NPS 2012).

After the floodwaters receded in fall 2011, MNRR and the Missouri River Institute at the University of South Dakota collaborated on a bankline inventory for MNRR. The purpose of this study was to create a database that contains bank descriptions and their locations, including any processes that were occurring at the time of data collection (such as erosion and tree loss), detailed information on stabilization if it was present, and any areas in need of cleanup. We used these data to identify where portions of the Missouri River are being inhibited from natural flow patterns and where potential restoration could occur. Areas with stabilized shorelines were not included if they protect river management infrastructure (tailraces), major highways, cities, or private residences.

Cultural, Geological, Scenic, and Recreation Prioritization

NPS cultural resource experts developed a cultural resource sensitivity model that identified areas that are potentially sensitive for cultural resources (figure 9). The model identifies high- and medium-sensitivity zones in the two conservation areas on the basis of environmental characteristics of known archeological sites within the administrative boundary. Three attributes were used to create the model: archeological site locations, distance to water, and slope.

Chalkstone bluffs, a prominent geologic and scenic feature in the NCCA and on the south side of the Missouri River in the PBCA were mapped in a Geographical Information System (GIS) database using digital elevation models (figure 9). These areas, besides providing scenic value, also make a crucial contribution to river functionality in the form of sediment. Rivers continually use dynamic forces to move sediment throughout the floodplain. Much of this sediment is initially derived from river bluffs.

Current recreational access sites (such as boat ramps) were identified in a GIS layer (figure 10). We established a 500-meter buffer, which allowed us to prioritize a small but reasonable management area around existing access to maintain access to those sites. We then examined where on the Missouri River more access may be needed based on comments from the public and requests from agencies, tribes, or other stakeholders; we also considered areas where more access may be necessary to increase human safety. We incorporated the conservation of existing public access sites through the use of a boundary length modifier (described in the next section); this approach allowed us to identify a network of conserved areas.

Overall Landscape Prioritization

The species-specific maps (figures 4, 5, and 6) are useful for determining where in the landscape the key habitats for the focal species occur. However, they do not help decisionmakers with determining which areas would provide the most effective conservation returns overall.

Besides the presence or absence of habitat for individual species, it is important to consider issues such as connectivity, cost, and unequal conservation need for each species. Accordingly, the software package Marxan (Ball, Possingham, and Watts 2009), with its simulated annealing algorithm, was used to identify "optimal" solutions for conservation prioritization in the NCCA and PBCA. Marxan permits the user to specify individual conservation targets for conservation features (in this case, area of focal species habitat) and species-specific penalties for models that do not meet conservation targets. This feature allows the user to individually weight features—for example, the program can assign penalties for not including enough habitat for species of higher conservation concern, or can reduce the amount of land necessary for generalist widespread species. By designating a boundary length modifier, the user can generate a more compact reserve system. The landscape can also be classified by cost; this attribute can be as simple as land area, or it can be made more complex and meaningful by accounting for variables such as land costs or metrics of the human footprint.

Because of the flexibility allowed by Marxan, the values for the selected parameters need to be optimized by successive iterations of the program. For this analysis, hexagonal planning units were selected, as these have been shown to result in less fragmented, more efficient reserve networks (Nhancale and Smith 2011). Hexagons encompassed 20 acres (approximately 8.1 hectares), providing resolu-

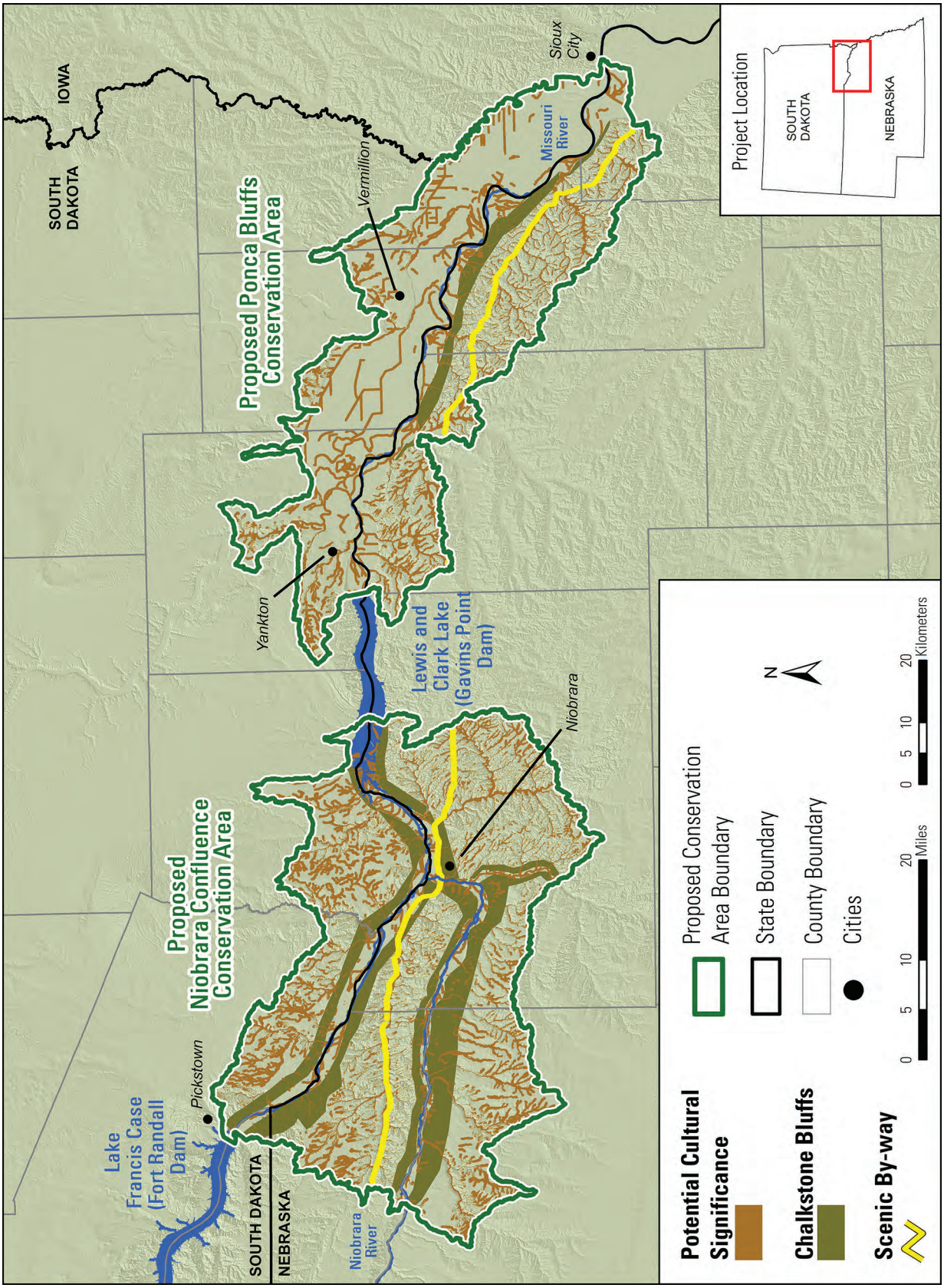

Figure 9. Chalkstone bluffs and historical trails in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

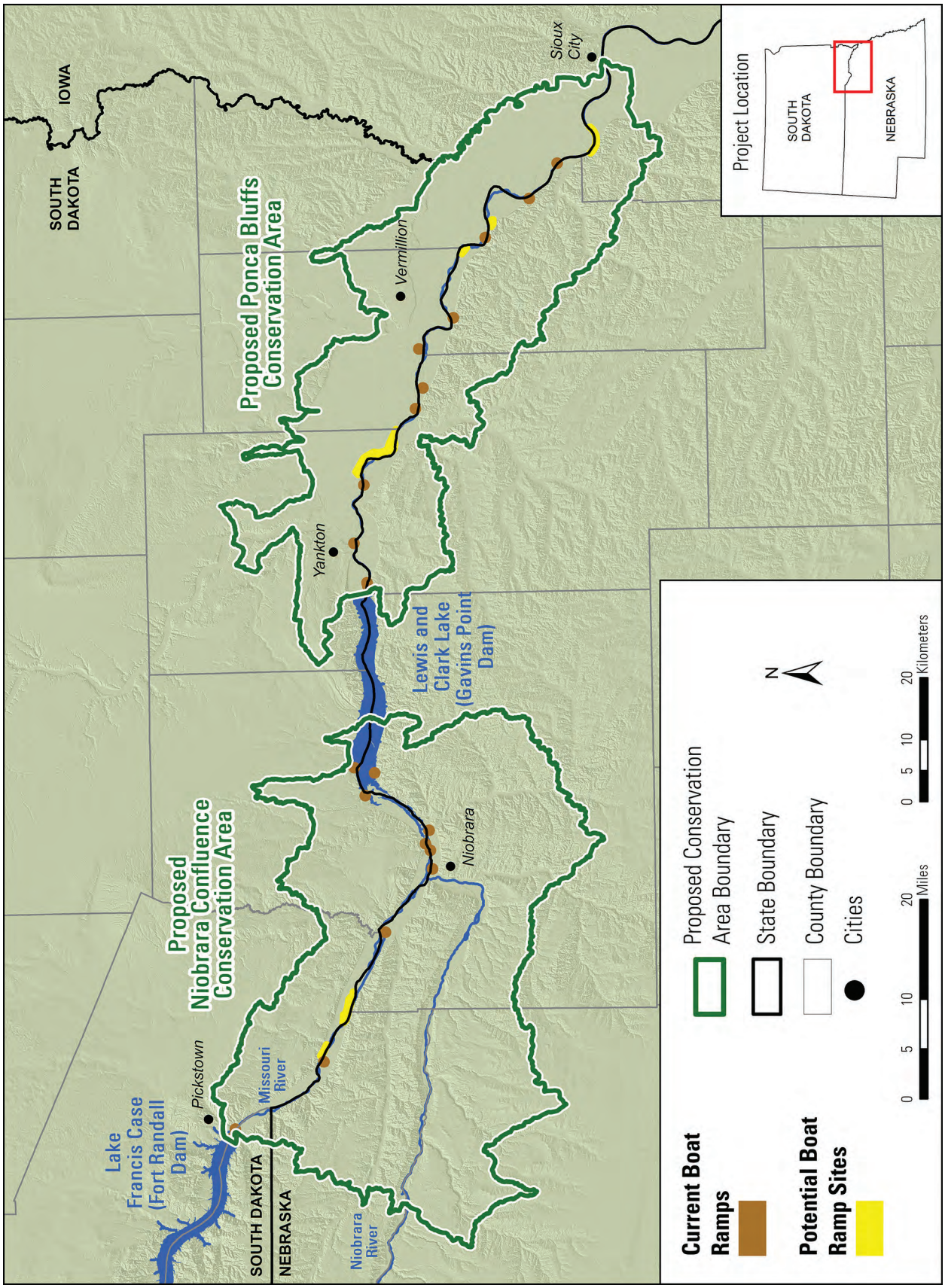

Figure 10. River access points in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

tion that is sufficient for making land protection decisions while covering the project areas in few enough planning units to be computationally manageable. Hexagons already in a permanent protected status (that is, existing conservation easements or land already owned by the FWS or the NPS in fee title) were locked into the model because they typically met the objectives of the NCCA and PBCA. However, lands owned by federally recognized tribes were excluded from the model because discussions and formal consultation with the tribes suggested that other methods would be more viable than land acquisition to achieve conservation goals. Marxan was run for 100 runs at 100 million iterations. The species-specific data were included as features in the Marxan model. A boundary length modifier of 0.001 was used to create a slightly more compact reserve network. Increasing that value to 0.01 oversimplified the reserve network and did not meet the intent of the NCCA and PBCA.

Targets for protection were set at 40, 50, and 60 percent of the land supporting focal species habitats or essential river features (Ecological and Fish and Wildlife ORVs) for alternatives B–D, respectively. Targets for Cultural, Geological, Scenic, and Recreation ORVs were set at 20, 25, and 30 percent of the entire landscape for alternatives B–D, respectively. We developed individual models for each proposed conservation area and alternative (figures 11–13).

Evaluation of Easement Potential

As described earlier, acquisition of conservation easements is not a new tool for achieving conservation objectives in the NCCA or PBCA; the Nebraska NRCS holds a number of easements, and nongovernmental organizations hold several easements in the action area. These organizations have missions that are not identical to ours but that share many objectives.

The landscape modeling described above has generated maps of species-specific conservation priorities for each of the focal species, as well as a consensus map that shows where conservation returns for Federal funds would be maximized for the suite of species examined. Biologists and realty specialists would work cooperatively to use these tools to identify parcels where conservation efforts would result in the greatest benefit to trust species.

When a willing seller approaches us, or if we wish to proactively seek out sellers, the following criteria would guide our decisionmaking:

- *Overall conservation value*—is the property located, in whole or in part, in an area that was selected in 60 percent or more of the spatial conservation priority runs in Marxan?
- *Trust species value*—does the parcel contain priority habitat that was identified in any of the species-specific maps developed as part of this exercise?
- *Previously unidentified conservation value*—if neither of the preceding thresholds is reached, is there another compelling reason (such as promoting critical habitat connectivity, identification of new species of conservation concern, simplified management of an existing refuge unit, or donation of intact or easily restored habitat) that justifies the property's protection?

Nothing in these guidelines is intended to limit the appropriate exercising of discretion and professional judgment by realty specialists and refuge staff. Potential acquisitions would be subject to scrutiny to determine (1) that acquisition would comply with realty policy, and (2) that the habitat for which the property was identified as a priority is, in fact, present on the parcel. As mentioned above, there may also be more reasons why acquisition of interest in a parcel is justified, even if the parcel did not rank highly in models for selected priority trust species at the time that this plan was approved.

3.2 Elements Common to All Alternatives

Key management elements will be included in the final EIS and LPP. Regardless of the alternative selected, we would comply with all laws, regulations, and policies pertaining to management activities that could affect conservation area resources such as soil, water, air quality, threatened and endangered species, and cultural resources. Such activities include subsurface mineral reservations and the management of utility lines, easements, contaminants, and invasive species. Specific elements common to all alternatives are as follows:

- The Lake Andes Wetland Management District, a unit of the Lake Andes National Wildlife Refuge Complex, will continue to manage waterfowl production areas and easements associated with wetlands and grasslands in the Prairie Pothole Region.

- The NPS will continue to manage the 39-mile and 59-mile districts of the MNRR as a national recreational river as designated by Congress through the Wild and Scenic Rivers Act.

- The FWS's Partners for Fish and Wildlife program will continue to work with willing landowners on site-specific conservation projects such as water improvements, wetland restoration, grazing plans, and other projects. (Please refer to www.fws.gov/partners for further information on this effort.)

- We will continue to work with Missouri River basin initiatives such as the MRRP and other efforts of the Missouri River Recovery Implementation Committee.

- We will continue to work toward the goals outlined in the recovery plans for piping plover, least tern, and pallid sturgeon.

Specific elements common to all action alternatives (B–D) are as follows:

- We propose to use conservation easements on 80 percent of the lands conserved to reduce impacts on local tax bases, while still achieving the objectives and strategies identified in section 3.8.

- Achieving conservation actions would be contingent on willing landowners and project funding. Accordingly, there can be no estimated completion date, but for the purposes of this analysis we have assumed the conservation areas can be fully realized over a period of 50 years.

- If the LPP is approved, the FWS would develop an interim conceptual management plan for fee-title lands until a CCP can be completed. The interim plan would help guide potential management of acquired parcels in the short term and would include items such as interim compatibility determinations.

3.3 Descriptions of Alternatives

Summaries of alternatives A–D are presented below. For each action alternative (B–D), the summary indicates what percentage of the total landscape would be conserved and how conservation efforts would be allocated. Maps showing conservation area boundaries and priorities for each action alternative are also included. Section 3.9 presents a summary of conservation efforts for all alternatives.

Summary of Alternative A—No Action

Under the no-action alternative, the areas outside existing protected areas would largely remain privately owned and subject to changes in land use or habitat type. However, some additional protection is likely because of ongoing conservation easement initiatives by public entities such as the NRCS and the USACE and nongovernmental organizations such as Northern Prairie Land Trust and The Nature Conservancy.

The NPS would continue to manage the 39-mile and 59-mile districts of the MNRR as a national recreational river and would continue acquisition of lands under the authority outlined in section 6 of the Wild and Scenic Rivers Act. However, this authority authorizes fee-title acquisition of no more than 100 acres per mile, on average, on both sides of the river.

Under this alternative, much of the privately owned riparian corridor and uplands that are vulnerable to conversion to nonnative conditions or other destruction may be lost. The burden of conserving lands without compensation would lie more heavily on private landowners and other conservation entities, and a large extent of marginal lands would not be restored.

Summary of Alternative B—Minimal Conservation Action

We would work with willing landowners and communities to strategically conserve up to approximately 5 percent of the total project area (red and orange areas in figure 11) through conservation easements on 4 percent of the landscape and fee-title acquisition of 1 percent. The acquisition goals would

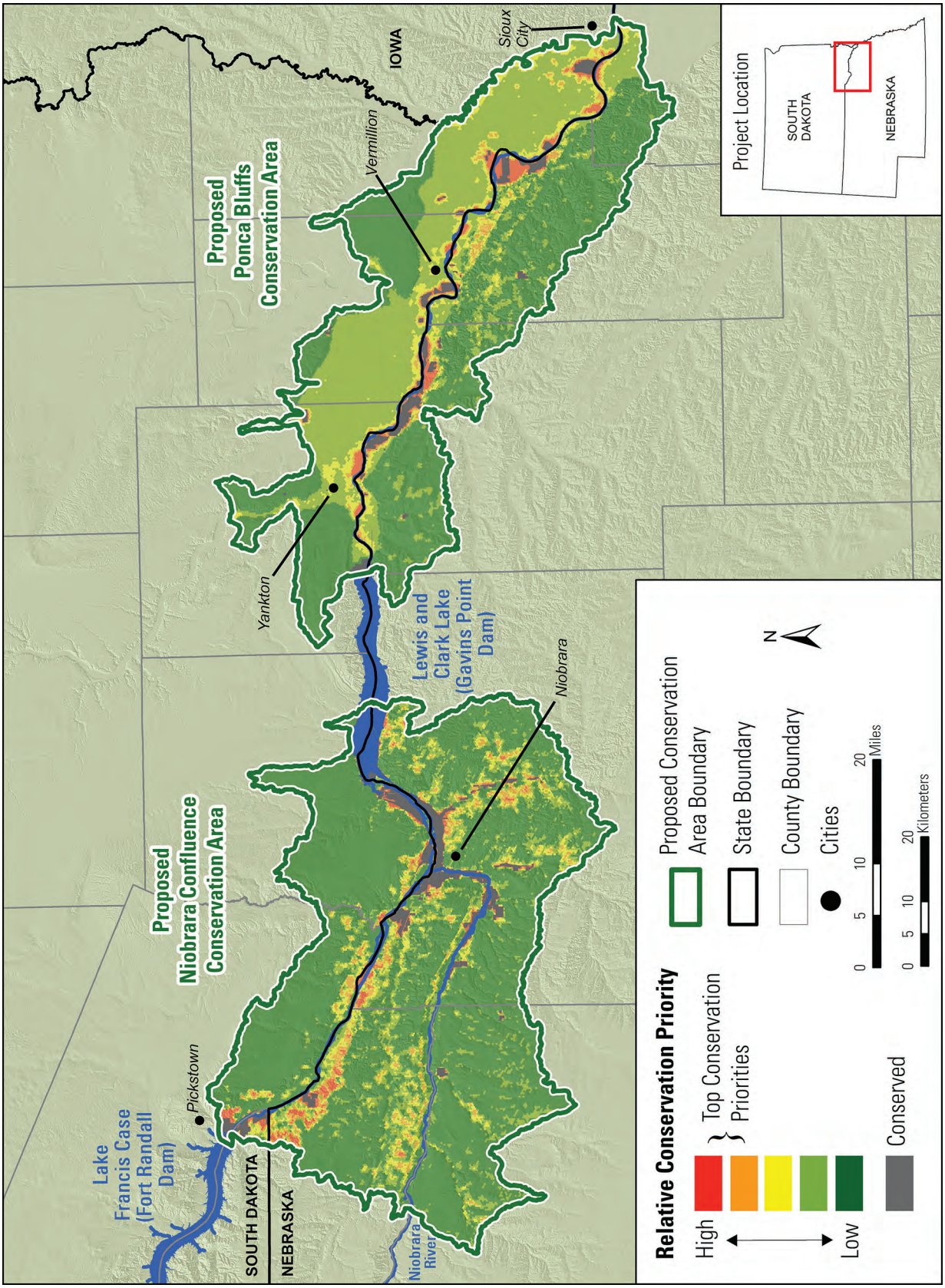

Figure 11. "Alternative B—Minimal Conservation Action" for the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

be 40,000 acres for the NCCA and 30,000 acres for the PBCA. Under alternative B we would protect:

- 40 percent of floodplain riparian habitats and important ecological attributes;
- 20 percent of upland grasslands and forests;
- 20 percent of historic trails and cultural sites;
- 20 percent of recreational access sites.

Draft conservation easement concepts are as follows:

- Unless prior approval in writing is granted by the FWS or the NPS, landowners will maintain permanent vegetative cover consisting of grasses, forbs, low-growing shrubs, and trees on easement lands and abide by the following restrictions:
  - Haying, mowing, and seed harvesting for any reason will not occur before July 15 in any calendar year.
  - Grassland, wildlife habitat, or other natural features will not be altered by digging, plowing, disking, or otherwise destroying the vegetative cover, and no agricultural crop production can occur on the habitat areas delineated.
  - Draining, filling, and leveling of wetlands will be prohibited.
  - Altering and stabilizing the riverbank and shoreline will be prohibited.
  - Livestock confinement facilities such as feedlots will be prohibited.
- Grazing will be permitted on the easement land at any time throughout the year without approval in writing.
- Grantors will pay taxes and assessments, if any, that may be levied against the easement land.
- Noxious weed control will remain a responsibility of the landowner.
- If the landowner would like to allow public access, the easement will be held by the NPS under an additional access agreement; if the landowner wishes to exclude public access, the easement could be held by either agency.
- This easement and the covenants and agreements contained herein will run with the land and will be binding on all persons and entities who come into ownership or possession of the lands subject to this easement.

Lands purchased in fee title would be restored (if needed) to native conditions and subsequently managed to meet the goals and strategies discussed in section 3.4 below and in detail in the LPP.

Summary of Alternative C—Moderate Conservation Action (Preferred Alternative)

We would work with willing landowners and communities to strategically conserve up to approximately 10 percent of the total project area (red and orange areas in figure 12), using conservation easements on 8 percent of the project area and fee-title acquisition of 2 percent. The acquisition goals would be 80,000 acres for the NCCA and 60,000 acres for the PBCA. Under alternative C we would protect:

- 50 percent of floodplain riparian habitats and important ecological attributes;
- 25 percent of upland grasslands and forests;
- 25 percent of historic trails and cultural sites;
- 25 percent of recreational access sites.

Easement terms would be the same as those under alternative B. Additionally, lands purchased in fee title would be restored (if needed) to native conditions and subsequently managed to meet the objectives and strategies discussed in section 3.4 below and in detail in the LPP.

Summary of Alternative D—High Conservation Action

We would work with willing landowners and communities to strategically conserve up to approximately 15 percent of the total project area (red and orange areas in figure 13), using conservation ease-

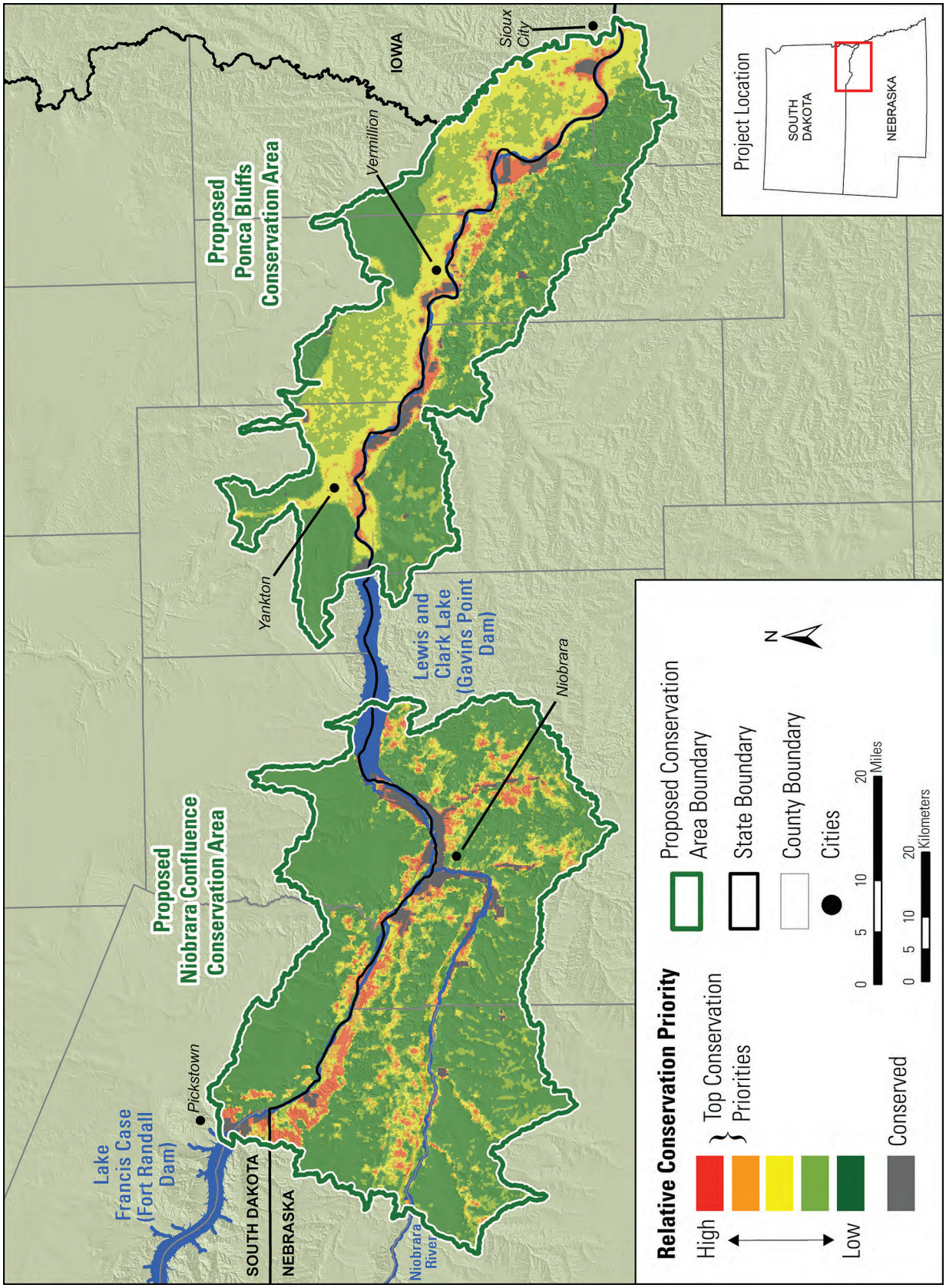

Figure 12. "Alternative C—Moderate Conservation Action" for the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

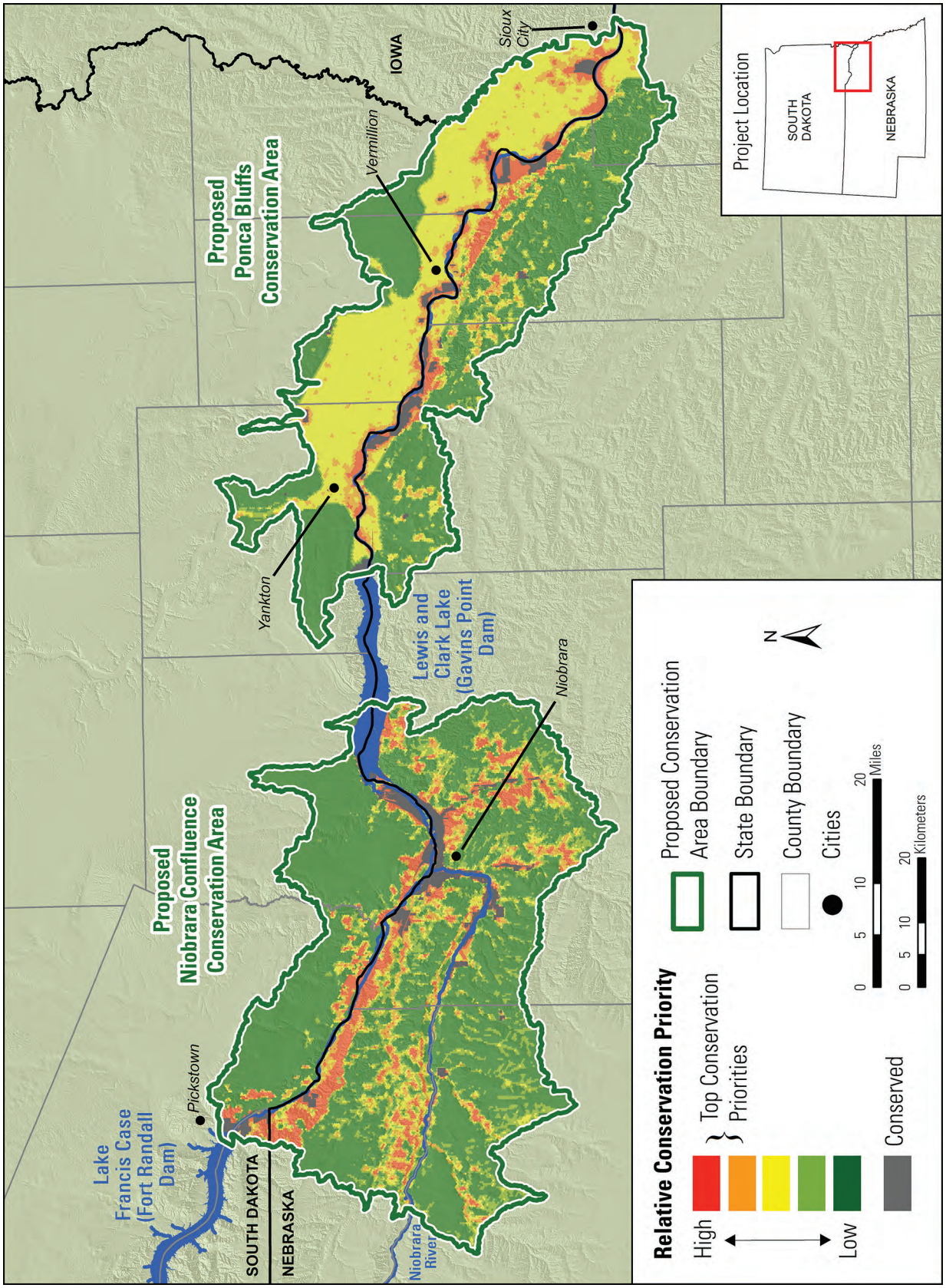

Figure 13. "Alternative D—High Conservation Action" for the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

ments on 12 percent of the project area and fee-title acquisition of 3 percent. The acquisition goals would be 120,000 acres for the NCCA and the 90,000 acres for the PBCA. Under alternative D we would protect:

- 60 percent of floodplain riparian habitats and important ecological attributes;
- 30 percent of upland grasslands and forests;
- 30 percent of historic trails and cultural sites;
- 30 percent of recreational access sites.

Easement terms would be the same as those under alternatives B and C. Additionally, lands purchased in fee title would be restored (if needed) to native conditions and subsequently managed to meet the objectives and strategies discussed in section 3.4 below and in detail in the LPP.

3.4 Goals and Strategies

Each action alternative is designed to address the goals listed in chapter 2. This section summarizes the actions by which the following goals would be achieved:

- local economies and tourism
- partnerships and collaboration
- ecological and river functionality
- cultural resources
- recreational opportunities
- wildlife, fisheries, and their habitats

These goal categories and the strategies to attain these goals are discussed below. Because the action alternatives only differ by level and focus of conservation effort, the strategies for each of these alternatives are identical.

Local Economies and Tourism Goal

Help sustain local economies through preserving working farm and ranch landscapes and conserving lands, both of which will attract tourists from across the Nation.

Discussion

Conservation easements are valuable conservation tools because they allow for the preservation of habitat while maintaining working farm and ranch landscapes like farmlands and rangelands. Consequently, this approach would be cost effective and socially and politically acceptable. Furthermore, conservation easements allow lands to remain privately owned and on local tax rolls while still providing lifelong conservation value to the public. Landowners would be compensated for conserving their properties in perpetuity in a native condition—promoting the growth of native grasses, shrubs, and trees; eliminating or reducing invasive species; and protecting culturally significant sites. In return, these landowners would have money available to use how they see fit, and this money would eventually enter the local economy.

The action alternatives call for an 80-percent to 20-percent ratio of conservation easement to fee-title acquisition.

Strategies

- Provide for a healthy, natural river system that attracts local and other tourists to the area by conserving lands and increasing access to those sites.
- Emphasize conservation through the acquisition of easements to help support and maintain vital local economies.

Partnerships and Collaboration Goal

Develop and foster partnerships with local landowners, communities, tribes, and others by offering financial incentives, sharing knowledge, or collaborating on projects with ecological benefits.

Discussion

Working with landowners, communities, schools, counties, tribes, and other agencies enables us to share knowledge and understand one another's goals and objectives. Groups such as Missouri River Futures (www.missouririverfutures.com) provide a forum for sharing information. Although we would continue to participate in activities in the proposed conservation areas under alternative A, alternatives B–D provide an opportunity for us to play a greater

role in conserving and promoting the Missouri River as a precious resource.

Strategies

- Foster and maintain active participation in community environmental projects, educational outreach, school functions, and landowner workshops.
- Develop an increased presence of the FWS's Partners for Fish and Wildlife Program.
- Work with Indian tribes to develop joint collaborative conservation efforts and long-term management plans—possibly through the use of a memorandum of understanding.
- Continue to work with State and Federal partners on conservation activities.

Ecological and River Functionality Goal

Increase river and ecological functionality by improving water and air quality, maintaining healthy native plant communities such as cottonwood galleries, increasing floodplain connectivity, promoting active channel processes, and reducing flood risk.

Discussion

River systems are among the most biologically diverse and ecologically important systems in the world. This is due in part to their highly dynamic nature, which creates a mosaic of shifting habitat types that vary in age, species composition, and structure (The Nature Conservancy 2008). Rivers are constantly shaping and reshaping the landscape by eroding, transporting, and depositing sediment, debris, and other materials.

Strategies

- Work with partners and landowners to manage lands for native plant communities such as cottonwood galleries and to promote regeneration and establishment.
- Restore and conserve in perpetuity sites that allow river channel movement for natural erosion and deposition (for example, sandbars and point bars) that are crucial to native wildlife and fish species.

Cultural Resources Goal

In consultation with our partners, locate, document, and evaluate cultural resources and encourage preservation and interpretation when appropriate.

Discussion

The lands making up the proposed conservation areas possess a rich history of Native American traditions and practices as well as a rich history of post-European exploration, settlement, and development. These were places where wild bison crossed the river to areas of greater food supplies or to escape Indian hunting groups. Lewis and Clark first discovered black-tailed prairie dogs here and had their crew

NPS

NPS

We would encourage preservation and interpretation of cultural resources whenever appropriate. Pictured are the remains of a fur trapper's cabin (left) and the North Alabama steamship (right).

carry water from the river to pour down prairie dog holes so they could catch, examine, and describe them in their journals. Preserving and maintaining such sites for future generations is crucial to maintain our legacies.

Strategies

- Work with partners to continue to identify areas of cultural or historic significance.
- Work with American Indian tribes to develop joint collaborative conservation efforts and long-term management plans—possibly through the use of a memorandum of understanding.
- Use land protection measures to preserve culturally significant sites in perpetuity.

Recreational Opportunities Goal

Increase recreational opportunities for residents and visitors.

Discussion

Recreational activities are typically what connect individuals to the outdoors and the plants and animals that live there. However, Americans today have become increasingly disconnected from the outdoors. In April 2010, President Obama launched the America's Great Outdoors Initiative and directed agencies like the FWS and the NPS to develop a plan to reconnect individuals to the outdoors (FWS 2012a). The proposed action aims to provide reliable and consistent access to the Missouri River and its tributaries.

Nick Kaczor / FWS

Recreational opportunities would be increased for residents and visitors.

Strategies

- Partner with local communities, outdoor recreational groups, State and Federal partners to identify additional recreational sites (for example, boat ramps, campgrounds, and hunting areas).
- Encourage landowners who acquire conservation easements to exercise the option of allowing public access (through the NPS), which may increase the easement's value, and compensate them accordingly.
- Foster relationships between landowners and State wildlife agencies to provide more liberal access policy like the existing annual public access programs (typically walk-in areas).

Wildlife, Fisheries, and Their Habitats Goal

Support the recovery and protection of threatened and endangered species and reduce the likelihood of future listings under the ESA, while continuing to provide migration habitats for millions of migrating birds and habitats for resident fish and wildlife populations.

Discussion

There are now eight threatened and endangered wildlife species known to utilize the proposed project area; three (least tern, piping plover, and pallid sturgeon) use the NCCA and PBCA to meet their life-cycle requirements. The recovery plans for all three

© Ryan Williamson

Habitats for both migratory and resident wildlife would be preserved.

species have identified the NCCA and PBCA as either crucial habitat or recovery priority areas (FWS 1988, 1990, 1993). Furthermore, the recovery plans for these three species call for actions to restore habitats and functions of the Missouri River ecosystem while minimizing impacts on other uses of the river; the plans also highlight the use of conservation easements or fee-title lands to conserve those essential habitats.

Of the five remaining species, some migrate through the area; we require more information on the others to determine their utilization of the area. One threatened plant species—western prairie fringed orchid—is also known to occur in the project area. Descriptions of these species can be found in section 4.2.10.

Strategies

- Use land protection measures to conserve in perpetuity important sites that provide, or contribute to, the life-cycle requirements for threatened or endangered species and clearly help achieve one or more recovery objectives.
- If applicable, restore sites to natural or favorable conditions for threatened and endangered species.
- Use land protection measures—and restoration techniques if applicable—to conserve riparian areas, wetlands, grasslands, and forestlands in perpetuity to aid in water retention, water quality, carbon sequestration, and improved habitat conditions for migratory and resident fish and wildlife species.

3.5 Foreseeable Activities

Missouri National Recreational River Actions

The NPS would continue to manage the 39-mile and 59-mile districts as a recreational river under the Wild and Scenic Rivers Act and implement the final general management plans for each area. The NPS would continue to acquire lands of no more than an average of 100 acres per river mile on both sides of the river and would coordinate with the USACE on the 59-mile district, because the USACE also has responsibility under the Wild and Scenic Rivers Act. The USACE also has joint responsibility with NPS under the Wild and Scenic Rivers Act for the 59-mile district of the MNRR.

Lake Andes National Wildlife Refuge Complex Actions

The FWS recently developed a CCP for the Lake Andes National Wildlife Refuge Complex in southeast South Dakota. This CCP, which will guide management of the refuge complex's three units, primarily focuses on wetland and grassland protection in the Prairie Pothole Region north of the NCCA and PBCA. In addition, the refuge complex will be implementing the recently approved Dakota Grassland Conservation Area and the current Small Wetlands Acquisition Program, which are large landscape plans in North Dakota and South Dakota designed to work with willing landowners to conserve wetlands and grasslands through the use of conservation easements.

U.S. Army Corps of Engineers Actions

The USACE is expected to continue to manage the Missouri River for the eight authorized purposes of flood control, water supply, navigation, water quality, irrigation, recreation, hydropower, and fish and wildlife, as established by the Flood Control Act of 1944. These actions will be consistent with prior USACE management actions along the river, and the proposed conservation areas would not affect or change any of these authorized purposes.

3.6 Alternatives Considered but Eliminated from Further Consideration

Voluntary Landowner Zoning

Landowners would voluntarily petition their county commissioners to create a zoning district to direct the types of development that can occur in an area. For example, landowners would petition the county government to zone an area as agricultural, precluding certain types of nonagricultural development such as residential subdivision. Citizen initiatives like this one are rarely realized, and we did not consider this alternative further.

County Zoning

In a traditional approach used by counties and municipalities, the local government would use zoning to designate the type of development that could occur in an area. While laws in Nebraska and South Dakota grant cities and counties the authority to regulate land use, engaging in planning and zoning activities is optional. Many counties in these States have opted to have no planning or zoning requirements. However, where zoning is used, it is subject to frequent changes and would not ensure the long-term prevention of residential or commercial development in the proposed conservation areas.

Short-Term Contracts

One alternative considered was developing a program similar to the Conservation Reserve Program that would pay landowners for protecting their wetlands from being altered or destroyed for a period of 10 years. The contract would be available for renewal every 10 years. However, this approach would not ensure long-term protection of riparian and upland habitats. Like Conservation Reserve Program lands, wetlands would become susceptible to drainage when crop prices make it profitable to convert such wetlands to cropland. Furthermore, the Partners for Fish and Wildlife Program is active in the area and can be used to help with technical and financial assistance to private landowners if acquisition is not an option for them.

3.7 Monitoring and Evaluation

Lands included under conservation easements would be monitored and evaluated on an annual basis by the agency holding the easement. Conservation easements would allow regular access by the agency to inspect for compliance with easement terms and agreements. Specific monitoring and evaluation criteria are outlined in chapter 4 of the LPP. In the future, if a landowner submits a reasonable request to modify an easement, we would provide reasonable accommodation in a manner that best conserves the values of the easement while addressing the legitimate needs of the landowner.

3.8 Funding and Staff

We propose to use the following funds for land acquisition and future management.

Land and Water Conservation Fund

The United States Land and Water Conservation Fund is a Federal program that was established by Act of Congress in 1964 to provide funds to Federal, State, and local governments for the acquisition of and easements on land and water for the benefit of all Americans. The main emphases of the fund are recreation and the protection of national natural treasures in the form of parks and protected forest and wildlife areas. The fund's primary source of income is fees paid to the Bureau of Ocean Energy Management, Regulation, and Enforcement by companies drilling offshore for oil and gas. Other minor income sources are the sale of surplus Federal real estate and taxes on motorboat fuel. This fund does not originate from Federal income taxes. Both FWS and the NPS can access monies from this fund.

Migratory Bird Hunting and Conservation Stamp (Duck Stamp)

On March 16, 1934, Congress passed and President Roosevelt signed the Migratory Bird Hunting Stamp Act. Popularly known as the Duck Stamp Act, the bill's purpose was to generate revenue for one use: acquiring wetlands for what is now known as the National Wildlife Refuge System. Funds are generated by migratory bird hunters and conservationists purchasing annual stamps. These funds are then used for the preservation and conservation of wetlands. Like the Land and Water Conservation Fund, this fund does not originate from Federal income taxes. Only the FWS can access Duck Stamp funds.

Other Funding Sources

Other sources of money could include—but would not be limited to—the North American Wetlands Conservation Act; nongovernmental partners such as The Nature Conservancy, Northern Prairie Land Trust, and Ducks Unlimited; and donations by landowners.

Staff

The level and number of staff required to manage the NCCA and PBCA would ultimately depend on landowner involvement and participation in the program along with monies available for conservation. If the goals of the preferred alternative (alternative C) are reached, it is estimated that the staff listed in table 2 would be required to manage the areas. In addition, it is anticipated that the FWS's private lands program (Partners for Fish and Wildlife Program) based out of Grand Island, Nebraska and Huron, South Dakota would be adequate to address the proposed action.

3.9 Comparison of Alternatives

Alternatives B–D provide us with a range of conservation actions for analyzing conservation-related effects on the focal species identified in the LPP and for gauging landowner interest in the proposed action. Alternative A would result in an "as-is" management approach, and nothing would change. By contrast, alternatives B–D would result in an increasing level of conservation effort by us in partnership with willing landowners. The terms and conditions of easements would be the same under all action alternatives. Tables 3 and 4 summarize the acquisition goals for each conservation area.

Table 2. Staff required under alternative C for the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

Staff group	*Position*	*Grade*
Management	Interagency project leader	GS–13
	Wildlife refuge manager	GS–12
	Biological sciences technician	GS–07
Acquisition	Realty specialist	GS–12
Biology	Wildlife biologist	GS–11
Visitor services	Outdoor recreation planner	GS–11
Administration	Administrative officer	GS–07
Maintenance	Engineering equipment operator	WG–10
	Maintenance worker	WG–08
Fire management	Prescribed fire specialist	GS–09
Law enforcement	Law enforcement officer	GS–09
	Park ranger	GS–05

Abbreviations: GS = General Schedule, WG = Wage Grade.

Table 3. Acquisition goals for the proposed Niobrara Confluence Conservation Area, Nebraska and South Dakota.

Alternative	*Easement acreage goal*	*Percentage of project area—easements*	*Fee title acreage goal*	*Percentage of project area—fee title*	*Total acreage goal*	*Total percentage of project area*
A	0	0%	0	0%	0	0%
B	32,000	4%	8,000	1%	40,000	5%
C	64,000	8%	16,000	2%	80,000	10%
D	96,000	12%	24,000	3%	120,000	15%

Table 4. Acquisition goals for the proposed Ponca Bluffs Conservation Area, Nebraska and South Dakota.

Alternative	*Easement acreage goal*	*Percentage of project area—easements*	*Fee title acreage goal*	*Percentage of project area—fee title*	*Total acreage goal*	*Total percentage of project area*
A	0	0%	0	0%	0	0%
B	24,000	4%	6,000	1%	30,000	5%
C	48,000	8%	12,000	2%	60,000	10%
D	72,000	12%	18,000	3%	90,000	14%

Chapter 4—Affected Environment

Rob Holm / FWS

Pallid sturgeon swarming.

This chapter describes the existing resource conditions within the analysis area and provides the background for analyzing the effects of the alternatives on the environment. The resources within the study areas have received extensive study and are fairly well documented except where noted.

4.1 Physical Environment

Physical environment refers to the nonliving elements of the environment that provide a home for people, plants, fish, and wildlife.

Climate

The climate of the analysis area is known for hot summers and extremely cold winters. Seasonal climate in the analysis area often changes from extreme drought to flood in relatively short periods. Similarly, abrupt changes in temperature occur seasonally as well as daily. Climate data from the National Weather Service's Cooperative Stations in Nebraska; Pickstown, Vermillion, and Yankton, South Dakota; and Gavins Point Dam indicate that temperatures in these areas can range from –38 to 116 °F. The extreme lowest temperature was –38 °F in January 1912, and the extreme highest temperature was 116 °F in July 1939. Annual precipitation is highly variable and can range from 11 inches to more than 39 inches. The Gavins Point area on average receives the lowest average annual precipitation (24.17 inches), and Vermillion receives the highest average annual precipitation (25.31 inches). The average total snowfall for the analysis area ranges from 22.9 to 30.2 inches per year.

Climate Change

A report released by the U.S. Global Change Research Program, "The Global Climate Change Impacts in the United States" (Karl 2009), places the analysis area within the Great Plains ecosystem. According to this report, average temperatures in

the Great Plains will increase, especially during the winter months. Cold days will occur less often and warmer days more often. Precipitation is expected to increase, but with more frequent extremes of heavy rainfall and drought (National Oceanic and Atmospheric Administration 2013).

Over the next century, climate change could profoundly affect fish and wildlife populations and plant resources within the analysis area. These effects could be direct, such as changes in temperature and precipitation influencing species and their habitats, or indirect, such as falling reservoir levels because of reduced snowpacks or increased costs of responses to catastrophic storms.

Spring snowpack in the Rocky Mountains in Montana and Wyoming represents a reservoir of water that can sustain Missouri River flows throughout the summer. Warmer winters would result in more precipitation falling as rain instead of snow, reducing the spring snowpack and causing an early runoff and reduced flow in the summer, affecting fish and wildlife as well as recreation and agricultural activities. Climate change is likely to affect native plant and animal species by altering key feeding and nesting habitats such as emergent wetlands, emergent sandbars, shallow water, and prairie potholes or playa lakes.

Air Quality

Air quality directly affects all living things. Poor air quality can affect visibility and create objectionable odors, thus affecting visitor experiences. The Clean Air Act was amended in 1977 to ensure high air quality standards in national parks, refuges, and other nationally important areas. Under the act the MNRR was designated as a Class II clean air area, and this designation would also extend to the proposed PBCA and NCCA if they are adopted. There could be moderate, well-planned industrial growth in the vicinity of the PBCA and NCCA as long as the Class II maximum allowable increases for particulate matter, sulfur dioxide, and nitrogen dioxide are not exceeded. Hazardous air pollutants, also known as toxic air pollutants or air toxins, are those pollutants that cause or may cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental and ecological effects.

The EPA Office of Air Quality, Planning, and Standards has set National Ambient Air Quality Standards for six criteria pollutants: carbon monoxide, nitrogen dioxide, ozone, lead, particulate material, and sulfur dioxide. Most air toxics originate from human-made sources, including mobile sources (like cars, trucks, and buses), stationary sources (like factories, refineries, and power plants), and indoor sources (like building materials and from activities such as cleaning).

The project area is within the Nebraska Intrastate Air Quality Region. The air quality in this region is generally good and falls within all parameters for all the National Ambient Air Quality Standards (EPA 2012).

The Santee Sioux Tribe has developed a smoke management plan that addresses air quality in relation to prescribed burning activities on the reservation.

Visual Resources

Outstanding scenic character distinguishes national parks and other publicly owned natural areas, and it is often integral to their fundamental value. The proposed NCCA and PBCA abound with impressive natural, serene pastoral views. Both areas contain special scenic qualities that are a product of the area's regional combination of topography, geology, vegetation, and cultural history.

The proposed NCCA contains numerous stunning vistas that include chalkstone bluffs, rolling hills, pastoral settings, and dark night skies. Views of the untamed Missouri and Niobrara Rivers are also visual highlights. Notable scenery includes historic Fort Randall and Old Baldy, a site noted by Lewis and Clark.

Views within the proposed PBCA in the unchannelized portion of the Missouri River upstream of Ponca State Park contain a mix of open and forested lands, including old growth cottonwood forest and native prairie, rare pocket or goat prairies, hills, and chalkstone bluffs. This braided, driftwood-strewn stretch of river contains large expanses of picturesque bluffs and wooded hills. Spirit Mound, visited by Lewis and Clark, is a large and visually interesting geological feature within the area.

Acoustic Resources

Acoustic resources within national park and refuge units include natural sounds (such as wildlife, waterfalls, wind, and rain), cultural sounds (such as the drumbeat from a tribal dance), and historical sounds (such as the cannon shot in a battle reenactment). Noise—that is, unwanted sound—can obscure the soundscape for both visitors and wildlife. Noise is extremely perceptible in quiet, remote places; accord-

ingly, wildlife and visitors in these places are likely to be especially sensitive to noise.

In the wild, the ability to hear is so important for survival that no deaf vertebrate species are known to exist. Animals communicate through sound and continuously detect sounds, even when asleep. Intrusive or excessive noise can have serious consequences for wildlife, causing them to miss the footfall of a predator or fail to adequately compare songs from potential mates. The more effectively that human activities protect the integrity of acoustic resources in the wild, the better chance wildlife species have of surviving.

Additionally, a healthy soundscape is not limited to the sounds of nature; cultural and historical sounds are important acoustic resources in many national park and refuge units. Such sounds can bring the past into the present, provide insight into historic events, and elicit a sense of connection to people of the past.

In the proposed conservation areas, natural sounds include those of wildlife, wind, and flowing water. Cultural sounds that may be important in these areas have not been specifically studied nor defined, but they might include sounds associated with Native American ceremonies (for example, powwow drums).

Land Features, Soils, Vegetation, and Geology

The proposed NCCA lies within the Great Plains Steppe Province (Bailey et al. 2008). The region is characterized by glacial till deposits north of the Missouri River and sand and loess deposited from windblown sediment of the retreating glaciers south of the river. The proposed PBCA lies within the Prairie Parkland (Temperate) Province (Bailey et al. 2008), which is characterized by steep bluffs and rounded, rolling plains. Soils of the area are generally mollisols with dark upper horizons with wide variety in the amounts of sand and clay they contain.

The natural vegetation of both conservation areas generally consists of mixed-height prairie and deciduous forest with the exception of cottonwood forests within the floodplain. Historically, cottonwood forests inhabited the floodplain of the river and provided woody debris to the river that trapped sediment and led to the creation of habitat for countless species of fish, reptiles, and birds including the threatened piping plover and endangered least tern. Cottonwood forests are also the preferred nesting, wintering, and roosting habitat for the bald eagle in this area. The installation and operation of the Missouri River main stem dam system have reduced the occurrence and severity of overbank flooding, reducing existing stands and preventing the establishment of new stands of cottonwood forest. Woodlands outside the floodplain are generally of bur oak and ash with some mulberry and walnut.

In the proposed PBCA and NCCA, native prairie occurs in draws and hilltops where moisture is less available. In the United States, less than 1 percent of the once extensive prairie remains due to conversion for homes, industry, and agriculture. This loss has been accelerating in recent years as farming has become more lucrative.

Invasion of red cedar, a native species, has become problematic throughout the proposed conservation areas. Salt cedar, leafy spurge, purple loosestrife, and a host of other noxious weeds are also present.

The geology is generally of shallow marine origin. The oldest rocks that can be found in the proposed Conservation Areas are the Graneros shale and rocks at the Ponca State Park. The bluff-forming chalky limestone of the Niobrara Formation and the Pierre Shale Formation are also some of the oldest rocks found in the proposed conservation areas. These deposits are covered with deposits from streams, winds, and glaciers.

Water Resources

Surface Hydrology

Upstream of the proposed conservation areas, the Missouri River originates in the Rocky Mountains and carries stream flow from drainages in Canada, Montana, Wyoming, North Dakota, South Dakota, and Nebraska. These drainages provide a snowmelt-dominated flow regime to the Missouri River.

The large dams constructed on the Missouri River under the Pick–Sloan Plan, a component of the Flood Control Act of 1944, attempt to minimize flooding and provide other benefits such as power generation, support for downstream navigation, recreation, fish and wildlife, water supply, water quality, and irrigation. The 2011 record flow through the proposed conservation areas has produced dramatic changes to the river channel. The net positive or negative effects on the aquatic ecosystem and riparian communities, and the persistence of those effects, are not yet known.

A substantial number of impoundments occur in the Missouri River basin above Fort Randall Dam, including four USACE main stem dams, two Bureau of Reclamation main stem dams, and seven Pacific Power and Light main stem dams. There are at least

70 dams (and diversions) on larger tributaries to the Missouri River. Additionally, there are many dams on small tributary drainages that create ponds for livestock watering and other uses.

Because of the presence of dams and reservoirs, the river's flow, sediment, temperature, and nutrient regimes are highly altered from their natural condition. Generally speaking, flow regulation of the Missouri River results in:

- reduced high flows;
- increased low flows;
- shorter low-flow periods;
- more short-term fluctuations in flow levels.

Despite highly regulated flows from the various dams on the Missouri River, flow variability that mimics natural conditions as much as possible can yield many ecological benefits, even if the flow variability is artificially created through dam releases.

In addition, "hydro-peaking" from Fort Randall Dam to increase electricity output during periods of high consumer demand can create daily discharge variation in excess of 35,000 cubic feet per second in the 39-mile river segment in the proposed NCCA.

Notwithstanding the effects of dams outside the proposed conservation area reaches, there are no impoundments, diversions, or straightened segments of the river channel within the proposed conservation areas to alter the free-flow condition of the river. Parts of these segments have been modified by bank stabilization (for example, riprap) and the presence of infrastructure and facilities (for example, bridges, power line crossings, boat ramps, irrigation intakes, and buried pipeline crossings). There are also wells in the Missouri River alluvial aquifer supplying water to Yankton, South Dakota, and the Lewis and Clark Rural Water System.

The river has seven principal aquatic habitats: the main channel, main channel border, sandbar, pool, chute, backwater, and marsh. Due to flow regulation, many of these habitats are threatened in the Missouri River. Furthermore, decreased channel meandering reduces the amount of woody debris that enters the system (Mestl and Hesse 1993) and can lead to improved habitat conditions for least terns, piping plovers and pallid sturgeon, along with many game species.

The Niobrara River within the proposed NCCA has a wide valley and spreads out in multiple meandering channels. It is naturally laden with silt, sand, and organic debris, thereby exhibiting relatively natural conditions. The highest flow recorded was 39,100 cubic feet per second in March of 1960. The Nebraska Public Power District's Spencer Hydroelectric Dam at the border of the proposed NCCA currently has little effect on the flow of the Niobrara River as the reservoir has mostly silted in which requires periodic sluicing to maintain generating capacity. Water rights have been granted for surface withdrawals and wells for irrigation and other uses within the Niobrara basin. These water right appropriations may reduce flow in the Niobrara River, although the Wild and Scenic Rivers Act provides for Federal Reserve water rights in quantities necessary to accomplish the purposes stated in this act.

Floodplains

The Missouri River in both proposed conservation areas is affected by USACE main stem dams. The dams prevent the natural movement of sediment in the river, increasing erosion rates in some areas and accelerating deposition in others. The USACE regulates flows to prevent floods and to allow for navigation downstream. Historically, the Missouri River flows varied widely throughout the year, and low-lying areas 1 or more miles wide were covered with water for several weeks almost annually. The construction and operation of the main-stem dams has led to a deeper river channel and loss of the river's connection with its floodplain.

The Niobrara River braids across the floodplain much as it did before settlement of the area. Its banks are sandy and unstable and it meanders regularly. Owing to the undeveloped nature of the river and its floodplain, its water elevation changes little even during floods.

Sedimentation

In the proposed PBCA and NCCA, the dominant processes that determine the ecological conditions of a given reach are: erosion, transportation, and deposition of sediment; recruitment, storage, and transport of large wood; and the streams lateral and vertical interaction with the valley alluvium. Prior to the installation of the main stem dams, the river meandered widely in its floodplain, removing and depositing sediment regularly. The installation of the Missouri River main stem dam system has affected the river's ability to move sediment in two ways. First, the dams themselves physically prevent the movement of sediment downstream. Second, the operation of the dam system disrupts the erosion and deposition process by preventing high flows that would have flushed sediment and allowed the river to meander across the floodplain. These issues are particularly evident in the area near Niobrara, Nebraska. This area has changed dramatically since the installation of Fort Randall and Gavins Point

NPS

Sandbars provide important nesting habitat for least terns and piping plovers.

Dams. The sediment-rich Niobrara River forms a large delta at its confluence with the Missouri River. The lack of high flows and the physical impediment of Gavins Point Dam have caused the delta to become massive and considerably raised the level of the river in this area. The river and its floodplain below Gavins Point Dam suffer from the opposite issue; because of the lack of sediment from upstream of the dam, the flow of water is constantly eroding the riverbed and riverbanks.

4.2 Biological Resources

Disturbance Factors Affecting Major Ecological Processes

Before Euro-American settlement, plants and animals within the project area adapted and evolved with the dynamic riverflows characteristic of a major river. Species like the pallid sturgeon have evolved in the distinctive environment provided by this large alluvial river system. The Missouri River was wide and meandered dramatically within the floodplain between the bluffs. Spring flooding due to snowmelt from the Great Plains and Rocky Mountains was the major ecological process that shaped river bottom plant and animal communities. These floods were the lifeblood of the project area. Early snowmelt in the lower elevations of the plains contributed to an early pulse of water into and down the river, as early as March continuing through April. This early pulse of water, depending on magnitude and duration, would mobilize and redistribute sediment and large wood. These processes were both hydraulic and physical through the contribution of ice scour that would have stripped vegetation from the river's banks and sandbars. This initial early pulse would also stimulate the large river fish community to begin migrating, redistributing themselves throughout the river in preparation for spawning, reproduction, and utilization of the food base. This early pulse contributed to early forage base production and habitat-building events and provided nesting habitat for bird species such as the least tern and piping plover. It contributed to natural plant communities along the river; these included plains cottonwood, which would release its seed in the spring when the river was often at flood stage, so the water deposited the seeds at high river elevations. There they would germinate and grow with little competition on the flood-scoured sand and gravel of the receding floodwater. Many species of riparian plants and wildlife depend on cottonwoods for appropriate habitat. Snags provided in-channel structure, serving as depositional areas for sediments and providing diverse flowing water habitats and organic matter to the river system.

Today, the fluvial system is highly altered, both hydrologically and physically. The Flood Control Act of 1944 (also called the Pick–Sloan Plan) (Public Law 78–534), authorized a water development plan for the Missouri River basin that included the construction of five large dams on the main stem of the river. Authorized purposes of these dams were flood control, navigation, irrigation, hydropower generation, water supply, water quality, recreation, and fish and wildlife. The plan included a sixth dam that would operate with the other five dams as a system; this dam, the Fort Peck Dam, predates the Flood Control Act and was completed in 1940.

The ecological processes that are essential for fish and wildlife in the Missouri River have been significantly altered by construction of these six dams. The reservoirs and dams inundated 755 miles of river valley at flood control pool and 1.2 million acres when full (USACE 2000). The dams altered about 1,100 miles (totaling 3 million acres) of natural river habitat and flows; 51 of 67 native fish species are now rare, uncommon, or decreasing; reproduction of cottonwoods has largely ceased; and aquatic insects—a key link in the food chain—have been reduced by 70 percent (NRC 2002). The dams also prevent fish from migrating up the river.

Water management through the dam operations has changed the hydrology of the river by eliminating high flows and shifting the timing of flows from primarily spring and early summer to early fall and winter. The low flows that ordinarily occurred throughout the late summer, fall, and winter are largely nonexistent under many water-year types.

The timing, magnitude, and frequency of these altered flows, along with decreased floodplain connectivity, no longer provide the biological cues necessary for large river fish to respond to for successful reproduction. The altered flows also reduce slow, shallow water where fish can forage and escape predators. The suppression of flood events prevents floodplain inundation that provides forage and prey items for young, large river fishes at times when those benefits are most needed (at the larval and juvenile stages).

The dams have also considerably reduced the sediment in the lower river from about 229 million metric tons to 40 million metric tons (NRC 2002). Furthermore, bank stabilization along the river eliminates bank erosion and reduces sediment transport downstream. This lack of sediment, along with other hydrologic alterations, suppressed the ability of the river to create the high sandbars and shallow water areas that provide essential nursery and foraging areas for birds and fish. Because fewer sandbars are available for nesting terns and plovers, predation has become a major factor on tern and plover reproduction. When there are fewer sandbars, the birds tend to concentrate their nests, making it easier for predators to find the nests and feed on the young.

In contrast, the Niobrara River maintains relatively natural flows and is limited by a small-scale hydroelectric dam (Spencer Dam) at the western boundary of the NCCA. The Niobrara River therefore maintains high sediment loads, thus creating natural sandbars on which least terns and piping plovers nest. Shortly before the Niobrara River joins with the Missouri River, Verdigre Creek flows into the Niobrara River. Similar, Verdigre Creek is free-flowing and maintains relatively uninhibited flows. The confluence of the Niobrara River with the Missouri River presents a unique microcosm as where the sediment enriched Niobrara River meets the sediment lacking Missouri River.

Direct water withdrawals and returns to the river occur for agricultural, municipal, and industrial uses as well as for oil and natural gas production, which may take place on the floodplain or neighboring uplands. Oil and natural gas production includes withdrawals for use in hydraulic fracturing technologies for oil and gas wells. Return flows of treated wastewater from these activities are possible. Hydraulic fracturing is a key element in the development of natural "shale gas" fields, of which several are under development or forecast for development in the basin.

Pollutants entering the waterways within and upstream of breeding areas can negatively affect water quality and forage resources. Water and air pollutants in the watershed include upwind emissions from local, regional, and global sources. These pollutants include compounds of nitrogen, sulfur, mercury, and pesticides that enter the atmosphere from burning fossil fuels, fertilizer use, livestock emissions, and airborne pollutant discharges (Hauer et al. 2003). Subsequent downwind deposition of these air pollutants can be captured in runoff. Bioaccumulation of pollutants could adversely affect maturation of eggs and embryos, the development of young, and the reproduction abilities of adult birds and fish as well as reptiles and amphibians. The main potential threat from oil and natural gas development would be from spills into the Missouri River from wells and pipelines. Active and abandoned mining and dredging operations contribute various pollutants to the Missouri River that can contribute to sediment toxicity and water pollution (Montana Department of Environmental Quality 2010, USACE 2010). Dredging the river channel can disturb contaminated sediments. Sand and gravel mining directly reduces the amount and availability of in-channel sands and gravels.

Domesticated livestock in the floodplain can affect native floodplain vegetation through improper intense grazing, as well as the trampling and compaction of floodplain soils (Kondolf et al. 1996). Also, non-native grazers and browsers commonly concentrate in floodplain areas because of a readily accessible drinking water source (Kondolf et al. 1996). When they have access to the reservoirs and river at low flows, cattle can trample tern and plover nests on sandy beaches and sandbars; however, this impact is estimated to be an uncommon occurrence.

The reservoirs experience thermal stratification in the summer with warmer water on the top (epilimnion) and colder water on the bottom (hypolimnion). This cold hypolimnion can be as much as 50 °F (10 °C) colder than the epilimnion. Hypolimnion is released from the dams and affects fish spawning and movements.

Snag removal in the main stem of the river has been undertaken since 1838 to facilitate increased boat traffic (Galat et al. 1996), with almost all the large woody debris in the main stem being removed by the early 1950s (Hesse 1996). Some snag removal still takes place. Mechanical removal of large logs, log jams, and wood debris piles simplifies aquatic habitat; reduces substrate surfaces for the attachment of algae and macroinvertebrates; and limits creation sandbars used by nesting least terns and piping plovers.

Introduced invasive species (discussed further below) are highly competitive and can colonize a wide variety of habitats, often displacing native vegetation and wildlife, causing alteration of the structure and composition of the existing plant and animal communities.

Fragmentation of the landscape through the permanent removal of floodplain vegetation to construct

NPS

Invasive species like the Russian olive can displace native vegetation, altering the structure and composition of existing plant and animal communities.

roads, utility corridors, railroads, homes, and other structures had negative effects on biodiversity because of direct mortality, behavioral modification by animals, alterations of the physical and chemical environment, increased access by invasive species, and by interrupting the continuity of the floodplain corridor (Kondolf et al. 1996).

Uplands

Beyond the riparian forests and grasslands, bur oak becomes the dominant tree in protected valleys and hillsides (Weaver 1960). The undergrowth in these oak savannas and forests contained woody plants such as western snowberry, roughleaf dogwood, sumac, gooseberry, and poison ivy, along with prairie grasses and wildflowers (Weaver 1960). These oak savannas and forests likely burned less often than grasslands but more often than the floodplain forests. The thick bark of oak trees protected them from all but the hottest fires.

Beyond the oak trees lie the expansive Northern Great Plains. The eastern edge of the project area (Ponca Bluffs) is representative of tallgrass prairie, whereas the western side (Niobrara Confluence) is representative of northern mixed-grass prairie (Kuchler 1964). These prairies were maintained by low moisture and, more importantly, by frequent fires and grazing bison (Anderson 2006). The fires were generally started throughout the year by native peoples for hunting and communication purposes, although many were likely accidental as well (Higgins 1986). Natural fires, such as those started by lightning, generally occurred in summer and were less common (Higgins 1986). The fire return interval— that is, how frequently a given location was burned—is thought to have been 1–5 years in tallgrass prairie. Grazing by bison is thought to have been intense but swift as large herds moved through a given location.

Tallgrass prairie is dominated by robust grasses such as big bluestem, switchgrass, Indian grass, Canada wildrye, and prairie cordgrass. These grasses can easily reach head height (6 feet) with adequate moisture. Mixed-grass prairie is dominated by knee-high (2-foot) grasses such as little bluestem, western wheatgrass, green needle grass, and porcupine grass; however, mixed-grass prairie gets its name because short grasses (such as blue grama and buffalograss) and tallgrasses can be locally dominant depending on grazing pressure and soil moisture.

While grasses dominate the prairie landscape, hundreds of wildflowers add incredible diversity and color to the prairie. Common among them are sunflowers such as annual, stiff, and maximilian sunflower; prairie and purple coneflower; blackeyed susan; compass plant; and Canada goldenrod, legumes such as purple prairie clover and breadroot scurf pea, and milkweeds such as swamp, showy, and plains milkweed.

River Bottoms (Floodplains), Riparian Area, Wetlands, and Shoreline

The pre-regulation Missouri River was a dynamic river, overflowing its banks and meandering through its floodplain. Side channels, backwaters, and floodplain lakes were formed as the channel shifted laterally across its floodplain. Each year this movement of the channel was influenced by two flood pulses, also known as spring rises. The first, often in April, represented local and regional snowmelt and rainfall, whereas the second, in June, represented the snowmelt from the Rocky Mountains. These flood pulses were the driving force behind river functions and processes such as floodplain maintenance and cottonwood forest formation.

The loss of the natural flow regime has drastically affected the floodplain, riparian areas, and wetlands within the analysis area. Although affected by reservoirs, flow regulation, and human alterations in some areas, the ever-changing Missouri River retains a diverse mosaic of channel habitats, including floodplains, side channels, backwaters, sandbars, pools, islands, and oxbow lakes.

The Missouri River also contains remnant wetlands, riparian cottonwood forests, bluff forests, and native prairies that provide habitat for many native species. Cottonwood forests, some of them over 100 years old, provide important nesting and migratory stopover habitats within the Great Plains for a diversity of rare woodland songbird species and nesting and wintering habitat for our national symbol, the bald eagle. These cottonwood forests tower over

grasses, forbs, and shrubs teeming with insects, small mammals, and other wildlife. Delta deposits near the confluence of the Missouri and Niobrara Rivers provide regionally important habitat for a wide variety of reptiles, amphibians, nesting and migrating waterfowl, and marshbirds.

The large presettlement riparian forests established on newly formed sandbars as the June floods receded. Cottonwoods typically set seed during the June flood; the floating seeds are deposited on barren sandbars with ample moisture to sustain the seedlings until they grew large root systems. If the cottonwoods survived future floods and ice scouring, they would eventually produce large forests with a dense under growth of willows, vines such as riverbank grape and green briar, and shrubs such as rough leaved dogwood and false indigo (Weaver 1960). As the forest matured, cottonwood seedlings could not reestablish in the shaded understory, so they would eventually be replaced by later successional tree species such as American elm, green ash, hackberry, box elder, and walnut (Weaver 1960). Intermixed with the riparian forests were large patches of prairie grasses, usually on higher ground (Weaver 1960). The grasses were generally coarse tallgrass species such as big bluestem, prairie cordgrass, and switch grass. Marshes and lake margins are often fringed by marsh grasses such as common reed and rice cutgrass, sedges, and rushes.

In 2011, of the 114 miles of total bankline within the 59-mile segment of the MNRR, 58 percent was unstabilized, 37 percent was stabilized, and 5 was not determined. Of the 83 miles of total bankline within the 39-mile segment, 71 percent was unstabilized, 23 percent was stabilized, and 6 percent was yet to be determined (Lisa Yager, MNRR biologist, personal communication).

Invasive Plant Species

In the uplands of the project area, invasive plants of concern include several species of noxious weeds, eastern red cedar, and exotic forage species. Noxious weeds are by definition introduced species that harm people, agriculture, or the environment; noxious weeds of the uplands include leafy spurge, several thistle species, and knapweeds, all of which are unpalatable to livestock and can be aggressive in natural and agricultural settings. Eastern red cedar, while native, also demonstrates aggressive growth which crowds out other native species. Historically this tree was kept at low population levels by fire, but the lack of fire has resulted in a population explosion in the last 100 years. Introduced forage species, such as smooth brome and sweet clover, were brought in by European settlers for pasture improvement, and these species' abilities to colonize unburned, ungrazed land has reduced native species abundance throughout the area.

Several invasive plant species are found along the Missouri River. The worst invaders are the noxious weeds salt cedar, purple loosestrife and European common reed. They have invaded and colonized huge areas of riverbank, pushing out all other vegetation and reducing habitat conditions for the endangered least tern and threatened piping plover. The exotic Russian olive has become established in many riparian areas, displacing cottonwood seedlings. Within riparian forests, the lack of flooding has allowed the native eastern red cedar to invade to the near exclusion of deciduous species and displacing grasses and wildflowers.

Wildlife

Mammals

The proposed conservation areas support a wide variety of mammals. These include two deer—white-tailed and mule deer—as well as numerous furbearers and small predators like black-tailed jackrabbit, white-tailed jackrabbit, Virginia opossum, beaver, muskrat, coyote, red fox, gray fox, raccoon, least weasel, long-tailed weasel, mink, badger, striped skunk, mountain lion, and bobcat (Higgins et al. 2000). The project area supports a long list of small mammal species that thrive in a large variety of habitats. Bats include western small-footed myotis, northern myotis, little brown bat, silver-haired bat, big brown bat, eastern red bat, and hoary bat. Other species include eastern cottontail, woodchuck, Franklin's ground squirrel, Thirteen-lined ground squirrel, black-tailed prairie dog, Eastern fox squirrel, Northern pocket gopher, and plains pocket gopher, masked shrew, least shrew, northern short-tailed shrew, Hayden's shrew, and Pygmy shrew, northern grasshopper mouse, eastern mole, olive-backed pocket mouse, plains pocket mouse, hispid pocket mouse, Ord's kangaroo rat, Western harvest mouse, plains harvest mouse, white-footed mouse, deer mouse, meadow jumping mouse, meadow vole, prairie vole, and Southern bog lemming. A list of mammals that occur or may occur in the project area appears in appendix C.

Birds

The Missouri River serves as a major flyway for migratory birds. The unique habitats and bottomlands present in the proposed NCCA and PBCA serve as wintering, feeding, breeding, and staging

grounds for these migrating avian species; the project area also has many year-round resident avian species. In total, 154 species of land birds have been confirmed in the project area. A list of birds that occur or may occur in the project area appears in appendix C.

Fishes

Fish species diversity is a defining characteristic of the Missouri River. In this section of the Missouri River there are approximately 93 species of fish, 72 of which are native to the Missouri River (Berry and Young 2004). Native riverine species common in the Missouri River included paddlefish, sauger, channel and blue catfish, whitebass, shovelnose sturgeon, blue sucker, freshwater drum, shortnose and longnose gar, and gizzard shad.

Habitat diversity is a key driver of fish diversity in this unchannelized and unimpounded stretch of the Missouri River. Habitats found in this stretch include submerged sandbars, snags, chutes, and backwaters. The slack water found in backwaters contains key spawning and nursery habitats for many native non-river species such as largemouth bass, bluegill, and black and white crappie.

As discussed previously in this chapter, the Missouri River reservoir system has had a negative impact on native fish populations, native species diversity, and the economic importance of angling in the Missouri River (Berry et al. 2007). Fish adapted to the frequent flooding, high sediment load, and warm water of the Missouri River have been negatively affected by reduced migration range, flow dynamics, sediment load, and—in the case of Fort Randall Dam—cold water releases (averages 54 °C [12 °C]). The best known example is the pallid sturgeon, which the FWS listed as endangered in 1990. Pallid sturgeon typically prefer turbid, fast flowing water and sand substrate characteristic of the pre-dam Missouri River. It is also thought that the spring and June rises (floods) were cues for spawning. Along with pallid sturgeon, many native minnow species such as sicklefin chub, sturgeon chub, flathead chub, silver chub, and highfin carpsucker are declining for the same reasons.

This section of river is a popular destination for anglers to pursue game fish such as walleye, sauger, catfish, and paddlefish. In 2009, anglers from 18 different states spent approximately 372,382 hours fishing the Fort Randall reach, Lewis and Clark Lake, and the Gavins Point reach, accounting for a total of 117,750 fish harvested and $8.14 million in local economic impact (Bouska and Longhenry 2009).

Many nonnative fish species have been introduced into the Missouri River system, mostly by accident but also intentionally. Some species have been particularly worrisome, such as Asian carp. Asian, silver, bighead, and grass carp were collectively introduced to North America in the 1970s for aquaculture purposes, but flooding on the Mississippi River allowed them to escape and invade the Mississippi, Ohio, and Illinois River basins (Kolar et al. 2007) and the Missouri River basin up to Gavins Point Dam. Asian carp affect the bottom of the food chain. Grass carp feed on aquatic vegetation and silver and bighead carp feed on plankton. All three carp species can reach high abundance, so there is a concern that they could lead to a collapse of the entire fishery. On the other hand, some intentional introductions, such as brown and rainbow trout, provide a unique fishery and likely cannot persist outside of the Fort Randall Dam tailwaters area.

Invertebrates and Macroinvertebrates

Freshwater invertebrates are a diverse group of organisms ranging from aquatic insects to unionid mollusks. Certain aquatic invertebrates can act as indicators of poor water quality, habitat loss, and declination in substrate quality.

Mussel beds are generally found "in areas with clean, stable substrate consisting of cobble, gravel, and sand, whereas they are not typically found in unstable substrate because they are unable to maintain their natural position and may be buried or displaced during fluvial events" (Ecological Specialists 2005). High silt content and fast, frequent changes in discharge also appear to negatively affect mussel habitat (Ecological Specialists 2005).

Macroinvertebrates, primarily the Aufwuchs community, are also extremely important in the food web, representing a major food source for the federally endangered pallid sturgeon and piping plover. Macroinvertebrates generally require off-channel

NPS

Woody debris contributes to a dynamic riverine ecosystem.

areas, such as backwaters and chutes, both of which have seen extensive declines since the 1960s (Mestl and Hesse 1993, Yager 2010). In addition, bank stabilization has decreased river meanders, reducing the amount of woody debris introduced into the river system (Mestl and Hesse 1993) and preventing the river from creating and maintaining new off-channel features, such as side channels and backwaters. Overall, off-channel areas have seen a great decline in area (approximately 618 acres from 1941 to 2008 in the 59-mile segment) (Yager 2010), and aquatic insect production has decreased along with area (Mestl and Hesse 1993).

An invasive Asian clam has been discovered in the 59-mile segment of the MNRR (Shearer et al. 2005). Grohs (2008) found 192 Asian clams in the Gavins Point reach and 18 Asian clams in the Fort Randall reach in 2005. Asian clams were found in the Gavins Point National Fish Hatchery paddlefish rearing ponds (Grohs et al. 2010), which could be problematic as the hatchery-reared paddlefish are released in Lake Francis Case (Sloss et al. 2009, as cited in Grohs et al. 2010). This could result in the hatchery reared paddlefish releasing glochidia (larval mussels) in the upper reaches of the Missouri River. However, Grohs et al. (2010) found no Asian clams in Lake Francis Case. Asian clams compete with native species for limited resources, biofoul water intake pipes, and may alter benthic substrates. Asian clams cause many economic problems by clogging pipes and tubes (Foster et al. 2011) and threaten the natural environment because they alter benthic substrates and compete with native mollusks for the limited habitat available in the 59-mile segment (Sickel 1986, as cited in Foster et al. 2011; Devick 1991, as cited in Foster et al. 2011).

The potential introduction of zebra mussels poses a significant risk to native mussels, as well as the entire ecosystem. To date, no zebra mussels have colonized the project area. Zebra mussel veligers (larvae) were independently confirmed in 2003; however, despite increased sampling efforts, neither veligers nor adults have been detected since (Lisa Yager, MNRR biologist, personal communication).

Amphibians and Reptiles

Several species of turtles, snakes, toads, and frogs all live in the project area. The eastern hognose snake and the false map turtle, both threatened species in South Dakota, are common throughout the area.

Threatened and Endangered Species and Species of Concern

Seven endangered animal species listed under the ESA are known to have occurred within the NCCA and PBCA: American burying beetle, whooping crane, pallid sturgeon, least tern, Topeka shiner, Higgins eye pearlymussel, and scaleshell mussel. The endangered Eskimo curlew may occur in the project areas occasionally but is not listed for the states of South Dakota or Nebraska. One federally listed threatened animal species (piping plover) and one listed threatened plant species (western prairie fringed orchid) occur within the project area.

One candidate species for Federal listing, the Sprague's pipit, occurs in the proposed project area. Candidate species are plants and animals for which the FWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities.

American Burying Beetle (Endangered)

The American burying beetle was federally listed as an endangered species under the ESA on July 13, 1989 (54 FR 29652).

The American burying beetle is known or believed to occur in Rhode Island, Massachusetts, Ohio, South Dakota, Nebraska, Missouri, Kansas, Arkansas, Oklahoma, Texas, and Canada. Specifically for the proposed project area, the American burying beetle is believed to occur in Boyd, Knox, and Holt Counties in Nebraska and in Gregory and Union Counties in South Dakota (Panella 2012, SDGFP 2013). Historical locations for the beetle in South Dakota include Haakon, Union, and Brookings Counties.

Scaleshell Mussel (Endangered)

The scaleshell mussel was federally listed as an endangered species under the ESA on October 9, 2001 (66 FR 51322).

Scaleshell mussels historically occurred across most of the eastern United States. The scaleshell mussel once occurred in 56 rivers in the Mississippi River drainage but has undergone a dramatic reduction in range in the last 50 years and is believed to be extirpated from 9 of the 13 states where it historically occurred. Of the 55 historical populations, 14 remain scattered within the Mississippi River basin in Arkansas, Missouri, and Oklahoma. While the species has been documented from 18 streams in the last

25 years, it can only be found consistently in three streams in Missouri, where it is still rare (FWS 2010a).

In a 1983 study of unionids of the Missouri River, Hoke (1983) reported finding a single fresh dead specimen about 0.6 mile east of Gavins Point Dam in Yankton County, South Dakota. There have been at least three surveys conducted within the project area since that time, and no evidence of scaleshell mussels was found (Clarke 1996, Ecological Specialists 2007, Shearer et al. 2005).

Higgins Eye Pearlymussel (Endangered)

On June 14, 1976 (41 FR 24064), the Higgins eye pearlymussel was federally listed under the ESA as an endangered species wherever it is found.

The Higgins eye pearlymussel is known to occur in Illinois, Iowa, Minnesota, Missouri, South Dakota, and Wisconsin. It is known to occur in South Dakota but is not listed in that state; it is listed in Nebraska, but does not occur in that state. A single valve from a freshly dead Higgins eye pearlymussel was found on October 27, 2004, in the 59-mile segment of the MNRR (Shearer et al. 2005). No Higgins eye were found during a 2006 freshwater mussel reconnaissance survey conducted by the USACE in the 59-mile segment (Ecological Specialists 2007).

Topeka Shiner (Endangered)

The Topeka shiner was federally listed as an endangered species under the ESA (FWS 1990) throughout its range on December 15, 1998 (63 FR 69008). Critical habitat for the Topeka shiner was designated on July 27, 2004 (69 FR 44736). This rule designated critical habitat in Iowa, Minnesota, and Nebraska. Habitat in Kansas, Missouri, and South Dakota was excluded from the designation.

Historically, Topeka shiners were abundant throughout the native prairie of South Dakota, Minnesota, Kansas, Iowa, and Missouri; these shiners still occur but exist in fragmented and isolated populations. The number of known occurrences has declined by 80 percent, and Topeka shiners have been eliminated from many watersheds. Topeka shiners have been adversely affected by degradation of stream quality, habitat destruction, siltation, channelization, dewatering of streams, and water impoundment.

Pallid Sturgeon (Endangered)

The pallid sturgeon was federally listed as an endangered species throughout its range under the ESA on September 6, 1990 (55 FR 36641–36647). The closely related shovelnose sturgeon is listed as threatened under the similarity of appearance provisions of the ESA because it is difficult to differentiate between the two species. This ruling is intended to avoid accidental harvesting of pallid sturgeon (FWS 2010b).

Rob Holm / FWS

A pallid sturgeon lurks in the river's depth.

The pallid sturgeon is a large-river fish that is native to the Missouri River. It can weigh up to 80 pounds and has rows of bony plates that stretch from head to tail. Proper water velocity, turbidity, and temperature, along with a sufficient food source, are essential in providing a diverse and productive habitat for pallid sturgeon. Potential pallid sturgeon prey species include sicklefin, sturgeon chub, flathead chub, silver chub, speckled chub, plains minnow, and western silvery minnow (Berry and Young 2004).

Pallid sturgeon prefer the bottoms of large, long, shallow and free-flowing rivers with swift and turbid water, coarse sand substrate with sand and gravel bars, and small invertebrates and native chubs for feeding (Aaron DeLonay, ecologist, USGS, pers. comm. with the NPS). Braided channels, inside bends, outside bends, and large connected secondary channels appear to be the most common macrohabitats for pallid sturgeon from fall through spring, while only braided channels and outside bends are the most common locations for pallid sturgeon in the summer months (Stukel et al. 2009).

Adult pallid sturgeon are thought to prefer water that is deep, relatively fast, and has turbulent flow (DeLonay et al. 2009). The presence of coarse sand substrate appears to be important for spawning (Peters and Parham 2008; Aaron DeLonay, ecologist, USGS, pers. comm.). Gravid pallid sturgeon females migrate upstream to spawn once every three to ten years (Keenlyne and Jenkins 1993; Mayden and Kuhadja 1997, as cited in Reuter et al. 2009, DeLonay et al. 2009). The distance fertile pallid sturgeon migrate can be anywhere from tens to thousands of kilome-

ters (DeLonay et al. 2009). However, the construction of six major dams on the Missouri River do not allow for upstream migration of fish (Aaron DeLonay, ecologist, USGS, pers. comm.). These dams limit upstream migrations of pallid sturgeon to find suitable habitat for spawning within the project area.

Typically, pallid sturgeon larvae drift for 7 to 13 days; these larvae can drift a total distance of 152–329 miles (245–530 kilometers) over that time (Braaten et al. 2008). It is important that the water is turbid, because larvae are fairly easy to see in the water, so drifting into clear water could result in a poor chance of survival (Shuman et al. 2010, Stukel et al. 2009).

Surveys indicate most pallid sturgeon originated from hatcheries; this implies that neither wild nor hatchery-reared fish are sufficiently reproducing on their own to maintain a viable population (Aaron DeLonay, ecologist, USGS, pers. comm.). However, in 2007, two female pallid sturgeon were documented spawning in the 59-mile segment of the MNRR (USGS 2007). In addition, spawning pallid sturgeon were documented in 2008, 2009, and 2010, with at least one pallid sturgeon spawning twice (Aaron DeLonay, ecologist, USGS, pers. comm.). In total, 10–12 female pallid sturgeon have been documented spawning in the 59-mile segment, with half of hatchery origin and half of wild origin (Aaron DeLonay, ecologist, USGS, pers. comm.). Accordingly, a possible explanation for the lack of spawning (until 2007) is that many hatchery-reared fish have not yet reached sexual maturity (Sam Stukel, Fisheries Biologist, SDGFP, pers. comm.).

The historical range of pallid sturgeon once included the Yellowstone, Missouri, and middle and lower Mississippi Rivers, as well as the lower reaches of their major tributaries. According to catch records, pallid sturgeon were considered to be somewhat common in the 1950s and 1960s (USDA 2011). Today, wild pallid sturgeon are rare in the Missouri River, primarily because of the construction of dams, channelization, and bank stabilization that have together damaged or destroyed much of that habitat (Weeks et al. 2005). Wild adults are only occasionally found in a few selected areas of the river.

The Niobrara Confluence segment is one of the recovery–priority areas for the species (Dryer and Sandoval 1993). The pallid sturgeon population in this segment is dependent on hatchery augmentation programs for recruitment. Shuman et al. (2010) found a total of 177 pallid sturgeon in the 39-mile segment of the MNRR, with 94 percent of hatchery origin. The Fort Randall reach currently has no confirmed wild pallid sturgeon (FWS 2005). However, Shuman et al. (2010) identified two potentially wild pallid sturgeon, though the origin of these individuals has not been genetically confirmed. The last time a wild pallid sturgeon was identified in this reach was around 1991 (FWS 2007). Despite the concerns about no truly wild fish existing in this reach, Shuman et al. (2005) found that the hatchery-reared fish are surviving and individuals are growing in size. USGS ecologist Aaron DeLonay (pers. comm.) suggests that pallid sturgeon can survive in the Fort Randall segment, but that the segment is likely not conducive (and likely will not be conducive) to pallid sturgeon spawning for several reasons: the water in the Fort Randall segment is too cold and there are extensive power peaks from the hydroelectric Fort Randall Dam. However, the proximity of the riverbank to shale bluffs likely fosters the creation of large substrates for historical spawning habitat.

Least Tern (Endangered)

On May 28, 1985, the interior population of the least tern was determined by the FWS to be endangered (50 FR 21784–21792). The least tern measures 9 inches long with a 20-inch wingspread, making it the smallest member of the gull and tern family, Laridae. The sexes look alike, with a black-capped crown, white forehead, grayish back and dorsal wing surfaces, snowy white undersurfaces, legs of various orange and yellow colors depending on the sex, and a black-tipped bill whose color also varies depending on sex (Boyd and Thompson 1985, Watson 1966). Immature birds have darker plumage than adults, a dark bill, and dark eye stripes on their white foreheads.

Interior least terns spend about 4–5 months at their breeding sites from late April to early June (Faanes 1983, Hardy 1957, FWS 1987, Wilson 1984, Wycoff 1960, Youngworth 1930) to early September (Bent 1921, Hardy 1957, Stiles 1939). The nest is a shallow and inconspicuous depression in an open sandy area, gravelly patch, or exposed flat. Small stones, twigs, pieces of wood and debris usually lie

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Least tern is one of the Federal trust species that depends on this vital ecosystem.

near the nest. The birds usually lay two or three eggs (Anderson 1983; Faanes 1983; Hardy 1957; Kirsch 1987, 1988, 1989; Smith 1985; Sweet 1985). Both sexes share incubation which generally lasts 20–25 days but has ranged from 17 to 28 days (Faanes 1983; G.R. Lingle, personal communication; Hardy 1957; Moser 1940; Schwalbach 1988).

The precocial behavior of interior least tern chicks is similar to that of other least terns. They hatch within 1 day of each other, are brooded for about 1 week, and usually remain within the nesting territory but wander further as they mature. Fledging occurs after 3 weeks, although parental attention continues until migration (Hardy 1957; Massey 1972, 1974; Tomkins 1959). Departure from colonies by both adults and fledglings varies but is usually complete by early September (Bent 1921, Hardy 1957, Stiles 1939).

The interior population of least tern is widely distributed in the Missouri River watershed and along the Mississippi River downstream from the Missouri confluence. Lott (2006) reported a grand total of 17,591 terns (in association with 489 different colonies) were counted in 2005 in a comprehensive, range-wide survey covering about 4,700 river miles, 22 reservoirs, 62 sand pits,12 industrial sites, 2 rooftop colonies, and over 16,000 acres of salt flats.

The average number of adults least terns on the Missouri River over 26 years has been 645 adults. The adult numbers have varied from a record 26-year low of 273 in 2011 to a high of 1,010 in 2007. Most of the estimated 273 adult least terns on the Missouri River in 2011 were on a sandbar in the headwaters of Lewis and Clark Lake. This was probably due to the flood conditions that year.

The natural and free-flowing 25-mile segment of the Niobrara River within the project area produces a high sediment load, creating a delta at its confluence with the Missouri River in the 39-mile segment of the MNRR. This delta provides important primary sandbar nesting for the Missouri River population of least terns, supporting a 3-year average (2010–2012) of 13.7 percent of the adults in the Missouri River ecosystem. The natural and free-flowing 59-mile Ponca Bluffs segment of the Missouri River provides important primary sandbar nesting for the Missouri River population of least terns, supporting an average of 36.4 percent of the adults in the Missouri River ecosystem.

Whooping Crane (Endangered)

The whooping crane was listed as threatened with extinction in 1967 (32 FR 4001) and endangered in 1970 (35 FR 8491–8498); both listings were "grandfathered" into the ESA. At a height of 5 feet, the whooping crane is the tallest bird in North America with a 7-foot wingspan. From a low of 15 birds in 1941, the current wild and captive whooping crane population is about 535. Whooping cranes pass through North Dakota and South Dakota in the company of sandhill cranes when migrating between their breeding territory in northern Canada and wintering grounds on the Gulf of Mexico between October 1 and December 1 in the fall and March 15 and May 16 in the spring. They are known to utilize shallow areas of rivers, lakes, and ponds along their migration route. The whooping crane has been documented in the project area as a stopover point during migration. Twenty percent of the 2012 spring whooping crane stopover sites were in Nebraska and South Dakota (USGS 2012a).

Eskimo Curlew (Endangered)

The Eskimo curlew was originally listed as endangered under the Endangered Species Preservation Act of 1966 on March 11, 1967 (32 FR 4001). The FWS is now conducting a 5-year status review of the Eskimo curlew (76 FR 36491). The Eskimo curlew had been one of the most abundant shorebirds until the late 1880s, and some fear that it may now be extinct. The endangered Eskimo curlew is a medium-sized shorebird in the Scolopacidae family and the smallest of the North American curlews. Their confirmed nesting grounds are on the treeless tundra in the Northwest Territories, Canada, and likely in northern Alaska and Siberia. They winter in the Pampas of Argentina, southern Brazil, Uruguay, and Chile. During migration, they are thought to move through midwestern United States feeding on grasshopper egg cases and emerging nymphs, other insects, and earthworms in undisturbed prairie and agricultural fields. The last confirmed sighting was in Nebraska in 1987. The Eskimo curlew had been known to occur in Yankton County, South Dakota, but is not listed for the states of South Dakota or Nebraska.

Piping Plover (Threatened)

The Great Lakes population of the piping plover was listed as endangered and threatened in the rest of its range on December 11, 1985 (50 FR 50726–50734). South Dakota and Nebraska are among the States in which piping plovers of threatened status are known or are believed to occur.

The piping plover is a small shorebird that inhabits barren sand and gravel shores of rivers and lakes; the plovers are attracted to the rare combination of windswept islands or peninsulas with a lack of nearby tree cover. Lake Sakakawea and Lake Audubon are significant areas for piping plovers on the Missouri River system.

On the Missouri River, critical habitat includes sparsely vegetated channel sandbars, sand and gravel beaches on islands, temporary pools on sandbars and islands, and the interface with the river. Critical habitat on Lake Sakakawea and Lake Oahe includes sparsely vegetated shoreline beaches; peninsulas; and islands formed of sand, gravel, or shale—and the interface of these lands with the water bodies. For alkali lakes and wetlands, critical habitat includes:

- shallow, seasonally to permanently flooded, mixosaline to hypersaline wetlands with sandy to gravelly, sparsely vegetated beaches, salt-encrusted mudflats, or gravelly salt flats;
- springs and fens along edges of alkali lakes and wetlands and the adjacent upland grasslands that are 200 feet above the high-water mark of the alkali lake or wetland. (FWS 2002.)

According to the International Census, the northern Great Plains population of piping plover in the United States declined from 1991 to 1996, but has increased since then (2,959 individuals counted in 2006). Piping plovers are widely distributed in the Missouri River and in the Mississippi River downstream from the Missouri confluence; however, the Missouri River population appears to be declining. The 2009 estimates of the Missouri River population were 897 adults and 425 fledglings.

The 2011 piping plover population in the Missouri River was estimated to be 182 adult breeding birds. Most of the birds were on a sandbar located in the headwaters for the Lewis and Clark Lake due to flood conditions. In the past, piping plover adult numbers on the Missouri River have varied from a low of 82 in 1997 to a high of 1,764 in 2005. The average number over 26 years has been 729 adults. Piping plover adults on the Missouri River have decreased in each of the past 3 years. The 2011 adult census of 182 piping plovers represents the second lowest adult census for the species in 26 years of censuses on the Missouri River.

The Niobrara Confluence segment of the Missouri River provides important primary sandbar nesting and chick-rearing habitat for the Missouri River population of piping plovers, supporting an average of 3.2 percent of the adults in the Missouri River ecosystem. The Ponca Bluffs segment of the Missouri River provides important primary sandbar-nesting and chick-rearing habitat for the Missouri River population of piping plovers, supporting an average of 23.6 percent of the adults in the Missouri River ecosystem.

Western Prairie Fringed Orchid (Threatened)

The western prairie fringed orchid was determined by the FWS to be of threatened status on September 28, 1989 (54 FR 39857–39863). This perennial plant, which may reach 3 feet in height, can be recognized by its large, white flowers on a single stem. The western prairie fringed orchid is a native of the North American tallgrass prairie flower that is found most often on unplowed, calcareous native prairies and sedge meadows.

The western prairie fringed orchid is known or believed to occur in Holt County, Nebraska and nearby Pierce County, Nebraska (Scott Wessel, personal communication). Historically, the western prairie fringed orchid was found in the Big Sioux Valley in Minnehaha County in South Dakota. It is not known to grow in South Dakota, although potential habitat exists.

Sprague's Pipit (Candidate)

On September 15, 2010 (75 FR 56028), the FWS found that, after review of all available scientific and commercial information, listing the Sprague's pipit as endangered or threatened is warranted under the ESA. However, listing the Sprague's pipit is currently precluded by higher priority actions to amend the Lists of Endangered and Threatened Wildlife and Plants; consequently, the Sprague's pipit was added to the candidate species list. Migratory bird species that are candidate species, such as Sprague's pipit, are still protected under the Migratory Bird Treaty Act.

The Sprague's pipit is a small passerine endemic to the Prairie Pothole region of North America. It has a plain buff colored face with a large eye ring. The bill is relatively short, slender, and straight, with a blackish upper mandible. The lower mandible is pale with a blackish tip. The Sprague's pipit is a ground-nester that breeds and winters on open grasslands. It feeds mostly on insects and spiders and some seeds.

Sprague's pipits require large patches of grassland habitat for breeding, with the preferred grass height between 4 and 12 inches. The pipit prefers to breed in well-drained, open grassland and avoids grassland with excessive shrubs. Sprague's pipits can be found in lightly to heavily grazed areas. Pipits avoid intrusive human features on the landscape, so the effect of a development can be much greater than the actual "footprint" of the feature.

Sprague's pipit is known to or is believed to occur in Nebraska and South Dakota. Sprague's pipit may occur in the project area during migration.

4.3 Special Management Areas

National Park Service—Missouri National Recreational River

The MNRR is operated under both the National Park Service Organic Act and the Wild and Scenic Rivers Act. The national river has management authority, regulatory authority, and land purchase and easement authorities associated with its establishment. The boundary of the national river lies within the proposed conservation areas' boundaries. Interest in lands within the national river boundary that might be purchased for the proposed conservation areas would be subject to Wild and Scenic River Act regulations. The establishment of the proposed conservation areas would result in the protection of the values Congress required the NPS to protect and would accordingly be compatible with the operation of the National Recreational River designation.

National Park Service—Lewis and Clark National Historic Trail

The Lewis and Clark National Historic Trail was established by Congress in an amendment to the National Trails System Act in 1978. The trail follows the route of the Lewis and Clark expedition from Wood River, Illinois, to the mouth of the Columbia River in Oregon and includes trail sites, trail segments, and motor routes. Portions of the trail that lie within the proposed conservation areas include a water-based trail along the Missouri River, historic sites Ionia Volcano and Old Baldy, and auto tour routes in Nebraska and South Dakota. The NPS administers the trail in cooperation with other Federal, State, and local agencies, private organizations, and private landowners. The purpose of the trail and its management is to identify, protect, and interpret the historic route, sites, landscapes, and resources associated with the Lewis and Clark expedition for public use and enjoyment. Management of this nationally significant historic trail is consistent with the purposes of the proposed conservation areas.

Nebraska State Parks

The Nebraska State Parks are managed according to park type. The proposed conservation areas contain both State parks and State recreation areas:

- State parks are public use areas of significant scenic, scientific, or historical values and of sufficient size to allow adequate development without infringing on the area's primary values.

- State recreation areas are areas that possess resource values primarily associated with active outdoor recreation pursuits, day-use activities, and camping. All of Nebraska's major water-oriented areas fall under this classification.

Niobrara State Park is situated at the confluence of the Niobrara and Missouri Rivers on Nebraska's northeastern border. It is managed for its natural resource values, scenic vistas, and high levels of visitor use. The management of the State park would not conflict with the purposes of the proposed conservation areas.

Lewis and Clark Recreation Area is located on Lewis and Clark Lake about 7 miles north of Crofton, Nebraska. The lake is about 16 miles long and 3 miles wide, with a maximum depth of 45 feet. This State recreation area includes five distinct units on the south side of the lake: Weigand-Burbach, Miller Creek, Bloomfield, South Shore and Deep Water. The recreation area is outside of the proposed conservation areas' boundaries but offers a high level of visitor use that should be considered during planning for the proposed conservation areas.

Ponca State Park is the eastern gateway to the 59-mile section of the MNRR, containing one of two unchannelized stretches of the Missouri River bordering Nebraska. The park is 2 miles from the town of Ponca. Ponca State Park encompasses nearly 2,400 acres of heavily forested rolling hills and Missouri River bottomland, including Ponca State Park's North Addition, which is next to the Elk Point Bend Wildlife Management Area. The scenic park offers visitors all the amenities of a modern State park while protecting and enhancing natural resource values. Management of Ponca State Park would support the principles of the proposed conservation areas.

South Dakota State Parks Division of Parks and Recreation

The South Dakota Division of Parks and Recreation provides diverse outdoor recreational opportunities and preserves the resources with which the division is entrusted. The agency strives for efficient, responsive, and environmentally sensitive management. The management of the South Dakota State parks within or next to the proposed conservation areas is consistent with the purposes of the proposed conservation areas.

Springfield Recreation Area is located on the north bank of the Missouri River near Springfield, South Dakota. The park is managed for both natural resource and recreational values.

Lewis and Clark State Recreational Area, Pierson Ranch, and Chief White Crane form a recreational complex on the north shore of Lewis and Clark Lake. The areas are managed primarily for recreational use within a natural setting. The recreation area is outside of the proposed conservation areas' boundaries but supports high levels of visitor use that should be considered during planning for the proposed conservation areas.

Adams Homestead and Nature Preserve contain 1,500 acres along the Missouri River, near North Sioux City, Iowa. The preserve is managed primarily for natural resource values and is also committed to environmental education.

U.S. Army Corps of Engineers—Fort Randall Dam and Lake Francis Case, Gavins Point Dam and Lewis and Clark Lake

The USACE manages Lake Francis Case and Lewis and Clark Lake for eight Congressionally authorized purposes: flood control, navigation, irrigation, fish and wildlife, hydropower, recreation, water supply, and water quality control. The installation of the main stem dams interrupts ecological processes along the Missouri River and its floodplain. The USACE has completed numerous studies and others are still in progress to restore or mediate processes that are inconsistent with the ESA. Current management of the Missouri River dams is not in direct conflict with the goals of the proposed conservation areas. Rather, the management of the dams and lakes requires that land be protected in order to protect and restore the river's ecological processes and species.

4.4 Visitor Services

A wide range of opportunities for learning and recreating exist within the proposed NCCA and PBCA. Recreation, access, and education build an appreciation for the importance of resource protection within the proposed conservation areas. All educational and recreational activities and facilities listed are compatible with the purposes of the NCCA and PBCA.

Existing Recreational and Educational Facilities in the Proposed Niobrara Confluence Conservation Area

Educational and recreational opportunities are readily available in or nearby the NCCA and support a variety of outdoor activities including modern camping (in campgrounds and cabins), boating, fishing, swimming, and trail rides. Many sites offer cultural interpretation of historic sites and educational talks and exhibits.

- Niobrara State Park offers visitors an opportunity to sample a wide range of outdoor experiences. Facilities include cabins, campsites, picnic sites, horseback trails, hiking trails, and are areas for fishing, boating, and swimming. The park also offers unique opportunities for solitude, artistic pursuits, and enjoying scenic vistas. Niobrara State Park does not offer boat access to the Missouri River. Educational opportunities include both wayside exhibits and formal interpretive programs focused on both cultural and natural history.

- Fort Randall Historic Site is listed on the NRHP. It commemorates the military presence in the area from 1856 to 1892 and preserves remaining structures including the remains of the chalkstone chapel. The site has numerous wayside exhibits that interpret the fort's role in the westward migration of that time period.

- Karl Mundt National Wildlife Refuge, located on the southwest side of the Missouri River, is managed by the FWS. The refuge is home to many nesting bald eagles, migratory birds, and other wildlife. The ref-

uge offers both exhibits and formal interpretive programs.

- Fort Randall Dam Visitor Center is managed by the USACE. Interpretive displays and programs at the site focus on the operation of the dam and powerhouse. A boat ramp is also nearby.

- Sunshine Bottom boat ramp is a concrete and stone ramp managed by the NGPC and offers year-round public access to the Missouri River.

- Verdel Landing boat ramp near the town of Verdel, Nebraska, is managed by the State of Nebraska and offers year-round public access to the Missouri River from a double concrete ramp. The site also has public restrooms.

- Niobrara boat ramp is a concrete public ramp managed by the State of Nebraska. It is generally unusable because of heavy sediments in the vicinity. It also has a picnic area.

- Running Water boat ramp is managed by the City of Running Water and offers a public concrete ramp.

- Bazile Creek Wildlife Management Area is a 4,500-acre site managed by the State of Nebraska. Fishing and hunting for deer and waterfowl are popular activities. This site also offers river access from a concrete ramp.

- Santee Sioux Recreation Park is located on the Santee Sioux Indian Reservation in Knox County, Nebraska. It has a boat ramp managed by USACE and provides access to the Missouri River. In addition, it provides some limited, primitive camping.

Besides the sites listed above, both Nebraska and South Dakota manage areas specifically for hunting that are within the proposed NCCA (table 5).

Existing Recreational and Educational Facilities in the Proposed Ponca Bluffs Conservation Area

Educational and recreational opportunities are readily available in or nearby the PBCA and support a variety of outdoor activities including modern camping (in campgrounds and cabins), boating, fishing, swimming, and trail rides. Many sites offer cultural interpretation of historic sites and educational talks and exhibits.

- Lewis and Clark State Recreation Area (Nebraska) includes five areas on the south side of the lake: Weigand–Burbach, Miller Creek, Bloomfield, South Shore, and Deep Water. The recreation area offers housekeeping cabins, campsites, scenic views of the lake and the bluffs, fishing, skating, snowmobiling, and cross country skiing. Interpretive waysides and formal educational programs focus on both cultural and natural resources.

- Lewis and Clark State Recreation Area (South Dakota) is a popular tourist attraction. The recreation area has a sand beach, marina, resort, cabins, campsites, bicycling routes, trails, a boat ramp, and fishing areas. Limited interpretation at the recreation area educates the public on natural resources, local history, and Yankton Sioux culture and history through both programs and wayside exhibits.

Table 5. Existing public hunting areas in the proposed Niobrara Confluence Conservation Area, Nebraska and South Dakota.

Name	*State*	*County*	*Acres*
Running Water Game Production Area	South Dakota	Bon Homme	1,441
Redbird Wildlife Management Area	Nebraska	Holt	433
O. John Emerson Wildlife Management Area	Nebraska	Holt	160
Bohemia Prairie Wildlife Management Area	Nebraska	Knox	680
Bazile Creek Wildlife Management Area	Nebraska	Knox	4,500

- Gavins Point Dam Visitor Center and Lewis and Clark Visitor Center are managed by the USACE. They provide interpretive exhibits, wayside exhibits, powerhouse tours, and formal interpretive programs focused on both natural and cultural history at the site. The USACE also manages two campgrounds near the dam, a concrete boat ramp on both sides of the river, fishing piers, fish cleaning stations, and a beach.

- Dakota Territorial Museum is located in Yankton, South Dakota, and has numerous historic exhibits. Occasionally formal educational programs are offered.

- Yankton, South Dakota, through the chamber of commerce, offers self-guided walking and driving tours of the historic capital of the Dakota Territories. The annual Riverboat Days festival draws visitors to the riverfront for food and entertainment. Riverside Park offers two double concrete boat ramps with ample parking.

- St. Helena County Park in Cedar County, Nebraska, offers a public boat ramp, picnic shelter, and restrooms.

- Myron Grove Wildlife Management Areas, managed by the State of South Dakota, has a public boat ramp and restroom.

- Brooky Bottom Landing is a Cedar County Park and has a double-wide concrete boat ramp, picnic area, and restroom.

- Clay County State Recreation Area in South Dakota offers a boat ramp, picnic shelter, fishing pier, fish cleaning station, and overlook.

- Clay County Park, which is next to the Clay County State Recreation Area, has a 3-mile paved nature trail, volleyball and horseshoe courts, horse trails, and a campground with showers and restrooms. The park occasionally offers interpretive programs.

- Spirit Mound in Clay County, South Dakota, is managed by the Spirit Mound Trust, which protects and manages the site for natural resource values. Wayside exhibits detail the Lewis and Clark's visit to the site and natural history. Formal programs are provided occasionally.

- Mulberry Bend Wildlife Management Area is a 6-acre site in Dixon County, Nebraska, with concrete boat ramp access to the Missouri River and a restroom facility.

- Mulberry Bend Scenic Overlook is managed by the NPS and provides accessible trails to sweeping views of the Missouri River and its floodplain.

- Bolton Game Production Area in Union County is managed by the State of South Dakota for boat ramp access to the Missouri River.

- Ponca State Park in Nebraska provides boat access to the Missouri River from a concrete ramp. It offers a wide range of visitor services and activities. The Missouri National Recreational River Resource and Education Center has high-quality exhibits to engage and inform visitors about the history and natural resources of the area. It also has a conference center. The park offers a variety of cabins and campgrounds, a swimming pool, 20 miles of hiking trails, and equestrian trails. The park is home to the annual Missouri River Expo, a weekend of outdoor activities that draws crowds from the tri-state area.

Besides the sites listed above, both Nebraska and South Dakota manage areas specifically for hunting that are within the vicinity of the proposed PBCA (table 6).

4.5 Human History and Cultural Resources

The legacy of human interaction with the landscape and natural resources is evident throughout the region in the form of structures, archeological sites, and changes in vegetation. The proposed conservation areas together have a long history of human use because of the abundant resources and travel routes provided by the two major riverways.

Prehistory

Evidence of prehistoric use abounds in the proposed conservation areas. However, full systematic

Table 6. Existing hunting areas in the proposed Ponca Bluffs Public Conservation Area, Nebraska and South Dakota.

Name	*State*	*County*	*Acres*
Chalkrock Wildlife Management Area	Nebraska	Cedar	130
Wiseman Wildlife Management Area	Nebraska	Cedar	380
Mulberry Bend Wildlife Management Area	Nebraska	Dixon	6
Buckskin Hills Wildlife Management Area	Nebraska	Dixon	340
Elk Point Bend Wildlife Management Area	Nebraska	Dixon	627
Bow Creek Recreation Area	Nebraska	Cedar	220
Myron Grove Game Production Area	South Dakota	Clay	62
Frost Wilderness Game Production Area	South Dakota	Clay	112
Donnelley Game Production Area	South Dakota	Clay	66
Cusick Game Production Area	South Dakota	Union	181
Bolton Game Production Area	South Dakota	Union	25
Rosenbaum Game Production Area	South Dakota	Union	10
Warren Wilderness Game Production Area	South Dakota	Union	160

surveys for archeological sites have not been completed. Many of the known sites have been fully or partially collected, and the artifacts reside in regional curation facilities or private collections. The known sites within the boundaries of the MNRR are well documented; information on neighboring sites is less complete, although it is reasonable to assume the entire analysis area contains archeological sites.

Paleo-Indian

Paleo-Indians were hunter-gatherers who were present on the North American continent between 11,500 and 7,000 years before present (B.P.). These people hunted large game along the margins of ice sheets that blanketed North America. The paleo-Indian period is generally divided into three cultural complexes—Clovis, Folsom, and Plano—and each had distinct differences in the tools or "points" they produced. At least one paleo-Indian site has been documented in the proposed NCCA and includes what may be a short-term campsite where hunters killed and processed game animals. At least three sites are also known from the proposed PBCA.

Archaic

The Archaic Period dates from 8,000 to 1,500 B.P. It is differentiated from the paleo-Indian period by an increase in the variety of plants and animals used by people as big game went extinct; it is also the time during which people began manipulating the environment more extensively. Several Archaic sites are known from or near the PBCA analysis area and include a quarry, burial sites, animal bone, and projectile points. The NCCA contains four documented Archaic sites. Both proposed conservation areas have a high potential for additional sites.

Plains Woodland

The Plains Woodland period (2,000–800 B.P.) is well represented within the study area with over 60 documented sites. Plains Woodland people are differentiated from earlier people by their increased use of technology including the manufacture and use of ceramic vessels, domestication of plants, and the development of the bow and arrow. The period is also marked by the development of semipermanent villages and the exploitation of local resources. Social advances during the Plains Woodland period include the development of mortuary rituals and formal burials along with the use of symbolic items that may suggest ritualistic or religious behavior. The potential for additional sites is high within the proposed conservation areas.

Great Oasis

Great Oasis (1150–850 B.P.) is considered a distinct cultural group that evolved during the Plains Woodland period. The Great Oasis people traded extensively with other groups from the east for shells and perhaps corn. Great Oasis sites contain distinctive pottery, campsites, village sites, burials, and evidence of small scale cultivation of foods.

Plains Villager and Coalescent Tradition

The Coalescent Tradition occurred from 900 to 1500 and reflects cultures with a less nomadic lifestyle, as suggested by semipermanent and permanent dwellings, greater population sizes, and improvements in small scale farming. The Missouri River bounds two distinct Plains Villager subareas, the Central Plains tradition and the Northern Plains tradition. The Central Plains tradition (Nebraska) is broken into six distinct cultural units including the St. Helena phase, which occupied major watersheds in the Great Plains and is well represented within the proposed PBCA. Known sites contain evidence of earthlodges, gardening tools made from animal bones, and advanced pottery. A reliance on farming seemingly led to a more sedentary lifestyle, which in turn led to technological and social advances. Both conservation areas contain numerous sites from this time period; many are on the national register.

Protohistoric

The Protohistoric period began around 1500. Distinct tribes had developed by this time, and their presence in the area is documented in the writings of early explorers. Many tribes are known to have used the land in both the proposed NCCA and PBCA; these tribes include the Omaha, Ponca, Santee Dakota, Pawnee, Arikara, Ioway, and the Brule and Oglala Lakota.

The Omaha and Ponca are closely related and are believed to have been part of the same tribe at one time. The Omaha are known to have participated heavily in the fur trade. They settled in the proposed PBCA in the 17th century and relocated south in the late 1700s. The Ponca homelands are located in the NCCA near the confluence of the Missouri and Niobrara Rivers and the Ponca Fort Village is a well-known and well preserved site. The Ponca lost their land to the government and the Lakota Sioux through treaty. They were forced to relocate to the Oklahoma Indian territory in 1877, and many of them perished on the long journey. One of the dead was the son of Chief Standing Bear who, along with 65 other tribal members, returned to his homeland to bury his son. He was arrested and—in a landmark case that confirmed that American Indians are people and citizens of the United States—released. Standing Bear was then able to live wherever he chose. He, along with a few others from his tribe, returned to the Niobrara River confluence. The Ponca Tribe of Nebraska now owns roughly 700 acres of their former homeland that is within the proposed NCCA.

The Pawnee and Arikara may have been part of the Coalescent Tradition of the Dakotas and could have an association with the St. Helena Phase. However, there is no archeological evidence to suggest they used the area in historic times other than for bison hunts. There is also evidence of a short Ioway presence between 1700 and 1730 within the proposed conservation areas. The Santee Dakota arrived by forced relocation following the Minnesota Sioux uprising of 1862 to the area that is now the Santee Reservation in Knox County, Nebraska.

The Yankton Sioux moved west to the area near present-day Greenwood, South Dakota, in the late 1700s. The Yankton Sioux reservation was established by the 1858 Fort Laramie Treaty in this same area.

Historic Period

Euro-American exploration of the middle Missouri River began in the early 1700s when the Mallet brothers explored the river in search of trade routes. Spanish traders followed, and by 1739 both traders and explorers had built encampments at the mouth of the Niobrara River. The entire area was part of the Louisiana Purchase, which prompted the Lewis and Clark expedition in 1804. Numerous Lewis and Clark sites are commemorated within the proposed conservation areas as part of the Lewis and Clark National Historic Trail.

A series of military expeditions to seek transportation routes followed in the mid-1800s. A series of military forts was also erected across South Dakota and Nebraska including Fort Randall, the main U.S. outpost on the Missouri River. The fort was continuously occupied for 36 years, and its remains have been preserved by the USACE and the NPS.

During this time, Euro-American presence increased as settlers and gold seekers came to the region. Government policies regarding American Indians including treaties, assimilation, and removal to reservations, effectively allowed for settlement of the area by Euro-Americans.

Numerous historic sites, both regionally and nationally recognized, are found within the proposed conservation areas. The sites include archeological sites, Lewis and Clark sites, bridges, structures, and landscapes.

Ethnographic Resources

Archeological and historical evidence confirms that the areas in and around the proposed PBCA and NCCA were places of spiritualistic and ritualistic use for indigenous people and those who settled the area. Given this long history, the proposed conservation

areas may contain ethnographic resources. An ethnographic resource is any landscape, object, plant, animal, site, or structure important to a people's sense of purpose. They are resources that are integral to a people's identity or way of life, are essential to their continued existence, or which at some point in time made them occupationally distinct. This association must have lasted for at least two generations, or 40 years, and the resource is generally regarded differently by the identifying group than it is by the general public. It is highly likely that both American Indians and the descendants of Euro-American settlers identify with the resources of the proposed conservation areas. An NPS study of ethnographic resources from an American Indian perspective is underway.

Traditional Cultural Properties

A traditional cultural property is a property that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community (NPS 1998). The entire Missouri River and the property along its banks have a long history of use by American Indians that continues through the present. The lands in the proposed conservation areas have not been assessed nor evaluated for eligibility for inclusion on the National Register as traditional cultural properties.

Sacred Sites

A sacred site, as defined in Executive Order 13007, is a "specific, discrete, narrowly delineated location… identified by an Indian Tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion , as sacred by virtue of its established religious significance to or ceremonial use by, an Indian religion." To date, no tribe or authoritative individual has alerted the Secretary of the Interior or the Secretary's representative of any sacred sites within the proposed conservation areas. Continued government-to-government consultation will take place throughout the planning process to ensure no unknown sacred sites are compromised by the establishment of the proposed conservation areas.

4.6 Paleontological Resources

In 2011, the NPS produced a literature review and summary of paleontological resources in the region. The resulting report (Tweet 2011) details the high potential for undiscovered fossil resources within the study area—this conclusion is supported by site-specific field research. Both study areas contain numerous documented sites rich with fossils from the Cretaceous (145.5 to 65.5 million years ago) and the Cenozoic (65.5 million years ago to present) time periods. The Greenhorn limestone and Niobrara formation are more or less completely comprised of fossil materials (Maher et al. 2003, Watkins and Diffendal 1997). The most common visible fossils in the other rock formations are mollusks, fish, and large marine reptiles dominated by mosasaurs (related to monitor lizards) (Voorhies and Corner 1993), sharks, and bony fish (Witzke 1981).

4.7 Socioeconomic Environment

Population, Ethnicity, and Education

Table 7 lists population statistics for the 12-county area surrounding the NCCA and PBCA. These counties have a combined population of about 2.6 million people (U.S. Census Bureau 2012). While both the States of Nebraska and South Dakota have experienced an increase in the number of residents since 2000, eight counties in the 12-county area (5 in Nebraska and 3 in South Dakota) have experienced a decline in growth (U.S. Census Bureau 2010). In Nebraska, four of the five counties showing a population decrease have experienced declining populations since 1930, with only Holt County showing some fluctuation in population growth during the late 20th century (Nebraska Department of Economic Development 2010a, 2010b). Dakota County is the only Nebraska county in the 12-county area that has experienced population growth, and this may be because of its location near Sioux City, Iowa. Three of the South Dakota counties have experienced a steady decline in population since 1920 (Brooks et al. 2008). In both South Dakota and Nebraska, the overall decline in county populations may reflect low birthrates in the counties as well as a migration of residents from rural counties to more urban areas.

Table 7. Population statistics for the 12-county area near the Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

	Residents (2010)	*Persons per square mile*	*Percentage population change since 2000*	*Percentage of population with bachelor's degree or higher*
Nebraska	1,826,341	23.8	7	28
Boyd County	2,099	3.9	–14	13
Cedar County	8,852	12.0	–8	15
Dakota County	21,006	79.5	4	11
Dixon County	6,000	12.6	–5	13
Holt County	10,435	4.3	–10	16
Knox County	8,701	7.9	–7	18
South Dakota	814,180	10.7	8	25
Bon Homme County	7,070	12.5	–3	15
Charles Mix County	9,129	8.3	–2	16
Clay County	13,864	33.6	2	40
Gregory County	4,271	4.2	–11	15
Union County	14,399	31.3	14	29
Yankton County	22,438	43.1	4	27

Source: U.S. Census Bureau 2010.

While the overall populations of both Nebraska and South Dakota are expected to grow, population decline is expected to continue in 8 of the 12 counties. The only counties that are expected to see an increase in population by the year 2020 are Dakota and Dixon Counties in Nebraska and Clay and Yankton Counties in South Dakota. The increase in population in these four counties may be because of their locations near Sioux City, Iowa, and the Interstate 29 corridor as well as Vermillion, South Dakota, home of the University of South Dakota. In both South Dakota and Nebraska, much of the population growth is expected to occur near Interstate 29 (Brooks et al. 2008, Nebraska Department of Economic Development 2010c).

Relative to the other counties in the 12-county area, Dakota County, Nebraska, has the largest percentage of individuals who identified themselves as Hispanic or Latino on the 2010 Census (36 percent of the population) (U.S. Census Bureau 2012). Dakota County also has the lowest percentage of individuals who identified themselves as white (55 percent of the total population). Charles Mix County, South Dakota, had the highest percentage of individuals who identified themselves as America Indian and Alaska Native (32 percent of the population). Cedar County, Nebraska, has the highest percentage of individuals who identified themselves as white (98 percent of the population) (U.S. Census Bureau 2012).

As shown in table 7, within the proposed area and compared to South Dakota, Nebraska has a higher percentage of individuals who earned at least a bachelor's degree (28 percent of the population) (U.S. Census Bureau 2012). Among the counties in Nebraska, Knox County has the highest percentage of the population to have earned at least a bachelor's degree (18 percent), while Dakota County has the lowest percentage (11 percent of the total population). Among the counties in South Dakota, Clay County has the highest percentage of individuals who have earned at least a bachelor's degree (40 percent of the population), while Bon Homme and Gregory Counties have the lowest percentage (each with 15 percent of the population).

Regional Employment and Income

Table 8 shows median household income and poverty rates for both Nebraska and South Dakota. Nebraska had a higher median household income in 2010 than South Dakota ($49,342 and $46,369, respectively) (U.S. Census Bureau 2010). Both South Dakota and Nebraska have poverty rates above 10 percent, with South Dakota having 13.7 percent of individuals below the poverty line and Nebraska having 11.8 percent of individuals below the poverty line. Within the 12-county area, Charles Mix and Clay Counties, South Dakota, both had poverty rates of 24 percent, the highest in the 12-county area, while Union County, South Dakota, had the lowest poverty

Table 8. Income, unemployment, and poverty rates for the 12-county area near the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

	Median household income (2010)[1]	*Percentage unemployed 2011*[2,3]	*Percentage unemployed 2008*[2,4]	*Percentage of individuals below poverty (2010)*[1]
Nebraska	$49,342	4.4	3.3	11.8
Boyd County	$34,906	3.6	3.1	8.3
Cedar County	$40,497	3.1	2.5	10.6
Dakota County	$43,729	6.3	4.1	15.5
Dixon County	$42,388	4.8	3.1	10.3
Holt County	$43,452	3.1	2.7	7.8
Knox County	$36,798	3.7	3.1	13.7
South Dakota	$46,369	4.7	3.0	13.7
Bon Homme County	$41,107	5.7	3.4	12.4
Charles Mix County	$35,808	4.8	3.5	24.0
Clay County	$37,198	4.0	2.7	24.0
Gregory County	$33,940	4.2	3.4	16.0
Union County	$59,889	4.8	3.4	4.9
Yankton County	$47,124	4.6	2.7	11.2

Sources: [1] U.S. Census Bureau 2010, [2] Norton 2012, [3] Ingraham and Foster 2008, [4] Mestl et al. 2000.

rate within the 12-county area (4.9 percent). Three counties in South Dakota had poverty rates that fell below the state average and four counties in Nebraska had rates that fell below the state average (U.S. Census Bureau 2010)

Table 9 shows employment by sector within the 12-county area. The combined 12-county area had a total employment of 85,581 individuals in 2010 (Bureau of Economic Analysis 2012). Farm employment accounted for nearly 10 percent of the workforce. The highest percentage of total employment was found in the public administration sector (16.1 percent of nonfarm employment). This sector includes both local and nonlocal government agencies. The second and third highest percentage of total employment was in manufacturing (11.7 percent) and retail trade (9.6 percent). Forestry, fishing, mining, and related activities accounted for less than 1 percent of the total employment by sector.

Agricultural Sector

The States of South Dakota and Nebraska are highly productive regions in the United States for both crops and livestock. In 2007, farmland accounted for at least 90 percent of the total land in Nebraska and South Dakota (92.5 percent and 90 percent, respectively) (United States Department of Agriculture 2007). In 2007, Nebraska and South Dakota had an output of nearly $27 billion and $11 billion in the agriculture sector, respectively. The top five commodities produced by each state in 2007 were cattle and calves, corn, soybeans, hogs, and wheat.

According to the 2007 Census of Agriculture, the 12-county area was home to nearly 7,500 farms, with over 3.3 million acres in agricultural production. Holt County, Nebraska, led the 12-county area in the greatest number of farms and acreage under production (1,171 farms and 667,581 acres), while Boyd County, Nebraska, had the fewest farms and land in production (259 farms and 90,271 acres) (Economic Research Service 2012).

Tourism and Recreation

Angling, hunting, and wildlife-viewing are popular recreational activities across Nebraska and South Dakota and within the 12-county area. According to the 2011 "National Survey of Fishing, Hunting, and Wildlife-Associated Recreation," approximately 1.2 million participants engaged in wildlife-associated recreation activities in Nebraska and South Dakota in 2011 (FWS 2012b). These resident and nonresident participants spent over $2.5 billion on wildlife-associated recreation activities in the two States combined. Approximately 73 percent of expenditures were related to hunting and fishing activities while the remaining 27 percent were related to wildlife-watch-

Table 9. Percentage employment by sector for the 12-county area near the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, South Dakota and Nebraska.

Employment sectors	*Percentage of 12-county area employed*
Farm employment	9.2
Nonfarm employment[1]	90.8
Forestry, fishing, mining and related activities	0.5
Construction	4.9
Manufacturing	11.7
Wholesale trade	3.1
Retail trade	9.6
Transportation and warehousing, utilities	2.4
Information	0.9
Finance and insurance, real estate and real estate leasing	7.1
Professional, scientific, management, administrative, and waste-management services	6.2
Educational services, healthcare, social assistance	5.4
Arts, entertainment, and recreation; accommodation and food services	6.3
Accommodation and food services	5.0
Other services, except public administration	5.4
Public administration	16.1

Source: Bureau of Economic Analysis 2012.

[1] Not every sector category for every county was fully disclosed because of confidentiality requirements; the table reflects the best and most correct information available.

ing activities (FWS 2012b). The 12-county area provides many wildlife-related recreational and educational opportunities for many residents of South Dakota and Nebraska and attracts visitors from across the United States and from other countries. Recreational opportunities are widely varied and include hunting, fishing, wildlife viewing, boating, camping, paddling, photography, and snagging.

Recreation Areas in the Analysis Area

The NPS-managed MNRR, which receives over 167,000 recreation visits annually, lies within the boundaries of both proposed conservation areas. Ponca State Park (Nebraska) is within the proposed PBCA boundary at the eastern gateway to the 59-mile section of the MNRR boundary. In 2010, Ponca State Park was fourth in terms of most visited attractions in Nebraska with approximately 747,000 visits. Other recreational lands within the proposed PBCA include the Clay County State Recreation Area (South Dakota), Adams Homestead and Nature Preserve (South Dakota), Spirit Mound (managed by the Spirit Mound Trust in South Dakota), Dakota Territorial Museum (Yankton, South Dakota), as well as several wildlife management areas managed by the NGPC.

Niobrara State Park is located within the proposed NCCA at the confluence of the Niobrara and Missouri Rivers. In 2010, Niobrara State Park received a total of 157,000 visits. Other recreational lands within the proposed NCCA include several wildlife management areas managed by the NGPC, Running Water Game Production Area managed by the South Dakota Division of Parks and Recreation, and several boat ramps operated by the State of Nebraska and one operated by the City of Running Water, South Dakota, that provide access to the Missouri River.

Recreation Areas outside the Analysis Area

The USACE manages Lake Francis Case and Lewis and Clark Lake. These lakes along with associated recreational areas, including Lewis and Clark State Recreation Area (Nebraska), Lewis and Clark State Recreation Area (South Dakota), Gavins Point Dam Visitor Center and Lewis and Clark Visitor Center (the USACE), and Springfield Recreation Area (South Dakota Division of Parks and Recreation), annually attract a large number of visitors to the area. While considered outside of the boundaries of the proposed conservation areas, management activities at these areas can influence recreation within the proposed conservation areas.

Chapter 5—Environmental Consequences

NPS

Unfortunately, purple loose strife is common along the Missouri River.

This chapter summarizes and compares the potential effects of implementing the four management alternatives described in chapter 3 on the physical and biological environment, management of special area designations, public use opportunities, cultural and paleontological resources, and other social and economic factors. The environment that would be affected by the alternatives proposed is described in "Chapter 4—Affected Environment."

5.1 Analysis Methods

Under each topic (resource), the actions or things that could affect that resource are discussed. Usually, these are the actions stemming from the strategies identified in "Chapter 3—Alternatives." Often the effect of an action cuts across several resources. For example, the conservation of native upland bluffs is beneficial for wildlife species as well as for the scenic quality of the landscape.

The environmental effects are evaluated at several levels, including whether the effects are negative (or adverse in the case of threatened or endangered species) or beneficial and whether the effects are direct, indirect, or cumulative. The evaluation of environmental consequences also considers the duration of an effect—that is, whether it is a short- or a long-term effect.

Direct effects are those where the effect on the resource is immediate and a direct result of a specific action or activity. An example of a direct effect might be the trampling of vegetation because of increased public access to an area.

Indirect, or secondary, effects are those that are induced by project-related actions or activities but that occur later in time or are farther removed from the place of action through a series of interconnected effects. Examples of indirect effects include the downstream water quality effects of an upstream surface disturbance, or the consequences of reduced sediment input as a result of bank stabilization.

A cumulative effect is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). Reasonably foreseeable future actions independent of the LPP for the project are described in chapter 3.

Effects are often described in terms of their context, intensity, and duration:

- *Negligible*—the effect would be at the lower levels of detection (a change of less than 5 percent, compared to existing conditions).
- *Minor*—the effect would be detectable (a change of 5–24 percent).
- *Moderate*—the effect would be readily apparent, and it would have the potential to become major (a change of 25–50 percent).
- *Major*—the effect would be severe or, if beneficial, exceptionally beneficial (a change of more than 50 percent).

The duration of effects are described as occurring over the short or long term. Short-term effects would persist for a period of 1–5 years and would consist primarily of temporary disturbance associated with habitat restoration, prescribed fire, facility construction, and subsequent revegetation efforts. Long-term effects would last more than 5 years after the relevant action. For example, there could be a long-term benefit to wildlife habitat resulting from a short-term management action.

For each resource, the effects common to all alternatives are discussed first. This discussion is followed by a discussion of the effects of each alternative on that resource. For effects that could not be quantified, it was assumed that the level of effects would be associated with the extent of conservation specified—in other words, alternative B, with 40,000 acres of protected lands, would have the least effect, alternative C, with 80,000 acres, would have a greater effect, and alternative D, with 120,000 acres, would have the greatest level of effect.

In compliance with the provisions of the Improvement Act, we have thoroughly assessed the environmental effects using available science, in keeping with NEPA as well as FWS and NPS policies. We used GIS data from several sources—other agencies, organizations, and researchers—which are identified as appropriate. Although GIS is a useful tool for evaluation, it is not the same as conducting formal field surveys, and discrepancies can exist. Wherever possible, the degree of effect was quantified using known numeric information or modeled estimates, or where extensive monitoring or research provided pertinent numeric information. Where sufficient numeric information was not available, qualitative or relative assessments were made using scientific literature or professional field experience.

At the end of each discussion of environmental consequences (sections 5.3–5.9), the anticipated cumulative impacts of each alternative and the reasonably foreseeable actions are disclosed. Reasonably foreseeable actions are described near the end of "Chapter 3—Alternatives."

The cumulative effects analysis focuses on four broad categories of reasonably foreseeable actions:

- Federal land management activities
- State wildlife management
- nongovernmental conservation activities
- regional demographic and economic changes

The analysis of environmental consequences is documented in seven sections:

- 5.3 Environmental Consequences for the Physical Environment
- 5.4 Environmental Consequences for Biological Resources
- 5.5 Environmental Consequences for Special Management Areas
- 5.6 Environmental Consequences for Visitor Services
- 5.7 Environmental Consequences for Cultural Resources
- 5.8 Environmental Consequences for Paleontological Resources
- 5.9 Environmental Consequences for the Socioeconomic Environment

In addition, we analyzed the following aspects of implementing the alternatives:

- 5.10 Irreversible and Irretrievable Resource Commitments
- 5.11 Short-Term Uses of the Environment and Maintenance of Long-Term Productivity
- 5.12 Adherence to Planning Goals
- 5.13 Unavoidable Adverse Effects
- 5.14 Conflicts with Federal, State, Tribal, and Local Agencies

The chapter concludes with a comparison of alternatives.

5.2 Assumptions

Assessments were based on a variety of information including meetings and other communications with natural resource and other professionals, published scientific information, site monitoring, agency reports, and computer modeling, among other sources. The following assumptions have been made in the analysis presented in this chapter:

- Money and staff would be sufficient to carry out any alternative selected. This assumption does not constitute a commitment for funding, and future budgets could affect implementation. Funding will depend on congressional appropriations and thus be subject to annual fluctuations. We assume that acquisitions of the proposed action will grow proportionally to funds received and landowner interest. In addition, acquisitions will occur over an approximate 50-year time frame.

- Monitoring activities would be conducted annually for conservation easements to maintain compliance of the easement conditions, and adjustments or revisions would be made to management as indicated by evaluations (but within the scope of the particular alternative).

- Standard FWS and NPS operating procedures would be followed.

5.3 Environmental Consequences for the Physical Environment

The following sections discuss the effects of implementing the alternatives on the physical environment.

Effects on Climate and Climate Change

Alternative A

Implementation of alternative A, the no-action alternative, would have no discernible change in effect on climate or climate change compared to the existing condition. Climate and climate change would continue to be affected by stressors already present in the environment, such as existing carbon emissions from motor vehicles, change in land cover types, or changes in temperature and precipitation patterns.

Alternatives B–D

Implementation of the action alternatives may have a beneficial effect on human-induced climate change by increasing native vegetation (for example, cottonwood forest), which has the capability of sequestering more carbon than the amounts of vegetation found under existing conditions.

Wildland fire may be allowed to burn to promote natural ecosystem function. Such fire could consume all protected lands (40,000–120,000 acres) in a given year, but this scenario is not likely because the protected lands are not contiguous and because fire often leads to a mosaic of plant communities on the landscape when some areas severely burned next to areas that do not burn at all. Chapter 4 of the LPP addresses wildland fire management and planning. Although wildland fires may contribute to climate change, the extent of wildland fire on the protected lands would be inconsequential when compared to wildfires that average 4.2 million acres nationwide annually (1960–2011).

Prescribed fire may be used to control invasive species and promote natural ecosystem function. We expect to use this management action only when biologically necessary in any given year. The effect on climate change would be inconsequential. Wildland fire and prescribed fire are expected to have negligible effects on climate change.

Effects on Air Quality

Alternative A

Implementation of the no-action alternative would have no discernible change in effect on air quality compared to the existing condition.

Alternatives B–D

Implementation of any action alternative would have negligible negative effects on air quality, because there would be no substantial changes from the existing condition. Major air pollution sources would not increase because industrial and other developments would not occur on protected lands.

Increasing public access to protected lands could lead to increased traffic and associated vehicular emissions; this could occur on easement land (with owner-allowed public access) and on fee-title land. Increased vehicular emissions are not expected to have a substantial effect on air quality because of mandatory emission controls required by the Clean Air Act. The Clean Air Act mandates controls on air pollution from mobile sources by regulating both the composition of fuels and emission-control components on motor vehicles and non-road engines. Vehicle fuel standards for gasoline and diesel are met by refiners, importers, and other parties in the fuel distribution system. Regulation of vehicles includes vehicle emission limits for hydrocarbons, carbon monoxide, and nitrogen oxides, as well as particulates in the case of diesel vehicles. These limits, which must be met by the vehicle manufacturers, apply to on-road vehicles, off-road vehicles, and non-road sources (for example, marine engines, locomotives, and lawn and garden equipment). Under the 1990 Clean Air Act amendments, vehicle standards are being made more stringent, in stages, through 2005 or later.

Managing protected land may include using prescribed fire to promote natural ecosystem function and invasive species control. Wildland fires may be allowed to burn to promote natural ecosystem function. The LPP addresses wildland fire management and planning. Effects of wildland or prescribed fire on air quality are not possible to quantify because of the extreme variability of onsite conditions, including vegetation, humidity, wind, and anticipated weather. There is potential for increased smoke and particulate matter from wildland or prescribed fires, but this is expected to be a negligible or minor effect compared to the existing condition.

Effects on Visual Resources

Alternative A

Implementation of the no-action alternative would have no discernible change in effect on visual resources compared to the existing condition.

Alternatives B–D

Promoting native grasses, shrubs, and trees and controlling invasive species may improve the visual resources found on the protected lands. Increasing native vegetation, including riparian cottonwood forests, may increase native wildlife populations, in turn improving wildlife viewing and bird sightings and improving visual aesthetics along the river corridor.

Promoting increased access on protected land would require site-by-site analysis to determine suitable locations and practices to protect visual resources. Consulting with agency landscape architects for developing access sites would promote aesthetically pleasing results and would not substantially diminish visual resource quality on protected lands. Providing access to view some of the Scenic ORVs like the meandering rivers, riparian forests, chalkstone bluffs, pastoral grasslands, rolling hills, and the dark night sky in and near the river corridor would enhance visual resources on the protected lands.

Effects on Acoustic Resources

Alternative A

Implementation of the no-action alternative would have no discernible change in effect on acoustic resources compared to the existing condition.

Alternatives B–D

Increasing public access to the Missouri River and its tributaries through protected lands would increase vehicular traffic and boat traffic. Both activities may affect the acoustic resources (natural, cultural, or historic soundscape) of the proposed conservation areas. It is not known at this time how much land would actually be placed into protected status nor where public access would occur. The effect on the natural soundscape would be greater

NPS

Providing access to view some of the Scenic ORVs like the chalkstone bluffs would enhance visual resources on the protected lands.

than that on cultural or historical sounds. Cultural and historic sounds have not been determined or quantified for the Missouri River or its tributaries. The extent of the effect, which could range from negligible to major, would be determined by actual access sites (such as boat ramps, overlooks, and roadways) and the prevalent use near these sites. For example, a newly developed boat ramp could result in a major effect, while a hiking trail that accesses protected land or an overlook could have a negligible effect.

Effects on Land Features, Soils, Vegetation, and Geology

Alternative A

Implementation of the no-action alternative would have no discernible change in effect on land features, soils, vegetation, and geology compared to the existing condition.

Alternatives B–D

Implementation of any of the action alternatives would generally have negligible effects on land features, soils, vegetation, and geology with the exception of increased access to the river, its tributaries, and protected lands and the promotion of native vegetation.

Increasing access may require road construction (or upgrading), boat ramp construction, and perhaps overlook development. Agency landscape architects and engineers would design access features and other facilities to avoid substantial effects on land features, soils, vegetation, and geologic resources. Utilizing BMPs during construction activities would minimize effects on these resources. Because no specific access plan can be developed until conservation lands are acquired, the effects on these resources are impossible to quantify, but they could range from negligible to minor; substantial effects are not expected with the siting and design considerations and the application of BMPs.

Implementation of alternatives B–D is expected to have negligible to minor effects on land features, soils, vegetation, and geology, depending on the alternative selected.

Effects on Water Resources

Alternative A

Implementation of the no-action alternative would have no discernible change in effect on water resources compared to the existing condition.

Alternatives B–D

Implementation of the action alternatives would have a negligible adverse effect on water resources (surface hydrology, floodplains, and sedimentation.) The action alternatives would not affect the flow regime in the Missouri River or its tributaries because there is no change in streamflow associated with these actions.

Beneficial effects from the action alternatives may include natural bank erosion and floodplain building as a result of natural ecosystem functioning on protected lands. The goals and strategies identified in the LPP may increase aquatic habitat, encourage lateral channel migration, enhance water quality, create sandbars, and restore cottonwood riparian forests as part of a functioning natural ecosystem. These beneficial effects would range from minor to moderate depending on the alternative selected.

Cumulative Effects on the Physical Environment

Cumulative Effects Common to Action Alternatives

Alternatives B, C, and D differ only in the extent of conservation land. In view of this qualitative similarity, the analysis of cumulative effects on physical resources considers the action alternatives collectively. Where the level of contribution to cumulative effects would vary by alternative, it is assumed that the relative contribution would be proportional to the extent of conserved lands associated with each action alternative as described in “Section 5.1—Analysis Methods.”

The existing condition of the physical environment is the result of past human and natural activities. Because the purpose of the action alternatives is conservation, adverse cumulative effects are not anticipated for most components of the physical resources because the alternatives promote restoration of the environment through native vegetation

establishment and conservation of natural ecosystem functions. Overall, beneficial cumulative effects are anticipated for climate change through increased sequestration of carbon as a result of native vegetation restoration and for other resources constituting the physical environment through native vegetation restoration and enhanced ecosystem functioning.

Effects on Climate and Climate Change

Increased access and recreational opportunities have the potential to add incrementally to climate change because of increased vehicular emissions, but this effect is expected to be negligible because of requirements of the Clean Air Act and regulation of emission limits. Prescribed fire on protected lands has the potential to add incrementally to climate change because carbon is released during burning; however, the small areal extent and short duration of prescribed burns would make this effect negligible. Because wildfires may or may not be controllable and are subject to short-term environmental conditions, it is not possible to reach any quantitative conclusion.

Effects on Air Quality

Increased access and recreational opportunities could result in increased vehicular emissions, but this effect is expected to be negligible because of requirements of the Clean Air Act and regulation of emission limits. Prescribed fire on protected lands has the potential to effect air quality; this would be negligible or not detectable when combined with all other sources in the project area vicinity because of dispersal, dilution, and sparse population. Because wildfires may or may not be controllable and are subject to short-term environmental conditions, it is not possible to reach any quantitative conclusion; however, because wildfire management protocols would not change under the action alternatives, there would be no cumulative contribution associated with wildfire.

Effects on Visual Resources

Because the overall effects on visual resources would be beneficial, the cumulative effects would be beneficial as well.

Effects on Acoustic Resources

Increased access and expanded recreational opportunities have the potential to affect the acoustic resources of the project area through increased vehicular and boat traffic. There may be negligible to major cumulative effects on acoustic resources when combined with present and future vehicular and boat traffic, depending on the location and the sensitivity of wildlife or visitors.

Land Features, Soils, Vegetation, and Geology

Increased access and expanded recreational opportunities have the potential to create cumulative effects on these resources in combination with past human development in the project area, but because conservation and improving the function of natural ecosystems are the driving purpose of the proposed action, no cumulative adverse effects are anticipated. Implementing BMPs and adhering to a strong conservation ethic would further prevent substantial adverse effects.

Water Resources

Because the proposed action would likely result in beneficial effects on water resources in the project area, there would be no contribution to adverse cumulative effects.

5.4 Environmental Consequences for Biological Resources

This section addresses the effects on of the proposed action on biological resources.

Effects on Uplands

Alternative A

Uplands would continue to be protected to a limited extent through voluntary proactive measures by landowners or through programs like the Conservation Reserve Program or Farm and Ranchland Protection Program administered by the NRCS, agreements with the Partners for Fish and Wildlife program, or privately held conservation easements. Without further efforts, though, the future of grasslands in the proposed project area would be uncertain.

Changes in policy and the agricultural economy have historically resulted in changes in tilled acreage (Gerard 1995). Several factors have accelerated the conversion of grassland to cropland production: (1)

recent development of genetically modified grain crops; (2) agricultural policy providing increased crop and income protection; (3) increasing commodity prices; (4) technological advances (Stephens et al. 2008, Sohl et al. 2012). Current and projected grassland conversion rates will undoubtedly accelerate with increasing grain prices and low cattle numbers absent any meaningful effort to protect grasslands that remain in the proposed conservation areas.

- Recent (September 1, 2012) crop prices have increased more than 30 percent since spring 2012 (CME Group 2012):
  - corn—$8.03 per bushel;
  - soybeans—$17.70 per bushel;
  - wheat—$8.90 per bushel.
- Oklahoma State University's Division of Agricultural Sciences and Natural Resources reports that the beef cowherd in the United States decreased in 12 of the past 14 years. The beef cowherd dropped from a cyclical peak of 35.3 million head in 1996 to 31.3 million head in January 2010—the lowest level since 1963. Furthermore, the combined beef and dairy calf crop in 2010 was expected to be 35.4 million head—the smallest United States calf crop since 1950 (Oklahoma State University 2011).

Conversion of grassland to cropland would increase the pesticide load on the environment. On average across the United States, herbicide active ingredients were applied to 98 percent of acres planted to corn, and almost two-thirds of all active ingredients used on corn were herbicides. Glyphosate isopropylamine salt was the most widely used pesticide overall, and the active ingredient used in the greatest total amount. Fungicide and insecticide active ingredients were applied to 8 percent and 12 percent of acres planted to corn, respectively (NASS 2011). The effects of pesticides on wildlife are variable, but they include the reduction of nesting cover for birds, the direct contamination of egg embryos, and losses in the aquatic invertebrate food base that is critical for many nesting birds, particularly waterfowl (Dwernychuk and Boag 1973, Messmer and Dahl 1991, Pimentel et al. 1992, EPA 2011). Many species of fish, including juvenile pallid and shovelnose sturgeon, also eat aquatic macroinvertebrates (Grohs et al. 2009, Wanner et al. 2007). The correct application of pesticides reduces adverse effects on the environment; however, spills and other nonlabeled use can unfortunately occur, with resultant adverse environmental effects.

Conversion of grassland to crops has adverse effects on freshwater ecosystems. Intact grassland retains soil and nitrogen. Soil erosion from cropland increases sediment in freshwater systems, raising temperatures and degrading the habitat for fish. Land planted continuously to crops or close to aquatic systems releases high amounts of nitrates to freshwater systems. When these nitrogen-laden waters reach the larger bodies of water, they contribute to increased algal blooms, which increase biological oxygen demand, decrease oxygen levels, and change the vegetative habitats to a point that make it difficult for fish and other aquatic wildlife to survive.

Alternatives B–D

Establishing the NCCA and PBCA would enable us to conserve 20–30 percent of the associated uplands, thereby having minor effects under alternative B (20 percent) and moderate effects under alternatives C and D (25 and 30 percent, respectively).

The agricultural economy—in particular the livestock industry—is cyclical. In general, high prices of grain crops generate accelerated conversion of grassland to cropland and reduce the number of cattle because of the high costs and small profit margins related to feeding and finishing beef cattle. Conversely, low crop prices generate gradual buildup of cattle herds to take advantage of low feed costs. This contributes to the cyclical nature of the beef production industry, which does not benefit from protections provided by farm policy and programs to agricultural crop producers. Upland protection through the proposed action has the potential to moderate the cyclical effects of the livestock industry locally, helping to sustain viable cattle production and ranching industries.

Increasing restoration efforts for native upland ecosystems and reducing the conversion of some grassland to new cropland would slow the increase in volume of pesticide input into the environment. Protected grasslands would also act as buffers for wetlands near pesticide-treated cropland by filtering up to 70 percent of the water runoff (Hartwig and Hall 1980). Such actions may reduce the adverse effects on wildlife, such as nesting ducks, of ingesting contaminated invertebrates, and it may reduce the loss of the invertebrate food base from die-offs caused by pesticides (Grue 1988, Kantrud et al. 1989). In addition, an increase in the extent of upland buffers would provide an even greater benefit to aquatic resources. Importantly, these protected areas would exist regardless of changes in agricultural policy or economy, which are known to affect the rate of grassland conversion (Gerard 1995).

Conservation of uplands would also reduce fragmentation and help maintain larger blocks of native habitat, an important habitat characteristic for grassland nesting birds. With the increasing encroachment of invasive species like eastern red cedar, the spread of residential development, and habitat fragmentation by road networks, it is becoming more difficult to use the combination of prescribed fire and grazing necessary to maintain a healthy mosaic of upland prairie habitat. Increased development could make prescribed fire activities more difficult to implement, allowing tree encroachment in the areas surrounding these developments. By conserving large blocks of intact native grasslands, management tools like prescribed fire could be used more frequently and more safely. Accordingly, effects of the action alternatives on uplands would be beneficial.

Effects on River Bottoms

Alternative A

A significant overall decrease in the quantity and quality of wetlands has resulted from historical modification of the river and floodplain. River downcutting has lowered the water table, drying oxbow ponds. Downcutting has also reduced the quantity of backwater chute wetlands. Oxbow ponds and marshes fill in and change over time without periodic flooding to rejuvenate them. Ponds and seasonally wet areas have been drained for agriculture. Regulation of floods has encouraged conversion of native floodplain vegetation to agriculture and other development. Wetland restoration might result over the long term from proposed changes in riverflow management and from incentives in existing state and federal conservation programs.

Streambank erosion could continue where streambank protection is not in place. Private individuals could continue to apply for streambank protection permits as erosion threatens their property. The USACE could continue to maintain the section 32 streambank protection structures as appropriations are available for such purposes. New structures or extension of old structures in newly eroding areas could occur. Landowners could continue to allow for USACE maintenance of existing structures through permanent easements. Donation of permanent easements to the NPS or others to create wildlife habitat and allow for streambank protection could become an active program.

Dam construction has had a significant indirect effect in reducing wetlands and encouraging floodplain development and agriculture. There could be continued maintenance of existing structures along the streambanks. New structures could be built by the USACE. Land use changes without strong controls would ultimately result in adverse effects on wetlands and floodplains. There would be adverse effects on streambanks, even with some mitigation efforts (NPS 1999).

Alternatives B–D

Establishing the NCCA and PBCA would enable us to conserve between 40 and 60 percent of floodplain riparian habitats, resulting in moderate effects under alternatives B and C (40 and 50 percent, respectively) and major effects under alternative D (60 percent).

The Missouri River historically meandered throughout its wide floodplain, often shifting great distances in short periods (1–2 years). Captain William Clark noted:

> I observe a great alteration in the current course and appearance of this pt. of the Missouri. in places where there was Sand bars in the fall of 1804 at this time the main current passes, and where the current then passed it is now a Sand bar. Sand bars which were then naked are now covered with willow several feet high. The enterance of some of the Rivers & creeks change owing to the mud thrown into them, and a layor of mud over some of the bottoms of 8 inches thick.

Because these processes sustained the river's biological production and diversity, the pre-regulation Missouri River exhibited a rich heterogeneity of habitat. A typical cross section of the pre-regulation Missouri River contained a deep channel, multiple side channels, oxbow lakes, islands, sandbars and dunes, and backwater habitats interspersed by areas of higher land. These channels and backwater areas provided the slower-moving water critical for the reproduction, shelter, and feeding of native fish species (NRC 2002).

Despite the regulated nature of the Missouri River in both conservation areas because of Fort Randall and Gavins Point Dams, the action alternatives would allow the Missouri to meander in a more natural state and return to the ecological state described above as a result of the decreased presence of bank stabilization (where not needed for health and human safety) and the free-flowing ability of the river to move where the hydrology drives it. A river uninhibited by sideboards would allow for naturally forming sandbars, naturally reproducing cottonwood

galleries, and the presence of backwaters, chutes, and oxbows. The water, sediment, and nutrients would be spread across the floodplain by naturally caused overbank flows and river meandering.

The action alternatives would also aid in flood risk reduction by allowing naturally occurring habitats to establish alongside the river and extend into the floodplain. The presence of these habitats would reduce the chances of extensive damage to personal property as seen in the flood of 2011. Reducing the need for bank stabilization and revetment to protect valuable personal property would also reduce the need for disaster relief recovery funds alongside a river that historically had flows exceeding 200,000 cubic feet per second on an annual basis. The action alternatives would have beneficial effects on river bottoms.

Effects on Invasive Plant Species

Alternative A

The responsibility for the control of invasive species would continue to rest primarily with private landowners and local governments. Invasive species could continue to expand, and they would likely be controlled primarily by chemical and mechanical means. Effects are expected to be negligible under alternative A.

Alternatives B–D

Under the action alternatives, the control of invasive species would be required by either the private landowner in the case of conservation easements or by us if the land is conserved through fee-title acquisition. Rather than relying heavily on chemical and mechanical methods, emphasis would be on biological means (like leafy spurge and purple loosestrife control using beetles) or prescribed fire (to control species like eastern red cedar), although chemical and mechanical methods would be permitted to control salt cedar and phragmites. Overall effects on invasive species are expected to be minor across all alternatives.

Effects on Mammals

Alternative A

Public land would continue to be managed for wildlife. Some private landowners participate in habitat enhancement programs. However, protection of habitat depends on protection of the entire river system. Habitat loss could result from conversion to agriculture, development, and alteration of river flows. Effects on mammals would be negligible.

Alternatives B–D

Alternatives B–D would provide for increased concentration on high-quality wildlife habitat. Populations of mammals such as white-tailed deer, mule deer, elk, bobcats, raccoons, bats, and mice are expected to increase at minor rates under all action alternatives. However, annual hunting regulations established by both Nebraska and South Dakota should provide for sufficient means to control populations at appropriate levels.

Effects on Birds

The proposed project area is especially important to migratory birds for migration, nesting, and wintering. Conservation of this large group of Federal trust species is a core responsibility of the FWS. Literally millions of individual birds of more than two hundred species use the project area for a portion of their lives. These include groups of species such as waterfowl, waterbirds, shorebirds, and landbirds.

Alternative A

Public land in the project area would continue to provide habitats important to birds that use the river for migration, nesting, and wintering. Private lands would continue to provide important habitat; however, over the long term it is likely that development will degrade, fragment, and reduce the amount of these habitats in the absence of long-term protection. Nevertheless, waterfowl, waterbirds, and shorebirds would continue to find suitable habitat for migration, and in some cases nesting and wintering, in and along the river corridor. Riverine wetlands near the mouth of the Niobrara would continue to provide habitat for these groups. Similarly, landbirds that breed in grasslands are not highly reliant on the project area for migration; however, grasslands in the project area

are important for nesting. Grassland bird populations have suffered the largest rate of decline compared to other equivalent bird groups (NABCI 2009). Although grasslands are not the primary focus of this project, conserving them is important for populations of this declining species group. Forest birds are highly reliant on the project area for migration and nesting. Some species, such as the bald eagle, also rely on the project area for wintering.

Along this portion of the Missouri River, the narrow strips of forested habitats are vulnerable and easily severed. Fort Randall Dam was completed in 1956 and Gavins Point Dam in 1957. Since that time, cottonwoods and other riparian forest and shrub species have experienced a long-term decline along the river (Dixon et al. 2012). Dam operations and the dams themselves changed the processes with which cottonwoods evolved (Dixon et al. 2012). Older cottonwoods are maturing and dying without enough young cottonwoods to replace them, resulting in fragmentation of the forest habitat. On a more localized scale, these same riparian forests are being degraded, fragmented, and reduced by development. Despite the risk of flooding, development of cabins, houses, campgrounds, and crop fields is occurring within the floodplain.

Fragmentation and loss of these habitats adversely affects the populations of birds that use them. During migration the limiting factor for survival is oftentimes food. Forest birds such as American redstart, ovenbird, and wood thrush rely on riparian forests to supply their food (typically insects). Birds that cannot maintain their fat reserves perish, or if they do make it to their destination arrive in poor condition for nesting (spring). Moore et al. (1995) and Moore and Yong (1990) revealed how important food is for migrating landbirds.

Habitat degradation, fragmentation, and loss have numerous adverse effects on populations of nesting forest birds. Several species of nest predators are more abundant in the "edge" habitat created by fragmentation (Whitcomb et al. 1981). Similarly, fragmentation provides more habitat suitable for brown-headed cowbirds, resulting in increased rates of brood-parasitism (Brittingham and Temple 1983). When habitat patches become relatively small and isolated from each other, pairing success can decline significantly (Villard et al. 1993). Increased nest predation, increased brood parasitism, and reduced pairing success can have significant adverse effects on populations of nesting forest birds.

The bald eagle is perhaps the most visible and popular migratory bird that winters in the project area. People enjoy watching them in the winter, especially below Fort Randall and Gavins Point Dams. Large numbers of wintering eagles led to the designation of an area below Fort Randall Dam as a National Natural Landmark in 1967. Steenhof et al. (1980) indicated that bald eagles showed a preference for diurnal roosting near food sources, such as the edge of the Missouri River. Food was one important factor for selection of wintering habitat. The other important factor was large cottonwoods that offered protection from high winds and cold temperatures. Steenhof et al. documented a communal nocturnal roost area that offered thermal shelter from winter winds. Protecting habitat that is important to wintering bald eagle populations would enhance their recovery and the chance that they would continue to use the project area, where they can be observed and appreciated by many people.

Alternatives B–D

Alternatives B–D would enhance opportunities to conserve forested habitats on private lands in the proposed conservation areas. Important riparian habitats would be protected from development that could result in degradation, fragmentation, or loss. Bird populations would benefit from long-term protection of the habitats they depend on. Generally, the greater the amount of habitat conserved, the greater the positive effect on bird populations. Species that rely on forest habitats for nesting in the project area would benefit the most (Robbins et al. 1989). Species that would benefit include bald eagle, yellow-billed cuckoo, black-billed cuckoo, eastern screech owl, long-eared owl, eastern whip-poor-will, ruby-throated hummingbird, red-bellied woodpecker, red-headed woodpecker, eastern wood-pewee, least flycatcher, willow flycatcher, eastern phoebe, great crested flycatcher, Bell's vireo, warbling vireo, red-eyed vireo, tree swallow, black-capped chickadee, white-breasted nuthatch, eastern bluebird, wood thrush, American redstart, ovenbird, eastern towhee, spotted towhee, rose-breasted grosbeak, scarlet tanager, northern cardinal, indigo bunting, orchard oriole, and Baltimore oriole.

Alternative B would allow conservation of 20 percent and 40 percent of upland and riparian habitats, respectively, within the proposed conservation areas. Alternative C would allow conservation of 25 percent and 50 percent of upland and riparian habitats, respectively, and alternative D would allow conservation of 30 percent and 60 percent of upland and riparian habitats of habitats, respectively.

Effects on Fishes

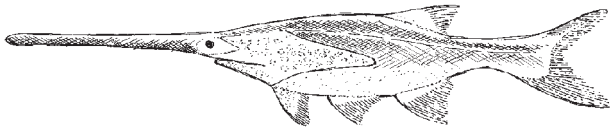
Alternative A

The no-action alternative would have minor to moderate adverse effects on fish communities in the two reaches over the next several decades. Because degradation, lack of sediment, and bank stabilization would either continue or remain static, the effects would continue to reduce habitat, lessen floodplain connectivity, and decrease turbidity in these reaches, causing minor to moderate adverse effects on fish.

Alternatives B–D

Fish in the project area have been subject to effects from many alterations to the natural environment. Flow, sediment, and habitat modifications have reduced and altered the native fish community. The proposed action would not address flow alterations. However, conservation of floodplain and riparian areas could support a more natural hydrologic regime without adversely affecting human infrastructure present in the river's floodplain. One of the primary benefits for fish from a more natural hydrologic regime would be increased floodplain connectivity. However, because of degradation or deepening of the river bottom that has taken place in the river segments involved, connectivity with the historical floodplain is difficult. Conservation efforts that reduce and remove stabilization in these reaches would have a beneficial effect on fish populations as habitat, sediment, and nutrients would be increased in a river system that is allowed to meander. Meandering of the river system, in time, may create a secondary (lower) floodplain that would be accessible to flows, allowing for a small amount of floodplain connectivity. Such connectivity, though far less than historical conditions, would nevertheless enhance fish populations in these reaches through increased nutrients and expanded spawning and rearing areas (NRC 2002, FWS 2003).

Alternatives B–D (including the preferred alternative) would have minor to moderate beneficial effects on the fish community in the conservation reaches. The degree of beneficial effect would vary both spatially and temporally. As habitat and functionality is returned to the system, the fish communities would be expected to increasingly respond. Some benefits would take time to develop; for example, the development of a lower floodplain as a result of increased meandering may require decades. These beneficial effects could be augmented by the implementation of a more natural hydrograph; however, although the proposed action would not address that issue directly, some improvement could evolve as a result of more natural hydrologic conditions.



Drawing of a paddlefish.
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Alternative B, protecting only 40 percent of the riparian and floodplain area, may not allow for sufficient meandering to enable floodplain connectivity; accordingly this alternative would likely result in minor beneficial effects.

Alternatives C and D would likely result in minor benefits initially with protection of 50 and 60 percent, respectively, of riparian and floodplain areas. Over time, the potential for development of more habitat and a secondary (lower) floodplain would likely result in moderate beneficial effects.

Effects on Other Wildlife

Insects, reptiles, amphibians, and other wildlife have been heavily affected by changes in the amount and functionality of terrestrial and aquatic habitat in the project area. The effects on these species vary from the river and floodplain to the uplands.

Alternative A

The no-action alternative would result in minor adverse effects on other wildlife species that depend on the river and floodplain system as degradation of functionality and habitat is expected to continue in the absence of changes in management. Other wildlife species that rely on uplands would likely experience negligible to minor effects because uplands and grasslands are expected to degrade further under the no-action alternative.

Alternatives B–D

Beneficial effects on insects, reptiles, amphibians, and other wildlife species would likely be realized under all action alternatives. The magnitude of these effects would range from minor to moderate, depending on the alternative selected.

Caddis fly, mayfly, and certain riparian-dependent species of tiger beetle are among some of the many riverine and sandbar insect species that would bene-

fit from the proposed conservation efforts. Mussels and softshell turtles would also benefit. Floodplain wetland and terrestrial species such as multiple salamander and toad species (including plains spadefoot) would experience minor to moderate benefits.

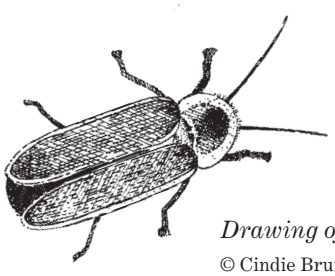
Effects on Threatened and Endangered Species and Species of Concern

Alternative A

Public land would continue to be managed for special-status species in accordance with the recovery plans that have been developed. The recovery plans for pallid sturgeon, least tern, and piping plover call for actions to restore habitats and functions of the Missouri River ecosystem. The USACE now manages the river for recovery of these three species using habitat protection, construction, and flow management under the MRRP. Some private landowners participate in habitat enhancement programs though easements. Habitat loss and decreased populations would continue within the Missouri River if habitat restoration programs were discontinued, if habitat was converted to development, or if river flows were not managed for these species.

Alternatives B–D

Alternatives B–D would provide for more opportunities to protect, develop, and manage for high-quality habitats as required by recovery plans and adaptive management. The proposed action would likely have beneficial effects on pallid sturgeon, least tern, and piping plover populations and habitat under all three action alternatives. This effort is expected to be most successful in cooperation with our partners, such as the USACE through the MRRP, States, private landowners through conservation easements, and other organizations and conservation programs.



Drawing of a firefly.
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Cumulative Effects on Biological Resources

Alternatives B, C, and D differ only in the extent of conservation land. In view of this qualitative similarity, the analysis of cumulative effects on biological resources considers the action alternatives collectively. Where the level of contribution to cumulative effects would vary by alternative, it is assumed that the relative contribution would be proportional to the extent of conserved lands associated with each action alternative as described in "Section 5.1—Analysis Methods."

The existing biological resources have been affected by past human and natural activities. Increasing the quantity of conservation lands will increase opportunities to enhance and restore ecosystem functions, including wildlife habitat. Because the purpose of the proposed action is to promote restoration of the environment through native vegetation establishment and natural ecosystem functions conservation, adverse cumulative effects are not anticipated. Overall, beneficial cumulative effects are anticipated under all action alternatives for all native fish and wildlife species and their habitats.

5.5 Environmental Consequences for Special Management Areas

Alternative A

Implementation of the no-action alternative would have no discernible change in effect on Special Management Areas compared to the existing condition.

Alternatives B–D

There would be no substantial effects on Special Management Areas. If the proposed conservation areas result in increased visitor use, there may be increased visitor use at the Special Management Areas described in the existing condition. Effects of alternatives B–D as described in the visitor services section are applicable here.

5.6 Environmental Consequences for Visitor Services

Alternative A

Implementation of the no-action alternative would have no discernible change in effect on visitor services compared to the existing condition.

Alternatives B–D

The action alternatives propose protection of up to 40,000–120,000 acres in the project area, depending on alternative. The actual extent of protected land is expected to change over time as lands are acquired or placed under conservation easements; moreover, it is not a foregone conclusion that the selected alternative would meet its target acreage.

All educational and recreational activities and facilities described are compatible with the purposes of the conservation areas. The increase in proposed protected land would provide opportunities to enhance the level of visitor services provided in the project area. The development of increased river access and public access to protected lands would permit more human interaction with the natural environment and offer more opportunities for educating the public on the importance of ecosystem functioning and habitat diversity.

Cumulative Effects on Visitor Services

The development of increased river access and public access to protected lands would permit more human interaction with the natural environment and offer more opportunities for educating the public on the importance of ecosystem functioning and habitat diversity.

There is not expected to be a substantial adverse cumulative effect on visitor services as a result of the action alternatives. The potential increase in protected lands and river access may lead to increased visitation, but development of added river access sites may disperse visitor use, rather than substantially increasing use at any given site. Nevertheless, securing reservations at developed and controlled campgrounds and state parks could become more difficult, and other accessible sites, like hunting areas, could become crowded.

NPS

The increase in proposed protected land under alternatives B–D would provide opportunities to enhance the level of visitor services provided in the project area.

Overall, there may be a reduction in visitor satisfaction if the increased protected lands draw larger numbers of visitors than now use the proposed conservation areas. The level of cumulative effects would likely be associated with the extent of land conserved.

5.7 Environmental Consequences for Cultural Resources

Alternative A

Some cultural resources could be adversely affected by activities such as development and conversion to other uses on lands outside existing public and private conservation lands. There are legitimate concerns that important sites may be destroyed or irreparably disturbed in the absence of protection.

Alternatives B–D

Compliance with applicable laws, regulations, and policies that concern cultural resources would continue under all four alternatives. These laws include section 106 of the National Historic Preservation Act which directs Federal agencies to consider the effect of their undertakings on historic properties (cultural resources that are eligible for the NRHP). The action alternatives would accordingly increase opportunities to identify, document, evaluate and potentially preserve cultural resources.

Greater Federal and State involvement would also spur the potential application of other laws and regulations that concern cultural resources. Although both Nebraska and South Dakota have state laws that govern unmarked human graves (Nebraska Revised Statute 12: 1201-1212; South Dakota Codified Law 34-27-25 to 33), additional Federal land acquisition would increase the potential for the Native American Graves Protection and Repatriation Act to apply to burials and their associated funerary objects. The Archaeological Resource Protection Act and other Federal laws that govern archaeological deposits and the rights of Native Americans would become applicable on these newly acquired lands.

This increased Federal involvement and legal authority affords added protection for significant cultural resources and would promote consultation and research. It would encourage planning that includes diverse concerns and voices and help to us better understand how to best identify and preserve our heritage. This would be a beneficial effect on cultural resources.

5.8 Environmental Consequences for Paleontological Resources

Like the consequences discussed above for cultural resources, increasing the amount of land under Federal ownership brings added protection for paleontological resources on those lands. Under the Omnibus Public Land Management Act of 2009 (Public Law 111-11, Title VI, Subtitle D), paleontological resources may not be collected from FWS or NPS lands without a permit. This law also encourages inventories, protection, public education, and scientific research in association with these resources. The proposed action would result in beneficial effects on paleontological resources.

5.9 Environmental Consequences for the Socioeconomic Environment

Regional economic impact analyses capture the complex interactions of consumers and producers of goods and services in local economies. Economies are complex webs of interacting consumers and producers in which goods produced by one sector of an economy become inputs to another, and the goods produced by that sector can become inputs to yet other sectors. Thus, a change in the final demand for a good or service can generate a ripple effect throughout an economy. For example, if more visitors come to an area, local businesses will purchase extra labor and supplies to meet the increase in demand for more services. The income and employment resulting from visitor purchases from local businesses represent the direct effects of visitor spending within the economy. Direct effects measure the net amount of spending that stays in the local economy after the first round of spending; the amount that does not stay in the local economy is termed a leakage (Carver and Caudill 2007). To increase supplies to local businesses, input suppliers must also increase their purchases of inputs from other industries. The income and employment resulting from these secondary purchases by input suppliers are the indirect effects of visitor spending within the economy. Employees of the directly affected businesses and input suppliers use their incomes to purchase goods and services. The resulting increased economic activity from new employee income is the induced effect of visitor spending. The indirect and induced effects are known as the secondary effects of visitor spending. “Multipliers” (or “response coefficients”) capture the size of the secondary effects, usually as a ratio of total effects on direct effects (Stynes 1998). The sums of the direct and secondary effects describe the total economic impact of visitor spending in the local economy.

Three measures of economic impacts are reported in this analysis: employment, labor income, and value added. Employment impacts represent the change in the number of jobs generated in the region from a change in regional output. These impacts include full time, part time, and temporary jobs. Labor income impacts include employee wages and salaries, payroll benefits, and incomes of sole proprietors. Value added impacts are a measure of the contribution expenditures make to Gross Domestic Product. Value added is equal to the difference between the amount an industry sells a product for and the production cost of the product, and is thus net of intermediate sales.

For the purposes of an economic impact analysis, a region (and its economy) is typically defined as all counties within a 30- to 60-mile radius of the impact area. Only spending that takes place within this regional area is included as stimulating changes in economic activity. The size of the region influences both the amount of spending captured and the multiplier effects. The impact area for the proposed NCCA and PBCA comprises 12 counties: 6 counties in Nebraska (Boyd, Cedar, Dakota, Dixon, Holt, and Knox) and 6 counties in South Dakota (Bon Homme, Charles Mix, Clay, Gregory, Union, and Yankton).

This section presents an analysis of the economic impacts associated with current management and a discussion about how the local economy may be affected under each alternative. The NPS-managed MNRR lies within the boundaries of the proposed conservation areas; therefore, current impacts of the MNRR are addressed under alternative A. The FWS-managed Lake Andes National Wildlife Refuge Complex in southeast South Dakota comprises Lake Andes National Wildlife Refuge, Karl E. Mundt National Wildlife Refuge, and Lake Andes Wetland Management District. The Karl E. Mundt National Wildlife Refuge (which is now closed to the public) and portions of the Lake Andes Wetland Management District lie within the boundaries of the proposed conservation areas (but away from the river corridor). The refuge complex recently developed a CCP to guide the management direction of the refuge complex over the next 15 years. The economic impacts of current and anticipated changes to refuge complex management are addressed in the CCP; accordingly, FWS refuge complex management activities are not addressed in this analysis.

Under each alternative, land acquisition is expected to occur over a 50-year period, so effects on the local economy will happen slowly over an extended period of time. It is important to note that willing sellers and available budgets may not always be available for full implementation of a proposed alternative under the LPP.

Conservation Easements

One of our high-priority objectives is to protect high-priority conservation areas by securing appropriate conservation easements. Conservation easements leave land in private ownership, protecting private property rights, while providing us with a cost-effective conservation strategy that enables the protection of large blocks of habitat. Under the LPP, we propose to purchase conservation easements to permanently protect valuable tracts of habitat to maintain wildlife populations, plant communities, and ecosystem functions.

A conservation easement is a voluntary legal agreement entered into between a landowner and a conservation entity. Conservation easements are binding in perpetuity; the landowner reserves the right to sell or bequeath the property, but the easement and its associated restrictions remain with the property in perpetuity.

A conservation easement on a parcel of land may have restrictions from all types of human development (for example, surface disturbance from solar, mineral, or wind energy development) and may include restrictions to ensure maintenance of historical water use patterns that help wildlife. Once a conservation easement is purchased, the landowner maintains a number of rights, including: grazing, wetland management, hunting, and other undeveloped recreation. In all cases, the terms of a conservation easement must be mutually agreed upon by the landowner and the FWS or the NPS.

Fee-Title Purchases

In some instances, particularly when public use is expected to be extensive, the construction of new buildings is expected, or major habitat restoration is planned, it may be more appropriate for us to purchase and manage the lands. Under fee-title purchases, full ownership of the land, including the underlying title, is transferred. This gives the new owner maximum interest in the purchased land and allows them to manage the land in any manner that is consistent with local, state, Federal laws and existing easements and rights-of-way. Any fee-title acquisition would be from willing sellers in coordination with the affected county. The anticipated amount of fee-title purchases at fair market value is expected to range from 14,000 acres under alternative B up to 42,000 acres under alternative D. All acquisitions will be subject to the terms and conditions of existing easements, rights-of-way, or other restrictions as legally allowable.

Social and Economic Effects of Conservation Easements and Fee-Title Acquisitions

Lands in conservation easements and fee-title acquisitions can provide public goods that generate benefits for local residents, communities, and governments. Easements and fee-title acquisitions also

reshape future development patterns, change existing land use, affect property values, and inject new money into local communities. There are many dynamic variables at play when considering the social and economic effects of conservation easements and fee-title acquisitions, especially given that potential purchases may span five decades. Because of future uncertainty surrounding such factors as the likelihood and timing of easements and acquisitions, the availability of funds to purchase lands, population growth, land values, and agricultural commodity prices, the economic effects of these easements and acquisitions cannot be quantified in this analysis. However, these effects can be described qualitatively. This analysis estimates the economic effects associated with current management activities and describes how the following could be affected by fee-title and easement acquisition under the alternatives:

- conservation and ecosystem service values in the region
- effects on local communities
- landowner compensation
- effects on local government net revenue
- visitor expenditures
- administration expenditures

Conservation and Ecosystem Service Values

Ecosystems are integrated natural communities stemming from the interactions among and between humans, animals, plants, and the physical environment. The natural functions maintained by a healthy ecosystem provide ecological goods and services that preserve the natural capital required to maintain biodiversity and provide for the social, cultural, and economic needs of humans. The beneficial outcomes of these ecological processes provide "provisioning services" such as food, water, and timber; "regulating services" such as flood and disease regulation; "cultural services" including recreational and spiritual services; and "supporting services" such as soil formation and nutrient cycling (Millennium Ecosystem Service Assessment 2005). The suite of services provided by the ecosytem are "public" and "non-market" in nature, meaning they often help many people, whether or not they pay for them, and they are typically not sold in a traditional market setting where a relative price is revealed for the goods or services (like cars at a dealership). These characteristics often underrate the true value of such goods and services and lead to them being overlooked or underprovided for the public in private decisionmaking. As a result, conservation and restoration efforts usually stem from the coordination of government agencies and public trusts.

Ecosystem services can have significant economic implications. For instance, one can begin to describe the economic importance of riparian habitat by identifying the role it plays in mitigating destructive flooding to nearby homes, businesses, and crop fields; or how the preservation of grasslands and their resident bee colonies are economically important to a farmer who depends on them for crop pollination; or the value of wetland habitat to local hunters through their relation to waterfowl abundance. It is the link between ecological processes and human well-being that defines ecosystem services and provides context for their economic valuation (Daily 1997, Millennium Ecosystem Service Assessment 2005). A recent study attempted to value the ecosystem services provided by the FWS's national wildlife refuges in the contiguous United States and determined the various habitats within the Refuge System were providing services valued at, on average, $2,900 per acre per year (Ingraham and Foster 2008). Conservation easements and fee-title acquisitions preserve and often enhance the ecosystem services provided by the landscape. While often public and non-market in nature, these services certainly have economic relevance to local residents and beyond.

Effects on Local Communities

Although local residents may not be able to explicitly use or access all lands protected by conservation easements or fee-title purchases, protected lands act as a buffer that helps residents through increased biodiversity, recreational quality, and hunting opportunities on publicly accessible wildlife refuges and on some private lands (Rissman et al. 2007). It is well documented that open space carries positive values for local residents and communities, as well as to passersby (McConnell and Walls 2005), as evidenced by the success of open space preservation ballot initiatives at the local, county, and state levels. Banzhaf et al. (2006) point out that between 1997 and 2004, over 75 percent of the more than 1,100 referenda on open space conservation that appeared on ballots across the United States passed, most by a wide margin.

It is also well documented that open space and protected natural areas can increase surrounding property values (see McConnell and Walls (2005) for a comprehensive review). The reciprocating value of open space on property values varies depending on

landscape characteristics and location attributes (for example, distance to the conserved area) (Kroger 2008). The permanence of the open space is also an influencing factor. Typically, open space that is permanently protected (such as refuge lands and lands protected with perpetual conservation easements) will generate a higher enhancement value of local properties than land that has the potential for future development (Geoghegan et al. 2003). Location and demographic factors in the region can also influence the relative level of property enhancement value. For instance, open space may generate larger amenity premiums for property in more urbanized areas and where median incomes are higher (Netusil et al. 2000); this is not to say that property values cannot increase substantially in rural areas as well (Crompton 2001, Phillips 2000, Thorsnes 2002).

Conservation easement and fee-title purchases would inject new money into the local economy. The sale of conservation easements and fee-title lands provides landowners with added revenue. Some percentage of these funds may be spent in the local economy, including purchasing new real estate, consumer goods, or services in the local area. This spending activity can directly affect local industries (such as construction and various service sectors), with added indirect effects following suit.

Conservation easements may also help maintain the character of a region by protecting a traditional and historical way of life and the associated working landscape. Land with historical commercial use, such as ranching, forestry, and farming, is often compatible with or beneficial to Agency objectives (Jordan et al. 2007, Rissman et al. 2007). Conservation easements provide financial benefits for landowners that may enable them to preserve the natural and historical value of their farm, ranch, and open space lands, and to pass this legacy on to their children and grandchildren. Besides maintaining cultural heritages, the preservation of farming and ranching operations can result in maintained economic effects on the local economy. Farmers' costs for equipment, supplies, and materials will be spent in the local economy, thus stimulating local businesses and supporting local employment. Farm workers will also spend their salaries in the local economy, thus supporting further local employment.

Landowner Compensation

We propose to acquire land through fee-title purchase or through conservation easements from willing sellers. For fee-title acquisitions, landowners would be compensated for the fair market value of the land, which is the competitive price the land would sell for on the open market. Accordingly, fee-title purchases are expected to range from $2,000 to $6,000 per acre based on current land prices in the 12-county area. Under fee-title acquisition, landowners forfeit all rights of ownership and turn the property over to the FWS or the NPS. In the case of conservation easements, landowners would be compensated for the fair market value of the easement. The fair market value of a conservation easement is determined through an appraisal process. An appraiser estimates how much the land would sell for unencumbered by the conservation easement (the "before" value) and how much the land would sell for with the conservation easement in place (the "after" value). The value of the conservation easement is equal to the before value minus the after value, or the difference in the fair market value of the property with and without the easement. Landowners may also choose to donate conservation easements. The donation of a conservation easement may qualify as a tax-deductible charitable donation, which may result in Federal income tax benefits. The sale of a conservation easement for less than its fair market value (called a "bargain sale") may also qualify for tax deductions. Landowners may be able to claim a charitable income-tax donation equal to the difference between the fair market value and the bargain sale price of their easement. Income from the sale of a conservation easement may be taxable[2].

Conservation easements reduce the value of an encumbered property. A conservation easement will reduce the fair market value of an estate, because the easement permanently removes some of the estate's development potential and may place added use restrictions on the land. The reduction in value depends on the potential development value of the land and the level of restriction agreed upon in the easement. In general, an easement on land in an area with high development pressure will have a greater effect on the value of the land than an easement on land in an area with low development pressure, and a wetland easement that is more restrictive will have a greater effect on the value of the land than an agricultural easement that is less restrictive. We will purchase easements at their appraised fair market value; therefore, easements that are more restrictive or on lands with high development pressure will entail higher payments.

[2] Please note that the NPS and the FWS do not give tax advice. Landowners considering entering into a conservation agreement with the NPS or the FWS should consult a tax advisor or attorney for advice on how a conservation easement would affect their taxes and estate.

Effects on Local Government Net Revenue

Local governments collect revenue through intergovernmental transfers, property taxes, sales taxes, personal income taxes, and other charges, such as permitting. These revenues are then spent to provide community services such as fire and police services, schools, infrastructure, and public spaces. Conservation easements and fee-title purchases affect property tax revenues, intergovernmental transfers, and the location of future development, and therefore can affect both future revenues and costs for local governments. Land values and property taxes are always in flux and are likely to change within the acquisition horizon, and future development patterns are unknown; thus, the effect of conservation easement and fee-title acquisitions on local government net revenue is complex and speculative. The following sections describe the possible effects of fee-title and conservation easement acquisitions in the NCCA and the PBCA on local government revenues and costs.

Effects on Local Government Revenues

We are proposing to acquire lands within the NCCA and PBCA through a combination of conservation easements and fee-title purchases. In the case of conservation easements, the effects on local government revenues will depend on the state in which the acquisition occurs (South Dakota or Nebraska). In the case of fee-title purchases, the effects on local government revenues will depend on the managing agency (the FWS or NPS). Figure 14 graphically describes the primary effects on local government revenues of conservation easements and fee-title acquisitions, and the text below describes these effects in greater detail.

Property taxes constitute the largest source of local governments' revenue (Urban Institute and Brookings Institution 2008), and are assessed on the basis of property value. The effect of conservation easements on tax revenues to local governments depends on the assessment methods used to determine the taxable value of a property. These assessment methods are determined by the rules and statutes established by local property tax codes. Since the property tax codes in Nebraska are different from those in South Dakota, the effect of conservation easements on local property tax revenues will vary by state. Methods used to assess property values also vary by land use classification. For most types of properties, county assessors use fair market value to determine property tax liabilities. The fair market value of land is the amount for which a property is estimated to sell. This value includes both the

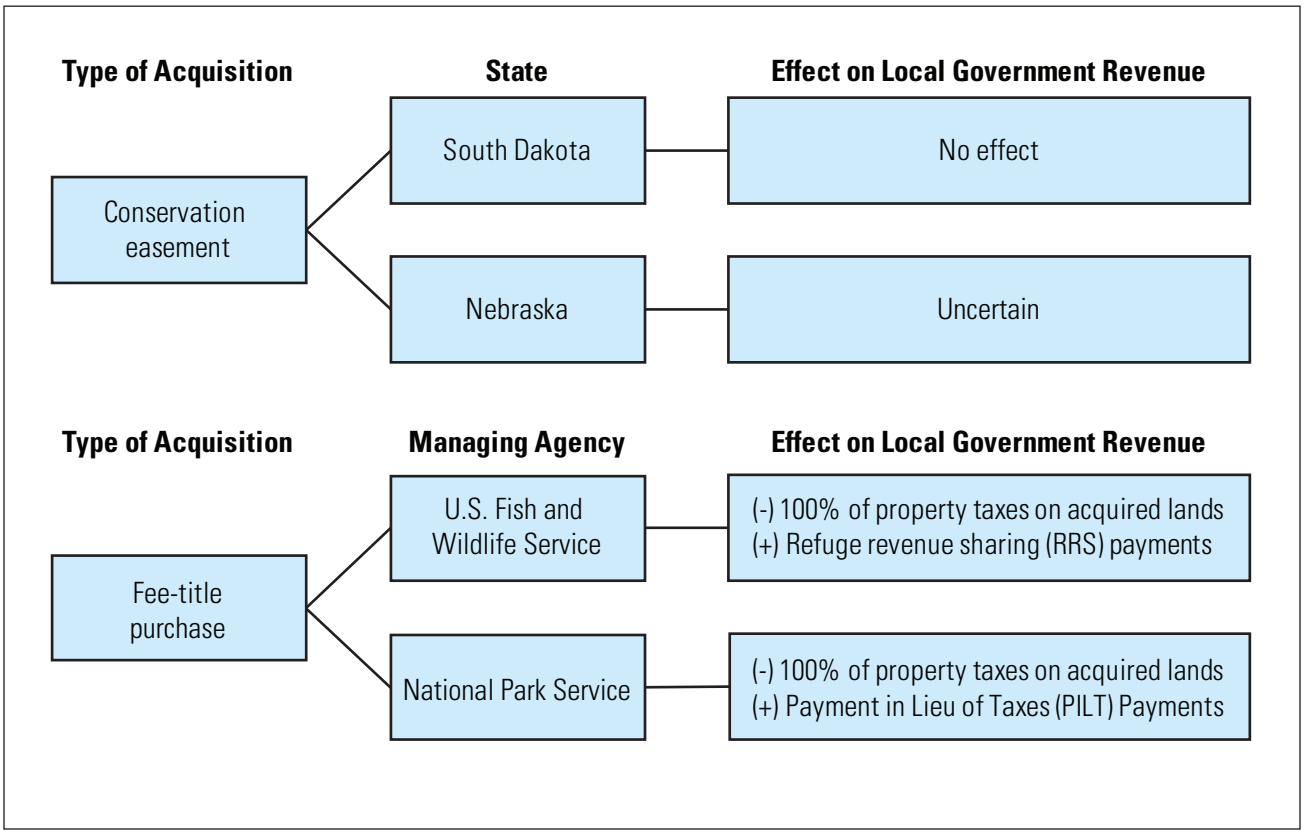

Figure 14. Effects on local governments of conservation easements and fee-title acquisitions in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

productive or use values of the land and any speculative value associated with the possibility of developing the land. Conservation easements reduce the fair market value of property by removing the speculative value associated with possible development and, depending on land use restrictions agreed upon as part of the easement, may reduce the productive value of the land. It is assumed that the majority of the easements that will be acquired in the NCCA and the PBCA will be on properties classified as agricultural. The primary types of agricultural lands that will be candidates for easements are wastelands (that is, lands that cannot be used economically and are not suitable for agricultural purposes) and grasslands.

In South Dakota, the assessed value of agricultural land is based on the productive value of the land (South Dakota Department of Revenue 2012). Although a conservation easement may change the productive value of a parcel, current South Dakota statutes stipulate that agricultural lands encumbered by conservation easements be assessed as if no easement were in place. Thus, conservation easements purchased on agricultural lands in South Dakota are expected to have no effect on the current property tax base for the six South Dakota counties.

In Nebraska, the assessed value of agricultural land is set at 69–75 percent of the fair market value of the land (Nebraska Department of Revenue 2007). This assessment includes any wasteland that is next to and in common ownership or management with land used for agricultural or horticultural purposes. However, land encumbered by an easement that cannot be used for agricultural purposes cannot be characterized as agricultural land and is therefore assessed at 100 percent of its fair market value. Thus, there are two opposing forces on property tax values for Nebraska wastelands encumbered with conservation easements: (1) the fair market value of the land will decline, thus reducing the assessed value of the land, and (2) the land will no longer be classified as agricultural so will be assessed at 100 percent (as opposed to 69–75 percent) of its fair market value. Under NCCA and PBCA easement agreements, grazing will continue to be allowed on grasslands encumbered by easements. Thus, the fair market value of grasslands will decline, but the land will continue to be classified as agricultural. Because of the opposing forces on property tax values for wastelands and uncertainty in the makeup of easement acquisitions (that is, acres of wasteland and acres of grassland), the impact of conservation easements on the current property tax base for the six Nebraska counties is uncertain.

In both states, the purchase of fee-title lands would reduce the amount of property tax revenue collected by local governments, because we are exempt from taxation on our property holdings. However, the loss of local government revenues resulting from fee-title purchases would be partially offset by federal reimbursement programs.

Counties with fee-title lands managed by the FWS would qualify for reimbursement under the Refuge Revenue Sharing Act of 1935, which allows the FWS to make annual payments to local governments in areas where fee-title purchases have removed land from the tax rolls. Under provisions of this Act, local counties receive an annual payment for lands that have been purchased in full fee-title acquisition by the FWS. Payments are based on the greater of 75 cents per acre or 0.75 percent of the fair market value. The exact amount of the annual payment depends on Congressional appropriations, which in recent years have tended to be substantially less than the amount required to fully fund the authorized level of payments. In fiscal year 2011, RRS payments were appropriated at only 22 percent of the approved value.

Counties with fee-title lands managed by the NPS would qualify for reimbursement under the Payment in Lieu of Taxes Act of 1976. Local governments receive annual PILT payments in areas where fee title purchases have removed qualified lands from the tax rolls. The exact amount of the annual payment is determined by several factors including acreage of eligible land, population of the county in which the eligible land is located, the amount of the previous year's PILT payments, and the inflation rate (Corn 2011). Prior to 2008, PILT payments were funded by annual appropriations. A 2008 provision for mandatory funding, however, has ensured that all counties receive 100 percent of authorized payment beginning with fiscal year 2008 and continuing through fiscal year 2012. Much uncertainty remains as to whether the mandatory funding provision will be extended (Simpon 2012). If the provision is not extended, the program would return to funding through annual appropriations (Corn 2011).

Effects on Local Government Costs

Land protection through conservation easements and fee-title acquisition could result in a reduction in future expenditures for local governments and municipalities. New residential developments require local governments to provide services such as fire protection, police services, and schools, and to construct new infrastructure such as roads, parks, and water and electric-delivery systems. The costs to provide government services for new residential developments often exceed new revenues derived from the developments. This is especially true for rural residences, which tend to have higher costs to county governments and school districts than urban residences. In 2001, the American Farmland Trust found that, on average, the cost to provide commu-

nity services to new residential developments was $1.15 for every $1.00 of revenue generated by those developments (American Farmland Trust 2001, Coupal et al. 2002). A study conducted in Wyoming found that community service costs averaged $2.01 for every $1.00 of revenue for rural residential lands; in contrast, the average cost to provide services for lands under agricultural production averaged $0.54 for every $1.00 of revenue (Coupal et al. 2002).

Effects of Visitor Expenditures

As previously discussed, the 12-county area provides numerous wildlife-related recreational and educational opportunities on Federal, State, and local county lands for many residents of South Dakota and Nebraska while also attracting visitors from across the United States and other countries. Spending associated with recreational visits generates significant economic activity in the 12-county area. A visitor usually buys a wide range of goods and services while visiting an area. Major expenditure categories include lodging, restaurants, supplies, groceries, and recreational equipment rental. Given the numerous recreational areas and activities within the proposed boundaries of the NCCA and PBCA, estimating the overall current economic contribution of visitor spending as well as potential changes in visitation because of the establishment of the NCCA and PBCA would require a comprehensive visitor use study, which is beyond the scope of this analysis. Instead, we compiled existing visitation and spending estimates to provide an overview of the current contribution of visitor spending within the project area.

Overall Tourism in 12-County Area

Two existing studies quantify the effects of tourism within the 12-county area. The first study, conducted by IHS Global Insight, found that, in 2011, tourism expenditures in South Dakota totaled more than $3.7 billion in sales and generated more than 27,000 jobs (Norton 2012). Tourism spending in the six South Dakota counties in the project area represented approximately 7.2 percent of South Dakota's total tourism sales for a total of $253 million in sales and 250 jobs (Norton 2012). The second study, conducted by Dean Runyan Associates, found that, in 2008, tourism spending in the six Nebraska Counties totaled more than $56 million and created 880 jobs—approximately 2.5 percent of Nebraska's total tourism effects (Dean Runyan Associates 2009). Even though these studies utilized different methods and were conducted in different years, they provide a starting range for the overall importance of tourism jobs in the 12-county area. As shown in table 9 (chapter 4), nonfarm employment accounts for 90.8 percent or approximately 77,700 jobs in the 12-county area. While tourism employment from the IHS Global Insights and Dean Runyan Associates studies accounts for less than 2 percent of total nonfarm employment in the 12-county area, it is important to note that cities and towns near the recreational river areas are more heavily dependent on tourism spending than other cities in the 12-county area outside the proposed boundaries of the NCCA and PBCA.

Missouri River Recreation in the Proposed NCCA and PBCA

River-dependent recreation accounts for a large portion of tourism in the 12-county area. Two existing studies quantify river recreation for portions of the Missouri River within the proposed conservation areas.

The most recent study, conducted between January 2004 and January 2005, is a multi-agency comprehensive assessment of public use on the 811-mile stretch of the Missouri River from Gavins Point Dam to Saint Louis. The objectives of the assessment were to determine the types and amount of public use on the river and along its banks, estimate fish and wildlife harvest levels, describe user sociodemographic characteristics, and estimate the economic value of the river to the users (Sheriff et al. 2011). The assessment's River Segment 7, from Gavins Point Dam to the Big Sioux River, closely aligns with the proposed boundaries of the PBCA. Survey results for River Segment 7 estimated 192,940 total visits during 2004, with an average visit length of 3.1 hours per visit. Approximately 48 percent of total visits were for nonconsumptive activities, 42 percent were fishing visits, and 5 percent were hunting visits (Sheriff et al. 2011). Based on these visitation levels and expenditure data from the FWS's "National Survey of Fishing, Hunting, and Wildlife-associated Recreation," Sheriff et al. (2011) estimated that there were 685,790 total visits along the Nebraska border river segments for a total of $16.3 million in expenditures (in 2004 dollars) and 370 jobs in Nebraska. River Segment 7 accounted for approximately 28 percent of the visits along the Nebraska border segments (Sheriff et al. 2011), and associated 2004 expenditures for River Segment 7 totaled $4.6 million in spending (in 2004 dollars) and 104 jobs in Nebraska.

Unfortunately, the Sheriff et al. assessment did not extend far enough upriver to evaluate the proposed NCCA.

The second study, a 2000 Missouri River Recreational Use Survey (Mestl et al. 2000), sampled visitors from the Fort Randall Dam to the Big Sioux River reach, which encompasses the proposed boundaries of both the NCCA and PBCA. However, this study did not elicit sufficient information to credibly estimate the economic effects of visitation along the river stretch.

Table 10. Economic contribution of Missouri National Recreational River visitor spending to local communities in 2010.

Current effects (alternative A)	*Employment (number of full- and part-time jobs)*	*Labor income (thousands $2010)*	*Value added (thousands $2010)*
Direct effects	143	$1,932	$3,047
Secondary effects	20	$506	$932
Total effect	163	$2,438	$3,979

Source: Stynes and Propst 2011.

Current NPS Visitation in the Proposed NCCA and PBCA Project Area

The NPS-managed MNRR lies within the boundaries of the proposed conservation areas. The MNRR is split into two segments: the lower 59-mile reach from about 1 mile below Gavins Point Dam to Nebraska's Ponca State Park; and the upper 39-mile reach, which begins immediately downstream of Fort Randall Dam at Pickstown, South Dakota, and continues to Running Water, South Dakota, and includes 25 miles of the lower Niobrara River and 8 miles of Verdigre Creek. The NPS estimates that in 2010 the MNRR received more than 167,000 recreation visits. According to Stynes and Propst (2011), park visitors spent $7.94 million in local communities (defined as communities within roughly 60 miles of the MNRR), and these expenditures directly contributed an estimated 143 jobs, $1.9 million in labor income, and $3.1 million in value added to the local economy (estimated effects from the Stynes and Propst report are shown in table 10). The secondary or multiplier effects of these expenditures accounted for an additional 20 jobs, $506,000 in labor income, and $932 thousand in value added to local communities. Accounting for both the direct and secondary effects, visitor spending in the MNRR generated an estimated total contribution of 163 jobs, $2.44 million in labor income, and $3.98 million in value added to the local economy in 2010 (Stynes and Propst 2011). The two local economic sectors most directly affected by nonlocal visitor spending were lodging and restaurants.

Recreation at Nebraska State Parks within the Project Area. The Ponca and Niobrara State Parks lie within the boundaries of the proposed conservation areas, and are major hubs for recreation along the river. A recent report by Southwick (2011) estimated trip-related and equipment expenditures associated with visitation to Nebraska State Parks totaled $448.8 million in 2010 and generated more than 8,000 jobs and $265.8 million in labor income in the Nebraska economy (in 2010 dollars). The Ponca State Park is located in the proposed PBCA boundary at the eastern gateway to the 59-mile section of the MNRR boundary. In 2010, Ponca State Park was the fourth most-visited attraction in Nebraska with approximately 747,000 visits. According to the Nebraska Game and Parks Commission (personal communication), approximately 20,000 of these visits were overnight stays in park cabins or campgrounds.

Niobrara State Park is located within the proposed NCCA at the confluence of the Niobrara and Missouri Rivers. In 2010, Niobrara State Park received a total of 157,000 visits. The Southwick (2011) Nebraska state park impact estimates include equipment expenditures; therefore, the report results cannot be used to estimate visitor spending impacts at the individual park level in a way that would be directly comparable with the MNRR or the other Missouri River visitor spending impacts reported above.

Summary of Missouri River Recreation Estimates in the Proposed Conservation Areas

While comprehensive Missouri River visitor use studies have been conducted for segments of the proposed conservation areas, the most comprehensive river-based recreation survey (Sheriff et al. 2011) only included the PBCA and was conducted almost a decade ago. Visitation levels and trends have certainly increased since then. The most recent economic contribution estimates (Stynes and Propst 2011) only consider MNRR visitation, which does not fully capture all river-based recreation within the proposed conservation areas. Aggregating MNRR visitation estimates with Ponca State Park, Niobrara State Park, USACE, or past Missouri River recreation survey visitation data is not appropriate, because aggregating estimates would result in overestimating visitation by double counting visitors multiple times during one trip. This is because visitor sampling techniques for estimating MNRR visitation include visitors to an NPS interpretive display within Ponca State Park, a visitor overlook near Niobrara State Park, as well as visitors entering the Lewis and Clark Visitor Center, which is next to Gavins Point Dam and jointly administered by the USACE and the NPS. Given these limitations, it is not possible to calculate the current contribution of river-based rec-

reation within the proposed conservation areas based on existing visitor use studies. However, the existing estimates provide an overview of the range of effects, and the MNRR estimates reported in table 10 serve as a conservative lower bound.

For alternatives B, C, and D, we aim to provide reliable and consistent access to the Missouri River and its tributaries, thereby stimulating local economies through increased visitation, while compensating landowners if they choose to allow public access to their properties. Overall visitation levels are anticipated to increase as public access to the river increases. The overall increase in visitation will be influenced by a number of factors, such as landowner involvement and participation in the program, funds available for conservation, the amount and location of new recreational lands and opportunities, the timing of purchases, and overall demand for recreation along the river.

Administration Expenditures

Current MNRR employees reside and spend their salaries on daily living expenses in the local area, thereby generating effects in the local economy. Household consumption expenditures consist of payments by individuals and households to industries for goods and services used for personal consumption. The economic impacts associated with spending of salaries in the local area by MNRR employees are summarized in table 11. In Fiscal Year 2010 the MNRR employed 13 people with a total payroll of $625,000 in wages, salaries, and payroll benefits (Stynes and Propst 2011). Including the induced effects of the spending of MNRR wages and salaries in the local region, the total local economic impacts of park payrolls are $673,000 in labor income, $726,000 in value added, and 15 jobs including NPS jobs (Stynes and Propst 2011).

Additionally, management of the NCCA and PBCA will require purchasing a wide variety of supplies and services for operations and maintenance activities, and many of these supplies and services will be purchased within the local 12-county area. Purchases made in the 12-county area will contribute to the local economic impacts associated with the NCCA and PBCA.

The FWS and NPS anticipate hiring more full-time staff, but the increase in the number of staff and nonsalary expenditures required to manage NCCA and PBCA will ultimately depend on landowner involvement and participation in the program, as well as funds available for conservation. Though these effects cannot be quantified at this time, added nonsalary expenditures and staff will have a positive effect on the local economy through the local spending of salaries and through purchases of more goods and services in the local 12-county area.

Cumulative Effects on Socioeconomic Environment

Lands acquired through conservation easements would remain under private ownership, but would provide a cost-effective means to conserve larger blocks of habitat. In some circumstances, when public use is expected to be high or when extensive construction or restoration is expected, land would be acquired through fee-title purchases. We would comanage this land, and it would be removed from county tax rolls. Reductions in county taxes would be partially replaced by RRS payments; though, given the declining trend in RRS appropriations, RRS payments are expected to make up only a small portion of the reduction in property taxes collected.

The proposed action would have numerous public benefits. Restoration of wildlife habitat would increase conservation and ecosystem service values by enhancing and preserving wildlife habitat and providing flood mitigation services, and adjacent landowners may experience increased property values through their proximity to permanently protected lands. Newly acquired lands may provide more access points, trails, and wildlife viewing opportunities, which would help local residents. These new and enhanced recreational opportunities are also anticipated to draw more nonlocal visitors to

Table 11. Economic contribution of Missouri National Recreational River payroll to local communities in 2010.

Current impact (alternative A)	*Employment (number of full- and part-time jobs)*	*Labor income (thousands $2010)*	*Value added (thousands $2010)*
NPS payroll	13	$625	$625
Induced effects	2	$49	$101
Total effect	15	$673	$726

Source: Stynes and Propst 2011.

the proposed conservation areas, increasing economic activity associated with visitor spending in the local economy. Furthermore, the proposed action would create more local economic activity through increased spending by us on operations and maintenance, and increased salary spending by our staff.

The effects of the proposed action are complex and difficult to quantify. There are many variables at play, and it is not possible to precisely predict the economic impacts of the proposed action. The conversion of private land to federal land will happen incrementally over a 50-year horizon; thus, the changes described in this analysis will happen slowly, giving the local economy time to adjust. Over time, losses in local government revenues and agricultural production will be offset by gains from restoration activities and spending generated through visitation and operations. These changes are well within the normal evolution of an economy (USGS 2012b).

5.10 Irreversible and Irretrievable Resource Commitments

NEPA requires a discussion of any irreversible or irretrievable commitment of resources that would result from implementing the alternatives. An irreversible commitment of resources means nonrenewable resources are consumed or destroyed. These resources are permanently lost because of plan implementation. In contrast, an irretrievable commitment of resources is the loss of resources or resource production, or the use of renewable resources during the period under consideration.

Alternative A

Under alternative A, there would be no added commitment of resources by us. Riparian, grassland, and forest habitats converted to other uses would be irretrievably lost because their natural function would be lost, contributing to the overall loss of fish and wildlife habitat, scenic values, and (potentially) of cultural resources.

Alternatives B–D

The establishment of the NCCA and PBCA would not, of itself, constitute an irreversible or irretrievable commitment of resources. However, if interests in land were acquired through the use of Land and Water Conservation Fund monies or other funds and donations, the administration of the easement provisions or donated property would require an irreversible and irretrievable commitment of resources. The monitoring of easements would represent a moderate increase in overall costs borne by the Lake Andes Wetland Management District (FWS) or MNRR (NPS). Federal money for staff and operations would be an irretrievable commitment of resources. These resources would not be available for other Federal programs or projects.

The digging of fossil resources on fee lands for research purposes would be an irreversible commitment of resources. These resources would no longer be in the ground in their original context, although they would continue to be available to the public for research and educational purposes.

Fossil fuel used by motor vehicles, boats, and equipment—either by the FWS or the public—would represent an irreversible commitment of resources because their use is lost for future generations. In addition, they would result in irretrievable adverse effects on air quality and global climate change.

Like fossil fuel, prescribed fires and wildfires would emit carbon and particulates and would result in irretrievable adverse effects on air quality and global climate change. However, there would be an expected benefit to overall habitat conditions.

The potential for properties to be used for tillage agricultural production or subdivision by private landowners would be removed in perpetuity, unless we divested interest in such lands in the future.

5.11 Short-Term Uses of the Environment and Maintenance of Long-Term Productivity

Alternative A

Continued efforts to conserve habitats would be ongoing through the efforts and activities of the MNRR, the FWS's Partners for Fish and Wildlife program, and the efforts of other agency and nonprofit partners. Important riparian and upland habitats would be expected to continue to be lost at current rates of conversion, having long-term negative implications for the maintenance of the ecological communities they support.

Alternatives B–D

We would be authorized to purchase perpetual easements or land in fee title only from willing sellers, providing an immediate short-term economic benefit to landowners. This benefit may provide capital for expansion of ranching operations, or it may permit struggling operators to stay in business. This infusion of capital at an opportune time would likely have important long-term benefits to the economy of the Missouri River valley.

The conservation of habitats under the proposed action would also have important short- and long-term ecological benefits. The proposed action would preserve habitat now used by wildlife, including federally protected species. This protection would result in preservation of the area's biodiversity, which is important for long-term ecosystem stability and function of riverine environments. By preventing fragmentation and conversion, particularly in wildlife corridors like riparian areas, the proposed action would promote long-term ecological resiliency to habitat perturbations such as bank stabilization and infiltration of chemicals.

In contrast, the long-term availability of land for tillage agriculture would be reduced and the burden of producing higher yields to maintain growing populations would affect agricultural producers. In addition, the amount of land available to developers of residential properties would be decreased.

5.12 Adherence to Planning Goals

This section describes by goal how each alternative meets that goal for the action. Table 12 summaries this discussion.

Local Economies and Tourism

Help sustain local economies through preserving working farm and ranch landscapes and conserving lands, both of which will attract tourists from across the Nation.

Alternative A would not permit us to work with private landowners and communities to develop conservation easements or increase tourism. Alternative B would allow minimal interaction, while alternatives C and D would provide progressively increasing opportunities to work with private landowners. Alternative D would have the greatest affect on local tax bases and could lead to adverse effects on local county revenues.

Partnerships and Collaboration

Develop and foster partnerships with local landowners, communities, tribes, and others by offering financial incentives, sharing knowledge, or collaborating on projects with ecological benefits.

Alternative A would limit the FWS and NPS's ability to work with private landowners, communities, schools, and other organizations to work on natural resources issues. The FWS could still work with private landowners on conservation issues through the Partners for Fish and Wildlife Program. The action alternatives would provide progressively increasing opportunities for partnerships.

Ecological and River Functionality

Increase river and ecological functionality by improving water and air quality, maintaining healthy native plant communities such as cottonwood galleries, increasing floodplain connectivity, promoting active channel processes, and reducing flood risk.

Improving and maintaining ecological and river functionality is a long-term process and will be constrained by the main stem dams on the Missouri River. Under alternative A, the opportunity to improve conditions would be dependent primarily on private landowners and other agencies. Alternative B would provide for some increased function, but without a larger floodplain and upland habitats to rely upon, effects would be minimal and would satisfy the goal marginally. Alternatives C and D provide for the opportunity to restore floodplain function and connectivity by creating a mosaic of lands in protected status.

Cultural Resources

In consultation with our partners, locate, document, and evaluate cultural resources and encourage preservation and interpretation when appropriate.

Table 12. Ratings of alternatives for the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

Goal	*Alternatives—adherence to goals*[1]			
	A	B	C	D
Local economies and tourism	×	◊	•	•
Partnerships and collaboration	×	◊	•	•
Ecological and river functionality	×	◊	•	•
Cultural resources	◊	◊	•	•
Recreational opportunities	◊	◊	•	•
Wildlife, fisheries, and their habitats	◊	◊	◊	•

[1] Ratings note that an alternative either satisfies (•) the goal, partially satisfies (◊) the goal, or does not satisfy (×) the goal.

We are working with partners on advancing the preservation and educational opportunities along the Missouri River. Alternatives A and B would partially fulfill the goals set for this project because of our legal mandates to protect cultural resources where we have jurisdiction. Alternatives C and D would provide us with greater flexibility and opportunities to work with partners to proactively conserve cultural resources.

Recreational Opportunities

Increase recreational opportunities for residents and visitors.

This area of the Missouri River is a recreational destination for local residents and visitors— primarily from the four-state region of Iowa, Minnesota, Nebraska, and South Dakota. This level of visitation would likely continue with implementation of alternative A. Alternative B would only partially meet the recreational opportunities goal. Alternatives C and D would allow for increased access to the river, increased public lands for both consumptive and nonconsumptive uses, and increased habitat conditions for native species, thereby fulfilling the recreational opportunity goal.

Wildlife, Fisheries, and Their Habitats

Support the recovery and protection of threatened and endangered species and reduce the likelihood of future listings under the ESA, while continuing to provide migration habitats for millions of migrating birds and habitats for resident fish and wildlife populations.

Full recovery of the three focal species identified in the LPP (piping plover, least tern, and pallid sturgeon) is outside the scope of this project and will require full recovery of the Missouri River ecosystem as outlined in the MRRP. The action alternatives would help us achieve this goal to varying degrees by protecting habitats on increasing amounts of riparian and upland areas. Alternative D would be most effective in supporting the recovery of these species by protecting 30 percent of riparian areas and 60 percent of the uplands.

5.13 Unavoidable Adverse Effects

Any adverse effects that may be unavoidable are described below.

Alternative A

The loss of wetland and grassland habitats through conversion to agriculture and development would continue, although protection of some of these habitats would continue through existing acquisition authorities and funding.

Alternatives B–D

The increased protection of riparian and upland habitats would reduce fragmentation, increase water quality, maintain current levels of carbon sequestration, and maintain the area's rich biological diversity. Management of lands for healthy rivers, grasslands and forests would benefit ranching operations but

may reduce the potential production of agricultural crops in the area, although most areas to be protected are not well suited for crop production. In addition, the acquisition of land in fee-title would cause a direct decline in taxes paid to counties.

5.14 Conflicts with Federal, State, Tribal, and Local Agencies

Actions considered in this EIS do not appear to conflict with USACE, NRCS, SDGFP, NGPC, or tribal goals, objectives, policies, or plans. The associated LPP is designed to provide private landowners with an option to consider when desiring to implement conservation actions. While there is a possibility that a landowner could choose one easement program over another, thereby affecting the program not chosen, this effect is expected to be minor.

Where other agencies, tribes, or organizations have primary jurisdiction, we will have secondary or "junior" jurisdiction. Accordingly, we will ensure that the provisions and regulations of the Wild and Scenic River Act are being met where applicable.

5.15 Comparison of Environmental Consequences

Table 13 summarizes the environmental consequences discussed above to compare the effects of under each alternative.

Table 13. Summary of environmental consequences for alternatives for the Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

Alternative A	*Alternative B*	*Alternative C*	*Alternative D*
Climate and climate change			
No discernible effect; conditions would remain unchanged.	Negligible beneficial effects of providing a buffer against climate change through promotion of native ecosystems.	Negligible beneficial effects of providing a buffer against climate change through promotion of native ecosystems.	Negligible beneficial effects of providing a buffer against climate change through promotion of native ecosystems.
Air quality			
No discernible change in effect; conditions would remain unchanged.	Emissions from visitor vehicles would increase, but effects would be negligible because of controls required by the Clean Air Act.	Emissions from visitor vehicles would increase, but effects would be negligible because of controls required by the Clean Air Act.	Emissions from visitor vehicles would increase, but effects would be negligible because of controls required by the Clean Air Act.
Visual resources			
No discernible change in effect; conditions would remain unchanged, but the quality of visual resources is expected to decrease.	Scenic quality would increase as areas would be conserved in a native ecosystem, but the effect is expected to be negligible.	A slight increase in scenic quality over alternative B.	A slight increase in scenic quality over alternative C.
Acoustic resources			
No discernible change in effect.	Negligible to moderate effects based on positioning of access sites. New boat ramps Could be a major effect.	A slight increase in effects over alternative B.	A slight increase in effects over alternative C.

Table 13. Summary of environmental consequences for alternatives for the Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

Alternative A	*Alternative B*	*Alternative C*	*Alternative D*
Land features, soils, vegetation, and geology			
Land features, soils, vegetation and geology would continue to be altered by private landowners.	20 and 40 percent of the natural land features, soils, vegetation and geology would be conserved in the uplands and floodplain.	25 and 50 percent of the natural land features, soils, vegetation and geology would be conserved in the uplands and floodplain.	30 and 60 percent of the natural land features, soils, vegetation and geology would be conserved in the uplands and floodplain.
Construction of new public access sites and roads would not occur.	Negligible effects associated with the construction of public access sites and roads would occur.	A slight increase in effects over alternative B.	A slight increase in effects over alternative C.
Water resources			
Water resources would remain primarily unchanged from current conditions.	Minor to moderate beneficial effects on water resources would occur through natural bank erosion and floodplain building.	A slight increase in effects over alternative B.	A slight increase in effects over alternative C.
Uplands			
Uplands would continue to be vulnerable to conversion.	20 percent of uplands would be conserved.	25 percent of uplands would be conserved.	30 percent of uplands would be conserved.
Herbicide and pesticide loads would increase over time.	Herbicide and pesticide loads would be filtered by maintaining uplands.	Herbicide and pesticide loads would be filtered by maintaining uplands.	Herbicide and pesticide loads would be filtered by maintaining uplands.
Fragmentation and conversion would continue.	Fragmentation of uplands would be reduced by 20 percent.	Fragmentation of uplands would be reduced by 25 percent.	Fragmentation of uplands would be reduced by 30 percent.
River bottoms			
The river would continue to be stabilized and species like cottonwoods would continue to decline.	40 percent of the river floodplain habitat would be uninhibited to allow the river to meander naturally.	50 percent of the river floodplain habitat would be uninhibited to allow the river to meander naturally.	60 percent of the river floodplain habitat would be uninhibited to allow the river to meander naturally.
The floodplain would continue to be developed and vulnerable to flooding.	Areas vulnerable to risk of flooding would be decreased by 40 percent.	Areas vulnerable to risk of flooding would be decreased by 50 percent.	Areas vulnerable to risk of flooding would be decreased by 60 percent.
Invasive species			
Invasive species would be controlled through chemical and mechanical means by landowners and county governments.	Invasive species would be controlled more through biological means and prescribed fire by the FWS and NPS.	Invasive species would be controlled more through biological means and prescribed fire by the FWS and NPS.	Invasive species would be controlled more through biological means and prescribed fire by the FWS and NPS.
Mammals			
Mammals could continue to experience habitat loss.	Floodplains and uplands would be conserved and habitat conditions would improve for mammals.	A slight increase in effects over alternative B.	A slight increase in effects over alternative C.
Birds			
Habitat for native grassland and riparian bird species would continue to decline in quantity and quality because of conversion to other uses and fragmentation.	At least 20 and 40 percent of the habitat for native grassland and riparian bird species would be protected in the uplands and riparian areas, respectively.	At least 25 and 50 percent of the habitat for native grassland and riparian bird species would be protected in the uplands and riparian areas, respectively.	At least 30 and 60 percent of the habitat for native grassland and riparian bird species would be protected in the uplands and riparian areas, respectively.

Table 13. Summary of environmental consequences for alternatives for the Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

Alternative A	*Alternative B*	*Alternative C*	*Alternative D*
Generalist and parasitic species like brown-headed cowbirds would continue to experience population increases.	Native species such as bald eagles would be expected to experience population increases.	A slight increase in effects over alternative B.	A slight increase in effects over alternative C.
Fish			
Native fish habitat would continue to decline because of degradation, lack of sediment, bank stabilization, and loss of floodplain connectivity.	Minor beneficial effects would occur, but alternative would not provide sufficient floodplain connectivity.	Moderate long-term beneficial effects from potential for floodplain connectivity.	An increase in beneficial effects over alternative C.
Other wildlife			
Negligible effects on other wildlife are expected.	Minor beneficial effects are expected for insects, reptiles, amphibians, and other wildlife.	Minor to moderate beneficial effects are expected for insects, reptiles, amphibians, and other wildlife.	Moderate beneficial effects are expected for insects, reptiles, amphibians, and other wildlife.
Threatened and endangered species and species of concern			
Habitat loss and decreased populations would continue if habitat restoration programs were discontinued or lands converted to other uses.	Habitat restoration and enhancement would lead to population increases.	An increase in beneficial effects over alternative B.	An increase in beneficial effects over alternative C.
Special management areas			
No discernible change in effects are expected.	Although negligible effects are expected, increased visitation to other areas is expected.	An increase in beneficial effects over alternative B.	An increase in beneficial effects over alternative C.
Visitor services			
No discernible change in effects are expected.	The number of visitors and interactions between visitors and other recreationists and wildlife would increase.	An increase in effects over alternative B.	An increase in effects over alternative C.
Cultural and historical resources			
Some cultural resources could be adversely affected by development and conversion to other uses. Some sites could be destroyed.	Increased protection of cultural resources and potential for education would occur on conserved properties.	An increase in beneficial effects over alternative B.	An increase in beneficial effects over alternative C.
Paleontological resources			
Some paleontological resources could be adversely affected by development and conversion to nonnative uses. Some sites could be destroyed.	Increased protection of paleontological resources and potential for education would occur on conserved properties.	An increase in beneficial effects over alternative B.	An increase in beneficial effects over alternative C.

Table 13. Summary of environmental consequences for alternatives for the Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

Alternative A	*Alternative B*	*Alternative C*	*Alternative D*
Conservation and ecosystem service values			
The ecosystem would remain primarily unchanged.	Increased focus would be placed on a functional native ecosystem and the societal values they produce (such as water, food)	An increase in beneficial effects over alternative B.	An increase in beneficial effects over alternative C.
Effects on local economies			
New funds would not be available to the local communities.	Funds would be invested into the local community through payments to landowners; conservation would increase open space and help maintain rural landscape characteristics.	An increase in beneficial effects over alternative B.	An increase in beneficial effects over alternative C.
Landowner compensation			
Landowners would rely on other agencies or organizations for conservation programs.	Landowners would be compensated for the value of the conservation easement, which may provide beneficial tax implications.	An increase in beneficial effects over alternative B.	An increase in beneficial effects over alternative C.
Effects on local government net revenue			
No change from current conditions is anticipated.	Local governments would see a direct loss in property tax revenue, but a decreased cost in expenditures.	An increase in effects over alternative B.	An increase in effects over alternative C.
Visitor expenditures			
No change from current conditions is anticipated.	Visitor expenditures would increase because of larger areas of public lands and increased access. Increased visitation would result in increased recreational revenue and jobs.	An increase in beneficial effects over alternative B.	An increase in beneficial effects over alternative C.
Administrative expenditures			
No change from current conditions is anticipated.	New positions would be created as the LPP is implemented resulting in salary spending in local communities and increased use of contractors to perform restoration and maintenance actions.	An increase in beneficial effects over alternative B.	An increase in beneficial effects over alternative C.

Appendix A

List of Preparers and Reviewers

This document is the result of the extensive, collaborative, and enthusiastic efforts by members of the core planning team, cooperating agencies, and other organizations listed below.

Core Planning Team

Name	*Agency, position, and location*	*Education and experience*	*Contribution*
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Mike Bryant	FWS Lake Andes Wildlife Refuge Complex project leader; Lake Andes, South Dakota	B.A. Anthropology, M.A. Anthropology; 41 years	Project oversight, writing and review
Steven Mietz	NPS Missouri National Recreational River superintendent; Yankton, South Dakota	B.A. Policy Analysis, M.S. Environmental Studies; 19 years	Project oversight and review
Wayne Nelson-Stastny	FWS Missouri River Recovery Team; Yankton, South Dakota	B.S. Biology, M.A. Biology; 22 years	Writing and review
Carol Smith	FWS Missouri River Recovery Team; Yankton, South Dakota	B.S. Fish and Wildlife Sciences; 34 years	Writing and review
Jim Gropper	FWS realty specialist; Huron, South Dakota	B.S. Geology, M.S. Environmental Planning; 34 years	Realty and land acquisition review
Cindy Loban	FWS realty specialist; Huron, South Dakota	A.D. Business Administration; 9 years	Realty and land acquisition review
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Cooperating Agency Team Members

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Dane Shuman	FWS fish and wildlife biologist, Pierre, South Dakota	Pallid sturgeon biological data for NCCA
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Other Contributors

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Appendix B

Public Scoping Report

Methods for Comment Collection and Analysis

The objective of the scoping process is to gather the full range of comments, questions, and concerns that the public has about the proposed action. The U.S. Fish and Wildlife Service (FWS) issued a press release (figure 1) on February 6, 2012, to media outlets and tribes in Iowa, Minnesota, Nebraska, and South Dakota that announced the scoping period and three scoping meetings. A four-page information factsheet was mailed to 475 individuals and organizations. These names were identified from prior FWS and National Park Service (NPS) projects where groups or individuals expressed interest. The FWS and NPS also issued a notice of intent to prepare National Environmental Policy Act (NEPA) documents in association with this project in the Federal Register on February 15, 2011 (figure 2). In response to two separate public requests, FWS and NPS added two scoping meetings (figure 3). All information was also posted to the FWS and NPS Facebook and Twitter profiles.

The FWS and NPS conducted the five scoping meetings held February 21–24, 2012, in Sioux Falls, Wagner, Yankton, and Vermillion, South Dakota, and in Niobrara, Nebraska. Public attendees at the five scoping meetings totaled 108 individuals.

Public scoping was conducted until March 16, 2012, thereby allowing 40 days from the issuance of the first news release and 30 days from the issuance of the notice of intent.

All comments, questions, or issues—whether from written submissions or recorded at the public meetings—were organized by topic and coded for organizational purposes. Every effort was made to document all issues, questions, and concerns. Regardless of whether comments and questions were general or specific, they were added to the record one at a time.

All comments received on FWS and NPS NEPA documents become part of the final official public record. Requests for information contained in comments are handled in accordance with the Freedom of Information Act, NEPA (40 CFR 1506.6 [f]), and other Department of the Interior and FWS policies and procedures. In compliance with FWS and NPS policies regarding the disclosure of personal information, any names, addresses, or other personal information of individuals (does not apply to agencies or organizations) who commented will not be published in this document unless that information was spoken in a public meeting. It should be noted that public scoping is not a voting process, and each comment is considered to be of equal importance.

Summary of Scoping Comments

In summary, the FWS and NPS received 38 comments and answered approximately 10 phone calls. The majority of the comments were focused on the overall management of the Missouri River and on how this proposal will coordinate with those efforts.

Below is a list of the issues, questions, and comments raised by the public during scoping. Comments were submitted in writing during the 40-day public scoping period that ended March 16, 2012, and offered at the public meetings held February 21–24, 2012.

Comments and Questions on the Purpose and Need for this Project

- Individuals envision a natural wildlife refuge with plenty of visitor opportunities.
- The designation of the river as a Recreational River under the Wild and Scenic Rivers Act should be sufficient for conservation efforts.
- Since the closure of Gavins Point Dam, the destruction of prime floodplain, agricultural land, roads, highways, river access, farm dwellings, and large cottonwood forests has continued.
- Returning sediment to the river channel is needed.
- What is the vision for this project?

Office of External Affairs

Mountain-Prairie Region

NEWS RELASE

United States Department of the Interior

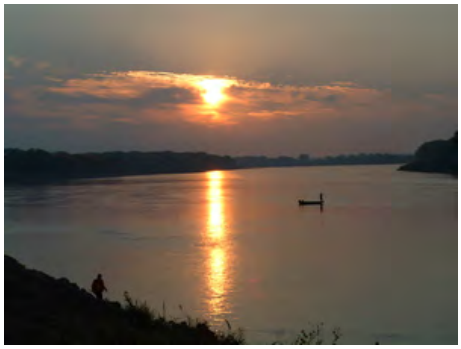
FISH AND WILDLIFE SERVICE
Mountain-Prairie Region
P.O. Box 25486, DFC
Denver, Colorado 80225

NATIONAL PARK SERVICE
Missouri National Recreational River
508 E. 2nd Street
Yankton, South Dakota 57078

For Immediate Release
Date: February 6, 2012
Nick Kaczor (303) 236-4387
Steve Mietz (605) 665-0209

U.S. Fish and Wildlife Service and National Park Service to Host Public Meetings Regarding Conservation Efforts with Willing Landowners along the Missouri River in Northeast Nebraska and Southeast South Dakota

Public Scoping Comments Regarding This Conservation Effort Will Be Accepted Until March 12, 2012



Sundown on the Missour River River
Photo Credit: National Park Service

To increase conservation efforts and recreational opportunities along the Missouri River, the U.S. Fish and Wildlife Service (FWS) and National Park Service (NPS) are proposing to work in partnership with willing landowners and local communities.

Efforts will be focused upon the Missouri River between Ft. Randall Dam to the Running Water Bridge and upstream the Niobrara River to the Spencer Dam. This area is referred to as the Niobrara Confluence. The other area, called the Ponca Bluffs, is centered on the Missouri River from Gavins Point Dam to Sioux City, Iowa.

The FWS and NPS will work with local communities and willing landowners to conserve stretches of the Missouri River that have significant natural resource, recreational, or cultural value. The opportunity to preserve, and even improve, important natural river processes and habitats for fish and wildlife would benefit the visitors, neighbors, and local communities of the Niobrara Confluence and Ponca Bluffs areas, now and into the future. Through a combination of actions along a spectrum from restoration efforts, conservation easements,

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Figure 1. Press release announcing the scoping period and three scoping meetings for the proposed conservation areas.

or land acquisition, the unique nature of the Missouri River would be maintained and in some cases, restored to its former glory. These efforts would not result in increased regulations or alter dam operations; but provide for increased wildlife habitats, protection of culturally and historically important sites, and improved recreational access.

Individual or group representatives may visit the project website (http://parkplanning.nps.gov/niob-ponca) to learn more or to provide comments. The FWS and NPS will gather public input as part of public scoping during the month of February. Public scoping comments will be accepted until March 12, 2012. Received public comments will be considered by the NPS and FWS during development of a Land Protection Plan. There will be another opportunity to comment on the draft Land Protection Plan in the fall of 2012.

Public meetings regarding the proposal will begin with an open house at 5:30 p.m. local time where individuals can meet one-on-one with the FWS and NPS staff; followed by a short presentation at 6:30 p.m. with time for additional discussion afterwards. The meetings will be at the following dates and locations:

Tuesday, February 21, 2012
5:30 p.m.-8:00 p.m.
The Outdoor Campus
4500 S. Oxbow Ave.
Sioux Falls, South Dakota

Thursday, February 23, 2012
5:30 p.m.-8:00 p.m.
W.H. Over Museum
1110 Ratingen Street
Vermillion, South Dakota

Friday, February 24, 2012
5:30 p.m.-8:00 p.m.
WFLA Hall
Spruce and Park Avenues
Niobrara, Nebraska

Information will broadcast via local radio stations in the event of a cancellation or postponement. For more information or to provide comments, contact:

Nick Kaczor, Planning Team Leader
Division of Refuge Planning
U.S. Fish and Wildlife Service
P.O. Box 25486, DFC
Denver, Colorado 80225
303- 236-4387

Steve Mietz, Superintendent
National Park Service
Missouri National Recreational River
508 East 2nd Street
Yankton, South Dakota 57078
605-665-0209

Email Us: MountainPrairie@fws.gov
Mountain-Prairie Region Press Releases

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Figure 1. Press release announcing the scoping period and three scoping meetings for the proposed conservation areas.

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Alternative B: Optimize Wildlife-Dependent Public Use and Management (Proposed Alternative)

The proposed alternative, Alternative B, would emphasize management of the natural resources of Clarks River NWR based on maintaining and improving wetland habitats, monitoring targeted flora and fauna representative of the surrounding Clarks River watershed, and providing quality public use programs and wildlife-dependent recreational activities. All species occurring on the refuge would be considered, and certain targeted species would be managed for and monitored in addition to species of Federal responsibility. These species would be chosen based on the criteria that they are indicators of the health of important habitat or species of concern. Information gaps in knowledge of the refuge's aquatic species would be addressed.

Restoration efforts, habitat management, a prescribed fire program, and forest management would reflect best management practices determined after examination of historical regimes, soil types and elevation, and the current hydrological system. Management actions would be monitored for effectiveness and adapted to changing conditions, knowledge, and technology. A habitat management plan would be developed to plan future habitat projects and evaluate previous actions.

Overall public use would be monitored to determine if any negative impacts are occurring on resources from overuse. Education programs would be reviewed and improved to complement current management and current staffing. Public use programs would be updated to support and teach the reasons behind management actions, and to provide quality experiences to visitors. The refuge headquarters would be developed to provide more visitor services. In an increasingly developing region, a balanced wildlife-dependent recreational program would be a focus under this alternative. A new visitor center would be constructed. Archaeological resources would be surveyed.

The refuge currently has fee-title ownership of about 8,634 acres with an approved acquisition boundary of 19,605 acres. Lands are purchased on a willing-seller basis only. Alternative B includes a proposed expansion of 34,269 acres and would bring the total refuge acquisition boundary to approximately 53,874 acres, and would protect lands along the east and west forks of the Clarks River. Land acquisitions within the existing and proposed expanded acquisition boundaries would be based on importance of the habitat for target management species. We would offer interpretation of refuge wildlife and habitats, as well as demonstrate habitat improvements for individual landowners.

In general, under Alternative B, management decisions and actions would support wildlife species and habitat occurring on the refuge based on well-planned strategies and sound scientific judgment. Quality wildlife-dependent recreational uses and environmental education and interpretation programs would be offered to support and explain the natural resources of the refuge.

This alternative would add six new positions to current staffing in order to protect resources, provide visitor services, and attain goals of facilities and equipment maintenance in the future. The biological environment would improve as adaptive and best management practices are utilized. Socioeconomic values should also increase as we offer increased wildlife-dependent recreational opportunities. Areas such as this are beneficial to local ecotourism trade and residents searching for natural landscapes and associated benefits.

Alternative C: Maximize Wildlife-Dependent Recreation and Management

Alternative C would emphasize maximizing wildlife-dependent recreational uses on the refuge. The increase of nine staff members in addition to the existing employees would support public use activities, including hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. In general, the focus would be on expanding public use activities to the fullest extent possible, while conducting only mandated resource protection, such as conservation of threatened and endangered species, migratory birds, and archaeological resources.

All management programs for conservation of wildlife and habitat, such as monitoring, surveying, and researching, would support species and resources of importance for public use enhancement. Emphasis would be placed more on interpreting and demonstrating these programs than actual implementation. Providing access with trails would be maximized, as well as providing public use facilities throughout the refuge. Federal trust species and archaeological resources would be monitored as mandated, but other species targeted for management would depend on which ones the public is interested in utilizing. Habitat restoration efforts would be based on public use demands and criteria rather than determined through methods using a strategic habitat conservation approach.

With the majority of staff time and funds supporting a public use program, wildlife-dependent recreation and environmental education and interpretation could be more successful than in the other alternatives. Land acquisitions within the approved acquisition boundary would be based on importance of the habitat for public use. The refuge headquarters and visitor center would be developed for public use activities such as interpretation and outreach.

Next Step

After the comment period ends, we will analyze the comments and address them.

Public Availability of Comments

Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While 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.

Authority

This notice is published under the authority of the National Wildlife Refuge System Improvement Act of 1997 (Pub. L. 105–57).

Dated: January 4, 2012.

Mark J. Musaus,

Acting Regional Director.

[FR Doc. 2012–3477 Filed 2–14–12; 8:45 am]

BILLING CODE 4310–55–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

National Park Service

[FWS–R6–R–2011–N211; FXRS1265066CCP0S2–123–FF06R06000]

Detailed Planning To Consider Additional Land Protection on the Missouri River From Fort Randall Dam to Sioux City, IA; National Environmental Policy Act Documents

AGENCY: Fish and Wildlife Service, National Park Service, Interior.

Figure 2. Notice of intent to prepare National Environmental Policy Act documents for the proposed conservation areas.

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ACTION: Notice of intent; request for comments.

SUMMARY: This notice advises the public that the U.S. Fish and Wildlife Service (FWS) and the National Park Service (NPS), U.S. Department of the Interior, as lead agencies, intend to gather information necessary to complete detailed planning and prepare associated documents under the National Environmental Policy Act (NEPA) and its implementing regulations, in order to consider additional land protection on the Missouri River from Fort Randall Dam to Sioux City, Iowa. The FWS and NPS are furnishing this notice in compliance with the National Wildlife Refuge System Administration Act of 1966, as amended, and the National Park Service Organic Act of 1916, as amended, to advise other agencies, Tribal governments, and the public of our intentions and to obtain suggestions and information on the scope of issues to include in the environmental documents. Special mailings, newspaper articles, and other media announcements will inform people of the opportunities for input throughout the planning process.

DATES: We are soliciting written comments and will hold public scoping meetings in February 2012. Information on meeting dates and times will be available at *http://parkplanning.nps.gov/niob-ponca* when that information is available.

ADDRESSES: Send your comments or requests for more information by any of the following methods.

Email: niobrara_ponca@fws.gov.

U.S. Mail: Nick Kaczor, USFWS, Division of Refuge Planning, P.O. Box 25486, DFC, Denver, CO 80225.

FOR FURTHER INFORMATION CONTACT: Nick Kaczor, Planning Team Leader, Division of Refuge Planning, USFWS, P.O. Box 25486, DFC, Denver, CO 80225.

SUPPLEMENTARY INFORMATION:

Introduction

With this notice, the FWS and NPS, as lead agencies, propose to complete detailed planning on a joint comprehensive conservation strategy and land protection plan (LPP) for the Niobrara Confluence and Ponca Bluffs areas of the Missouri River in southeast South Dakota and northeast Nebraska aimed to improve floodplain management. The LPP would develop a proposal for a comprehensive conservation strategy, including a plan aimed at enhancing wildlife habitat, increasing recreational opportunities, and improving floodplain management within the study area, by working with willing landowners to strategically protect land through acquisition and conservation easements.

The Niobrara Confluence segment between Fort Randall Dam and Lewis and Clark Lake is one of the last portions of the middle Missouri River that remain un-channelized, relatively free-flowing, and undeveloped. This area of the Missouri River's main channel in the old, wider river valley contains important habitat for at least 60 native and 26 sport fish. In addition, the riparian woodlands and island complexes are important for approximately 25 year-round bird species and 115 species of migratory birds, including piping plovers, least terns, and bald eagles.

The Ponca Bluffs segment between Gavins Point Dam and Sioux City is a diverse, relatively unaltered, riverine/floodplain ecosystem characterized by a main channel, braided channels, wooded riparian corridor, pools, chutes, sloughs, islands, sandbars, backwater areas, wetlands, natural floodplain and upland forest communities, pastureland, and croplands. This area also supports a wide variety of wildlife and fisheries resources similar to the Niobrara Confluence segment.

The National Wildlife Refuge System Improvement Act of 1997 outlines six priority public uses (hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation) that are to be facilitated on national wildlife refuges, where compatible.

The river reaches are components of the National Wild and Scenic River System as designated by Congress in 1978 and 1991 under the Wild and Scenic River Act (Pub. L. 90–542, as amended). The National Park Service is the river administering agency and is tasked to protect and enhance the outstandingly remarkable recreational, fish and wildlife, and scenic or similar values. The Wild and Scenic Rivers Act specifies that these river reaches shall be preserved in free-flowing condition and that their Outstandingly Remarkable Values shall be protected for the benefit and enjoyment of present and future generations.

Public feedback into the land protection planning process is essential to ensure that the FWS and NPS include society's input into the proposed project. FWS and NPS will request public review and comment throughout the planning process.

Background

The Missouri River basin encompasses 530,000 square miles—approximately one-sixth of the continental United States. The main stem, stretching from Three Forks, Montana, to St. Louis, Missouri, is the longest river in the United States, at more than 2,300 miles long. Historically, the Missouri River was a dynamic ecosystem, characterized by a changing interplay of open free-flowing, braided channel, sandbar, prairie, wetland, and forest habitats. Although manmade structures and activities have altered many of these natural processes, important habitats still remain, for a rich diversity of plants and animals. The dynamic nature of the Missouri River means that habitats change on a daily, seasonal, annual, and long-term basis. Erosive forces constantly transport sediment down the river, creating and modifying habitat and removing terrestrial vegetation from some areas while creating suitable conditions for new plants to grow in other areas. Seasonal river flow patterns flood river-bottom wetlands and maintain chutes, backwaters, and lakes in the floodplain that provide important wildlife breeding and foraging habitat. The combination of open water, floodplain wetlands, and river vegetation is particularly important for the large number of migratory birds that use the Missouri River during spring and fall migrations.

Despite significant alterations of impoundment and stabilization, portions of the Missouri River have shown resiliency, exhibiting numerous historical characteristics witnessed by Lewis and Clark during their explorations in the early 1800s. The FWS and NPS will work with local communities and willing landowners to conserve significant stretches of the Missouri River. The opportunity to preserve and potentially improve important processes and habitats for fish and wildlife will provide benefits to visitors, neighbors, and local communities of these areas now and into the future. The project proposal is designed to improve conditions within the channel migration zone, retaining those habitat characteristics important to federally managed species such as pallid sturgeon, least tern, and piping plover, while potentially mitigating flooding impacts in the future. In addition, the project proposal is also designed to enhance recreation opportunities such as boating, fishing, hunting, and camping, while increasing scenic values along the river and protecting cultural resources.

Public Availability of Comments

Before including your address, phone number, email address, or other personal identifying information in your

Figure 2. Notice of intent to prepare National Environmental Policy Act documents for the proposed conservation areas.

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comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available at any time. While 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.

Authorities

The FWS and NPS are furnishing this notice in compliance with the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd–668ee) (Administration Act), as amended by the National Wildlife Refuge System Improvement Act of 1997; the National Park Service Organic Act of 1916, as amended; and the National Environmental Policy Act (42 U.S.C. 4321 *et seq.*) and its implementing regulations.

Dated: December 2, 2011.

Matt Hogan,

Acting, Deputy Regional Director, Mountain-Prairie Region, U.S. Fish and Wildlife Service.

Dated: December 20, 2011.

Michael T. Reynolds,

Regional Director, NPS, Midwest Region.

[FR Doc. 2012–3491 Filed 2–14–12; 8:45 am]

BILLING CODE 4310–55–P; 4312–51–P

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[LLCON06000–L16100000–DP0000]

Notice of Resource Advisory Council Meetings for the Dominguez-Escalante Advisory Council

AGENCY: Bureau of Land Management, Interior.

ACTION: Notice of Public Meetings.

SUMMARY: In accordance with the Federal Land Policy and Management Act of 1976 and the Federal Advisory Committee Act of 1972, the U.S. Department of the Interior, Bureau of Land Management (BLM) Dominguez-Escalante Advisory Council (Council) will meet as indicated below.

DATES: Meetings will be held March 21, 2012; April 4, 2012; and May 2, 2012. All meetings will begin at 3 p.m. and will normally adjourn at 6 p.m. These meetings are in addition to the already-scheduled meeting on March 7, 2012, which was advertised through a separate notice. Any adjustments to duration of meetings will be advertised on the Dominguez-Escalante RMP Web site, *http://www.blm.gov/co/st/en/nca/denca/denca_rmp.html*. Field trips may be scheduled in these months as well. Notice of field trips will also be posted on the Web site.

ADDRESSES: Meetings on March 21 and May 2 will be held at the Delta County Courthouse, Room 234, 501 Palmer, Delta, Colorado. The meeting on April 4 will be held at the Mesa County Courthouse Annex, Training Room A, 544 Rood, Grand Junction, Colorado.

FOR FURTHER INFORMATION CONTACT: Katie Stevens, Advisory Council Designated Federal Official, 2815 H Road, Grand Junction, CO 81506. Phone: (970) 244–3049. *Email: kasteven@blm.gov*. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1–800–877–8339 to contact the above individual during normal business hours. The FIRS is available 24 hours a day, 7 days a week, to leave a message or question with the above individual. You will receive a reply during normal business hours.

SUPPLEMENTARY INFORMATION: The 10-member Council advises the Secretary of the Interior, through the BLM, on a variety of planning and management issues associated with the resource management planning process for the Dominguez-Escalante National Conservation Area and Dominguez Canyon Wilderness.

Topics of discussion during the meeting may include informational presentations from various resource specialists working on the resource management plan, as well as Council reports relating to the following topics: recreation, fire management, land-use planning process, invasive species management, travel management, wilderness, land exchange criteria, cultural resource management and other resource management topics of interest to the Council raised during the planning process.

These meetings are anticipated to occur monthly, and may occur as frequently as every two weeks during intensive phases of the planning process. Dates, times and agendas for additional meetings may be determined at future Advisory Council Meetings, and will be published in the **Federal Register**, announced through local media and on the BLM's Web site for the Dominguez-Escalante planning effort, *www.blm.gov/co/st/en/nca/denca/denca_rmp.html*.

These meetings are open to the public. The public may present written comments to the Council. Each formal Council meeting will have time allocated at the beginning and end of each meeting for hearing public comments. Depending on the number of persons wishing to comment and time available, the time for individual oral comments may be limited at the discretion of the chair.

Dated: February 9, 2012.

Helen M. Hankins,

State Director.

[FR Doc. 2012–3490 Filed 2–14–12; 8:45 am]

BILLING CODE 4310–JB–P

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[LLMTB07900 09 L10100000 PH0000 LXAMANMS0000]

Notice of Public Meeting; Western Montana Resource Advisory Council

AGENCY: Bureau of Land Management, Interior.

ACTION: Notice of Public Meeting.

SUMMARY: In accordance with the Federal Land Policy and Management Act and the Federal Advisory Committee Act of 1972, the U.S. Department of the Interior, Bureau of Land Management (BLM) Western Montana Resource Advisory Council (RAC) will meet as indicated below.

DATES: The meeting will be held March 14, 2012, beginning at 9 a.m. with a 30-minute public comment period and will adjourn at 3 p.m.

ADDRESSES: The meeting will be in the BLM's Butte Field Office, 106 N. Parkmont, in Butte, MT.

SUPPLEMENTARY INFORMATION: This 15-member council advises the Secretary of the Interior on a variety of management issues associated with public land management in Montana. During these meetings the council will participate in/discuss/act upon several topics, including the BLM's Sage Grouse Conservation Strategy, a report from the RAC's recreation fee subgroup, and reports from the Butte, Missoula and Dillon field offices.

All RAC meetings are open to the public. The public may present written comments to the RAC. Each formal RAC meeting will also have time allocated for hearing public comments. Depending on the number of persons wishing to comment and time available, the time for individual oral comments may be limited.

FOR FURTHER INFORMATON CONTACT: David Abrams, Western Montana Resource Advisory Council Coordinator, Butte Field Office, 106 North Parkmont, Butte, MT 59701, 406–533–7617, *dabrams@blm.gov*. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1–800–877–8339

Figure 2. Notice of intent to prepare National Environmental Policy Act documents for the proposed conservation areas.

Office of External Affairs

Mountain-Prairie Region

NEWS RELASE

United States Department of the Interior

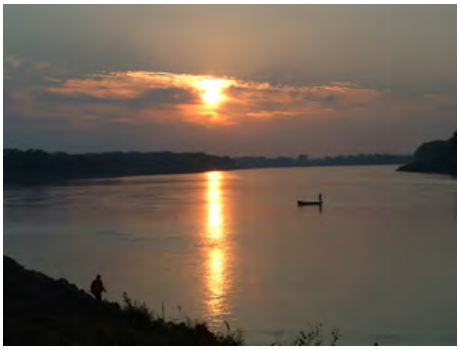
FISH AND WILDLIFE SERVICE
Mountain-Prairie Region
P.O. Box 25486, DFC
Denver, Colorado 80225

NATIONAL PARK SERVICE
Missouri National Recreational River
508 E. 2nd Street
Yankton, South Dakota 57078

For Immediate Release
Date: February 16, 2012
Nick Kaczor (303) 236-4387
Steve Mietz (605) 665-0209

U.S. Fish and Wildlife Service and National Park Service to Host Two Additional Public Meetings for the Land Protection Plan for Niobrara Confluence and Ponca Bluffs

Public Scoping Comments Accepted Through March 16, 2012



Sundown on the Missour River River
Photo Credit: National Park Service

In response to requests for increased public participation regarding the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, the U.S. Fish and Wildlife Service (FWS) and National Park Service (NPS) have scheduled two additional scoping meetings to gather public input.

The two lunch-time meetings will be held Wednesday, February 22 in Wagner, South Dakota and Thursday, February 23 in Yankton, South Dakota. Both meetings start at noon, beginning with a brief presentation followed by questions and answers.

Comments may be submitted through March 16, 2012, for consideration by the NPS and FWS during development of the Land Protection Plan. There will be another opportunity to comment on the draft Land Protection Plan in the fall of 2012.

Figure 3. Press release announcing the scoping period and three scoping meetings for the proposed conservation areas.

For more information or to submit comments, visit the project website (http://parkplanning.nps.gov/niob-ponca).

The other previously scheduled public meetings regarding the proposal will begin with an open house as follows:

Tuesday, February 21, 2012
5:30 p.m.-8:00 p.m.
The Outdoor Campus
4500 S. Oxbow Ave.
Sioux Falls, South Dakota

Wednesday, February 22, 2012
Noon to 1:00 p.m.
City Council Room
60 South Main Ave.
Wagner, South Dakota

Thursday, February 23, 2012
Noon to 1:00 p.m.
Yankton County Government Center
321 West 3rd Street
Yankton, South Dakota

Thursday, February 23, 2012
5:30 p.m.-8:00 p.m.
W.H. Over Museum
1110 Ratingen Street
Vermillion, South Dakota

Friday, February 24, 2012
5:30 p.m.-8:00 p.m.
WFLA Hall
Spruce and Park Avenues
Niobrara, Nebraska

Information will broadcast via local radio stations in the event of a cancellation or postponement. To receive additional information or to ask questions, contact:

Nick Kaczor, Planning Team Leader
Division of Refuge Planning
U.S. Fish and Wildlife Service
P.O. Box 25486, DFC
Denver, Colorado 80225
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Steve Mietz, Superintendent
National Park Service
Missouri National Recreational River
508 East 2nd Street
Yankton, South Dakota 57078
605-665-0209

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Figure 3. Press release announcing the scoping period and three scoping meetings for the proposed conservation areas.

- Is there a hidden agenda?
- We need forward and out-of-the-box problem solving with listening and collaboration. A shared vision that includes big thoughts is necessary.
- Increased recreational and hunting opportunities are needed.
- Maintaining the Missouri River for future generations is critical.
- This area needs to become the Appalachian Trail of the Midwest or the Mickelson Trail of eastern South Dakota.

Items of General Value and Concern for the Natural Resources

- Individuals identified the following values of the Missouri River:
  - natural habitats
  - the now-rare channels
  - backwaters
  - riparian zones
  - sandbars
  - wildlife habitat
  - recreational opportunities
  - fishing
  - untamed beauty
  - willing landowners to share their treasure with the public
  - paddling
  - camping
  - the Missouri River's resiliency
  - tributaries and wetlands
  - ability to irrigate agricultural crops
  - surrounding native grasslands (tallgrass and mixed-grass)
  - biotic diversity
  - oak and cottonwood forests
  - water quality and quantity
  - free-flowing unchannelized river
  - wildness

- Individuals identified the following threats to the Missouri River:
  - inappropriate bank stabilization
  - residential development
  - commercial development
  - failure to recognize the treasure of the Missouri River
  - pollution and litter
  - consolidation and innovation of agriculture
  - development of the floodplain
  - lack of fire in the bluff communities
  - attempting to prevent landowners from entering into easements
  - concern the Missouri will turn into the Platte River (shallow and flat)
  - construction and operation of main stem dams on habitats
  - Federal Government activities
  - lack of sediment
  - lack of natural flooding
  - U.S. Army Corps of Engineers (USACE) mismanagement to control flooding
  - invasive species (red cedar)
  - global warming
  - lack of cottonwood regeneration
  - emerald ash borer infestation
  - siltation
  - loss of native prairie
  - petroleum pipelines

Comments and Questions regarding the Prioritization of Lands

- How was the approximate channel migration zone developed?
- This plan should incorporate local zoning and planning agencies into the conservation equation.
- Lands other than those that border the rivers should be considered.
- Why does the project stop at Running Water Bridge? It should continue to include Bazile Creek.
- Increased riparian forest size, distribution, and diversity should be included, as should the natural regeneration of cottonwoods.
- Tallgrass and mixed-grass prairies that occur on the bluffs and river breaks should be included, as they provide a key component to the Missouri River ecosystem.
- Bur oak and basswood–dominated bluff woodlands should also be included.
- Would the entire project boundary be purchased?
- How were the boundaries drawn?
- What is the definition of bad development?
- The project needs to focus on the river and its floodplain, not just the river.
- Will the recreational study from the early 1980s be used?
- Would the entire channel migration zone be purchased?
- Is there preference of easements over fee title?

Comments and Questions regarding Easement Terms and Compensation

- Easement terms should be perpetual.
- Easements must allow for managed grazing.
- The decision to allow public hunting or fishing should remain with the landowner.
- How do easements and this project affect neighboring landowners?
- Easement language should be different for each landowner.
- Easement language should be consistent between landowners.
- Will easement terms change?
- Will energy development be allowed?
- What will the terms of the upland easement be?
- Would an easement impact the sale of a parcel without an easement?
- Easements should be built upon current easements using a team approach.
- Compensation should be consistent between landowners.
- Current agricultural use should be maintained.
- Are easement payments a one-time payment or do they occur annually?
- Rates set for other conservation programs (Wetlands Reserve Program) are much less in Boyd County than in Knox County, Nebraska.
- Compensation should be higher for hunting and fishing access.
- Would eminent domain be used?

Comments and Questions on Future Land Management Issues

- We need to stabilize banks as that will protect eagle nests and the trees in which they nest.
- Ownership and management of fee-title lands should be held by the FWS.
- Existing traditional uses should not be infringed upon.
- Expanding alternative outdoor recreational opportunities is a desirable goal.
- Lack of enforcement needs to be addressed.
- How will this project work or coordinate with other actions as there are several entities which may complicate management?
- Debris like junk cars and broken glass needs to be cleared.
- Staff, equipment, and funding will be necessary to correctly manage properties in the future.
- How will cottonwoods continue to be managed, and can trees continue to be planted?
- How will this impact the city of Yankton and its authorities?
- Which agency would hold the easements?
- What jurisdiction does the NPS currently have on the river?
- Fire will be a necessary component to manage prairies and woodlands.
- This area should be free of development.
- More public access sites are needed, especially with the development of the Missouri National Recreational River Water Trail.
- The river will need more floods.
- Management of noxious weeds must be considered.
- Will easements overlap with one another?
- Will management of easements transfer to another agency?
- What are the plans for recreation?
- If substantial damage (for example, flooding) occurs on a land with an easement, who would pay for the restoration?
- How will fee-title properties be managed?
- Would we take ownership of easements currently held by the USACE, and what happens to those easements currently in place?
- Privately held easements may also be used.
- Additional walkways, trails, beaches, educational venues, and kayaking opportunities need to be increased.
- Collaboration with on-the-water users (for example, barges and recreational motor boats) is necessary.
- People who use the river should be required to clean it up.

Comments and Questions on the Socioeconomic Impact of this Project

- Preservation of a natural river will attract tourists and potential new residents.
- A 2000 survey estimated that approximately 750,000 hours of recreation use occurred on the Missouri River from Fort Randall Dam to the Big Sioux River confluence. Fishing (62 percent) and boating (34 percent) accounted for the majority.

- Consumptive uses did vary between the two river reaches, with 87 percent of the activity in the Niobrara reach being consumptive, while the Ponca Bluffs reach was 50 percent.
- Areas closer to urban centers are less likely to engage in nonconsumptive uses.
- Fee-title acquisition and actions by the USACE directly impact the tax base and population growth of Knox County.
- Will budget cuts impact this project?
- The land protection plan will benefit local communities, neighbors, and visitors in both areas—now and for future generations—if you work in partnership with landowners.
- The two areas contribute $4 million annually to the regional economy, creating more than 170 jobs. Increasing these opportunities will also increase the economic benefit to the area.
- The area has lost enough land, and landowners should be able to keep what is left.
- Where will the funds for this project come from?
- What makes the Refuge Revenue Sharing payment fluctuate?
- Five hundred acres west of Vermillion was purchased for conservation. Last year it flooded because it's in a floodplain. Because it was managed in a natural state and not developed, it saved the public a lot of money.
- Who pays property tax on fee-title acquisitions?
- Do we plan to increase tourism?
- How is the percentage of payout from Refuge Revenue Sharing determined?
- A natural river corridor will benefit the area in economic tours because it will attract visitors.
- The Land and Water Conservation Fund Act made a commitment to the American public that a small portion of revenues from offshore drilling paid by oil companies would go to conservation and outdoor recreation programs.
- In 2010, 437 million recreational visits to lands managed by the Department of the Interior managed lands contributed over $44 billion in economic activity and supported more than 388,000 jobs, many in rural areas.
- The $214 million that the Department of the Interior spent on land acquisition in 2010 created an estimated $442 million in economic activity, more than doubling the return on investment, and about 3,000 jobs.
- The Land and Water Conservation Fund Act state grants program further supports America's state park system, which contributes $20 billion to local and state economies.
- Looking forward, outdoor recreation has the potential to create an additional 100,000 to 200,000 U.S. jobs, again with magnified impacts in local and rural communities.
- The rivers beauty as a paddling destination is undersold.
- The problem with government ownership of land is that it greatly reduces the local tax revenue which most counties cannot stand. It also would help to close Niobrara schools and other school districts due to the loss of tax revenue.
- It would be great to be able to promote a wild and scenic weekend Missouri River adventure within a couple hours' drive from Sioux Falls.

Miscellaneous Comments or Questions

- The Yankton Sioux Tribe should be included in these discussions as they are a major landowner along the Missouri River.
- Public outreach to fully inform everyone is needed at each step in the process to ensure coordinated and strategic conservation efforts.
- I think the NPS has done a great job maintaining a scenic and natural river.
- My vision is to keep the river in its banks.
- The NPS has been trying to gain control of land for 20 years.
- Unless you start thinking and feeling the river you will use and abuse it solely for human purposes, which will kill the river.
- Rural communities get picked on.
- Would a revision of the Recreational River Management Plan be included in this process?
- Who is part of the planning team?
- How will local politics affect the development of plans for our immediate area?

Comments and Questions not being addressed by this Federal Action

- Will the creation of emergent sandbar habitat continue?
- Can the FWS simply move least terns and piping plovers to other sites?
- Where is the end to the Federal Government budget?
- The designation and regulations for Recreational River are established under the Wild and Scenic Rivers Act. This includes items such as bank stabilization and personal watercraft.
- There is a need for more hydroelectric power generation.
- Address the management of main stem dam operations and flow releases under the USACE Master Manual.
- Address the funding of USACE claims.
- Address the sedimentation of Lewis and Clark Lake.
- Address the route or approval of the Keystone XL Pipeline.
- Address the placement of Oahe Dam on a fault.
- Address the Federal Government budget.
- Address the development of a sedimentation plan for the reservoirs.
- All Federal expenditures in this area should be put into escrow and distributed to local communities for highways, bridges, levees, cities, farmers, businesses, and more.

List of Agencies and Organizations that Submitted Comments

- Izaak Walton League of America
- Knox County Supervisors
- Missouri River Natural Resources Committee
- Lewis and Clark Natural Resource District
- South Dakota Canoe and Kayak Association
- The Nature Conservancy

Summary of Future Actions

Although the formal scoping period is complete, an additional opportunity for official public involvement will be available during the 60-day public comment period on the draft environmental impact statement and land protection plan. At anytime during the NEPA process, the FWS and NPS welcomes comments from the public. Additional comments, questions, or concerns can be directed to:

Attention: Niobrara Confluence and Ponca Bluffs Conservation Areas
U.S. Fish and Wildlife Service
Division of Refuge Planning
134 Union Boulevard, Suite 300
Lakewood, CO 80228
Phone: 303 / 236 4387
Fax: 303 / 236 4792

Appendix C

List of Animals and Plants

The following species list has been adapted from the Missouri National Recreational River's species list. "Park status" refers to whether a particular species has been documented in the Missouri National Recreational River.

Amphibians of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*[1]	*Residency*	*Origin*
AMBYSTOMATIDAE					
Ambystoma tigrinum	Tiger salamander	Unconfirmed	NA	NA	Native
BUFONIDAE					
Bufo cognatus	Great plains toad	Present	Unknown	Unknown	Native
Bufo woodhousii	Woodhouse's toad	Present	Unknown	Unknown	Native
HYLIDAE					
Acris crepitans	Northern cricket frog	Present	Unknown	Unknown	Native
Hyla chrysoscelis	Cope's gray treefrog	Present	Unknown	Unknown	Native
Pseudacris triseriata	Western chorus frog	Present	Unknown	Unknown	Native
RANIDAE					
Rana blairi	Plains leopard frog	Present	Unknown	Unknown	Native
Rana catesbeiana	Bullfrog	Present	Unknown	Unknown	Native
Rana pipiens	Northern leopard frog	Present	Unknown	Unknown	Native
SCAPHIOPODIDAE					
Spea bombifrons	Plains spadefoot	Present	Unknown	Unknown	Native

[1] Unknown denotes that no abundance data exists for this species within this region.

Abbreviation: NA = not available.

Birds of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Residency*[1]	*Origin*
ACCIPITRIDAE					
Accipiter cooperii	Cooper's hawk	Present	Unknown	Unknown	Native
Accipiter striatus	Sharp-shinned hawk	Present	Unknown	Unknown	Native
Buteo jamaicensis	Red-tailed hawk	Present	Unknown	Breeder	Native
Buteo lagopus	Rough-legged hawk	Present	Unknown	Unknown	Native
Buteo platypterus	Broad-winged hawk	Present	Unknown	Unknown	Native
Buteo swainsoni	Swainson's hawk	Present	Unknown	Unknown	Native
Circus cyaneus	Northern harrier	Unconfirmed	NA	NA	Native
Haliaeetus leucocephalus	Bald eagle	Present	Unknown	Breeder	Native
Pandion haliaetus	Osprey	Present	Unknown	Unknown	Native

Birds of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Residency*[1]	*Origin*
		ALAUDIDAE			
Eremophila alpestris	Horned lark	Present	Unknown	Breeder	Native
		ALCEDINIDAE			
Ceryle alcyon	Belted kingfisher	Present	Unknown	Unknown	Native
		ANATIDAE			
Aix sponsa	Wood duck	Present	Unknown	Breeder	Native
Anas acuta	Northern pintail	Present	Unknown	Unknown	Native
Anas americana	American wigeon	Present	Unknown	Breeder	Native
Anas clypeata	Northern shoveler	Present	Unknown	Unknown	Native
Anas crecca	Green-winged teal	Present	Unknown	Breeder	Native
Anas discors	Blue-winged teal	Present	Unknown	Unknown	Native
Anas platyrhynchos	Mallard	Present	Unknown	Breeder	Native
Anas rubripes	American black duck	Present	Unknown	Migratory	Native
Anas strepera	Gadwall	Present	Unknown	Breeder	Native
Anser albifrons	Greater white-fronted goose	Present	Unknown	Migratory	Native
Aythya affinis	Lesser scaup	Present	Unknown	Migratory	Native
Aythya americana	Redhead	Present	Unknown	Breeder	Native
Aythya collaris	Ring-necked duck	Present	Unknown	Migratory	Native
Aythya marila	Greater scaup	Present	Unknown	Migratory	Native
Aythya valisineria	Canvasback	Present	Unknown	Migratory	Native
Branta canadensis	Canada goose	Present	Unknown	Breeder	Native
Bucephala albeola	Bufflehead	Present	Unknown	Migratory	Native
Bucephala clangula	Common goldeneye	Present	Unknown	Unknown	Native
Chen caerulescens	Snow goose	Present	Unknown	Migratory	Native
Chen rossii	Ross's goose	Present	Unknown	Migratory	Native
Cygnus columbianus	Tundra swan	Present	Unknown	Migratory	Native
Lophodytes cucullatus	Hooded merganser	Present	Unknown	Migratory	Native
Melanitta perspicillata	Surf scoter	Present	Unknown	Migratory	Native
Mergus merganser	Common merganser	Present	Unknown	Migratory	Native
Mergus serrator	Red-breasted merganser	Present	Unknown	Migratory	Native
Oxyura jamaicensis	Ruddy duck	Present	Unknown	Unknown	Native
		APODIDAE			
Chaetura pelagica	Chimney swift	Present	Unknown	Unknown	Native
		ARDEIDAE			
Ardea alba	Great egret	Present	Unknown	Unknown	Native
Ardea herodias	Great blue heron	Present	Unknown	Breeder	Native
Botaurus lentiginosus	American bittern	Unconfirmed	NA	NA	Native
Bubulcus ibis	Cattle egret	Unconfirmed	NA	NA	Native
Butorides virescens	Green heron	Present	Unknown	Unknown	Native
Egretta thula	Snowy egret	Unconfirmed	NA	NA	Native
Ixobrychus exilis	Least bittern	Present	Unknown	Breeder	Native
Nycticorax nycticorax	Black-crowned night-heron	Unconfirmed	NA	NA	Native
		BOMBYCILLIDAE			
Bombycilla cedrorum	Cedar waxwing	Present	Unknown	Breeder	Native

Birds of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Residency*[1]	*Origin*
		CAPRIMULGIDAE			
Caprimulgus vociferus	Whip-poor-will	Present	Unknown	Breeder	Native
Chordeiles minor	Common nighthawk	Present	Unknown	Unknown	Native
Phalaenoptilus nuttallii	Common poorwill	Unconfirmed	NA	NA	Native
		CERTHIIDAE			
Certhia americana	Brown creeper	Present	Unknown	Unknown	Native
Cistothorus palustris	Marsh wren	Present	Unknown	Breeder	Native
Cistothorus platensis	Sedge wren	Present	Unknown	Breeder	Native
Polioptila caerulea	Blue-gray gnatcatcher	Present	Unknown	Unknown	Native
Thryothorus ludovicianus	Carolina wren	Present	Unknown	Migratory	Native
Troglodytes aedon	House wren	Present	Unknown	Breeder	Native
		CHARADRIIDAE			
Charadrius melodus	Piping plover	Present	Unknown	Breeder	Native
Charadrius semipalmatus	Semipalmated plover	Present	Unknown	Migratory	Native
Charadrius vociferus	Killdeer	Present	Unknown	Breeder	Native
Pluvialis dominica	American golden-plover	Present	Unknown	Migratory	Native
Pluvialis squatarola	Black-bellied plover	Present	Unknown	Migratory	Native
Recurvirostra americana	American avocet	Present	Unknown	Unknown	Native
		CICONIIDAE			
Cathartes aura	Turkey vulture	Present	Unknown	Unknown	Native
		COCCYZIDAE			
Coccyzus americanus	Yellow-billed cuckoo	Present	Unknown	Unknown	Native
Coccyzus erythropthalmus	Black-billed cuckoo	Present	Unknown	Breeder	Native
		COLUMBIDAE			
Columba livia	Rock dove	Present	Unknown	Unknown	Nonnative
Zenaida macroura	Mourning dove	Present	Unknown	Breeder	Native
		CORVIDAE			
Corvus brachyrhynchos	American crow	Present	Unknown	Breeder	Native
Cyanocitta cristata	Blue jay	Present	Unknown	Breeder	Native
Pica hudsonia	Black-billed magpie	Present	Unknown	Unknown	Native
		FALCONIDAE			
Falco columbarius	Merlin	Present	Unknown	Migratory	Native
Falco sparverius	American kestrel	Present	Unknown	Breeder	Native
		FRINGILLIDAE			
Agelaius phoeniceus	Red-winged blackbird	Present	Unknown	Breeder	Native
Ammodramus leconteii	Le Conte's sparrow	Present	Unknown	Migratory	Native
Ammodramus savannarum	Grasshopper sparrow	Present	Unknown	Breeder	Native
Calamospiza melanocorys	Lark bunting	Present	Unknown	Unknown	Native
Calcarius lapponicus	Lapland longspur	Present	Unknown	Migratory	Native
Cardinalis cardinalis	Northern cardinal	Present	Unknown	Breeder	Native
Carduelis pinus	Pine siskin	Present	Unknown	Migratory	Native
Carduelis tristis	American goldfinch	Present	Unknown	Breeder	Native
Carpodacus mexicanus	House finch	Present	Unknown	Unknown	Native

Birds of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Residency*[1]	*Origin*
Carpodacus purpureus	Purple finch	Present	Unknown	Migratory	Native
Chondestes grammacus	Lark sparrow	Present	Unknown	Breeder	Native
Dendroica caerulescens	Black-throated blue warbler	Present	Unknown	Migratory	Native
Dendroica castanea	Bay-breasted warbler	Present	Unknown	Unknown	Native
Dendroica coronata	Yellow-rumped warbler	Present	Unknown	Unknown	Native
Dendroica fusca	Blackburnian warbler	Present	Unknown	Migratory	Native
Dendroica magnolia	Magnolia warbler	Present	Unknown	Unknown	Native
Dendroica palmarum	Palm warbler	Present	Unknown	Migratory	Native
Dendroica pensylvanica	Chestnut-sided warbler	Present	Unknown	Unknown	Native
Dendroica petechia	Yellow warbler	Present	Unknown	Breeder	Native
Dendroica pinus	Pine warbler	Present	Unknown	Migratory	Native
Dendroica striata	Blackpoll warbler	Present	Unknown	Unknown	Native
Dendroica tigrina	Cape may warbler	Present	Unknown	Migratory	Native
Dendroica virens	Black-throated green warbler	Present	Unknown	Unknown	Native
Dolichonyx oryzivorus	Bobolink	Present	Unknown	Breeder	Native
Geothlypis trichas	Common yellowthroat	Present	Unknown	Breeder	Native
Icteria virens	Yellow-breasted chat	Present	Unknown	Unknown	Native
Icterus galbula	Baltimore oriole	Present	Unknown	Breeder	Native
Icterus spurius	Orchard oriole	Present	Unknown	Breeder	Native
Junco hyemalis	Dark-eyed junco	Present	Unknown	Migratory	Native
Melospiza georgiana	Swamp sparrow	Present	Unknown	Unknown	Native
Melospiza lincolnii	Lincoln's sparrow	Present	Unknown	Migratory	Native
Melospiza melodia	Song sparrow	Present	Unknown	Breeder	Native
Mniotilta varia	Black-and-white warbler	Present	Unknown	Unknown	Native
Molothrus ater	Brown-headed cowbird	Present	Unknown	Breeder	Native
Oporornis agilis	Connecticut warbler	Present	Unknown	Migratory	Native
Oporornis philadelphia	Mourning warbler	Present	Unknown	Unknown	Native
Parula americana	Northern parula	Present	Unknown	Migratory	Native
Passerculus sandwichensis	Savannah sparrow	Present	Unknown	Breeder	Native
Passerella iliaca	Fox sparrow	Present	Unknown	Migratory	Native
Passerina caerulea	Blue grosbeak	Present	Unknown	Breeder	Native
Passerina cyanea	Indigo bunting	Present	Unknown	Unknown	Native
Pheucticus ludovicianus	Rose-breasted grosbeak	Present	Unknown	Breeder	Native
Pipilo erythrophthalmus	Eastern towhee	Present	Unknown	Breeder	Native
Pipilo maculatus	Spotted towhee	Present	Unknown	Breeder	Native
Piranga olivacea	Scarlet tanager	Present	Unknown	Breeder	Native
Plectrophenax nivalis	Snow bunting	Present	Unknown	Migratory	Native
Pooecetes gramineus	Vesper sparrow	Present	Unknown	Breeder	Native
Protonotaria citrea	Prothonotary warbler	Unconfirmed	NA	NA	Native
Quiscalus mexicanus	Great-tailed grackle	Present	Unknown	Breeder	Native
Quiscalus quiscula	Common grackle	Present	Unknown	Breeder	Native
Seiurus noveboracensis	Northern waterthrush	Present	Unknown	Unknown	Native
Setophaga ruticilla	American redstart	Present	Unknown	Breeder	Native
Spiza americana	Dickcissel	Present	Unknown	Breeder	Native

Birds of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Residency*[1]	*Origin*
Spizella arborea	American tree sparrow	Present	Unknown	Migratory	Native
Spizella pallida	Clay-colored sparrow	Present	Unknown	Migratory	Native
Spizella passerina	Chipping sparrow	Present	Unknown	Breeder	Native
Spizella pusilla	Field sparrow	Present	Unknown	Breeder	Native
Sturnella magna	Eastern meadowlark	Unconfirmed	NA	NA	Native
Sturnella neglecta	Western meadowlark	Present	Unknown	Breeder	Native
Vermivora celata	Orange-crowned warbler	Present	Unknown	Unknown	Native
Vermivora chrysoptera	Golden-winged warbler	Present	Unknown	Unknown	Native
Vermivora peregrina	Tennessee warbler	Present	Unknown	Unknown	Native
Vermivora pinus	Blue-winged warbler	Present	Unknown	Migratory	Native
Vermivora ruficapilla	Nashville warbler	Present	Unknown	Unknown	Native
Wilsonia canadensis	Canada warbler	Present	Unknown	Unknown	Native
Wilsonia pusilla	Wilson's warbler	Present	Unknown	Unknown	Native
Xanthocephalus xantho-cephalus	Yellow-headed blackbird	Present	Unknown	Breeder	Native
Zonotrichia albicollis	White-throated sparrow	Present	Unknown	Migratory	Native
Zonotrichia leucophrys	White-crowned sparrow	Present	Unknown	Migratory	Native
Zonotrichia querula	Harris's sparrow	Present	Unknown	Migratory	Native
GAVIIDAE					
Gavia immer	Common loon	Present	Unknown	Unknown	Native
HIRUNDINIDAE					
Hirundo rustica	Barn swallow	Present	Unknown	Breeder	Native
Petrochelidon pyrrhonota	Cliff swallow	Present	Unknown	Breeder	Native
Progne subis	Purple martin	Present	Unknown	Unknown	Native
Riparia riparia	Bank swallow	Present	Unknown	Breeder	Native
Stelgidopteryx serripennis	Northern rough-winged swallow	Present	Unknown	Breeder	Native
Tachycineta bicolor	Tree swallow	Present	Unknown	Breeder	Native
LANIIDAE					
Lanius excubitor	Northern shrike	Present	Unknown	Migratory	Native
Lanius ludovicianus	Loggerhead shrike	Present	Unknown	Breeder	Native
LARIDAE					
Chlidonias niger	Black tern	Present	Unknown	Unknown	Native
Larus argentatus	Herring gull	Present	Unknown	Migratory	Native
Larus californicus	California gull	Present	Unknown	Migratory	Native
Larus delawarensis	Ring-billed gull	Present	Unknown	Unknown	Native
Larus hyperboreus	Glaucous gull	Present	Unknown	Migratory	Native
Larus philadelphia	Bonaparte's gull	Present	Unknown	Migratory	Native
Larus pipixcan	Franklin's gull	Present	Unknown	Unknown	Native
Larus thayeri	Thayer's gull	Present	Unknown	Migratory	Native
Rissa tridactyla	Black-legged kittiwake	Present	Unknown	Migratory	Native
Sterna antillarum	Least tern	Present	Unknown	Breeder	Native
Sterna caspia	Caspian tern	Present	Unknown	Unknown	Native
Sterna forsteri	Forster's tern	Present	Unknown	Unknown	Native

Birds of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Residency*[1]	*Origin*
Xema sabini	Sabine's gull	Present	Unknown	Migratory	Native
		MUSCICAPIDAE			
Catharus guttatus	Hermit thrush	Present	Unknown	Unknown	Native
Catharus minimus	Gray-cheeked thrush	Present	Unknown	Migratory	Native
Catharus ustulatus	Swainson's thrush	Present	Unknown	Unknown	Native
Hylocichla mustelina	Wood thrush	Present	Unknown	Breeder	Native
Sialia sialis	Eastern bluebird	Present	Unknown	Breeder	Native
Turdus migratorius	American robin	Present	Unknown	Breeder	Native
Odontophoridae					
Colinus virginianus	Northern bobwhite	Present	Unknown	Breeder	Native
		PARIDAE			
Poecile atricapillus	Black-capped chickadee	Present	Unknown	Breeder	Native
		PARULIDAE			
Seiurus aurocapilla	Ovenbird	Present	Unknown	Breeder	Native
		PASSERIDAE			
Anthus rubescens	American pipit	Present	Unknown	Migratory	Native
Passer domesticus	House sparrow	Present	Unknown	Breeder	Nonnative
		PELECANIDAE			
Pelecanus erythrorhynchos	American white pelican	Present	Unknown	Migratory	Native
		PHALACROCORACIDAE			
Phalacrocorax auritus	Double-crested cormorant	Present	Unknown	Unknown	Native
		PHASIANIDAE			
Meleagris gallopavo	Wild turkey	Present	Unknown	Breeder	Native
		PHASIANIDAE			
Perdix perdix	Gray partridge	Present	Unknown	Unknown	Nonnative
Phasianus colchicus	Ring-necked pheasant	Present	Unknown	Breeder	Nonnative
Tympanuchus cupido	Greater prairie-chicken	Unconfirmed	NA	NA	Native
Tympanuchus phasianellus	Sharp-tailed grouse	Probably Present	NA	NA	Native
		PICIDAE			
Colaptes auratus	Northern flicker	Present	Unknown	Breeder	Native
Melanerpes carolinus	Red-bellied woodpecker	Present	Unknown	Breeder	Native
Melanerpes erythrocephalus	Red-headed woodpecker	Present	Unknown	Breeder	Native
Picoides pubescens	Downy woodpecker	Present	Unknown	Breeder	Native
Picoides villosus	Hairy woodpecker	Present	Unknown	Breeder	Native
Sphyrapicus varius	Yellow-bellied sapsucker	Present	Unknown	Migratory	Native
		PODICIPEDIDAE			
Aechmophorus clarkii	Clark's grebe	Present	Unknown	Migratory	Native
Aechmophorus occidentalis	Western grebe	Present	Unknown	Migratory	Native
Podiceps auritus	Horned grebe	Present	Unknown	Migratory	Native
Podiceps grisegena	Red-necked grebe	Present	Unknown	Migratory	Native
Podiceps nigricollis	Eared grebe	Present	Unknown	Migratory	Native
Podilymbus podiceps	Pied-billed grebe	Present	Unknown	Breeder	Native

Birds of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Residency*[1]	*Origin*
RALLIDAE					
Fulica americana	American coot	Present	Unknown	Breeder	Native
Gallinula chloropus	Common moorhen	Present	Unknown	Unknown	Native
Porzana carolina	Sora	Present	Unknown	Unknown	Native
Rallus elegans	King rail	Present	Unknown	Unknown	Native
Rallus limicola	Virginia rail	Unconfirmed	NA	NA	Native
REGULIDAE					
Regulus calendula	Ruby-crowned kinglet	Present	Unknown	Migratory	Native
Regulus satrapa	Golden-crowned kinglet	Present	Unknown	Migratory	Native
SCOLOPACIDAE					
Actitis macularius	Spotted sandpiper	Present	Unknown	Breeder	Native
Gallinago delicata	Wilson's snipe	Present	Unknown	Migratory	Native
Arenaria interpres	Ruddy turnstone	Present	Unknown	Migratory	Native
Bartramia longicauda	Upland sandpiper	Present	Unknown	Unknown	Native
Calidris alba	Sanderling	Present	Unknown	Migratory	Native
Calidris alpina	Dunlin	Present	Unknown	Migratory	Native
Calidris bairdii	Baird's sandpiper	Present	Unknown	Migratory	Native
Calidris fuscicollis	White-rumped sandpiper	Present	Unknown	Migratory	Native
Calidris himantopus	Stilt sandpiper	Present	Unknown	Migratory	Native
Calidris minutilla	Least sandpiper	Present	Unknown	Migratory	Native
Calidris pusilla	Semipalmated sandpiper	Present	Unknown	Migratory	Native
Catoptrophorus semipalmatus	Willet	Present	Unknown	Migratory	Native
Limnodromus scolopaceus	Long-billed dowitcher	Present	Unknown	Migratory	Native
Limosa fedoa	Marbled godwit	Present	Unknown	Migratory	Native
Limosa haemastica	Hudsonian godwit	Present	Unknown	Migratory	Native
Phalaropus lobatus	Red-necked phalarope	Present	Unknown	Migratory	Native
Phalaropus tricolor	Wilson's phalarope	Present	Unknown	Unknown	Native
Scolopax minor	American woodcock	Present	Unknown	Breeder	Native
Tringa flavipes	Lesser yellowlegs	Present	Unknown	Migratory	Native
Tringa melanoleuca	Greater yellowlegs	Present	Unknown	Migratory	Native
Tringa solitaria	Solitary sandpiper	Present	Unknown	Migratory	Native
SITTIDAE					
Sitta canadensis	Red-breasted nuthatch	Present	Occasional	Migratory	Native
Sitta carolinensis	White-breasted nuthatch	Present	Unknown	Breeder	Native
STRIGIDAE					
Asio otus	Long-eared owl	Present	Unknown	Unknown	Native
Bubo virginianus	Great horned owl	Present	Unknown	Breeder	Native
Megascops asio	Eastern screech-owl	Present	Unknown	Breeder	Native
Strix varia	Barred owl	Unconfirmed	NA	NA	Native
STURNIDAE					
Dumetella carolinensis	Gray catbird	Present	Unknown	Breeder	Native
Sturnus vulgaris	European starling	Present	Unknown	Breeder	Nonnative
Toxostoma rufum	Brown thrasher	Present	Unknown	Breeder	Native

Birds of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Residency*[1]	*Origin*
		TROCHILIDAE			
Archilochus colubris	Ruby-throated humming-bird	Present	Unknown	Unknown	Native
		TYRANNIDAE			
Contopus virens	Eastern wood-pewee	Present	Unknown	Breeder	Native
Empidonax alnorum	Alder flycatcher	Present	Unknown	Unknown	Native
Empidonax flaviventris	Yellow-bellied flycatcher	Present	Unknown	Migratory	Native
Empidonax minimus	Least flycatcher	Present	Unknown	Unknown	Native
Empidonax traillii	Willow flycatcher	Present	Unknown	Breeder	Native
Myiarchus crinitus	Great crested flycatcher	Present	Unknown	Breeder	Native
Sayornis phoebe	Eastern phoebe	Present	Unknown	Unknown	Native
Sayornis saya	Say's phoebe	Present	Unknown	Unknown	Native
Tyrannus tyrannus	Eastern kingbird	Present	Unknown	Breeder	Native
Tyrannus verticalis	Western kingbird	Present	Unknown	Breeder	Native
		TYTONIDAE			
Tyto alba	Barn owl	Unconfirmed	NA	NA	Native
		VIREONIDAE			
Vireo bellii	Bell's vireo	Present	Unknown	Breeder	Native
		VIREONIDAE			
Vireo flavifrons	Yellow-throated vireo	Present	Unknown	Breeder	Native
Vireo gilvus	Warbling vireo	Present	Unknown	Breeder	Native
Vireo olivaceus	Red-eyed vireo	Present	Unknown	Breeder	Native
Vireo philadelphicus	Philadelphia vireo	Present	Unknown	Migratory	Native
Vireo solitarius	Blue-headed vireo	Present	Unknown	Unknown	Native

[1] "Breeder" means the species reproduces in the vicinity of the Missouri National Recreational River. "Migratory" means the species is a nonbreeder in this area and is present less than 2 months per year.

Abbreviation: NA = not available.

Fishes of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*[1]	*Abundance*	*Residency*	*Origin*
		ACIPENSERIDAE			
Acipenser fulvescens	Lake sturgeon	Present	Occasional	Unknown	Native
Scaphirhynchus albus	Pallid sturgeon	Present*	Common	Unknown	Native
Scaphirhynchus platorynchus	Shovelnose sturgeon	Present*	Common	Breeder	Native
		ANGUILLIDAE			
Anguilla rostrata	American eel	Present	Rare	Resident	Native
		CATOSTOMIDAE			
Carpiodes carpio	River carpsucker	Present*	Common	Breeder	Native
Carpiodes cyprinus	Quillback	Present*	Common	Breeder	Native
Carpiodes velifer	Highfin carpsucker	Present	Rare	Breeder	Native
Catostomus commersonii	White sucker	Present*	Rare	Breeder	Native
Cycleptus elongatus	Blue sucker	Present*	Uncommon	Breeder	Native

Fishes of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*[1]	*Abundance*	*Residency*	*Origin*
Ictiobus bubalus	Smallmouth buffalo	Present*	Uncommon	Breeder	Native
Ictiobus cyprinellus	Bigmouth buffalo	Present*	Uncommon	Breeder	Native
Ictiobus niger	Black buffalo	Unconfirmed	NA	NA	Native
Moxostoma erythrurum	Golden redhorse	Unconfirmed	NA	NA	Native
Moxostoma macrolepidotum	Shorthead redhorse	Present*	Common	Breeder	Native
CENTRARCHIDAE					
Ambloplites rupestris	Rock bass	Present	Common	Breeder	Native
Archoplites interruptus	Sacramento perch	Probably Present	NA	NA	Nonnative
Lepomis cyanellus	Green sunfish	Present*	Common	Breeder	Native
Lepomis gibbosus	Pumpkinseed	Probably Present*	Rare	NA	Nonnative
Lepomis humilis	Orangespotted sunfish	Present*	Uncommon	Breeder	Native
Lepomis macrochirus	Bluegill	Present*	Common	Breeder	Nonnative
Lepomis microlophus	Redear sunfish	Probably Present	NA	NA	Nonnative
Micropterus dolomieu	Smallmouth bass	Present	Common	Breeder	Nonnative
Micropterus punctulatus	Spotted bass	Unconfirmed	NA	NA	Nonnative
Micropterus salmoides	Largemouth bass	Present*	Common	Breeder	Nonnative
Pomoxis annularis	White crappie	Present*	Occasional	Breeder	Nonnative
Pomoxis nigromaculatus	Black crappie	Present	Occasional	Breeder	Nonnative
CLUPEIDAE					
Alosa chrysochloris	Skipjack herring	Present	Occasional	Unknown	Native
Alosa pseudoharengus	Alewife	Probably Present	NA	NA	Nonnative
Dorosoma cepedianum	Gizzard shad	Present*	Abundant	Breeder	Native
CYPRINIDAE					
Campostoma anomalum	Central stoneroller	Present	Occasional	NA	Native
Carassius auratus	Goldfish	Unconfirmed	NA	NA	Nonnative
Ctenopharyngodon idella	Grass carp	Present	Rare	Resident	Nonnative
Cyprinella lutrensis	Red shiner	Present*	Common	Breeder	Native
Cyprinella spiloptera	Spotfin shiner	Present*	Abundant	Breeder	Nonnative
Cyprinus carpio	Common carp	Present*	Common	Breeder	Nonnative
Hybognathus argyritis	Western silvery minnow	Present	Occasional	NA	Native
Hybognathus hankinsoni	Brassy minnow	Present*	Uncommon	Breeder	Native
Hybognathus nuchalis	Mississippi silvery minnow	Probably Present	NA	NA	Native
Hybognathus placitus	Plains minnow	Present	Occasional	Breeder	Native
Hypophthalmichthys molitrix	Silver carp	Present	Common	Resident	Nonnative
Hypophthalmichthys nobilis	Bighead carp	Present	Common	Resident	Nonnative
Luxilus cornutus	Common shiner	Present	Unknown	Breeder	Native
Macrhybopsis hystoma	Shoal chub	Present	Rare	Breeder	Native
Macrhybopsis gelida	Sturgeon chub	Present	Rare	Breeder	Native

Fishes of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*[1]	*Abundance*	*Residency*	*Origin*
Macrhybopsis meeki	Sicklefin chub	Present	Rare	Breeder	Native
Macrhybopsis storeriana	Silver chub	Present*	Occasional	Breeder	Native
Notemigonus crysoleucas	Golden shiner	Present*	Rare	Breeder	Native
Notropis atherinoides	Emerald shiner	Present*	Abundant	Breeder	Native
Notropis blennius	River shiner	Present	Uncommon	Breeder	Native
Notropis buchanani	Ghost shiner	Unconfirmed	NA	NA	Native
Notropis dorsalis	Bigmouth shiner	Present*	Rare	Breeder	Native
Notropis hudsonius	Spottail shiner	Present	Uncommon	Unknown	Nonnative
Notropis shumardi	Silverband shiner	Unconfirmed	NA	NA	Native
Notropis stramineus	Sand shiner	Present*	Common	Breeder	Native
Notropis topeka	Topeka shiner	Unconfirmed	NA	NA	Native
Notropis volucellus	Mimic shiner	Present	Rare	Unknown	Native
Phenacobius mirabilis	Suckermouth minnow	Unconfirmed*	NA	NA	Native
Phoxinus eos	Northern redbelly dace	Probably Present	NA	NA	Native
Pimephales notatus	Bluntnose minnow	Present*	Occasional	Unknown	Native
Pimephales promelas	Fathead minnow	Present*	Rare	Breeder	Native
Platygobio gracilis	Flathead chub	Present*	Rare	Breeder	Native
Rhinichthys atratulus	Blacknose dace	Present	Occasional	Unknown	Native
Rhinichthys cataractae	Longnose dace	Probably Present*	NA	NA	Native
Semotilus atromaculatus	Creek chub	Present*	Unknown	Unknown	Native
ESOCIDAE					
Esox americanus	Grass pickerel	Present*	Rare	Breeder	Native
Esox lucius	Northern pike	Present*	Uncommon	Breeder	Native
Esox masquinongy	Muskellunge	Present	Rare	Unknown	Nonnative
FUNDULIDAE					
Fundulus sciadicus	Plains topminnow	Present	Unknown	Unknown	Native
GADIDAE					
Lota lota	Burbot, eelpout	Present	Rare	Breeder	Native
GASTEROSTEIDAE					
Culaea inconstans	Brook stickleback	Unconfirmed	NA	NA	Native
HIODONTIDAE					
Hiodon alosoides	Goldeye	Present	Abundant	Breeder	Native
Ictaluridae					
Ameiurus melas	Black bullhead	Present*	Uncommon	Breeder	Native
Ameiurus natalis	Yellow bullhead	Present	Uncommon	Breeder	Native
Ictalurus furcatus	Blue catfish	Probably Present	NA	NA	Native
Ictalurus punctatus	Channel catfish	Present*	Common	Breeder	Native
Noturus flavus	Stonecat	Present*	Rare	Breeder	Native
Noturus gyrinus	Tadpole madtom	Unconfirmed	NA	NA	Native
Pylodictis olivaris	Flathead catfish	Present*	Common	Breeder	Native

Fishes of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*[1]	*Abundance*	*Residency*	*Origin*
LEPISOSTEIDAE					
Lepisosteus oculatus	Spotted gar	Probably Present	NA	NA	Native
Lepisosteus osseus	Longnose gar	Present	Common	Breeder	Native
Lepisosteus platostomus	Shortnose gar	Present*	Common	Breeder	Native
MORONIDAE					
Morone americana	White perch	Unconfirmed	NA	NA	Nonnative
Morone chrysops	White bass	Present*	Common	Breeder	Native
OSMERIDAE					
Osmerus mordax	Rainbow smelt	Present	Rare	Resident	Nonnative
PERCIDAE					
Etheostoma exile	Iowa darter	Present	Occasional	Unknown	Native
Etheostoma nigrum	Johnny darter	Present*	Rare	Breeder	Native
Perca flavescens	Yellow perch	Present*	Uncommon	Breeder	Native
Sander canadensis	Sauger	Present*	Uncommon	Breeder	Native
Sander vitreus	Walleye	Present*	Uncommon	Breeder	Native
PETROMYZONTIDAE					
Ichthyomyzon unicuspis	Silver lamprey	Unconfirmed	NA	NA	Native
POLYODONTIDAE					
Polyodon spathula	Paddlefish	Present	Uncommon	Breeder	Native
SALMONIDAE					
Oncorhynchus mykiss	Rainbow trout	Present	Occasional	Migratory	Nonnative
Salmo trutta	Brown trout	Present	Occasional	Migratory	Nonnative
SCIAENIDAE					
Aplodinotus grunniens	Freshwater drum	Present*	Common	Breeder	Native

[1]The asterisk (*) denotes a species that has been documented in the Niobrara River by the U.S. Fish and Wildlife Service's Great Plains Fish and Wildlife Conservation Office.

Abbrevation: NA = not available.

Mammals of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Residency*	*Origin*
BOVIDAE					
Bos bison	American bison	Present	Uncommon	Breeder	Native
CANIDAE					
Canis latrans	Coyote	Present	Common	Breeder	Native
Urocyon cinereoargenteus	Common gray fox	Probably Present	NA	NA	Native
Vulpes vulpes	Red fox	Present	Common	Breeder	Native
CASTORIDAE					
Castor canadensis	American beaver	Present	Common	Breeder	Native
CERVIDAE					
Cervus elaphus	Elk	Present	Uncommon	Breeder	Native
Odocoileus hemionus	Mule deer	Present	Unknown	Breeder	Native
Odocoileus virginianus	White-tailed deer	Present	Common	Breeder	Native

Mammals of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Residency*	*Origin*
DIDELPHIDAE					
Didelphis virginiana	Virginia opossum	Present	Uncommon	Breeder	Unknown
DIPODIDAE					
Zapus hudsonius	Meadow jumping mouse	Probably Present	NA	NA	Native
ERETHIZONTIDAE					
Erethizon dorsatum	North American porcupine	Present	Unknown	Unknown	Native
FELIDAE					
Lynx rufus	Bobcat	Probably Present	NA	NA	Native
Puma concolor	Mountain lion	Present	Rare	Unknown	Native
GEOMYIDAE					
Geomys bursarius	Plains pocket gopher	Present	Abundant	Breeder	Native
HETEROMYIDAE					
Chaetodipus hispidus	Hispid pocket mouse	Present	Rare	Breeder	Native
Dipodomys ordii	Ord's kangaroo rat	Unconfirmed	NA	NA	Native
Perognathus flavescens	Plains pocket mouse	Present	Uncommon	Breeder	Native
LEPORIDAE					
Lepus californicus	Black-tailed jackrabbit	Present	Uncommon	Breeder	Native
Sylvilagus floridanus	Eastern cottontail	Present	Common	Breeder	Native
MEPHITIDAE					
Mephitis mephitis	Striped skunk	Present	Unknown	Unknown	Native
MURIDAE					
Microtus ochrogaster	Prairie vole	Present	Uncommon	Breeder	Native
Microtus pennsylvanicus	Meadow vole	Present	Uncommon	Breeder	Native
Mus musculus	House mouse	Probably Present	NA	NA	Nonnative
Ondatra zibethicus	Common muskrat	Present	Common	Breeder	Native
Peromyscus leucopus	White-footed mouse	Present	Abundant	Breeder	Native
Peromyscus maniculatus	Deer mouse	Present	Abundant	Breeder	Native
Rattus norvegicus	Norway rat	Present	Uncommon	Breeder	Nonnative
Reithrodontomys megalotis	Western harvest mouse	Present	Common	Breeder	Native
MUSTELIDAE					
Lontra canadensis	Northern river otter	Probably Present	NA	NA	Native
Mustela frenata	Long-tailed weasel	Probably Present	NA	NA	Native
Mustela nivalis	Least weasel	Probably Present	NA	NA	Native
Mustela vison	American mink	Present	Common	Breeder	Native
Taxidea taxus	American badger	Present	Unknown	Breeder	Native
PROCYONIDAE					
Procyon lotor	Northern raccoon	Present	Common	Breeder	Native
SCIURIDAE					
Marmota monax	Woodchuck	Present	Common	Breeder	Native

Mammals of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Residency*	*Origin*
Sciurus niger	Eastern fox squirrel	Present	Common	Breeder	Native
Spermophilus franklinii	Franklin's ground squirrel	Present	Uncommon	Breeder	Native
Spermophilus tridecemlineatus	Thirteen-lined ground squirrel	Present	Unknown	Breeder	Native
SORICIDAE					
Blarina brevicauda	Northern short-tailed shrew	Present	Common	Breeder	Native
Sorex cinereus	Masked shrew	Present	Common	Breeder	Native
Sorex hoyi	Pygmy shrew	Probably Present	NA	NA	Native
TALPIDAE					
Scalopus aquaticus	Eastern mole	Present	Unknown	Breeder	Native
VESPERTILIONIDAE					
Eptesicus fuscus	Big brown bat	Present	Common	Breeder	Native
Lasionycteris noctivagans	Silver-haired bat	Present	Unknown	Unknown	Native
Lasiurus borealis	Eastern red bat	Present	Uncommon	Breeder	Native
Lasiurus cinereus	Hoary bat	Present	Uncommon	Breeder	Native
Myotis lucifugus	Little brown myotis	Present	Uncommon	Breeder	Native
Myotis septentrionalis	Northern long-eared myotis	Present	Common	Breeder	Native
Nycticeius humeralis	Evening bat	Probably Present	NA	NA	Native
Pipistrellus subflavus	Eastern pipistrelle	Present	Unknown	Unknown	Native

Abbrevation: NA = not available.

Reptiles of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Residency*	*Origin*
CHELYDRIDAE					
Chelydra serpentina	Snapping turtle	Present	Common	Unknown	Native
COLUBRIDAE					
Coluber constrictor	Racer	Present	Unknown	Unknown	Native
Diadophis punctatus	Ring-necked snake	Present	Unknown	Unknown	Native
Elaphe vulpina	Western foxsnake	Present	Unknown	Unknown	Native
Heterodon nasicus	Western hog-nosed snake	Present	Unknown	Unknown	Native
Heterodon platirhinos	Eastern hog-nosed snake	Present	Unknown	Unknown	Native
Lampropeltis triangulum	Milksnake	Unconfirmed	NA	NA	Native
Nerodia sipedon	Northern water snake	Unconfirmed	NA	NA	Native
Pituophis catenifer	Gopher snake	Present	Unknown	Unknown	Native
Storeria occipitomaculata	Redbelly snake	Unconfirmed	NA	NA	Native
Thamnophis radix	Plains garter snake	Present	Unknown	Unknown	Native
Thamnophis sirtalis	Common garter snake	Present	Unknown	Unknown	Native
EMYDIDAE					
Chrysemys picta	Western painted turtle	Present	Common	Unknown	Native

Reptiles of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Residency*	*Origin*
Graptemys pseudogeographica	False map turtle	Present	Common	Unknown	Native
Terrapene ornata	Western box turtle	Present	Unknown	Unknown	Native
SCINCIDAE					
Eumeces fasciatus	Five-lined skink	Unconfirmed	NA	NA	Native
Eumeces septentrionalis	Prairie skink	Present	Unknown	Unknown	Native
TEIIDAE					
Cnemidophorus sexlineatus	Six-lined racerunner	Present	Unknown	Unknown	Native
TRIONYCHIDAE					
Apalone mutica	Smooth softshell	Present	Common	Unknown	Native
Apalone spinifera	Spiny softshell	Present	Unknown	Unknown	Native
VIPERIDAE					
Crotalus viridis	Prairie rattlesnake	Present	Unknown	Unknown	Native

Abbrevation: NA = not available.

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
ACERACEAE				
Acer negundo	Box elder	Present	Uncommon	Native
Acer negundo var. *negundo*	Boxelder	Unconfirmed	NA	Native
Acer saccharinum	Silver maple	Unconfirmed	NA	Native
AGAVACEAE				
Yucca glauca	Soapweed yucca	Present	Uncommon	Native
ALISMATACEAE				
Alisma subcordatum	American water plantain	Unconfirmed	NA	Native
Alisma triviale	Northern water plantain	Present	Uncommon	Native
Sagittaria calycina	Hooded arrowhead	Present	Uncommon	Native
Sagittaria latifolia	Broadleaf arrowhead	Probably Present	NA	Native
AMARANTHACEAE				
Amaranthus arenicola	Sandhill amaranth	Unconfirmed	NA	Native
Amaranthus blitoides	Mat amaranth	Present	Uncommon	Native
Amaranthus retroflexus	Redroot amaranth	Present	Unknown	Nonnative
Amaranthus rudis	Tall amaranth	Present	Unknown	Native
ANACARDIACEAE				
Rhus aromatica var. *serotina*	Fragrant sumac	Unconfirmed	NA	Native
Rhus glabra	Smooth sumac	Present	Unknown	Native
Toxicodendron radicans ssp. *negundo*	Eastern poison ivy	Present	Unknown	Native
APIACEAE				
Cicuta maculata var. *maculata*	Spotted water hemlock	Present	Uncommon	Native
Conium maculatum	Poison hemlock	Unconfirmed	NA	Nonnative

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Cryptotaenia canadensis	Canadian honewort	Present	Uncommon	Native
Heracleum maximum	Common cowparsnip	Unconfirmed	NA	Native
Osmorhiza claytonii	Clayton's sweetroot	Present	Uncommon	Native
Osmorhiza longistylis	Longstyle sweetroot	Present	Unknown	Native
Sanicula canadensis	Canadian blacksnakeroot	Present	Unknown	Native
Sanicula odorata	Clustered blacksnakeroot	Present	Uncommon	Native
Sium suave	Hemlock waterparsnip	Present	Uncommon	Native
Spermolepis inermis	Red river scaleseed	Present	Uncommon	Native
Zizia aurea	Golden zizia	Unconfirmed	NA	Native
	APOCYNACEAE			
Apocynum cannabinum	Indianhemp	Present	Unknown	Native
	Araceae			
Arisaema triphyllum	Jack in the pulpit	Present	Rare	Native
	ARALIACEAE			
Aralia nudicaulis	Wild sarsaparilla	Unconfirmed	NA	Native
Aralia racemosa	American spikenard	Unconfirmed	NA	Native
Panax quinquefolius	American ginseng	Present	Rare	Native
	ASCLEPIADACEAE			
Asclepias arenaria	Sand milkweed	Unconfirmed	NA	Native
Asclepias incarnata	Swamp milkweed	Present	Uncommon	Native
Asclepias syriaca	Common milkweed	Present	Unknown	Native
Asclepias tuberosa ssp. *interior*	Butterfly milkweed	Unconfirmed	NA	Native
Asclepias verticillata	Whorled milkweed	Present	Uncommon	Native
Asclepias viridiflora	Green comet milkweed	Present	Uncommon	Native
	ASTERACEAE			
Ageratina altissima	White snakeroot	Present	Unknown	Native
Ageratina altissima var. *altissima*	White snakeroot	Present	Unknown	Native
Ambrosia artemisiifolia var. *elatior*	Annual ragweed	Present	Unknown	Native
Ambrosia psilostachya	Cuman ragweed	Present	Uncommon	Native
Ambrosia trifida	Great ragweed	Present	Unknown	Native
Antennaria neglecta	Field pussytoes	Present	Uncommon	Native
Arctium minus	Lesser burrdock	Present	Unknown	Nonnative
Artemisia absinthium	Absinthium	Present	Uncommon	Nonnative
Artemisia biennis	Biennial wormwood	Present	Uncommon	Unknown
Artemisia campestris ssp. *caudata*	Field sagewort	Unconfirmed	NA	Native
Artemisia dracunculus	Tarragon	Present	Uncommon	Native
Artemisia frigida	Prairie sagewort	Present	Uncommon	Native
Artemisia ludoviciana ssp. *ludoviciana*	White sagebrush	Present	Uncommon	Native
Bidens cernua	Nodding beggarticks	Present	Uncommon	Native
Bidens frondosa	Devil's beggartick	Present	Uncommon	Native
Bidens tripartita	Threelobe beggarticks	Present	Uncommon	Native
Bidens vulgata	Big devils beggartick	Unconfirmed	NA	Native
Boltonia asteroides	White doll's daisy	Unconfirmed	NA	Native
Brickellia eupatorioides var. *corymbulosa*	False boneset	Present	Uncommon	Native

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Carduus acanthoides	Spiny plumeless thistle	Present	Unknown	Nonnative
Carduus nutans	Nodding plumeless thistle	Present	Unknown	Nonnative
Cirsium altissimum	Tall thistle	Present	Unknown	Native
Cirsium arvense	Canada thistle	Present	Unknown	Nonnative
Cirsium discolor	Field thistle	Unconfirmed	NA	Native
Cirsium flodmanii	Flodman's thistle	Present	Uncommon	Native
Cirsium undulatum	Wavyleaf thistle	Present	Uncommon	Native
Cirsium vulgare	Bull thistle	Present	Unknown	Nonnative
Conyza canadensis	Canadian horseweed	Present	Unknown	Native
Coreopsis tinctoria	Golden tickseed	Present	Uncommon	Unknown
Dyssodia papposa	Fetid marigold	Present	Uncommon	Unknown
Echinacea angustifolia	Blacksamson echinacea	Present	Uncommon	Native
Echinacea pallida	Pale purple coneflower	Unconfirmed	NA	Native
Eclipta prostrata	False daisy	Present	Uncommon	Native
Erechtites hieraciifolia	American burnweed	Present	Uncommon	Native
Erigeron annuus	Eastern daisy fleabane	Present	Uncommon	Native
Erigeron philadelphicus	Philadelphia fleabane	Present	Uncommon	Native
Erigeron strigosus	Prairie fleabane	Present	Uncommon	Native
Eupatorium altissimum	Tall thoroughwort	Present	Uncommon	Native
Eupatorium maculatum var. *bruneri*	Spotted joe-pye weed	Unconfirmed	NA	Native
Eupatorium perfoliatum	Common boneset	Present	Uncommon	Native
Eupatorium purpureum var. *holzingeri*	Holzinger's eupatorium	Present	Uncommon	Native
Eupatorium serotinum	Lateflowering thoroughwort	Unconfirmed	NA	Native
Euthamia gymnospermoides	Texas goldentop	Present	Uncommon	Native
Grindelia squarrosa var. *squarrosa*	Curlycup gumweed	Present	Unknown	Unknown
Gutierrezia sarothrae	Broom snakeweed	Present	Uncommon	Native
Helenium autumnale	Common sneezeweed	Present	Uncommon	Native
Helianthus annuus	Common sunflower	Present	Unknown	Native
Helianthus hirsutus	Hairy sunflower	Present	Uncommon	Native
Helianthus maximiliani	Maximilian sunflower	Present	Uncommon	Native
Helianthus pauciflorus	Stiff sunflower	Present	Uncommon	Native
Helianthus pauciflorus ssp. *pauciflorus*	Stiff sunflower	Probably Present	NA	Native
Helianthus petiolaris	Prairie sunflower	Present	Uncommon	Native
Helianthus tuberosus	Jerusalem artichoke	Present	Uncommon	Native
Heliopsis helianthoides var. *occidentalis*	Smooth oxeye	Present	Uncommon	Native
Heterotheca villosa	Hairy false goldenaster	Present	Uncommon	Native
Lactuca canadensis	Canada lettuce	Present	Uncommon	Native
Lactuca floridana	Woodland lettuce	Present	Rare	Native
Lactuca serriola	Prickly lettuce	Present	Unknown	Nonnative
Lactuca tatarica var. *pulchella*	Blue lettuce	Present	Uncommon	Native
Liatris aspera	Tall blazing star	Unconfirmed	NA	Native
Liatris punctata	Dotted blazing star	Present	Uncommon	Native
Lygodesmia juncea	Rush skeletonplant	Present	Uncommon	Native

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Machaeranthera pinnatifida	Lacy tansyaster	Present	Uncommon	Native
Machaeranthera pinnatifida var. *pinnatifida*	Lacy tansyaster	Unconfirmed	NA	Native
Matricaria discoidea	Disc mayweed	Present	Unknown	Nonnative
Nothocalais cuspidata	Sharppoint prairie-dandelion	Unconfirmed	NA	Native
Oligoneuron rigidum var. *rigidum*	Stiff goldenrod	Present	Unknown	Native
Packera plattensis	Prairie groundsel	Present	Uncommon	Native
Ratibida columnifera	Upright prairie coneflower	Present	Uncommon	Native
Ratibida pinnata	Pinnate prairie coneflower	Unconfirmed	NA	Native
Rudbeckia hirta var. *pulcherrima*	Blackeyed susan	Present	Uncommon	Native
Rudbeckia laciniata	Cutleaf coneflower	Present	Uncommon	Native
Rudbeckia triloba	Browneyed susan	Present	Uncommon	Nonnative
Shinnersoseris rostrata	Beaked skeletonweed	Present	Rare	Native
Silphium integrifolium var. *integrifolium*	Wholeleaf rosinweed	Unconfirmed	NA	Native
Silphium laciniatum	Compassplant	Present	Uncommon	Native
Silphium perfoliatum	Cup plant	Present	Uncommon	Native
Solidago canadensis	Canada goldenrod	Present	Unknown	Native
Solidago gigantea	Giant goldenrod	Present	Unknown	Native
Solidago missouriensis var. *fasciculata*	Missouri goldenrod	Present	Uncommon	Native
Solidago mollis	Velvety goldenrod	Present	Uncommon	Native
Solidago nemoralis	Gray goldenrod	Unconfirmed	NA	Native
Solidago speciosa var. *rigidiuscula*	Showy goldenrod	Present	Uncommon	Native
Sonchus arvensis ssp. *uliginosus*	Moist sowthistle	Present	Unknown	Nonnative
Sonchus asper	Spiny sowthistle	Present	Unknown	Nonnative
Symphyotrichum ciliatum	Rayless alkali aster	Present	Uncommon	Native
Symphyotrichum ericoides var. *ericoides*	White heath aster	Present	Unknown	Native
Symphyotrichum laeve var. *laeve*	Smooth blue aster	Present	Uncommon	Native
Symphyotrichum lanceolatum var. *lanceolatum*	White panicle aster	Present	Unknown	Native
Symphyotrichum novae-angliae	New England aster	Present	Uncommon	Native
Symphyotrichum oblongifolium	Aromatic aster	Present	Uncommon	Native
Symphyotrichum ontarione	Bottomland aster	Present	Uncommon	Native
Symphyotrichum sericeum	Western silver aster	Present	Uncommon	Native
Taraxacum officinale	Common dandelion	Present	Unknown	Nonnative
Tragopogon dubius	Yellow salsify	Present	Unknown	Nonnative
Vernonia fasciculata	Prairie ironweed	Present	Uncommon	Native
Xanthium strumarium	Rough cockleburr	Present	Unknown	Native
AZOLLACEAE				
Azolla mexicana	Mexican mosquitofern	Unconfirmed	NA	Native
BALSAMINACEAE				
Impatiens capensis	Jewelweed	Present	Uncommon	Native
Impatiens pallida	Pale touch-me-not	Present	Uncommon	Native
BERBERIDACEAE				
Berberis thunbergii	Japanese barberry	Unconfirmed	NA	Nonnative

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Caulophyllum thalictroides	Blue cohosh	Unconfirmed	NA	Native
	BETULACEAE			
Corylus americana	American hazelnut	Unconfirmed	NA	Native
Ostrya virginiana	Hophornbeam	Present	Unknown	Native
	BIGNONIACEAE			
Catalpa speciosa	Northern catalpa	Unconfirmed	NA	Native
	BORAGINACEAE			
Hackelia deflexa	Nodding stickseed	Present	Uncommon	Native
Hackelia virginiana	Beggarslice	Present	Uncommon	Native
Lappula squarrosa	European stickseed	Unconfirmed	NA	Nonnative
Lithospermum canescens	Hoary puccoon	Present	Uncommon	Native
Lithospermum incisum	Narrowleaf stoneseed	Present	Uncommon	Native
Onosmodium molle ssp. *occidentale*	Western marbleseed	Present	Uncommon	Native
	BRASSICACEAE			
Alliaria petiolata	Garlic mustard	Present	Rare	Nonnative
Alyssum desertorum	Desert madwort	Present	Uncommon	Nonnative
Arabis canadensis	Sicklepod	Unconfirmed	NA	Native
Arabis hirsuta var. *pycnocarpa*	Creamflower rockcress	Present	Uncommon	Native
Arabis shortii	Short's rockcress	Present	Rare	Native
Capsella bursa-pastoris	Shepherd's purse	Present	Unknown	Nonnative
Descurainia pinnata ssp. *brachycarpa*	Western tansymustard	Present	Unknown	Native
Draba reptans	Carolina draba	Present	Uncommon	Native
Erysimum cheiranthoides	Wormseed wallflower	Present	Uncommon	Unknown
Erysimum inconspicuum	Shy wallflower	Unconfirmed	NA	Unknown
Lepidium campestre	Field pepperweed	Present	Uncommon	Nonnative
Lepidium densiflorum	Common pepperweed	Present	Uncommon	Native
Rorippa palustris ssp. *fernaldiana*	Fernald's yellowcress	Present	Uncommon	Native
Rorippa sessiliflora	Stalkless yellowcress	Unconfirmed	NA	Native
Rorippa sinuata	Spreading yellowcress	Unconfirmed	NA	Native
Sinapis arvensis	Charlock mustard	Present	Uncommon	Nonnative
Sisymbrium loeselii	Small tumbleweed mustard	Present	Unknown	Nonnative
Thlaspi arvense	Field pennycress	Present	Unknown	Nonnative
	BUTOMACEAE			
Butomus umbellatus	Flowering rush	Present	Uncommon	Nonnative
	CACTACEAE			
Opuntia fragilis	Brittle pricklypear	Unconfirmed	NA	Native
Opuntia macrorhiza var. *macrorhiza*	Twistspine pricklypear	Unconfirmed	NA	Native
	CAMPANULACEAE			
Campanulastrum americanum	American bellflower	Present	Uncommon	Native
Lobelia siphilitica	Great blue lobelia	Present	Uncommon	Native
Triodanis holzingeri	Holzinger's venus' looking-glass	Unconfirmed	NA	Native
	CANNABACEAE			
Cannabis sativa	Hemp	Present	Unknown	Nonnative

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Humulus lupulus	Common hop	Present	Uncommon	Native
	CAPPARACEAE			
Polanisia dodecandra ssp. *trachysperma*	Sandyseed clammyweed	Unconfirmed	NA	Native
	CAPRIFOLIACEAE			
Lonicera dioica	Limber honeysuckle	Unconfirmed	NA	Native
Lonicera maackii	Amur honeysuckle	Unconfirmed	NA	Nonnative
Lonicera tatarica	Tatarian honeysuckle	False Report	NA	Unknown
Lonicera X bella	Bell's honeysuckle	Present	Uncommon	Nonnative
Sambucus nigra ssp. *canadensis*	Common elderberry	Unconfirmed	NA	Native
Symphoricarpos occidentalis	Western snowberry	Present	Unknown	Native
Triosteum perfoliatum	Feverwort	Present	Uncommon	Native
Viburnum lentago	Nannyberry	Unconfirmed	NA	Native
	CARYOPHYLLACEAE			
Myosoton aquaticum	Giantchickweed	Unconfirmed	NA	Nonnative
Silene antirrhina	Sleepy silene	Unconfirmed	NA	Native
Silene latifolia ssp. *alba*	Bladder campion	Unconfirmed	NA	Nonnative
Silene stellata	Widowsfrill	Present	Uncommon	Native
Stellaria media	Common chickweed	Present	Unknown	Nonnative
	CELASTRACEAE			
Celastrus scandens	American bittersweet	Present	Uncommon	Native
Euonymus atropurpurea	Eastern wahoo	Present	Uncommon	Native
	CERATOPHYLLACEAE			
Ceratophyllum demersum	Coon's tail	Present	Unknown	Native
	CHENOPODIACEAE			
Chenopodium album	Lambsquarters	Unconfirmed	NA	Unknown
Chenopodium album var. *missouriense*	Missouri lambsquarters	Present	Uncommon	Native
Chenopodium album var. *striatum*	Lateflowering goosefoot	Present	Unknown	Unknown
Chenopodium berlandieri var. *zschackii*	Zschack's goosefoot	Present	Unknown	Native
Chenopodium glaucum	Oakleaf goosefoot	Present	Unknown	Nonnative
Chenopodium pallescens	Slimleaf goosefoot	Unconfirmed	NA	Native
Chenopodium pratericola	Desert goosefoot	Present	Uncommon	Native
Chenopodium simplex	Mapleleaf goosefoot	Present	Uncommon	Native
Chenopodium standleyanum	Standley's goosefoot	Present	Uncommon	Native
Chenopodium subglabrum	Smooth goosefoot	Unconfirmed	NA	Native
Corispermum americanum	American bugseed	Unconfirmed	NA	Native
Corispermum villosum	Hairy bugseed	Present	Uncommon	Native
Cycloloma atriplicifolium	Winged pigweed	Present	Uncommon	Native
Kochia scoparia	Mexican-fireweed	Present	Unknown	Nonnative
Salsola collina	Slender Russian thistle	Present	Unknown	Nonnative
Salsola tragus	Prickly Russian thistle	Present	Uncommon	Nonnative
	CLUSIACEAE			
Hypericum majus	Large St. Johnswort	Present	Uncommon	Native

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
	COMMELINACEAE			
Commelina communis	Asiatic dayflower	Unconfirmed	NA	Nonnative
Tradescantia bracteata	Longbract spiderwort	Present	Uncommon	Native
Tradescantia occidentalis	Prairie spiderwort	Unconfirmed	NA	Native
	CONVOLVULACEAE			
Calystegia sepium ssp. *angulata*	Hedge false bindweed	Unconfirmed	NA	Native
Convolvulus arvensis	Field bindweed	Present	Unknown	Nonnative
	CORNACEAE			
Cornus drummondii	Roughleaf dogwood	Present	Unknown	Native
Cornus obliqua	Silky dogwood	Unconfirmed	NA	Native
Cornus sericea	Redosier dogwood	Unconfirmed	NA	Native
	CRASSULACEAE			
Penthorum sedoides	Ditch stonecrop	Present	Uncommon	Native
	CUCURBITACEAE			
Echinocystis lobata	Wild cucumber	Unconfirmed	NA	Native
Sicyos angulatus	Oneseed burr cucumber	Present	Unknown	Native
	CUPRESSACEAE			
Juniperus virginiana	Eastern redcedar	Present	Unknown	Native
Cuscuta megalocarpa	Bigfruit dodder	Unconfirmed	NA	Native
Cuscuta polygonorum	Smartweed dodder	Unconfirmed	NA	Native
	CYPERACEAE			
Carex aggregata	Glomerate sedge	Present	Uncommon	Native
Carex albicans var. *albicans*	Whitetinge sedge	Present	Uncommon	Native
Carex amphibola	Eastern narrowleaf sedge	Present	Uncommon	Native
Carex atherodes	Wheat sedge	Unconfirmed	NA	Native
Carex aurea	Golden sedge	Present	Uncommon	Native
Carex bicknellii	Bicknell's sedge	Unconfirmed	NA	Native
Carex blanda	Eastern woodland sedge	Present	Uncommon	Native
Carex brevior	Shortbeak sedge	Present	Uncommon	Native
Carex cephalophora	Oval-leaf sedge	Present	Rare	Native
Carex comosa	Longhair sedge	Unconfirmed	NA	Native
Carex conjuncta	Soft fox sedge	Unconfirmed	NA	Native
Carex cristatella	Crested sedge	Present	Uncommon	Native
Carex davisii	Davis' sedge	Present	Rare	Native
Carex duriuscula	Needleleaf sedge	Unconfirmed	NA	Native
Carex eburnea	Bristleleaf sedge	Present	Uncommon	Native
Carex emoryi	Emory's sedge	Probably Present	NA	Native
Carex granularis	Limestone meadow sedge	Present	Uncommon	Native
Carex gravida	Heavy sedge	Present	Uncommon	Native
Carex hitchcockiana	Hitchcock's sedge	Present	Rare	Native
Carex hystericina	Bottlebrush sedge	Present	Uncommon	Native
Carex inops ssp. *heliophila*	Sun sedge	Present	Uncommon	Native
Carex jamesii	James' sedge	Unconfirmed	NA	Native

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Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Carex lacustris	Hairy sedge	Unconfirmed	NA	Native
Carex laeviconica	Smoothcone sedge	Probably Present	NA	Native
Carex leavenworthii	Leavenworth's sedge	Present	Uncommon	Native
Carex meadii	Mead's sedge	Unconfirmed	NA	Native
Carex melanostachya	Great plains sedge	Unconfirmed	NA	Native
Carex mesochorea	Midland sedge	Unconfirmed	NA	Native
Carex molesta	Troublesome sedge	Present	Uncommon	Native
Carex normalis	Greater straw sedge	Present	Rare	Native
Carex oligocarpa	Richwoods sedge	Present	Uncommon	Native
Carex pellita	Woolly sedge	Present	Unknown	Native
Carex rosea	Rosy sedge	Present	Uncommon	Native
Carex rossii	Ross' sedge	Unconfirmed	NA	Native
Carex saximontana	Rocky mountain sedge	Present	Uncommon	Native
Carex scoparia	Broom sedge	Probably Present	NA	Native
Carex sparganioides	Burr reed sedge	Present	Rare	Native
Carex sprengelii	Sprengel's sedge	Present	Unknown	Native
Carex stipata	Owlfruit sedge	Present	Uncommon	Native
Carex tenera	Quill sedge	Present	Rare	Native
Carex tribuloides	Blunt broom sedge	Unconfirmed	NA	Native
Carex vulpinoidea	Fox sedge	Present	Uncommon	Native
Cyperus bipartitus	Slender flatsedge	Present	Uncommon	Native
Cyperus diandrus	Umbrella flatsedge	Unconfirmed	NA	Native
Cyperus erythrorhizos	Redroot flatsedge	Present	Uncommon	Native
Cyperus esculentus var. *leptostachyus*	Yellow nutsedge	Unconfirmed	NA	Native
Cyperus lupulinus ssp. *lupulinus*	Great plains flatsedge	Unconfirmed	NA	Native
Cyperus odoratus	Fragrant flatsedge	Present	Uncommon	Native
Cyperus schweinitzii	Schweinitz's flatsedge	Present	Uncommon	Native
Cyperus strigosus	Strawcolored flatsedge	Present	Uncommon	Native
Eleocharis acicularis	Needle spikerush	Present	Uncommon	Native
Eleocharis engelmannii	Engelmann's spikerush	Present	Uncommon	Native
Eleocharis erythropoda	Bald spikerush	Present	Unknown	Native
Eleocharis palustris	Common spikerush	Probably Present	NA	Native
Fimbristylis puberula var. *interior*	Hairy fimbry	Present	Rare	Native
Schoenoplectus acutus	Hardstem bulrush	Present	Unknown	Native
Schoenoplectus fluviatilis	River bulrush	Present	Uncommon	Native
Schoenoplectus maritimus	Cosmopolitan bulrush	Present	Uncommon	Native
Schoenoplectus pungens var. *longispicatus*	Common threesquare	Present	Unknown	Native
Schoenoplectus tabernaemontani	Softstem bulrush	Present	Unknown	Native
Scirpus atrovirens	Green bulrush	Unconfirmed	NA	Native
Scirpus pallidus	Cloaked bulrush	Present	Unknown	Native
DRYOPTERIDACEAE				
Cystopteris fragilis	Brittle bladderfern	Present	Uncommon	Native

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Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Cystopteris protrusa	Lowland bladderfern	Unconfirmed	NA	Native
Cystopteris tenuis	Upland brittle bladderfern	Present	Uncommon	Native
Dryopteris carthusiana	Spinulose woodfern	Unconfirmed	NA	Native
Matteuccia struthiopteris	Ostrich fern	Unconfirmed	NA	Native
Onoclea sensibilis	Sensitive fern	Unconfirmed	NA	Native
Woodsia obtusa	Bluntlobe cliff fern	Unconfirmed	NA	Native
ELAEAGNACEAE				
Elaeagnus angustifolia	Russian olive	Present	Unknown	Nonnative
Elaeagnus umbellata	Autumn olive	Present	Unknown	Nonnative
Elaeagnus umbellata ssp. *parvifolia*	Autumn olive	Unconfirmed	NA	Unknown
Shepherdia argentea	Silver buffaloberry	Present	Uncommon	Native
EQUISETACEAE				
Equisetum arvense	Field horsetail	Present	Unknown	Native
Equisetum hyemale var. *affine*	Scouringrush horsetail	Present	Unknown	Native
Equisetum laevigatum	Smooth horsetail	Probably Present	NA	Native
Equisetum X ferrissii	Ferriss' horsetail	Present	Unknown	Native
EUPHORBIACEAE				
Acalypha rhomboidea	Virginia threeseed mercury	Present	Uncommon	Native
Chamaesyce geyeri var. *geyeri*	Geyer's sandmat	Unconfirmed	NA	Native
Chamaesyce glyptosperma	Ribseed sandmat	Present	Unknown	Native
Chamaesyce maculata	Spotted sandmat	Present	Unknown	Native
Chamaesyce missurica	Prairie sandmat	Present	Uncommon	Native
Chamaesyce nutans	Eyebane	Present	Unknown	Unknown
Chamaesyce prostrata	Prostrate sandmat	Present	Unknown	Nonnative
Chamaesyce serpens	Matted sandmat	Unconfirmed	NA	Native
Chamaesyce stictospora	Slimseed sandmat	Present	Uncommon	Native
Euphorbia corollata	Flowering spurge	Unconfirmed	NA	Native
Euphorbia cyathophora	Fire on the mountain	Present	Uncommon	Native
Euphorbia davidii	David's spurge	Present	Unknown	Native
Euphorbia dentata	Toothed spurge	Probably Present	NA	Unknown
Euphorbia esula	Leafy spurge	Present	Unknown	Nonnative
Euphorbia hexagona	Sixangle spurge	Unconfirmed	NA	Native
Euphorbia marginata	Snow on the mountain	Present	Unknown	Native
Euphorbia spathulata	Warty spurge	Present	Uncommon	Native
FABACEAE				
Amorpha canescens	Leadplant	Present	Uncommon	Native
Amorpha fruticosa	Desert false indigo	Present	Unknown	Native
Amorpha nana	Dwarf false indigo	Present	Uncommon	Native
Astragalus canadensis	Canadian milkvetch	Present	Uncommon	Native
Astragalus crassicarpus var. *crassicarpus*	Groundplum milkvetch	Present	Uncommon	Native
Astragalus drummondii	Drummond's milkvetch	False report	NA	Unknown
Astragalus lotiflorus	Lotus milkvetch	Unconfirmed	NA	Native

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Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Astragalus missouriensis	Missouri milkvetch	Present	Uncommon	Native
Astragalus racemosus var. *racemosus*	Cream milkvetch	Present	Uncommon	Native
Chamaecrista fasciculata	Sleepingplant	Present	Unknown	Native
Coronilla varia	Purple crownvetch	Present	Unknown	Nonnative
Crotalaria sagittalis	Arrowhead rattlebox	Present	Uncommon	Native
Dalea candida var. *oligophylla*	White prairie clover	Present	Uncommon	Native
Dalea enneandra	Nineanther prairie clover	Present	Uncommon	Native
Dalea leporina	Foxtail prairie clover	Present	Uncommon	Native
Dalea purpurea var. *purpurea*	Violet prairie clover	Present	Uncommon	Native
Desmanthus illinoensis	Prairie bundleflower	Present	Uncommon	Native
Desmodium canadense	Showy ticktrefoil	Present	Uncommon	Native
Desmodium canescens	Hoary ticktrefoil	Present	Uncommon	Native
Desmodium glutinosum	Pointedleaf ticktrefoil	Unconfirmed	NA	Native
Desmodium illinoense	Illinois ticktrefoil	Present	Uncommon	Native
Desmodium paniculatum	Panicledleaf ticktrefoil	Unconfirmed	NA	Native
Gleditsia triacanthos	Honeylocust	Present	Uncommon	Nonnative
Glycyrrhiza lepidota	American licorice	Present	Unknown	Native
Gymnocladus dioicus	Kentucky coffeetree	Present	Uncommon	Native
Lespedeza capitata	Roundhead lespedeza	Present	Uncommon	Native
Lotus corniculatus	Birdfoot deervetch	Present	Unknown	Nonnative
Medicago lupulina	Black medick	Present	Unknown	Nonnative
Medicago sativa ssp. *sativa*	Alfalfa	Unconfirmed	NA	Nonnative
Melilotus alba	White sweetclover	Present	Unknown	Nonnative
Melilotus officinalis	Yellow sweetclover	Present	Unknown	Nonnative
Mimosa nuttallii	Nuttall's sensitive-briar	Present	Uncommon	Native
Oxytropis lambertii	Purple locoweed	Unconfirmed	NA	Native
Pediomelum argophyllum	Silverleaf Indian breadroot	Present	Uncommon	Native
Pediomelum esculentum	Large Indian breadroot	Present	Uncommon	Native
Psoralidium lanceolatum	Lemon scurfpea	Present	Uncommon	Native
Psoralidium tenuiflorum	Slimflower scurfpea	Present	Uncommon	Native
Robinia pseudoacacia	Black locust	Present	Uncommon	Nonnative
Strophostyles helvula	Trailing fuzzybean	Present	Uncommon	Native
Strophostyles leiosperma	Slickseed fuzzybean	Present	Uncommon	Native
Trifolium campestre	Field clover	Unconfirmed	NA	Nonnative
Trifolium pratense	Red clover	Present	Unknown	Nonnative
Vicia americana ssp. *americana*	American vetch	Unconfirmed	NA	Native
Vicia americana ssp. *minor*	Mat vetch	Unconfirmed	NA	Native
FAGACEAE				
Quercus macrocarpa	Bur oak	Present	Unknown	Native
Quercus rubra	Northern red oak	Unconfirmed	NA	Native
FUMARIACEAE				
Corydalis micrantha	Smallflower fumewort	Unconfirmed	NA	Native
Dicentra cucullaria	Dutchman's breeches	Present	Uncommon	Native
GROSSULARIACEAE				

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Ribes americanum	American black currant	Unconfirmed	NA	Native
Ribes missouriense	Missouri gooseberry	Present	Unknown	Native
	HYDROPHYLLACEAE			
Ellisia nyctelea	Aunt Lucy	Present	Unknown	Native
Hydrophyllum virginianum	Shawnee salad	Present	Unknown	Native
	IRIDACEAE			
Sisyrinchium campestre	Prairie blue-eyed grass	Present	Uncommon	Native
	JUGLANDACEAE			
Carya cordiformis	Bitternut hickory	Unconfirmed	NA	Native
Juglans nigra	Black walnut	Present	Uncommon	Native
	JUNCACEAE			
Juncus alpinoarticulatus	Northern green rush	Unconfirmed	NA	Native
Juncus arcticus	Arctic rush	Unconfirmed	NA	Native
Juncus bufonius	Toad rush	Unconfirmed	NA	Native
Juncus dudleyi	Dudley's rush	Present	Uncommon	Native
Juncus interior	Inland rush	Present	Uncommon	Native
Juncus nodosus	Knotted rush	Unconfirmed	NA	Native
Juncus tenuis	Poverty rush	Unconfirmed	NA	Native
Juncus torreyi	Torrey's rush	Present	Unknown	Native
	LAMIACEAE			
Agastache foeniculum	Blue giant hyssop	Unconfirmed	NA	Native
Agastache nepetoides	Yellow giant hyssop	Present	Uncommon	Native
Agastache scrophulariifolia	Purple giant hyssop	Unconfirmed	NA	Native
Blephilia hirsuta	Hairy pagoda-plant	Unconfirmed	NA	Native
Chaiturus marrubiastrum	Lion's tail	Present	Uncommon	Nonnative
Galeopsis bifida	Splitlip hempnettle	Unconfirmed	NA	Nonnative
Glechoma hederacea	Ground ivy	Unconfirmed	NA	Nonnative
Hedeoma hispida	Rough false pennyroyal	Present	Uncommon	Native
Leonurus cardiaca	Common motherwort	Present	Unknown	Nonnative
Lycopus americanus	American water horehound	Present	Unknown	Native
Lycopus asper	Rough bugleweed	Present	Uncommon	Native
Lycopus uniflorus	Northern bugleweed	Unconfirmed	NA	Native
Lycopus virginicus	Virginia water horehound	Unconfirmed	NA	Native
Mentha arvensis	Wild mint	Present	Uncommon	Native
Monarda fistulosa	Wild bergamot	Present	Unknown	Native
Monarda fistulosa var. *fistulosa*	Wild bergamot	Unconfirmed	NA	Unknown
Monarda fistulosa var. *menthifolia*	Wild bergamot	Unconfirmed	NA	Unknown
Nepeta cataria	Catnip	Present	Unknown	Nonnative
Physostegia virginiana ssp. *virginiana*	Obedient plant	Present	Uncommon	Native
Prunella vulgaris ssp. *lanceolata*	Lance selfheal	Present	Uncommon	Native
Prunella vulgaris ssp. *vulgaris*	Common selfheal	Unconfirmed	NA	Native
Salvia nemorosa	Woodland sage	Unconfirmed	NA	Nonnative
Salvia reflexa	Lanceleaf sage	Present	Unknown	Native
Scutellaria lateriflora	Blue skullcap	Present	Uncommon	Native

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Scutellaria parvula var. *missouriensis*	Leonard's skullcap	Present	Uncommon	Native
Stachys tenuifolia	Smooth hedgenettle	Unconfirmed	NA	Native
Teucrium canadense var. *canadense*	Canada germander	Present	Unknown	Native
Teucrium canadense var. *occidentale*	Western germander	Present	Uncommon	Native
LEMNACEAE				
Lemna gibba	Swollen duckweed	Unconfirmed	NA	Native
Lemna minor	Common duckweed	Unconfirmed	NA	Native
Spirodela polyrrhiza	Common duckmeat	Unconfirmed	NA	Native
LENTIBULARIACEAE				
Utricularia macrorhiza	Common bladderwort	Unconfirmed	NA	Native
LILIACEAE				
Allium canadense var. *canadense*	Meadow garlic	Present	Uncommon	Native
Allium tricoccum	Wild leek	Present	Rare	Native
Asparagus officinalis	Garden asparagus	Present	Unknown	Nonnative
Erythronium albidum	White fawnlily	Unconfirmed	NA	Native
Erythronium mesochoreum	Midland fawnlily	Unconfirmed	NA	Native
Maianthemum canadense	Canada mayflower	Unconfirmed	NA	Native
Maianthemum racemosum ssp. *racemosum*	Feathery false lily of the valley	Present	Uncommon	Native
Maianthemum stellatum	Starry false lily of the valley	Present	Unknown	Native
Polygonatum biflorum	Smooth Solomon's seal	Present	Uncommon	Native
LINACEAE				
Linum rigidum	Stiffstem flax	Present	Uncommon	Native
Linum rigidum var. *rigidum*	Stiffstem flax	Unconfirmed	NA	Native
Linum sulcatum	Grooved flax	Present	Uncommon	Native
LOASACEAE				
Mentzelia nuda	Bractless blazingstar	Unconfirmed	NA	Native
Mentzelia nuda var. *nuda*	Bractless blazingstar	Unconfirmed	NA	Native
LYTHRACEAE				
Ammannia robusta	Grand redstem	Present	Uncommon	Native
Lythrum alatum	Winged lythrum	Present	Uncommon	Native
Lythrum salicaria	Purple loosestrife	Present	Uncommon	Native
MALVACEAE				
Abutilon theophrasti	Velvetleaf	Present	Uncommon	Nonnative
Callirhoe involucrata	Purple poppymallow	Present	Uncommon	Unknown
Hibiscus trionum	Flower of an hour	Unconfirmed	NA	Nonnative
Sphaeralcea coccinea	Scarlet globemallow	Present	Uncommon	Native
MENISPERMACEAE				
Menispermum canadense	Common moonseed	Present	Uncommon	Native
MORACEAE				
Morus alba	White mulberry	Present	Unknown	Nonnative
Morus rubra	Red mulberry	Present	Uncommon	Native
NAJADACEAE				
Najas guadalupensis	Southern waternymph	Unconfirmed	NA	Native

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
	NELUMBONACEAE			
Nelumbo lutea	American lotus	Unconfirmed	NA	Native
	NYCTAGINACEAE			
Mirabilis albida	White four o'clock	Unconfirmed	NA	Native
Mirabilis hirsuta	Hairy four o'clock	Unconfirmed	NA	Native
Mirabilis linearis	Narrowleaf four o'clock	Unconfirmed	NA	Native
Mirabilis nyctaginea	Heartleaf four o'clock	Present	Unknown	Native
	OLEACEAE			
Fraxinus pennsylvanica	Green ash	Present	Unknown	Native
	ONAGRACEAE			
Calylophus serrulatus	Yellow sundrops	Present	Uncommon	Native
Circaea lutetiana ssp. *canadensis*	Broadleaf enchanter's nightshade	Present	Uncommon	Native
Epilobium ciliatum	Fringed willowherb	Present	Uncommon	Native
Epilobium coloratum	Purpleleaf willowherb	Present	Uncommon	Native
Epilobium leptophyllum	Bog willowherb	Unconfirmed	NA	Native
Gaura coccinea	Scarlet beeblossom	Present	Uncommon	Native
Gaura mollis	Velvetweed	Present	Uncommon	Native
Oenothera villosa ssp. *villosa*	Hairy evening-primrose	Present	Unknown	Native
	OPHIOGLOSSACEAE			
Botrychium virginianum	Rattlesnake fern	Present	Uncommon	Native
	ORCHIDACEAE			
Coeloglossum viride	Longbract frog orchid	Unconfirmed	NA	Native
Spiranthes cernua	Nodding ladies'-tresses	Present	Uncommon	Native
Spiranthes magnicamporum	Great plains ladies'-tresses	Present	Uncommon	Native
	OXALIDACEAE			
Oxalis stricta	Common yellow oxalis	Present	Unknown	Native
Oxalis violacea	Violet woodsorrel	Present	Uncommon	Native
	PAPAVERACEAE			
Sanguinaria canadensis	Bloodroot	Present	Uncommon	Native
	PLANTAGINACEAE			
Plantago major	Common plantain	Unconfirmed	NA	Native
Plantago patagonica	Woolly plantain	Present	Uncommon	Native
Plantago rugelii	Blackseed plantain	Present	Unknown	Native
	POACEAE			
Agropyron cristatum	Crested wheatgrass	Present	Unknown	Nonnative
Agrostis gigantea	Redtop	Present	Uncommon	Nonnative
Agrostis stolonifera	Creeping bentgrass	Unconfirmed	NA	Native
Alopecurus arundinaceus	Creeping meadow foxtail	Present	Unknown	Nonnative
Andropogon gerardii	Big bluestem	Present	Unknown	Native
Andropogon hallii	Sand bluestem	Unconfirmed	NA	Native
Aristida basiramea	Forked threeawn	Present	Uncommon	Native
Aristida oligantha	Prairie threeawn	Present	Uncommon	Native
Aristida purpurea var. *longiseta*	Fendler threeawn	Present	Uncommon	Native

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Bothriochloa bladhii	Caucasian bluestem	Present	Rare	Nonnative
Bouteloua curtipendula	Sideoats grama	Present	Unknown	Native
Bouteloua gracilis	Blue grama	Unconfirmed	NA	Native
Bouteloua hirsuta	Hairy grama	Unconfirmed	NA	Native
Brachyelytrum erectum	Bearded shorthusk	Unconfirmed	NA	Native
Bromus hordeaceus	Soft brome	Unconfirmed	NA	Nonnative
Bromus inermis	Smooth brome	Present	Unknown	Nonnative
Bromus japonicus	Japanese brome	Present	Unknown	Nonnative
Bromus latiglumis	Earlyleaf brome	Present	Uncommon	Native
Bromus pubescens	Hairy woodland brome	Unconfirmed	NA	Native
Bromus squarrosus	Corn brome	Present	Unknown	Nonnative
Bromus tectorum	Cheatgrass	Present	Unknown	Nonnative
Buchloe dactyloides	Buffalograss	Present	Uncommon	Native
Calamovilfa longifolia	Prairie sandreed	Present	Uncommon	Native
Cenchrus longispinus	Mat sandbur	Present	Unknown	Unknown
Dactylis glomerata	Orchardgrass	Present	Unknown	Nonnative
Diarrhena obovata	Obovate beakgrain	Unconfirmed	NA	Native
Dichanthelium acuminatum var. *fasciculatum*	Western panicgrass	Present	Uncommon	Native
Dichanthelium leibergii	Leiberg's panicum	Unconfirmed	NA	Native
Dichanthelium oligosanthes var. *scribnerianum*	Scribner's rosette grass	Present	Uncommon	Native
Dichanthelium wilcoxianum	Fall rosette grass	Unconfirmed	NA	Native
Digitaria ischaemum	Smooth crabgrass	Present	Unknown	Nonnative
Echinochloa crus-galli	Barnyardgrass	Present	Unknown	Nonnative
Echinochloa muricata var. *muricata*	Rough barnyardgrass	Unconfirmed	NA	Native
Eleusine indica	Indian goosegrass	Present	Unknown	Nonnative
Elymus canadensis	Canada wildrye	Present	Unknown	Native
Elymus hystrix	Eastern bottlebrush grass	Present	Uncommon	Native
Elymus repens	Quackgrass	Probably present	NA	Nonnative
Elymus submuticus	Virginia wildrye	Present	Uncommon	Native
Elymus trachycaulus ssp. *trachycaulus*	Slender wheatgrass	Present	Uncommon	Native
Elymus villosus	Hairy wildrye	Present	Unknown	Native
Elymus virginicus var. *virginicus*	Virginia wildrye	Present	Unknown	Native
Eragrostis cilianensis	Stinkgrass	Present	Unknown	Nonnative
Eragrostis hypnoides	Teal lovegrass	Present	Unknown	Native
Eragrostis pectinacea	Tufted lovegrass	Unconfirmed	NA	Native
Eragrostis spectabilis	Purple lovegrass	Unconfirmed	NA	Native
Eragrostis trichodes	Sand lovegrass	Unconfirmed	NA	Native
Eriochloa villosa	Hairy cupgrass	Unconfirmed	NA	Nonnative
Festuca subverticillata	Nodding fescue	Present	Uncommon	Native
Glyceria grandis	American mannagrass	Unconfirmed	NA	Native
Glyceria striata	Fowl mannagrass	Present	Uncommon	Native
Hesperostipa comata	Needle and thread	Present	Uncommon	Native

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Hesperostipa spartea	Porcupinegrass	Present	Uncommon	Native
Hordeum jubatum	Foxtail barley	Present	Unknown	Native
Hordeum pusillum	Little barley	Probably pPresent	NA	Native
Koeleria macrantha	Prairie junegrass	Present	Uncommon	Native
Leersia oryzoides	Rice cutgrass	Present	Unknown	Native
Leersia virginica	Whitegrass	Present	Uncommon	Native
Leptochloa fusca ssp. *fascicularis*	Bearded sprangletop	Present	Unknown	Native
Lolium arundinaceum	Tall fescue	Present	Unknown	Nonnative
Lolium perenne ssp. *perenne*	Perennial ryegrass	Present	Uncommon	Nonnative
Muhlenbergia asperifolia	Scratchgrass	Present	Uncommon	Native
Muhlenbergia bushii	Nodding muhly	Unconfirmed	NA	Native
Muhlenbergia cuspidata	Plains muhly	Present	Uncommon	Native
Muhlenbergia frondosa	Wirestem muhly	Present	Unknown	Native
Muhlenbergia mexicana	Mexican muhly	Present	Unknown	Native
Muhlenbergia racemosa	Marsh muhly	Present	Unknown	Native
Muhlenbergia schreberi	Nimblewill	Present	Unknown	Native
Muhlenbergia tenuiflora	Slender muhly	Unconfirmed	NA	Native
Nassella viridula	Green needlegrass	Present	Uncommon	Native
Panicum capillare	Witchgrass	Present	Unknown	Native
Panicum capillare var. *capillare*	Witchgrass	Probably present	NA	Unknown
Panicum dichotomiflorum	Fall panicgrass	Present	Unknown	Native
Panicum virgatum	Switchgrass	Present	Unknown	Native
Pascopyrum smithii	Western wheatgrass	Present	Uncommon	Native
Paspalum setaceum	Thin paspalum	Present	Uncommon	Native
Phalaris arundinacea	Reed canarygrass	Present	Unknown	Unknown
Phleum pratense	Timothy	Present	Unknown	Nonnative
Phragmites australis	Common reed	Present	Unknown	Unknown
Piptatherum micranthum	Littleseed ricegrass	Present	Uncommon	Native
Piptatherum racemosum	Blackseed ricegrass	Present	Rare	Native
Poa annua	Annual bluegrass	Present	Unknown	Nonnative
Poa compressa	Canada bluegrass	Present	Uncommon	Nonnative
Poa pratensis	Kentucky bluegrass	Present	Unknown	Nonnative
Poa trivialis	Rough bluegrass	Unconfirmed	NA	Nonnative
Polypogon monspeliensis	Annual rabbitsfoot grass	Present	Uncommon	Nonnative
Schizachyrium scoparium	Little bluestem	Present	Unknown	Native
Setaria pumila	Yellow bristlegrass	Present	Unknown	Nonnative
Setaria verticillata	Hooked bristlegrass	Unconfirmed	NA	Nonnative
Setaria viridis	Green bristlegrass	Present	Unknown	Nonnative
Sorghastrum nutans	Indiangrass	Present	Unknown	Native
Spartina pectinata	Prairie cordgrass	Present	Unknown	Native
Sphenopholis intermedia	Slender wedgescale	Present	Uncommon	Native
Sphenopholis obtusata	Prairie wedgescale	Present	Uncommon	Native

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Sporobolus compositus	Composite dropseed	Present	Unknown	Native
Sporobolus cryptandrus	Sand dropseed	Present	Unknown	Native
Sporobolus neglectus	Puffsheath dropseed	Present	Uncommon	Native
Sporobolus vaginiflorus	Poverty dropseed	Unconfirmed	NA	Native
Thinopyrum intermedium	Intermediate wheatgrass	Present	Unknown	Nonnative
Thinopyrum ponticum	Tall wheatgrass	Probably Present	NA	Nonnative
Tridens flavus	Purpletop tridens	Present	Unknown	Native
Triplasis purpurea	Purple sandgrass	Unconfirmed	NA	Native
Vulpia octoflora var. *octoflora*	Sixweeks fescue	Present	Uncommon	Native
POLEMONIACEAE				
Collomia linearis	Tiny trumpet	Present	Uncommon	Native
Phlox divaricata ssp. *laphamii*	Lapham's phlox	Present	Uncommon	Native
POLYGALACEAE				
Polygala alba	White milkwort	Present	Uncommon	Native
Polygala verticillata	Whorled milkwort	Present	Uncommon	Native
POLYGONACEAE				
Polygonum achoreum	Leathery knotweed	Present	Unknown	Unknown
Polygonum amphibium var. *stipulaceum*	Water smartweed	Probably Present	NA	Native
Polygonum arenastrum	Oval-leaf knotweed	Present	Unknown	Nonnative
Polygonum aviculare	Prostrate knotweed	Unconfirmed	NA	Nonnative
Polygonum bungeanum	Bunge's smartweed	Unconfirmed	NA	Nonnative
Polygonum convolvulus	Black bindweed	Present	Unknown	Nonnative
Polygonum hydropiperoides	Swamp smartweed	Unconfirmed	NA	Native
Polygonum lapathifolium	Curlytop knotweed	Present	Unknown	Native
Polygonum pensylvanicum	Pennsylvania smartweed	Present	Unknown	Native
Polygonum persicaria	Spotted ladysthumb	Present	Uncommon	Nonnative
Polygonum punctatum	Dotted smartweed	Present	Uncommon	Native
Polygonum ramosissimum	Bushy knotweed	Present	Uncommon	Native
Polygonum scandens	Climbing false buckwheat	Present	Unknown	Native
Polygonum virginianum	Jumpseed	Unconfirmed	NA	Native
Rumex altissimus	Pale dock	Present	Uncommon	Native
Rumex crispus	Curly dock	Present	Unknown	Nonnative
Rumex maritimus	Golden dock	Present	Uncommon	Native
Rumex patientia	Patience dock	Present	Unknown	Nonnative
Rumex patientia ssp. *patientia*	Patience dock	Unconfirmed	NA	Unknown
Rumex stenophyllus	Narrowleaf dock	Present	Unknown	Nonnative
PORTULACACEAE				
Portulaca oleracea	Little hogweed	Unconfirmed	NA	Nonnative
POTAMOGETONACEAE				
Potamogeton diversifolius	Waterthread pondweed	Unconfirmed	NA	Native
Potamogeton foliosus	Leafy pondweed	Present	Unknown	Native
Potamogeton nodosus	Longleaf pondweed	Present	Unknown	Native

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Stuckenia pectinatus	Sago pondweed	Present	Unknown	Native
	PRIMULACEAE			
Androsace occidentalis	Western rockjasmine	Unconfirmed	NA	Native
Lysimachia ciliata	Fringed loosestrife	Unconfirmed	NA	Native
	PTERIDACEAE			
Adiantum pedatum	Northern maidenhair	Unconfirmed	NA	Native
Pellaea atropurpurea	Purple cliffbrake	Unconfirmed	NA	Native
	RANUNCULACEAE			
Actaea rubra	Red baneberry	Unconfirmed	NA	Native
Anemone canadensis	Canadian anemone	Present	Uncommon	Native
Anemone cylindrica	Candle anemone	Present	Uncommon	Native
Anemone virginiana	Tall thimbleweed	Present	Rare	Native
Aquilegia canadensis	Red columbine	Present	Uncommon	Native
Ceratocephala testiculata	Curveseed butterwort	Present	Unknown	Native
Clematis virginiana	Devil's darning needles	Present	Uncommon	Native
Delphinium carolinianum ssp. *virescens*	Carolina larkspur	Present	Uncommon	Native
Pulsatilla patens	American pasqueflower	Present	Uncommon	Native
Ranunculus abortivus	Littleleaf buttercup	Present	Unknown	Native
Ranunculus cymbalaria	Alkali buttercup	Present	Uncommon	Native
Ranunculus flabellaris	Yellow water buttercup	Unconfirmed	NA	Native
Ranunculus pensylvanicus	Pennsylvania buttercup	Probably Present	NA	Native
Ranunculus recurvatus	Blisterwort	Unconfirmed	NA	Native
Ranunculus sceleratus var. *multifidus*	Cursed buttercup	Unconfirmed	NA	Native
Ranunculus sceleratus var. *sceleratus*	Cursed buttercup	Present	Unknown	Nonnative
Thalictrum dasycarpum	Purple meadow-rue	Present	Uncommon	Native
	RHAMNACEAE			
Ceanothus herbaceus	Jersey tea	Present	Uncommon	Native
Rhamnus cathartica	Common buckthorn	Present	Unknown	Nonnative
Rhamnus davurica	Dahurian buckthorn	Probably Present	NA	Nonnative
Rhamnus lanceolata ssp. *glabrata*	Lanceleaf buckthorn	Unconfirmed	NA	Native
	ROSACEAE			
Agrimonia gryposepala	Tall hairy agrimony	Unconfirmed	NA	Native
Crataegus mollis	Downy hawthorn	Unconfirmed	NA	Native
Fragaria vesca ssp. *americana*	Woodland strawberry	Present	Uncommon	Native
Fragaria virginiana ssp. *grayana*	Virginia strawberry	Unconfirmed	NA	Native
Geum canadense	White avens	Present	Uncommon	Native
Potentilla norvegica ssp. *monspeliensis*	Norwegian cinquefoil	Present	Uncommon	Native
Potentilla paradoxa	Paradox cinquefoil	Present	Uncommon	Native
Potentilla recta	Sulphur cinquefoil	Unconfirmed	NA	Nonnative
Potentilla rivalis	Brook cinquefoil	Unconfirmed	NA	Native
Prunus americana	American plum	Present	Unknown	Native
Prunus virginiana	Chokecherry	Present	Unknown	Native

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Rosa arkansana var. *suffulta*	Prairie rose	Present	Uncommon	Native
Rosa multiflora	Multiflora rose	Unconfirmed	NA	Nonnative
Rosa woodsii	Woods' rose	Present	Uncommon	Native
Rubus occidentalis	Black raspberry	Present	Unknown	Native
RUBIACEAE				
Galium aparine	Stickywilly	Present	Unknown	Native
Galium circaezans	Licorice bedstraw	Present	Uncommon	Native
Galium tinctorium	Stiff marsh bedstraw	Unconfirmed	NA	Native
Galium triflorum	Fragrant bedstraw	Present	Uncommon	Native
RUTACEAE				
Zanthoxylum americanum	Common pricklyash	Present	Unknown	Native
SALICACEAE				
Populus alba	White poplar	Unconfirmed	NA	Nonnative
Populus deltoides ssp. *monilifera*	Plains cottonwood	Present	Unknown	Native
Populus tremuloides	Quaking aspen	Unconfirmed	NA	Native
Salix amygdaloides	Peachleaf willow	Present	Unknown	Native
Salix eriocephala	Missouri river willow	Present	Unknown	Native
Salix interior	Sandbar willow	Present	Unknown	Native
Salix lutea	Yellow willow	Probably Present	NA	Native
SANTALACEAE				
Comandra umbellata var. *umbellata*	Bastard toadflax	Unconfirmed	NA	Unknown
SCROPHULARIACEAE				
Agalinis tenuifolia	Slenderleaf false-foxglove	Present	Uncommon	Native
Castilleja sessiliflora	Downy paintedcup	Present	Uncommon	Native
Lindernia dubia	Yellowseed false pimpernel	Present	Unknown	Native
Mimulus ringens	Allegheny monkeyflower	Present	Uncommon	Native
Penstemon albidus	White penstemon	Present	Uncommon	Native
Penstemon grandiflorus	Large beardtongue	Present	Uncommon	Native
Scrophularia lanceolata	Lanceleaf figwort	Present	Uncommon	Native
Scrophularia marilandica	Carpenter's square	Unconfirmed	NA	Native
Verbascum thapsus	Common mullein	Present	Unknown	Nonnative
Veronica anagallis-aquatica	Water speedwell	Present	Uncommon	Unknown
Veronica arvensis	Corn speedwell	Present	Unknown	Nonnative
Veronica biloba	Two-lobe speedwell	Unconfirmed	NA	Nonnative
Veronica peregrina ssp. *xalapensis*	Hairy purslane speedwell	False Report	NA	Unknown
Veronica peregrina var. *peregrina*	Hairy purslane speedwell	Unconfirmed	NA	Unknown
SMILACACEAE				
Smilax ecirrata	Upright carrionflower	Unconfirmed	NA	Native
Smilax lasioneura	Blue ridge carrionflower	Present	Uncommon	Native
Smilax tamnoides	Bristly greenbrier	Present	Uncommon	Native
SOLANACEAE				
Datura stramonium	Jimsonweed	Present	Uncommon	Unknown

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Physalis heterophylla	Clammy groundcherry	Present	Uncommon	Native
Physalis hispida	Prairie groundcherry	Unconfirmed	NA	Native
Physalis longifolia	Longleaf groundcherry	Present	Unknown	Native
Physalis virginiana	Virginia groundcherry	Present	Uncommon	Native
Solanum carolinense	Carolina horsenettle	Present	Uncommon	Native
Solanum interius	Deadly nightshade	Unconfirmed	NA	Native
Solanum ptychanthum	West Indian nightshade	Present	Unknown	Native
Solanum rostratum	Buffalobur nightshade	Present	Unknown	Unknown
	SPARGANIACEAE			
Sparganium eurycarpum	Broadfruit bur-reed	Present	Uncommon	Native
	STAPHYLEACEAE			
Staphylea trifolia	American bladdernut	Present	Rare	Native
	THYMELAEACEAE			
Thymelaea passerina	Mezereon	Present	Uncommon	Nonnative
	TILIACEAE			
Tilia americana	American basswood	Present	Unknown	Native
	TYPHACEAE			
Typha angustifolia	Narrowleaf cattail	Present	Unknown	Unknown
Typha latifolia	Broadleaf cattail	Unconfirmed	NA	Native
	ULMACEAE			
Celtis occidentalis	Common hackberry	Present	Unknown	Native
Ulmus americana	American elm	Present	Unknown	Native
Ulmus pumila	Siberian elm	Unconfirmed	NA	Nonnative
Ulmus rubra	Slippery elm	Present	Unknown	Native
Ulmus thomasii	Rock elm	Present	Uncommon	Native
	URTICACEAE			
Boehmeria cylindrica	Smallspike false nettle	Present	Uncommon	Native
Laportea canadensis	Canadian woodnettle	Present	Unknown	Native
Parietaria pensylvanica	Pennsylvania pellitory	Present	Unknown	Native
Pilea fontana	Lesser clearweed	Unconfirmed	NA	Native
Pilea pumila	Canadian clearweed	Present	Uncommon	Native
Urtica dioica ssp. *gracilis*	California nettle	Present	Unknown	Native
	VERBENACEAE			
Glandularia bipinnatifida	Dakota mock vervain	Present	Uncommon	Native
Phryma leptostachya	American lopseed	Present	Uncommon	Native
Phyla lanceolata	Lanceleaf fogfruit	Present	Unknown	Native
Verbena bracteata	Bigbract verbena	Present	Unknown	Unknown
Verbena hastata	Swamp verbena	Present	Unknown	Native
Verbena stricta	Hoary verbena	Present	Unknown	Native
Verbena urticifolia	White vervain	Present	Uncommon	Native
	VIOLACEAE			
Viola affinis	Sand violet	Present	Unknown	Native
Viola canadensis var. *rugulosa*	Creepingroot violet	Present	Uncommon	Native

Plants of the Missouri National Recreational River

Scientific name	*Common name*	*Park status*	*Abundance*	*Origin*
Viola nephrophylla	Northern bog violet	Present	Unknown	Native
Viola pedatifida	Prairie violet	Unconfirmed	NA	Native
Viola pubescens	Downy yellow violet	Present	Uncommon	Native
Viola sororia	Common blue violet	Present	Unknown	Native
VITACEAE				
Parthenocissus quinquefolia	Virginia creeper	Present	Unknown	Native
Parthenocissus vitacea	Woodbine	Present	Uncommon	Native
Vitis riparia	Riverbank grape	Present	Unknown	Native
ZANNICHELLIACEAE				
Zannichellia palustris	Horned pondweed	Present	Unknown	Native

Chapter 1—Introduction and Project Description

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The NCCA and PBCA together constitute a landscape-level strategic habitat conservation initiative to protect wildlife and fisheries resources and habitat in a segment of the Missouri River ecosystem in northeast Nebraska and southeast South Dakota.

The Lewis and Clark expedition—the Corps of Volunteers for Northwest Discovery—which set out to explore the Missouri River basin, was one of our Nation's most famous and influential explorations. Indeed, this expedition facilitated the great westward expansion of the nineteenth century. Since those early days, the Missouri River and its tributaries—constituting the Nation's longest and greatest river basin—have occupied a unique place in American history. In preserving both our national history and our natural resources, we Americans ensure that we have an understanding of ourselves as individuals and as Americans. Such understanding equips us to work toward the betterment of our communities through economic participation, public service, volunteer work, and other such efforts to improve the quality of life and preserve the irreplaceable gems of our heritage.

The Niobrara Confluence Conservation Area (NCCA) and Ponca Bluffs Conservation Area (PBCA) together constitute a landscape-level strategic habitat conservation initiative to protect wildlife and fisheries resources and habitat in a segment of the Missouri River ecosystem in northeast Nebraska and southeast South Dakota. These areas have been identified as supporting or linking important habitat for Federal trust species like pallid sturgeon and piping plover. The purpose of this project is to maintain and enhance habitats for present and future human generations and the survival of Federal trust species (defined as migratory birds, species listed as threatened or endangered under the Federal Endangered Species Act of 1973 [ESA], and certain fisheries) by working with willing landowners.

This land protection plan (LPP) complements existing landscape-scale conservation partnerships

already established in the ecosystem. Two examples are the Missouri River Ecosystem Restoration Plan (MRERP) and the Missouri River Recovery Program (MRRP).

We—the U.S. Fish and Wildlife Service (FWS) and the National Park Service (NPS)—have developed this draft LPP to provide alternatives and identify impacts for the development of increased conservation efforts with willing landowners along the Missouri River in northeast Nebraska and southeast South Dakota.

1.1 Project Description

This LPP has been developed to afford us the authority to develop conservation easements with private landowners or to purchase land in fee title. This plan is designed to work in partnership with willing landowners only. We would work toward increasing river functionality by maintaining and protecting native habitats along and surrounding the Missouri River and its tributaries. The vision for this project is stated below.

Through collaboration with landowners, communities, tribes, and other agencies, the Niobrara Confluence and Ponca Bluffs Conservation Areas will provide sustainable ecological and economic benefits within the middle Missouri River basin by maintaining native riparian and upland habitats that increase river functionality and recreational opportunities.

The following goals have been established for the proposed areas:

- *Local economies and tourism*—help sustain local economies through preserving working farm and ranch landscapes and conserving lands, both of which will attract tourists from across the Nation.
- *Partnerships and collaboration*—develop and foster partnerships with local landowners, communities, tribes, and others by offering financial incentives, sharing knowledge, or collaborating on projects with ecological benefits.
- *Ecological and river functionality*—increase river and ecological functionality by improving water and air quality, maintaining healthy native plant communities such as cottonwood galleries, increasing floodplain connectivity, promoting active channel processes, and reducing flood risk.
- *Cultural resources*—in consultation with our partners, locate, document, and evaluate cultural resources and encourage preservation and interpretation when appropriate.
- *Recreational opportunities*—increase recreational opportunities for residents and visitors.
- *Wildlife, fisheries, and their habitats*—support the recovery and protection of threatened and endangered species and reduce the likelihood of future listings under the ESA, while continuing to provide migration habitats for millions of migrating birds and habitats for resident fish and wildlife populations.

The locations of the proposed conservation areas are shown in figure 1. Table 1 shows the acquisition goals for each conservation area.

1.2 Purpose of and Need for the Land Protection Plan

The purpose of the LPP for the NCCA and PBCA is to outline a landscape-level strategic habitat conservation initiative in partnership with willing land-

Table 1. Acquisition goals in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

Conservation area	*Conservation easement acres*	*Fee title acres*	*Total acres*
Niobrara Confluence Conservation Area	64,000	16,000	80,000
Ponca Bluffs Conservation Area	48,000	12,000	60,000

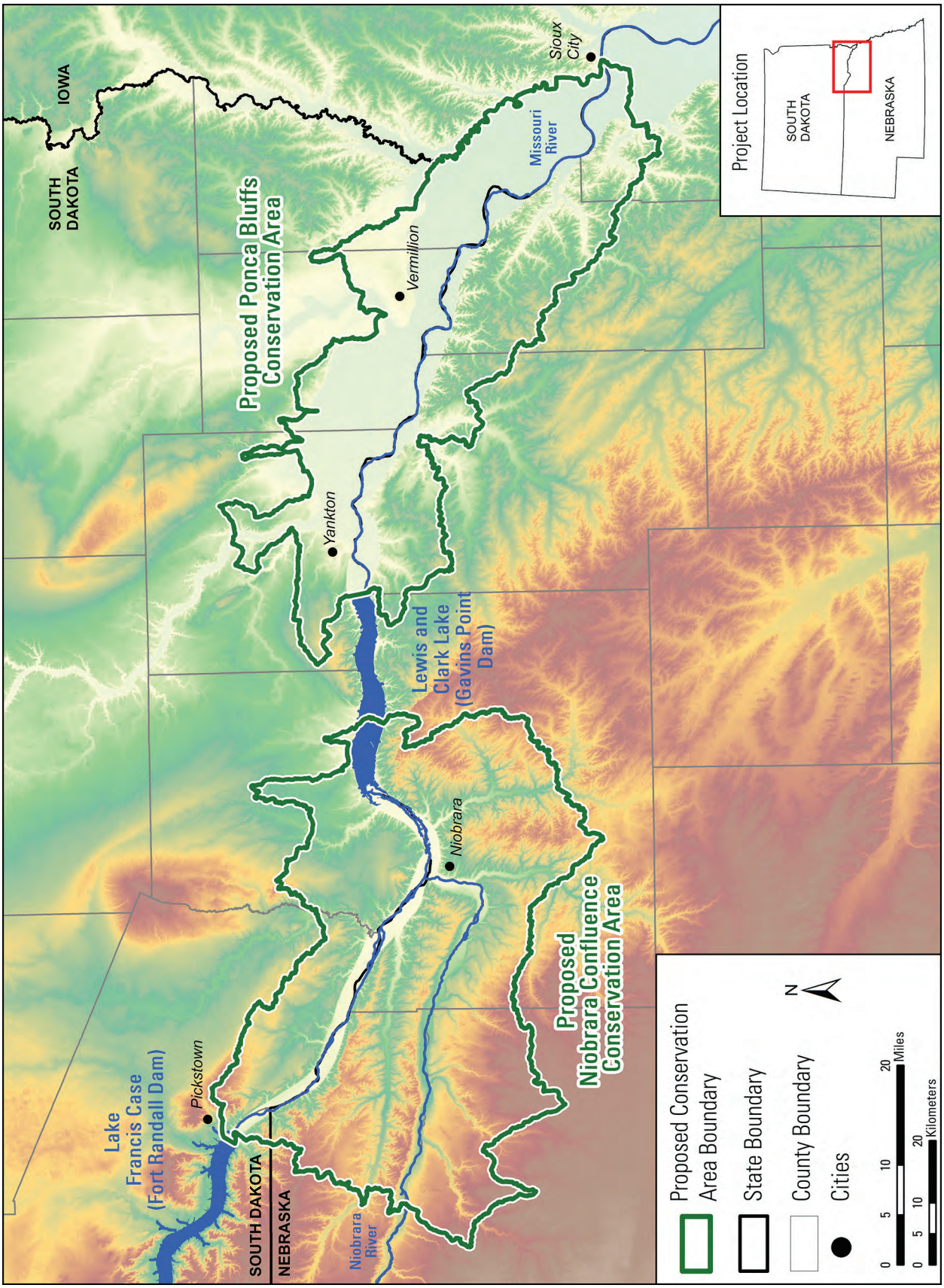

Figure 1. Boundaries of the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

owners to protect wildlife and fisheries resources and habitat in the Missouri River ecosystem in northeast Nebraska and southeast South Dakota. These areas have been identified as supporting or linking important habitat for Federal trust species like pallid sturgeon, piping plover, and migratory birds. The purpose of this project is to work with willing landowners to maintain and enhance habitats for present and future human generations and the survival of Federal trust species (defined as migratory birds, species listed as threatened or endangered under the ESA, and certain fisheries). The need for this project is to provide us with the authority to develop conservation easements with or purchase land in fee title from willing landowners.

The basic considerations in acquiring an easement interest in private lands are the biological significance of the area, biological requirements of the wildlife species of management concern, existing and anticipated threats to wildlife resources, and landowner interest in the program. It is our long-established policy to acquire the minimum interest in land from willing landowners that is necessary to achieve habitat protection goals.

Conservation Easements

Easements are valuable conservation tools that have been extensively employed in the Prairie Pothole Region of South Dakota, North Dakota, Montana, Minnesota, and throughout the larger Missouri River basin by other organizations to maintain various conservation values. Easements involve the acquisition of certain rights to the property, such as the right to alter natural vegetative cover or develop certain types of new infrastructure, while leaving the land title in the hands of the private property owner.

Easements tend to be a cost-effective and socially and politically acceptable means of habitat conservation. Many of the ongoing agricultural land use practices are consistent with wildlife resource protection, and the use of easements would help ensure continuation a strong and vibrant rural lifestyle.

Acquisition in Fee Title

Although the initial costs for fee-title acquisition and the recurring costs for annual management of such areas are more costly than those involved with conservation easements, fee-title acquisition typically offers increased security and protection for riparian, upland, scenic, and recreational areas. However, fee-title acquisition removes the property from the local tax base, and though there are mechanisms in place to offset that (like Refuge Revenue Sharing [RRS] and Payment in Lieu of Taxes [PILT]) we recognize the effect this loss can have on local counties. Accordingly, we have established a goal to use conservation easements for 80 percent of land protected while reserving fee title for purposes described in section 1.7 of this chapter and chapter 4 of the LPP.

Establishing Purposes

The following purposes, identified from existing law, have been acknowledged for the FWS to establish the conservation areas:

- "for any other management purpose, for migratory birds" 16 United States Code (U.S.C.) 715d (Migratory Bird Conservation Act).
- "the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions" 16 U.S.C. 3901(b), 100 Stat. 3583 (Emergency Wetlands Resources Act of 1986).
- "for the development, advancement, management, conservation, and protection of fish and wildlife resources" 16 U.S.C. 742a et seq. (Fish and Wildlife Act of 1956).
- "and land, or interests therein, which are suitable for: (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species listed by the Secretary pursuant to section 1533 of this title, or (4) carrying out two or more of the purposes set forth in paragraphs (1) through (3) of this section…" 16 U.S.C. 460(k) (Refuge Recreation Act, as amended).

The following purposes, identified from existing law, have been acknowledged for the NPS to increase acquisition authority:

- "The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified by such means and measures as conform to the fun-

damental purposes of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." 39 Stat. 535 (NPS Organic Act).

- "Section 6 (a) (1) The Secretary of the Interior and the Secretary of Agriculture are each authorized to acquire lands and interests in land within the authorized boundaries of any component of the national wild and scenic rivers system designated in section 3 of this Act, or hereafter designated for inclusion in the system by Act of Congress, which is administered by him, but he shall not acquire fee title to an average of more than 100 acres per mile on both sides of the river." The Wild and Scenic Rivers Act (16 U.S.C. 1271–1287).

- "Notwithstanding the authority to the contrary contained in Subsection 6(a) of this Act, no land or interests in land may be acquired without the consent of the owner…" Public Law 95-625 (Adding 59-Mile Reach to Wild and Scenic River Act).

1.3 Issues

Through the scoping process, we identified many qualities of the Missouri River along with issues and recommendations. Based on this information as well as guidance from the National Environmental Policy Act of 1969 (NEPA) and planning policies, we identified the following significant issues to address in the final LPP and environmental impact statement (EIS):

- local economies and tourism
- partnerships and collaboration
- ecological and river functionality
- cultural resources
- recreational opportunities
- wildlife, fisheries, and their habitats

The planning team considered every comment received during the public scoping process. These comments were grouped into related topics and subtopics as described in the scoping report (appendix B of the EIS). Significant issues are those that are within our jurisdiction that suggest different actions or alternatives and that will influence the decisionmakers.

Local Economies and Tourism

It is important to manage resources and public uses in ways that protect the resources, are financially responsible, and are integrated with the economic viability of the surrounding communities. The LPP and EIS address the following socioeconomic issues:

- increased public use of and visitation to the analysis area and the resulting increased economic activity in the area
- introduction of public money to the local community through the payment of conservation easements
- RRS and PILT payments to local counties if fee-title acquisition is used

Partnerships and Collaboration

Numerous Federal, State, tribal, and nongovernmental agencies and organizations manage land and laws associated with the Missouri River. Besides the FWS and the NPS, some of the key Federal agencies are the Natural Resources Conservation Service

NPS

The bullfrog is 1 of 10 species of amphibians found in the riparian habitat of the Missouri River.

(NRCS), the U.S. Army Corps of Engineers (USACE), the U.S. Geological Survey (USGS), the U.S. Environmental Protection Agency, and the Bureau of Indian Affairs. Additionally, 3 tribes are also located on the main stem of the river and 17 other tribes have ancestral interest in the area. The Nebraska Game and Parks Commission and South Dakota Department of Game, Fish and Parks (SDGFP) manage several properties along the river. In addition, local organizations such as Nebraska's Natural Resource Districts manage water resources, and the Northern Prairie Land Trust works with landowners on conservation efforts. The LPP and EIS address the following issues:

- description and clarification of overlapping jurisdictions and opportunities for landowners
- identification of where agencies and organizations can combine efforts and work collaboratively
- consultation and coordination with Federal, State, and local partners

Ecological and River Functionality

The Missouri River system as a whole has experienced significant alterations through anthropogenic changes such as large main stem dams inundating significant stretches of river and channelization in the lower third of the river. Flows are highly regulated by six major impoundments and three smaller impoundments, built to generate electricity and provide flood control. Because hydrogeomorphic processes have been so altered, the floodplain has become more accessible to other human activities, especially agriculture and urbanization. Such activities have led to fragmentation of corridors both longitudinally (along the river) and laterally (across the valley). These corridors are important to the many plants and animals that rely on the Missouri River ecosystem.

Nevertheless, outside the areas of these impoundments and other alterations, the Missouri River has shown resiliency, exhibiting numerous historical characteristics witnessed by Lewis and Clark during their explorations in the early 1800s. This project is designed to allow the Missouri River to flow and meander naturally to the extent possible, keeping those habitat characteristics important to Federal trust species such as pallid sturgeon, least tern, and piping plover. The LPP and EIS address the following:

- altered main stem flows (water and sediments) and their impact on resources
- prior and ongoing conservation efforts by landowners and agencies to improve habitat conditions

Cultural Resources

Humans have lived in the middle Missouri River region for more than 12,000 years. The sites, buildings, structures, and objects left by these people provide an irreplaceable record that reflects their stories, lives, and legacies. These cultural resources consist of prehistoric and historic places of local, state, or national significance and include those that have been placed on the National Register of Historic Places (NRHP) and others that have yet to be formally documented. The LPP and EIS address the following aspects of cultural resources:

- identification, documentation, and evaluation of cultural resources
- consultation with State agencies, Indian tribes, and the public concerning the location, importance, and preservation of these resources
- preservation and interpretation of significant individual resources, such as Spirit Mound and the Yankton Sioux Treaty Monument, and cultural landscapes, including those experienced by Lewis and Clark
- encouragement and support for ongoing research and interpretation of these resources

Recreational Opportunities

The proposed NCCA and PBCA and their surrounding areas provide recreational opportunities for many residents of the four-state region of South Dakota, Nebraska, Iowa, and Minnesota, while also attracting visitors from across the United States and other countries. Recreational opportunities are widely varied and consist of, but are not limited to, hunting, fishing, boating, camping, paddling, photography, and snagging. These resources are not only extremely important to the recreationists but the local communities as well. The LPP and EIS address the following aspects of public use and access:

- availability of safe public access points to the Missouri River
- availability of public hunting and fishing areas
- motorized and nonmotorized access and law enforcement
- impact of users of public lands on neighboring private landowners
- location of interpretation sites such as visitor centers, historic monuments, and wildlife viewing stations

Wildlife, Fisheries, and Their Habitats

The Missouri River and its surrounding riparian, grassland, and woodland habitats provide an exceptional resource for a wide variety of wildlife and fish including the following:

- 249 species of migratory birds
- 50 species of mammals
- 21 species of reptiles
- 10 species of amphibians
- 94 fish species (72 native and 22 introduced)
- 704 plant species
- Up to 10 threatened or endangered species (including the focal species for this project: piping plover, least tern, and pallid sturgeon)

The proposed action is designed to work with others to maintain and build on existing areas important for the above-mentioned species while also improving conditions. The LPP and EIS address the following aspects:

- habitat requirements for successful productivity of migratory bird species—especially bald eagles, piping plovers, and least terns
- habitat needs for the endangered pallid sturgeon, other fish species of concern, and game fish
- role surrounding grasslands and forestlands play in supporting river-dependent species while also providing habitat for other species
- opportunities to improve habitat conditions for all species

1.4 National Wildlife Refuge System and Authorities

The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, the restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

The NCCA and PBCA would be monitored partly under the National Wildlife Refuge System (Refuge System) in accordance with the National Wildlife Refuge System Administration Act of 1966 (Administration Act) as amended by the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act), as well as other relevant legislation, Executive Orders, regulations, and policies. Conservation of wildlife habitat along the Missouri River in Nebraska and South Dakota would continue to be consistent with the following:

- Land and Water Conservation Fund Act of 1956
- Migratory Bird Conservation Act of 1929
- Migratory Bird Hunting and Conservation Stamp Act of 1934
- Migratory Bird Treaty Act of 1918
- Administration Act

- Improvement Act
- North American Wetlands Conservation Act of 1968
- ESA
- Bald and Golden Eagle Protection Act of 1940
- Fish and Wildlife Act of 1956

The basic considerations in acquiring an easement interest in private lands are the biological significance of the area, biological needs of the wildlife species of management concern, existing and anticipated threats to wildlife resources, and landowner interest in the program. On approval of the conservation areas, habitat protection would occur through the purchase of conservation easements or acquisition in fee title if deemed necessary. It is the FWS's long-established policy to acquire the minimum interest in land from willing sellers that is necessary to achieve habitat protection goals.

1.5 The National Park Service and the Wild and Scenic Rivers System

As required by the 1916 Organic Act, these special places must be managed in a special way—a way that allows them to be enjoyed not just by those who are here today, but also by generations that follow. Enjoyment by present and future generations can be assured only if these special places are passed on to them in an unimpaired condition.

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.

The two legislative acts provide the following descriptions that pertain to the proposed action:

- 1978 designation
  - Missouri River: "The segment from Gavins Point Dam, South Dakota, fifty-nine miles downstream to Ponca State Park, Nebraska"
- 1991 designation
  - Missouri River: "The 39-mile segment from the headwaters of Lewis and Clark Lake to the Ft. Randall Dam"
  - Niobrara River and Verdigre Creek: "The 25-mile segment [of the Niobrara River] from the western boundary of Knox County to its confluence with the Missouri River, including that segment of the Verdigre Creek from the north municipal boundary of Verdigre, Nebraska, to its confluence with the Niobrara"

The national river boundary defines the area where the NPS has regulatory authority under the Wild and Scenic Rivers Act and where the NPS may buy easement or fee-title interest in lands. The boundary encompasses roughly 78,000 acres within the proposed conservation areas. The NPS owns 350 acres within the proposed PBCA.

Although affected by reservoirs, flow regulation, and human-altered channels in some areas, the ever-changing Missouri River has a diverse mosaic of channel habitats, including floodplains, side channels, backwaters, sandbars, pools, islands, and oxbow lakes. Accordingly, both the 59-mile segment and the 39-mile segment of the Missouri River were designated under the Wild and Scenic Rivers Act for their free-flowing condition; water quality; and outstanding recreational, fish and wildlife, scenic, historic, geologic, and cultural values. Despite these values, the Wild and Scenic Rivers Act applies the recreational river classification to those rivers or sections of rivers that are readily accessible by road, that may have some shoreline development, and that may have undergone some impoundment or diversion in the

past. The proposed LPP is consistent with the Department of the Interior's (Interior's) charge under section 10(a) of the Wild and Scenic River Act to protect and enhance the values for which the river was designated as part of the Wild and Scenic River System.

1.6 Related Actions and Activities

Landscape Conservation Cooperatives

As the primary land, water, and wildlife manager for the Nation, Interior has an obligation to address the impacts that climate change is having on America's resources by developing integrated adaptation and mitigation strategies. Secretarial Order 3289 established a Climate Change Response Council, chaired by the Secretary of the Interior, which is coordinating activities within and across the bureaus to develop and implement an integrated strategy for climate change response by Interior. Working at the landscape, regional, and national scales through the establishment of Climate Science Centers and Landscape Conservation Cooperatives (LCCs), Interior is defining and implementing a vision that integrates Interior science and management expertise with that of its partners, providing information and best management practices to support strategic adaptation and mitigation efforts on both public and private lands across the United States and internationally.

This vision supports individual bureau missions while creating synergies with other Interior agencies and both governmental and nongovernmental partners to carry out integrated climate change science, adaptation, and mitigation strategies across broad landscapes. The Climate Change Response Council promotes collaboration among LCCs and develops mechanisms for managing data and information, setting national priorities, and ensuring consistency and preventing duplication of effort among the national network of LCCs.

The proposed conservation areas lie within the recently established Plains and Prairie Pothole LCC. The work of the LCC will greatly help any conservation measures including the proposed NCCA and PBCA by providing high-quality scientific data and information.

The State of Nebraska Natural Legacy Project

The flora and fauna of Nebraska, along with the natural habitats they occupy, are the State's natural heritage. Populations of many once-common species have declined because of a variety of stresses, including habitat loss, habitat degradation, diseases, and competition and predation from invasive species. The goals of the Nebraska Natural Legacy Project are to reverse the decline of at-risk species, recover listed species and allow for their delisting, maintain the common species, and conserve natural communities.

The Nebraska Natural Legacy Project seeks to create new opportunities for collaboration among farmers, ranchers, communities, private and governmental organizations, and others for conserving Nebraska's biological diversity. The Nebraska Natural Legacy Project is a nonregulatory, voluntary, incentive-based conservation effort that would support the proposed conservation areas by offering added help to landowners in the management of natural areas.

The State of South Dakota Wildlife Action Plan

The South Dakota Wildlife Action Plan seeks to strategically address the needs of all fish and wildlife species, with priority on species of greatest concern and in need of conservation. The South Dakota Wildlife Action Plan takes a broad view of landscapes from a fish and wildlife perspective. The plan considers the location of essential habitats, changes since settlement, species at risk, and habitat improvement. The purposes and goals of the proposed conservation areas are compatible with the South Dakota Wildlife Action Plan.

Natural Resources Conservation Service—Wetlands Reserve Program

The NRCS provides national leadership in the conservation of soil, water, and related natural resources. As part of the U.S. Department of Agriculture (USDA), the NRCS provides balanced technical help and cooperative conservation programs to landowners and land managers throughout the United States.

In the Nebraska portions of the proposed conservation areas, the NRCS has an active Wetlands Reserve Program (WRP)—a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their properties. NRCS aims to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program. Through the WRP, NRCS provides technical and financial support to help landowners with their wetland restoration and long-term conservation efforts. As of 2011, approximately 11,000 acres have been protected through wetland easements in the proposed conservation areas. The proposed conservation areas would not conflict with any NRCS programs; moreover, our role in buying easements could help the NRCS achieve WRP goals and objectives.

Species Recovery Plans

Species recovery plans are discussed in the species descriptions in "Chapter 4—Affected Environment" of the draft EIS.

U.S. Army Corps of Engineers—Master Water Control Manual

The reservoir system on the main stem Missouri River is operated by the USACE in accordance with the "Missouri River Master Manual." Last updated in 2004, this manual includes a water control plan that guides how much water should be released, when, and for how long from the six reservoirs that make up the system. The plan is based on hydrologic models that consider variables such as volume, timing, and the shape of snow and rainfall runoff; these models have been built on more than 100 years of historical runoff records (1898–2004). The water control plan provides management guidance to support the purposes for which Congress authorized construction of the system: flood control, navigation, water supply, water quality, hydropower, irrigation, recreation, and fish and wildlife. The USACE strives to balance operation of the system to serve these purposes.

The USACE's operation of the main stem dam system has caused numerous ecosystem changes as well as impacts on individual species. The proposed conservation areas would seek to mitigate these impacts by providing more habitat and protecting floodplain lands important to species recovery as well as river and floodplain ecology.

Nick Kaczor / FWS

The Lake Andes National Wildlife Refuge Complex is managed by some of the same staff members who would manage the proposed conservation areas.

U.S. Fish and Wildlife Service—Lake Andes National Wildlife Refuge Complex Comprehensive Conservation Plan

A comprehensive conservation plan (CCP) was recently completed for the three units of the refuge complex: Lake Andes National Wildlife Refuge, Lake Andes Wetland Management District, and Karl E. Mundt National Wildlife Refuge, all in South Dakota. This CCP describes the management and use of these three units of Lake Andes National Wildlife Refuge Complex for the next 15 years. The proposed conservation areas would be managed, in part, by the same staff who manage the refuge complex. It is expected that the issues and conservation management direction of the proposed conservation areas would be compatible with those of the Lake Andes National Wildlife Refuge Complex.

U.S. Fish and Wildlife Service—Partners for Fish and Wildlife Program, Mountain–Prairie Region Strategic Plan, Eastern Tallgrass Prairie and Prairie Pothole Focus Areas

The Nebraska Partners for Fish and Wildlife Program will continue to work with its partners to control invasive species, restore and improve native grassland conditions, and promote biodiversity by restoring and enhancing important habitats. Additional opportunities may arise to work with its partners to restore riverine wetlands and wet meadow

habitats along the confluence of the lower Niobrara and Missouri Rivers.

The Mountain–Prairie Region Strategic Plan identifies focus areas throughout the region for the Partners for Fish and Wildlife Program to prioritize its efforts. The NCCA and PBCA are within the following focus areas.

The northern portion of the Eastern Tallgrass Prairie focus area includes the Missouri River and its associated habitats and has been expanded recently to include the land at the confluence of the Verdigre-Bazile, Lower Niobrara, and Missouri Rivers; the focus area now includes a portion of eastern Boyd County.

The southern portion of the Prairie Pothole focus area also includes the Missouri River. This focus area contains the glaciated portion of the state, which is characterized by a documented potential to support at least 20 breeding duck pairs per square mile. Preserving this focus area as a viable "recruitment source" for all suites of prairie nesting birds has been identified as an urgent priority for the FWS, Delta Waterfowl, and Ducks Unlimited. While many of the habitat actions in this focus area are designed to conserve waterfowl breeding habitat, they also have direct benefits for the entire spectrum of ground-nesting birds. These mutual conservation benefits are especially vital to grassland nesting passerines—widely considered to be one of the most imperiled bird guilds in North America (Peterjohn and Sauer 1999).

National Park Service—General Management Plans, Missouri National Recreational River

The general management plans for the Missouri National Recreational River (MNRR) were written in 1997 (for the 39-mile segment) and 1999 (59-mile segment). The plans describe the goals and management activities anticipated for the national recreational river. General management plans are designed to be used for up to 20 years; it is unlikely that another general management plan effort will be undertaken for the MNRR in the near future. The management described in the plans is consistent with the basic goals and principles of the proposed conservation areas.

North American Waterfowl Management Plan

Enacted in 1986, the "North American Waterfowl Management Plan" addresses declining waterfowl populations. The plan relies on the actions of joint ventures, of which there are 17 in the United States. The Prairie Pothole Joint Venture (PPJV) coordinates conservation efforts in North Dakota, South Dakota, Minnesota, Iowa, and Montana. Many PPJV projects are active within the proposed conservation areas and use funding partnerships with many entities. The proposed conservation areas are home to ducks, geese, sandhill cranes, tundra swan, as well as many other nonresident waterfowl species. Accordingly, activities under this international plan will aid in protecting, restoring, and enhancing high-priority wetland and grassland habitat to help sustain populations of waterfowl, shorebirds, waterbirds, and terrestrial prairie birds in the proposed conservation areas.

National Fish Habitat Partnership Action Plan

The National Fish Habitat Partnership was born in 2001 when an ad hoc group supported by the Sport Fishing and Boating Partnership Council explored the notion of developing a partnership effort for fish on the scale of what was done for waterfowl in the 1980s through the North American Waterfowl Management Plan. The waterfowl plan has worked wonders in the past 2 decades to boost waterfowl populations by forming strong local and regional partnerships to protect key habitats.

The mission of the National Fish Habitat Action Plan is to protect, restore and enhance the Nation's fish and aquatic communities through partnerships that foster fish habitat conservation and improve the quality of life for Americans. This program is compatible with the goals and purposes of the proposed conservation areas.

U.S. Army Corps of Engineers—Missouri River Recovery Program

The aim of the USACE's MRRP is to restore the Missouri River ecosystem to its natural form and function through habitat creation and flow modifications by using science, public involvement, and col-

laboration with agency partners and stakeholders. Although the river will never be the wild, dynamic, and uncontrolled system it once was, portions of the ecosystem can be revitalized to meet the needs and interests of all the area's inhabitants. Accordingly, the primary goal of the MRRP—which applies to the proposed conservation areas—is to create a sustainable ecosystem that supports thriving populations of native species while considering current social and economic values. Numerous plans have been written in support of the MRRP, such as a cottonwood management plan, an emergent sandbar habitat plan, and a spring pulse plan. The program is compatible with the goals and purposes of the proposed conservation areas.

Missouri River Ecosystem Recovery Plan

The USACE's MRRP, in partnership with the FWS, is conducting a collaborative long-term study authorized by the Water Resources Development Act of 2007. The study, known as the MRERP and EIS, will identify the actions required to mitigate losses of aquatic and terrestrial habitat, recover federally listed species under the ESA, and restore the ecosystem to prevent further declines among other native species. When completed, the plan will guide the USACE's mitigation, restoration, and recovery efforts on the Missouri River for the next 30–50 years.

The plan is a multiyear effort; however, it was not funded in 2012. The proposed conservation areas would be consistent with implementation of the MRERP.

NPS

A view of the Missouri River from Niobrara State Park.

Migratory Bird Program

The FWS has a legal mandate and a trust responsibility to maintain healthy migratory bird populations for the benefit of the American public. The FWS is authorized by primary conventions, treaties, and laws to ensure the conservation of more than 800 species of migratory birds and their habitats. The FWS work with many foreign governments, State and other Federal agencies, tribes, nonprofit organizations, academic institutions, industries, and private individuals, both within the United States and abroad, to meet these mandates. To meet the migratory bird conservation challenges of the 21st century, the Migratory Bird Program adheres to the principles of sound science and collaborative partnerships in its migratory bird conservation and management activities. Summer nesting habitat for two federally listed endangered migratory bird species—least tern and piping plover—occurs within the proposed conservation areas. The proposed conservation areas would strongly support the goals of the Migratory Bird Program.

The Nature Conservancy Ecoregional Portfolio

The NCCA is primarily located in The Nature Conservancy's Dakota Mixed Prairie Ecoregion, while the PBCA is split between the Northern and Central Tallgrass Prairie Ecoregion. A terrestrial ecoregion is a regional landscape that supports recognizably distinctive groupings of plants, animals, and natural communities due to regional patterns of climate, landform, soil, and hydrology. The Nature Conservancy has prioritized portions of the Missouri River ecosystem downstream of Gavins Point Dam as well as Verdigre Creek and the Niobrara River as important terrestrial habitats.

Nebraska Surface Water Quality Standards (Title 117)

The Nebraska Department of Environmental Quality has a legal mandate to maintain and protect the existing quality of surface waters designated as Class A State Resource Waters. Much of the surface water in the proposed project areas is considered Class A. In addition to Class A, there are also Class B waters in the project area. The proposed LPP

would be consistent with the regulations outlined in Title 117 of the State's Antidegradation Clause.

South Dakota Antidegradation of Waters of the State (74:51:01:34)

Similar to Nebraska, the State of South Dakota has enacted legislation that states "No further reduction of water quality may be allowed for surface waters of the state that do not meet the water quality levels assigned to their designated beneficial uses as a result of natural causes or conditions, and all new discharges must meet applicable water quality standards." The proposed LPP would be consistent with the regulations outlined under this State regulation.

1.7 Habitat Protection and the Acquisition Process

Functional riverine and upland habitat protection would occur primarily through conservation easements and fee-title purchases. It is our long-established policy to acquire the minimum interest in land from willing sellers necessary to achieve habitat acquisition goals.

The acquisition authorities for the proposed action are the Migratory Bird Hunting and Conservation Stamp Act of 1934, also known as the Duck Stamp Act, the North American Wetlands Conservation Act, and the Land and Water Conservation Fund Act of 1965. The Duck Stamp Act money used to acquire property is received from Duck Stamp revenue. The North American Wetlands Conservation Act funds are from congressional appropriations, Migratory Bird Treaty Act fines, and various Federal accounts. The Land and Water Conservation Fund is derived primarily from oil and gas leases on the outer continental shelf, motorboat fuel tax revenues, and sale of surplus Federal property.

There may be additional funds for the acquisition of lands, waters, or interest therein for fish and wildlife conservation purposes through congressional appropriations, donations from nonprofit organizations, and other sources.

Conservation easements would be purchased in perpetuity on privately owned property containing important biological, cultural, and social resources as identified in Chapter 4 of the LPP. The easements would protect the river, floodplain, and surrounding uplands from conversion to nonnative habitats, bank stabilization, and subdivision. Whether public access is allowed would be determined on a case-by-case basis at the time of the purchase in collaboration with the landowner and other partners. All other property rights and responsibilities, including grazing, haying, and control of noxious weeds, would remain with the landowner.

The basic considerations in acquiring interest in property are landowner interest in the program, biological significance, ability to contribute to increased river functionality, and feasibility of restoration, if needed. Fee-title acquisition would focus on areas with the following attributes:

- significant biological resources
- significant need for restoration
- need for high public use or administrative sites
- areas where the landowner will only sell in fee title

Purchases would be made only from willing sellers, would be subject to available funding, and would generally follow the process in figure 2.

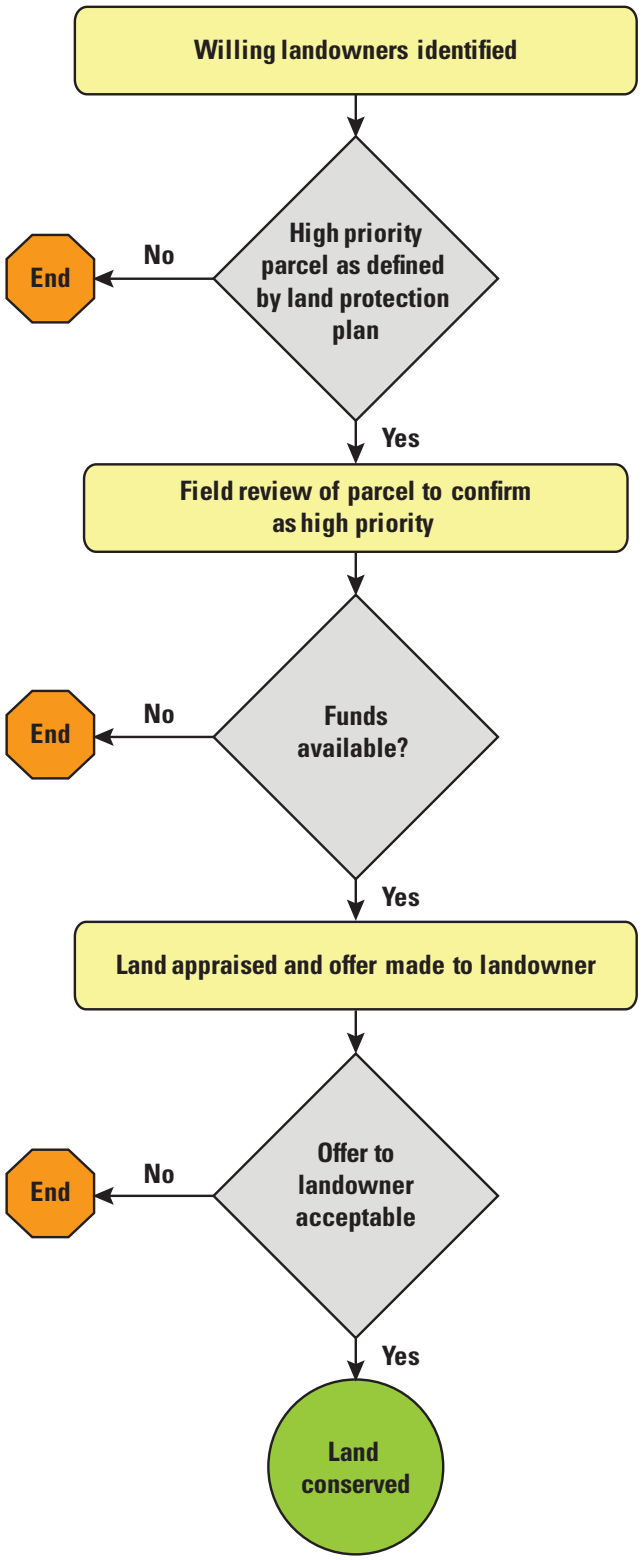

Figure 2. Land acquisition process for the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

Chapter 2—Area Description and Resources

Please refer to "Chapter 4—Affected Environment" of the draft EIS for a full description of the area and resources.

Chapter 3—Threats to and the Status of Resources

Please refer to "Section 4.2—Biological Resources" in the draft EIS for a description of threats to resources.

Chapter 4—Project Implementation

NPS

Goat Island lies within the 59-mile segment of the MNRR.

This chapter presents a brief summary of the land protection options that were considered during the planning process, then sets out the implementation procedures for the Niobrara Confluence and Ponca Bluffs LPP. This plan is intended to provide our staff with guidance and direction for acquiring conservation and access easements as well as lands in fee title in the project area.

4.1 Land Protection Options

Alternatives Considered

During the development of alternatives, various options for the protection of lands in the proposed conservation areas were considered in the EIS. These options were voluntary landowner zoning, county zoning, and acquisition or management by other entities (that is, neither the FWS nor the NPS). The planning team determined that none of these options met the purpose, need, or objectives for the Niobrara Confluence and Ponca Bluffs LPP; consequently, these options were not analyzed in the EIS.

Four alternatives were considered in the EIS, the no-action alternative and three action alternatives, encompassing a range of conservation targets using a combination of conservation and access easements and acquisition of lands in fee title in the proposed conservation areas.

The consequences of the no-action alternative were considered unacceptable; accordingly, one of the action alternatives, "Alternative C—Moderate Conservation Action," was selected as the preferred alternative.

Easement and Fee-Title Acquisition Program

We embrace the concept that a strong and vibrant rural lifestyle—with agriculture and livestock production at its heart—must be a key part of ensuring habitat integrity and wildlife resource protection. The LPP was developed to support this concept.

In view of the analysis carried out through the environmental review process, as described in the

EIS, and during a public comment period, alternative C was selected as the preferred alternative. The LPP proposes conservation of up to 140,000 acres through acquisition of conservation and access easements and contracts and limited acquisition of lands in fee title lands. Activities carried out under the LPP would augment the efforts of other conservation groups. The preferred alternative is discussed in detail in chapter 3 of the EIS. Environmental consequences are documented in chapter 5 of the EIS.

Easements have been shown to be not only a more cost-effective but also a more socially and politically acceptable means of ensuring protection of critical habitat than outright—or fee-title—acquisition. The LPP would involve two types of easements: conservation easements for habitat protection and access easements to support public use in the conservation areas (see section 4.2.1). Fee-title acquisition would be used to acquire lands where extensive public use, construction of facilities, or major habitat restoration is planned. A ratio of 20-percent fee-title acres to 80-percent easement acres is considered to be the optimum mix; it is the ratio reflected in the Small Wetlands Acquisition Program in eastern South Dakota.

If the LPP is approved, we would develop an interim conceptual management plan for managing fee-title lands until a CCP can be completed. The conceptual management plan would help guide the management of acquired parcels in the short term and include items such as interim compatibility determinations. It would also outline how we would comanage those parcels as well as areas under conservation easement.

4.2 Project Objectives and Actions

Land protection planning is the means by which we study opportunities for strategic conservation of land through long-term lease, conservation easement, or purchase. Such planning efforts involve the following steps:

- the detailed identification and prioritization of lands suitable for addition to the Refuge System or the National Park System
- a description of the lands' natural resource values
- an explanation of how the lands support the missions of the Refuge System, National Park System, or both

In the land protection planning process, we look at lands both at the landscape, or ecosystem, level and at the individual tract level. We use the principles of Strategic Habitat Conservation, which provides guidance for determining species' goals, setting objectives, developing implementation procedures, and prescribing techniques to monitor accomplishments.

The primary objective of the LPP is to maintain biodiversity and related wildlife values while protecting and promoting recreational opportunities, cultural sites, and scenic values through the use of conservation easements and fee-title purchase. Conservation easements would be an important tool for protecting wildlife habitat while leaving the land in private ownership.

Much of the watershed remains in agricultural use. Protecting these lands from residential and commercial development would maintain a vital habitat corridor between federally protected lands, state wildlife management areas, waterfowl production areas, voluntary perpetual easements, and Partners for Fish and Wildlife projects. The LPP would protect cottonwood forest communities, help protect and restore habitat for listed species, and help preserve the natural river ecosystem in the conservation areas. The following goals have been established for the NCCA and PBCA:

- *Local economies and tourism*—help sustain local economies through preserving working farm and ranch landscapes and conserving lands, both of which will attract tourists from across the Nation.
- *Partnerships and collaboration*—develop and foster partnerships with local landowners, communities, tribes, and others by offering financial incentives, sharing knowledge, or collaborating on projects with ecological benefits.
- *Ecological and river functionality*—increase river and ecological functionality by improving water and air quality, maintaining healthy native plant communities such as cottonwood galleries, increasing floodplain connectivity, promoting active channel processes, and reducing flood risk.
- *Cultural resources*—in consultation with our partners, locate, document, and evaluate cultural resources and encourage preservation and interpretation when appropriate.

NPS

Located in South Dakota, Spirit Mound is one cultural resource located within the vicinity of the proposed NCCA and PBCA.

- *Recreational opportunities*—increase recreational opportunities for residents and visitors.

- *Wildlife, fisheries, and their habitats*—support the recovery and protection of threatened and endangered species and reduce the likelihood of future listings under the ESA, while continuing to provide migration habitats for millions of migrating birds and habitats for resident fish and wildlife populations.

The LPP is designed to improve conditions in the Missouri River's floodplain and associated grasslands and uplands. The proposed management direction for the NCCA and PBCA would emphasize retaining those habitat characteristics important to federal trust species such as pallid sturgeon, least tern, and piping plover, as well as enhance opportunities for recreational activities such as boating, fishing, hunting, and camping while increasing scenic values along the river.

The 790,873-acre NCCA encompasses the river, adjacent 6th order watersheds, and the 6th order watersheds of the Niobrara River below Spencer Dam. We have identified a goal of 16,000 acres of fee-title acquisition and 64,000 acres of conservation easements on the basis of logistics, the extent of potentially available lands, and the desired ratio of fee-title to easement acreage described above.

The 623,921-acre PBCA comprises a mix of private property and local, federal, and state jurisdictions. We have established a goal of 12,000 acres of fee-title acquisitions and 48,000 acres of conservation easements. Management actions outside federal ownership are encouraged through partnerships with state and local governments and private landowners.

Easement and Fee-Title Requirements

We have developed standard conservation easement agreements that have been used successfully in other parts of the United States. With appropriate modifications, we would use similar language and terms to develop standard easement documents for the NCCA and PBCA. Standardization would minimize confusion, facilitate enforcement, and provide the necessary level of protection for the resources.

The easement and fee-title acquisition program would rely on voluntary involvement of landowners. We would pursue fee-title acquisition where there is both a willing landowner and a need for restoration or visitor services facilities and access. Similarly, where we require public access and use, access easements and contracts may be an option. For 80 percent of protected lands, we would pursue conservation easements. Landowner management practices—such as grazing and prescribed fire—would continue to be implemented on the land covered by conservation easement contracts. Because all land under such easements would remain in private ownership, property taxes and grassland management activities—such as invasive plant and tree control, grazing, and prescribed fire—would remain the landowner's responsibility. Public access, including hunting, may be allowed under the easement, depending on the landowner's wishes.

The easement program would be managed by staff at the Karl Mundt National Wildlife Refuge south of Pickstown, South Dakota, and the NPS office in Yankton, South Dakota. The FWS and NPS staff would be responsible for monitoring and administering all easements on private land and managing fee-title lands. Easement management would entail periodically reviewing land status in meetings with the landowners or land managers. Draft conservation easement concepts are shown below.

- Unless prior approval in writing is granted by the FWS or the NPS, landowners will maintain permanent vegetative cover consisting of grasses, forbs, low-growing shrubs, and trees on easement lands and abide by the following restrictions:

  - Haying, mowing, and seed harvesting for any reason will not occur before July 15 in any calendar year.

  - Grassland, wildlife habitat, or other natural features will not be altered by digging, plowing, disking, or otherwise destroying the vegetative cover, and no agricultural

crop production can occur on the habitat areas delineated.

- Draining, filling, and leveling of wetlands will be prohibited.
- Altering and stabilizing the riverbank and shoreline will be prohibited.
- Livestock confinement facilities such as feedlots will be prohibited.

- Grazing will be permitted on the easement land at any time throughout the year without approval in writing.
- Grantors will pay taxes and assessments, if any, that may be levied against the easement land.
- Noxious weed control will remain a responsibility of the landowner.
- If the landowner would like to allow public access, the easement will be held by the NPS under an additional access agreement; if the landowner wishes to exclude public access, the easement could be held by either agency.
- This easement and the covenants and agreements contained herein will run with the land and will be binding on all persons and entities who come into ownership or possession of the lands subject to this easement.

Contaminants and Hazardous Materials

Level 1 preacquisition site assessments would be conducted on individual tracts before the purchase of any land interests. The FWS's environmental contaminants specialists from the Ecological Services offices in Nebraska and South Dakota would be contacted to make sure that policies and guidelines are followed before the acquisition of conservation easements.

4.3 Project Costs

The LPP would result in the development of a new project administered as part of the Karl Mundt National Wildlife Refuge south of Pickstown, South Dakota, and the Missouri National Recreation River of Yankton, South Dakota. Refuge and park staff would be responsible for researching available properties and working with willing sellers to acquire those properties.

Land Costs

Land values are estimated to be between $2,000 and $6,000 per acre depending on land cover type, agricultural production, and improvements. A summary of project costs is provided in table 2.

One-time initial costs for fee-title acquisition for the NCCA are estimated at $64,000,000 (16,000 acres times $4,000 per acre average cost). One-time initial costs for conservation easements are estimated at $128,000,000 (64,000 acres times $2,000 per acre average cost). Based on costs from other refuges in the region, operations and maintenance costs are estimated to be $30 per acre per year, or $480,000 per year for the 16,000-acre portion acquired in fee title. This estimate does not include startup costs, which are estimated to be $1,500,000 and would be associated with the Ponca Bluffs National Conservation Area.

One-time initial costs for fee-title acquisition for the PBCA are estimated at $48,000,000 (12,000 acres times $4,000 per acre average cost). One-time initial costs for conservation easements are estimated at

Table 2. Project costs for the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

Conservation area	*Fee-title acres*	*Fee cost*	*Easement acres*	*Easement cost*	*Operations and maintenance yearly costs*	*Start-up costs*
Niobrara Confluence	16,000	$64,000,000	64,000	$128,000,000	$480,000	$1,500,000
Ponca Bluffs	12,000	$48,000,000	48,000	$96,000,000	$360,000	$500,000
Totals	28,000	$112,000,000	112,000	$224,000,000	$840,000	2,000,000

$96,000,000 (48,000 acres times $2,000 per acre average cost). Based on estimates from other refuges in the region, operations and maintenance costs are estimated to be $30 per acre per year, or $360,000 per year for the 12,000-acre portion acquired in fee title. This does not include startup costs, which are estimated to be $500,000 and would be associated with the NCCA.

Staff

The level and number of staff members required to manage the NCCA and PBCA would ultimately depend on landowner involvement and participation in the program as well as the funds that are available for conservation. We estimate that staff shown in table 3 would be necessary when we reach the overall goals of the LPP. In addition, it is anticipated that the FWS's private lands program (Partners for Fish and Wildlife Program) based out of Grand Island, Nebraska, and Huron, South Dakota, would be adequate to address the proposed action.

4.4 Acquisition Funding

We expect that funding to acquire both easements and fee-title lands would come principally from the Land and Water Conservation Fund, although money from several sources and authorities could be used for land acquisition and management.

Land and Water Conservation Fund

We propose to acquire conservation easements principally with funds appropriated under the Land and Water Conservation Fund Act, which derives funds from royalties paid for offshore oil and gas leasing. These funds are intended for land and water conservation projects; they are not derived from general taxes. Funding is subject to annual appropriations by Congress for specific acquisition projects.

Other Sources

Money from other sources may also be used for land and easement acquisition. For example, monies from the Migratory Bird Conservation Fund (Duck Stamp) or the North American Wetlands Conservation Act could be used. Management activities associated with easements may be funded through other sources, such as The Nature Conservancy, Partners for Fish and Wildlife, and other private and public partners. We would also consider accepting voluntary donations for easements or fee-title acquisitions, as well as land transfers from other agencies.

4.5 Protection Priorities

We worked in consultation with internal FWS divisions (Migratory Birds, Fisheries, Ecological

Table 3. Labor costs for the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

Staff group	*Position*	*Grade*
Management	Interagency project leader	GS–13
	Wildlife refuge manager	GS–12
	Biological sciences technician	GS–07
Acquisition	Realty specialist	GS–12
Biology	Wildlife biologist	GS–11
Visitor services	Outdoor recreation planner	GS–11
Administration	Administrative officer	GS–07
Maintenance	Engineering equipment operator	WG–10
	Maintenance worker	WG–08
Fire management	Prescribed fire specialist	GS–09
Law enforcement	Law enforcement officer	GS–09
	Park ranger	GS–05

Abbreviations: GS = General Schedule, WG = Wage Grade.

Services) and the cooperating agency team and chose to develop protection priorities based on a prior extensive group effort to determine and quantify the Outstandingly Remarkable Values (ORVs) of the MNRR (NPS 2012). The ORVs were developed in the fall of 2011 by a group of more than 60 subject matter experts, interested stakeholders, and other river partners to help guide the management of the MNRR. The ORVs that were identified are listed below:

- Cultural
- Ecological
- Fish and Wildlife
- Geological
- Recreational
- Scenic

We used a two-pronged approach to landscape prioritization. The first component was to investigate a suite of focal fish and wildlife species, their habitats, and overall river function (Ecological and Fish and Wildlife ORVs). The second component was to investigate recreational access, scenic qualities, and the potential for sites to contain culturally significant sites (Cultural, Geological, Recreational, and Scenic ORVs).

Focal Species Prioritization

We selected a suite of fish and wildlife species that we felt were representative of a functional river ecosystem. Each of these focal species represents a group of species that are vulnerable to the same threat processes (Caro and O'Doherty 1999). The species selected are listed below:

- bald eagle
- pallid sturgeon
- least tern
- piping plover

All four species are Federal trust species or have State or regional conservation status, making them worthy of protection on their own; however, conserving habitat for these species would also protect habitat for other species with similar habitat requirements. In this way, these species serve as indicators of overall river functionality and health. In addition, species like the bald eagle are significant to many American Indian tribes.

Point data (such as capture locations or nest sites) for the four species were available from various research or monitoring studies conducted within the proposed conservation areas (figures 3, 4, and 5); however, no conceptual models or species-specific models have been developed for the action area in its entirety. Accordingly, we chose to identify the habitats those species were using and extrapolate to the entire action area. Using the finest scale available land cover dataset that covered the entire action area (LANDFIRE 2006), we identified the vegetation community (or land cover) types that correlated to the extensive point data for these species. We then ranked the land cover data relative to the species locations, with land cover classes in red and yellow representing 79.6 percent of bald eagle nest locations, 97.4 percent of pallid sturgeon capture locations, and 97.6 percent of least tern and piping plover nest sites (figure 6). We then classified the remaining land cover types according to their biological significance for the focal species, with grasslands and forestlands ranked as medium priority and row-crop agricultural lands and developed areas (roads and cities) ranked as the lowest priority.

In addition, we mapped characteristics that support or inhibit overall river function as shown in figure 7. These characteristics were:

- the historical floodplain of the Missouri River and its tributaries;
- confluences of tributaries with the Missouri River;
- large islands;
- areas with artificially stabilized banks that do not protect river management infrastructure (tailraces), major highways, cities, or private residences.

Historical floodplains were mapped because that characteristic is a key attribute necessary to support the processes associated with hydrology, sediment transport, and the transformation of organic and inorganic materials in river and riparian systems—for example, up and down channels, between channels, and between riparian areas and floodplains (The Nature Conservancy 2008).

Confluences were mapped because they contribute organic and inorganic materials and physical habitat features that may be locally important in the watershed (The Nature Conservancy 2008). More-

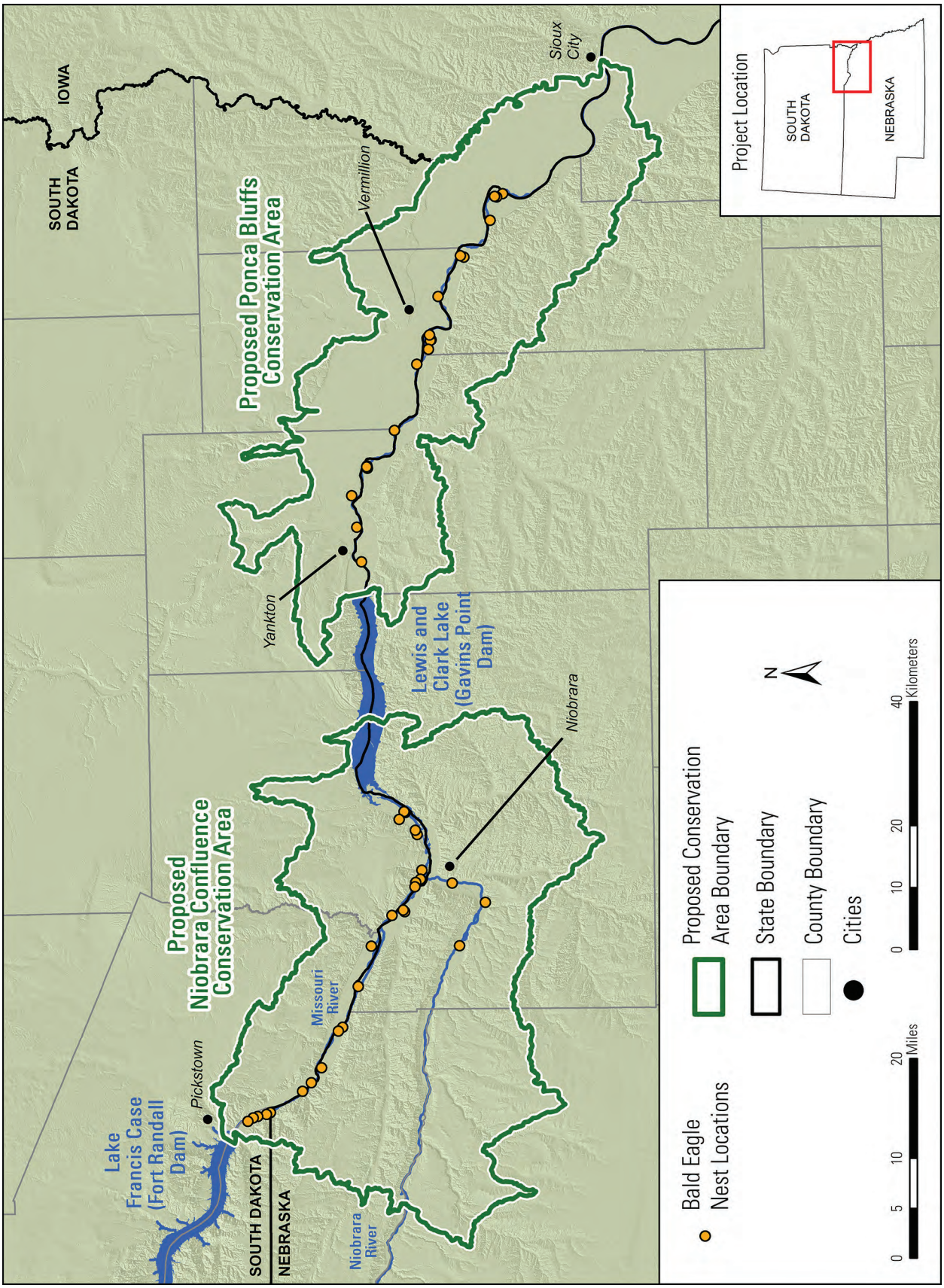

Figure 3. Bald eagle nest locations in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

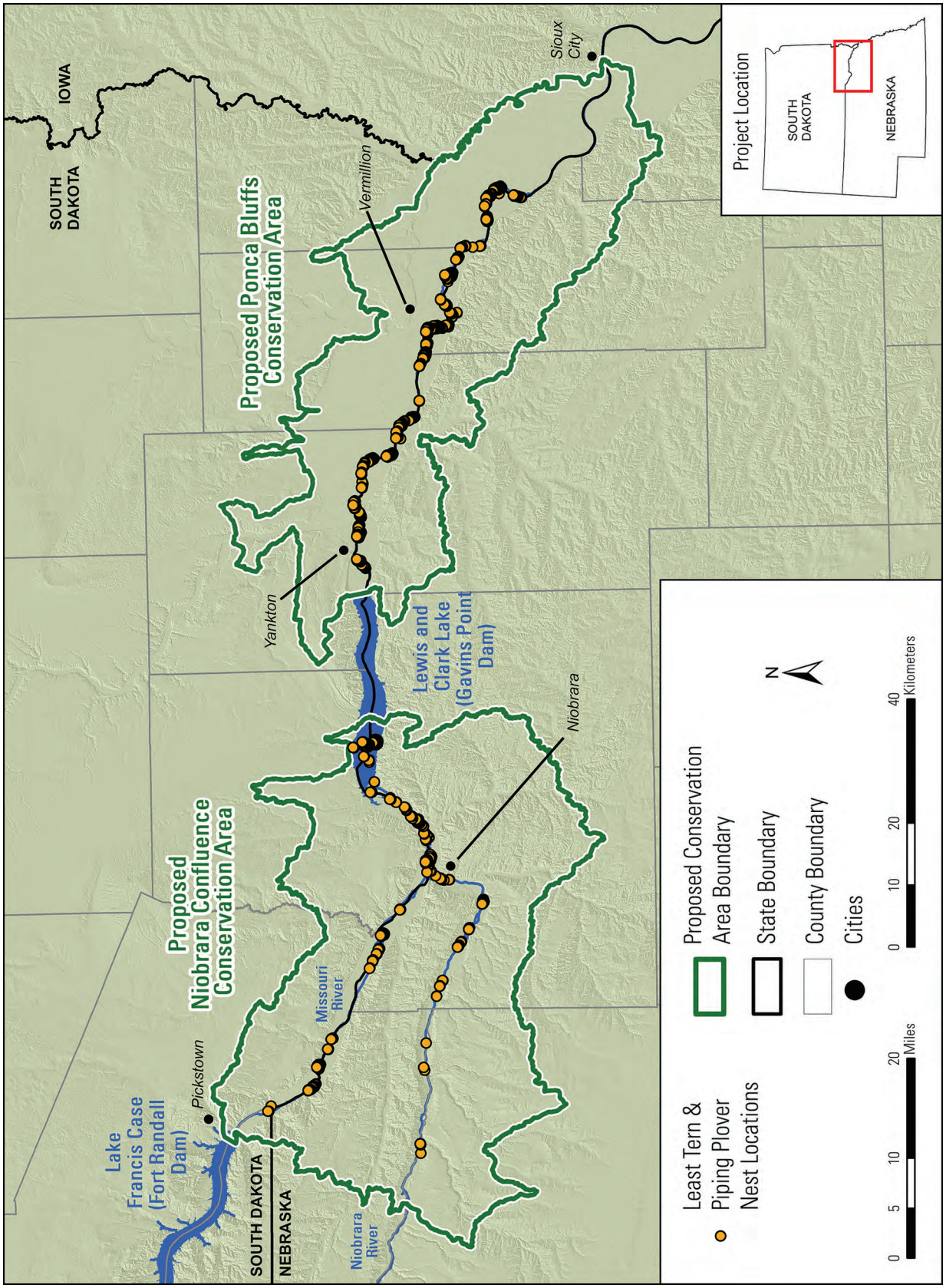

Figure 4. Least tern and piping plover nest locations in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

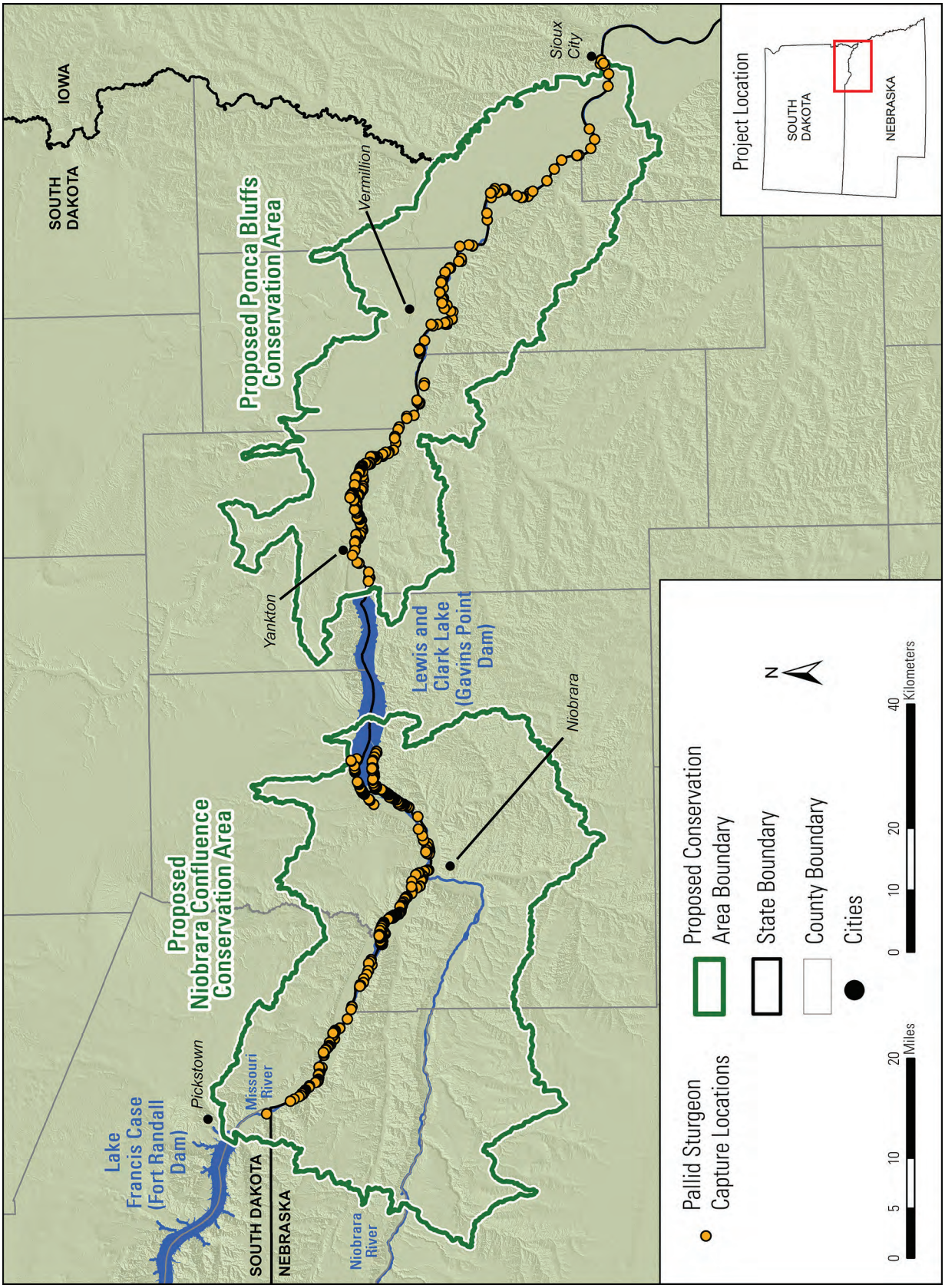

Figure 5. Pallid sturgeon capture locations in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

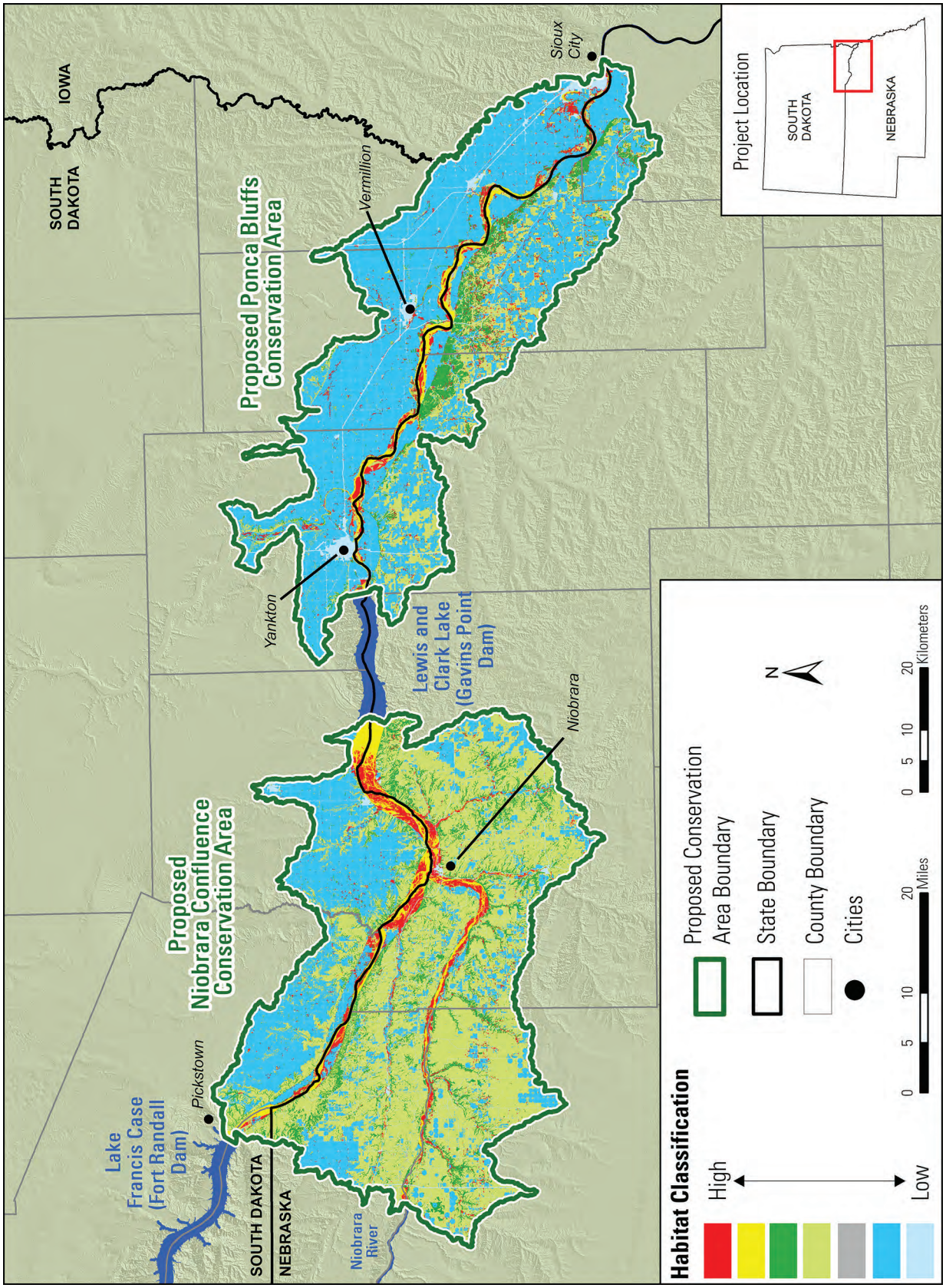

Figure 6. Focal species habitat prioritization in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

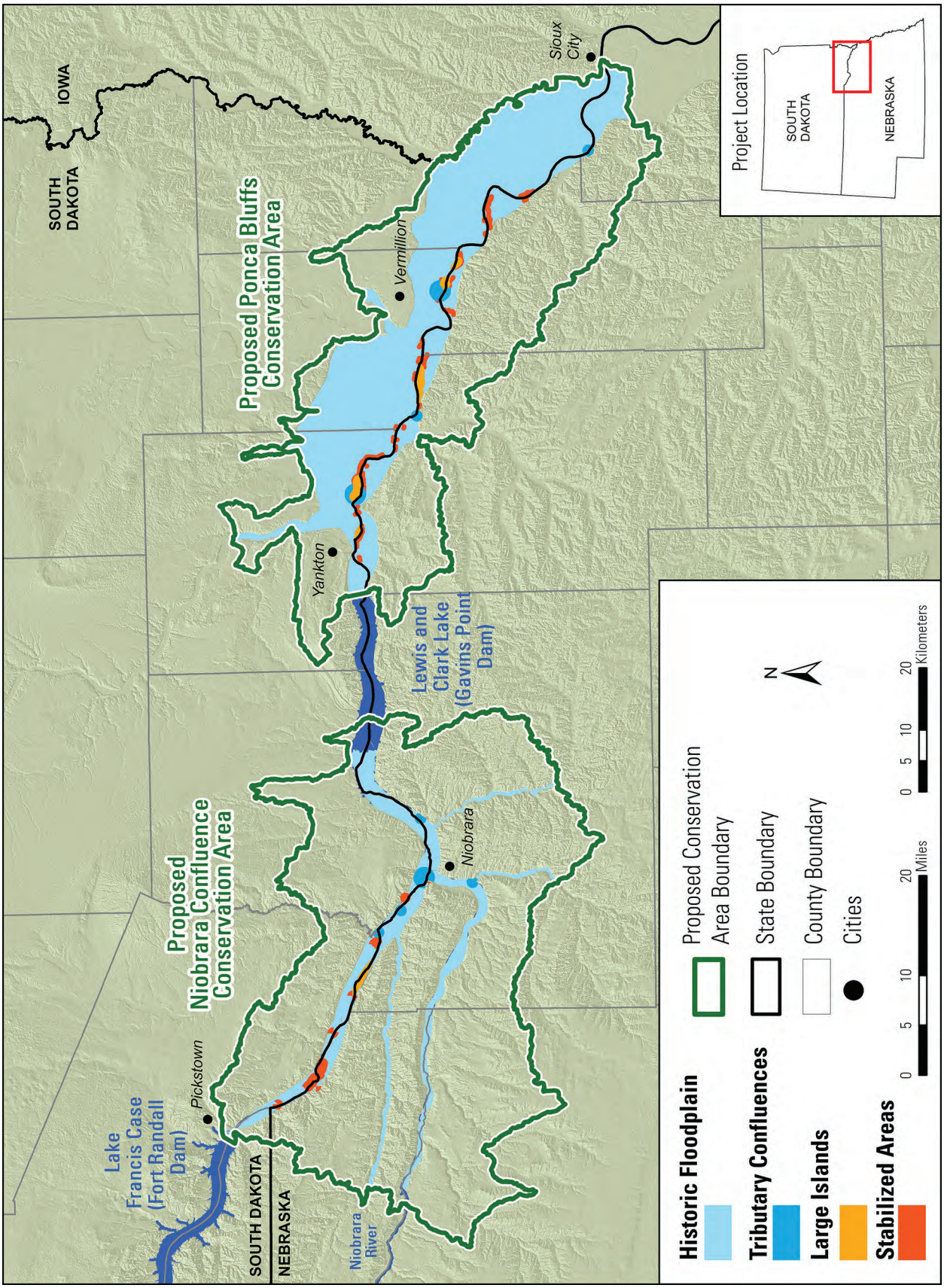

Figure 7. River features in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

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Piping plover is a focal species for the NCCA and PBCA.

over, the Niobrara River confluence is a unique site where a sediment-rich river (the Niobrara) meets a river that is generally considered to be sediment-hungry (the Missouri). The confluence, because of these characteristics, provides optimal habitat conditions for species like the pallid sturgeon.

Large islands were mapped because many of them provide dynamic habitat conditions ranging from barren sandbars to old-growth cottonwood galleries and mature lowland forests of ash and elm. These sites are also known for supporting nesting colonies of turtles, an important indicator of overall river function (NPS 2012).

After the floodwaters receded in fall 2011, MNRR and the Missouri River Institute at the University of South Dakota collaborated on a bankline inventory for MNRR. The purpose of this study was to create a database that contains bank descriptions and their locations, including any processes that were occurring at the time of data collection (such as erosion and tree loss), detailed information on stabilization if it was present, and any areas in need of cleanup. We used these data to identify where portions of the Missouri River are being inhibited from natural flow patterns and where potential restoration could occur. Areas with stabilized shorelines were not included if they protect river management infrastructure (tailraces), major highways, cities, or private residences.

Cultural, Geological, Scenic, and Recreation Prioritization

NPS cultural resource experts developed a cultural resource sensitivity model that identified areas that are potentially sensitive for cultural resources (figure 8). The model identifies high- and medium-sensitivity zones in the two conservation areas on the basis of environmental characteristics of known archeological sites within the administrative boundary. Three attributes were used to create the model: archeological site locations, distance to water, and slope.

Chalkstone bluffs, a prominent geologic and scenic feature in the NCCA and on the south side of the Missouri River in the PBCA were mapped in a Geographical Information System (GIS) database using digital elevation models (figure 8). These areas, besides providing scenic value, also make a crucial contribution to river functionality in the form of sediment. Rivers continually use dynamic forces to move sediment throughout the floodplain. Much of this sediment is initially derived from river bluffs.

Current recreational access sites (such as boat ramps) were identified in a GIS layer (figure 9). We established a 500-meter buffer, which allowed us to prioritize a small but reasonable management area around existing access to maintain access to those sites. We then examined where on the Missouri River more access may be needed based on comments from the public and requests from agencies, tribes, or other stakeholders; we also considered areas where more access may be necessary to increase human safety. We incorporated the conservation of existing public access sites through the use of a boundary length modifier (described in the next section); this approach allowed us to identify a network of conserved areas.

Overall Landscape Prioritization

The species-specific maps (figures 3, 4, and 5) are useful for determining where in the landscape the key habitats for the focal species occur. However, they do not help decisionmakers with determining which areas would provide the most effective conservation returns overall.

Besides the presence or absence of habitat for individual species, it is important to consider issues such as connectivity, cost, and unequal conservation need for each species. Accordingly, the software package Marxan (Ball, Possingham, and Watts 2009), with its simulated annealing algorithm, was used to identify "optimal" solutions for conservation prioritization in the NCCA and PBCA. Marxan permits the user to specify individual conservation targets for conservation features (in this case, area of focal species habitat) and species-specific penalties for models that do not meet conservation targets. This feature allows the user to individually weight features—for example, the program can assign penalties for not including enough habitat for species of higher conservation concern, or can reduce the amount of land necessary for generalist widespread species. By des-

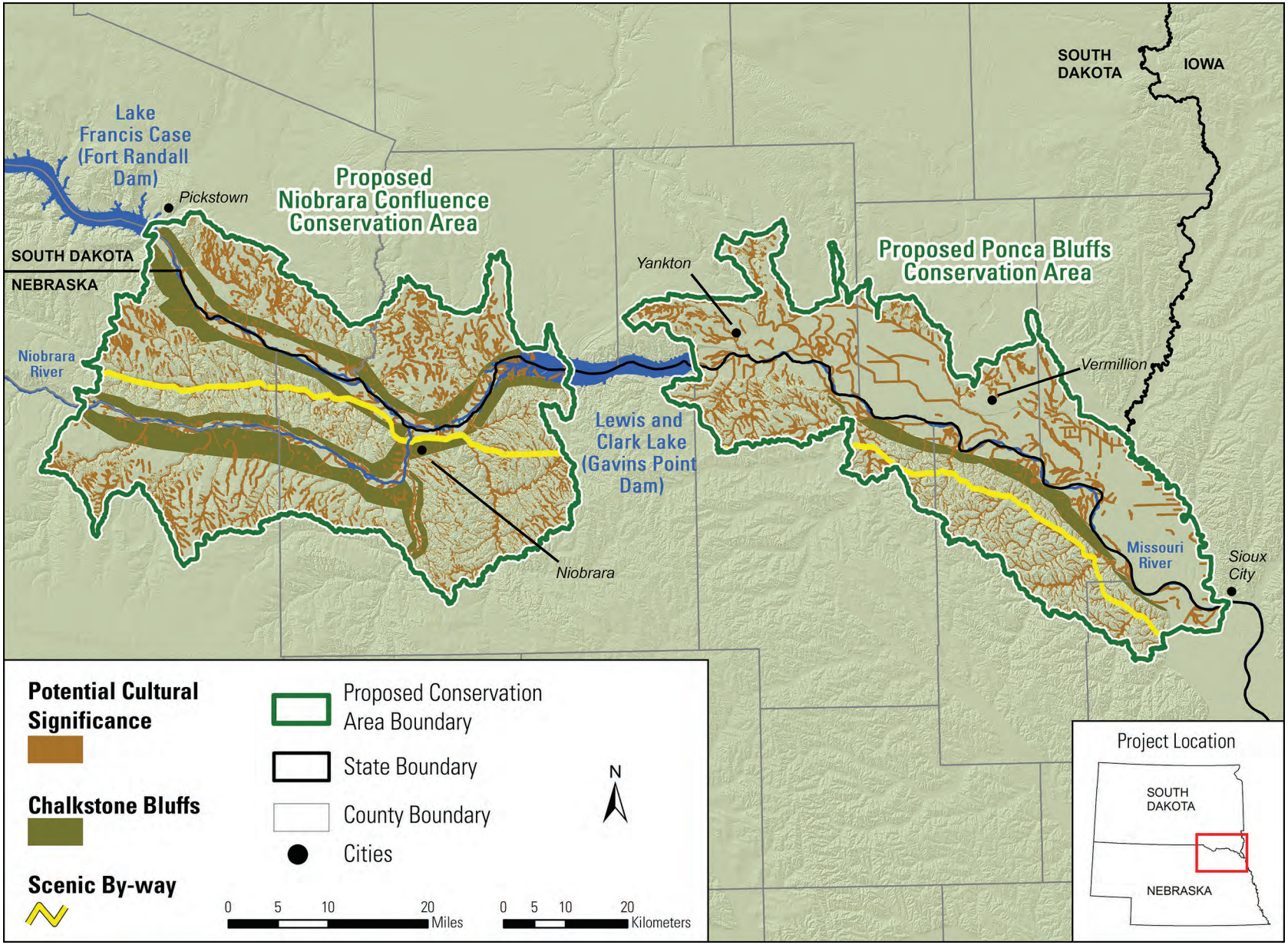

Figure 8. Chalkstone bluffs and historical trails in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

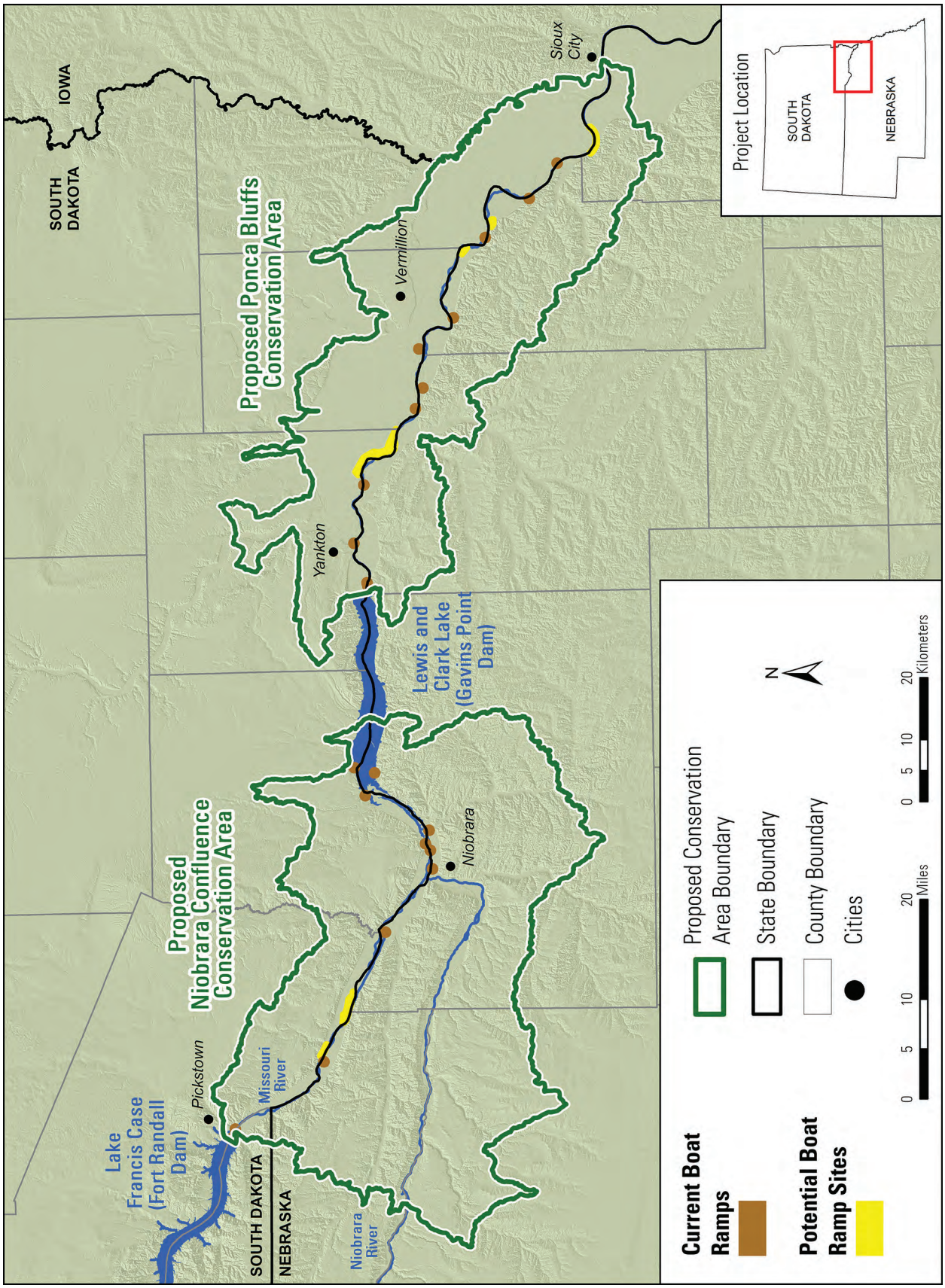

Figure 9. River access points in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

ignating a boundary length modifier, the user can generate a more compact reserve system. The landscape can also be classified by cost; this attribute can be as simple as land area, or it can be made more complex and meaningful by accounting for variables such as land costs or metrics of the human footprint.

Because of the flexibility allowed by Marxan, the values for the selected parameters need to be optimized by successive iterations of the program. For this analysis, hexagonal planning units were selected, as these have been shown to result in less fragmented, more efficient reserve networks (Nhancale and Smith 2011). Hexagons encompassed 20 acres (approximately 8.1 hectares), providing resolution that is sufficient for making land protection decisions while covering the project areas in few enough planning units to be computationally manageable. Hexagons already in a permanent protected status (that is, existing conservation easements or land already owned by the FWS or the NPS in fee title) were locked into the model because they typically met the objectives of the NCCA and PBCA. However, lands owned by federally recognized tribes were excluded from the model because discussions and formal consultation with the tribes suggested that other methods would be more viable than land acquisition to achieve conservation goals. Marxan was run for 100 runs at 100 million iterations. The species-specific data were included as features in the Marxan model. A boundary length modifier of 0.001 was used to create a slightly more compact reserve network. Increasing that value to 0.01 oversimplified the reserve network and did not meet the intent of the NCCA and PBCA.

Targets for protection were set at 50 percent of the land supporting focal species habitats or essential river features (Ecological and Fish and Wildlife ORVs). Targets for Cultural, Geological, Scenic, and Recreation ORVs were set at 25 percent of the entire landscape. We developed individual models for each proposed conservation area (figures 10 and 11).

Evaluation of Easement Potential

As described earlier, acquisition of conservation easements is not a new tool for achieving conservation objectives in the NCCA or PBCA; the Nebraska NRCS holds a number of easements, and nongovernmental organizations hold several easements in the action area. These organizations have missions that are not identical to ours but that share many objectives.

The landscape modeling described above has generated maps of species-specific conservation priorities for each of the focal species, as well as a consensus map that shows where conservation returns for Federal funds would be maximized for the suite of species examined. Biologists and realty specialists would work cooperatively to use these tools to identify parcels where conservation efforts would result in the greatest benefit to trust species.

When a willing seller approaches us, or if we wish to proactively seek out sellers, the following criteria will guide our decisionmaking:

- *Overall conservation value*—is the property located, in whole or in part, in an area that was selected in 60 percent or more of the spatial conservation priority runs in Marxan?

- *Trust species value*—does the parcel contain priority habitat that was identified in any of the species-specific maps developed as part of this exercise?

- *Previously unidentified conservation value*—if neither of the preceding thresholds is reached, is there another compelling reason (such as promoting critical habitat connectivity, identification of new species of conservation concern, simplified management of an existing refuge unit, or donation of intact or easily restored habitat) that justifies the property's protection?

Nothing in these guidelines is intended to limit the appropriate exercising of discretion and professional judgment by realty specialists and refuge staff. Potential acquisitions would be subject to scrutiny to determine (1) that acquisition would comply with realty policy, and (2) that the habitat for which the property was identified as a priority is, in fact, present on the parcel. As mentioned above, there may also be more reasons why acquisition of interest in a parcel is justified, even if the parcel did not rank highly in models for selected priority trust species at the time that this plan was approved.

4.6 Ecosystem Management and Landscape Conservation

The NCCA and PBCA project is a landscape-scale effort to conserve populations of focal species in a highly diverse and endangered ecosystem in the mid–Missouri River basin. Accordingly, it is important that we incorporate the elements of Strategic Habitat Conservation to ensure effective conservation. Stra-

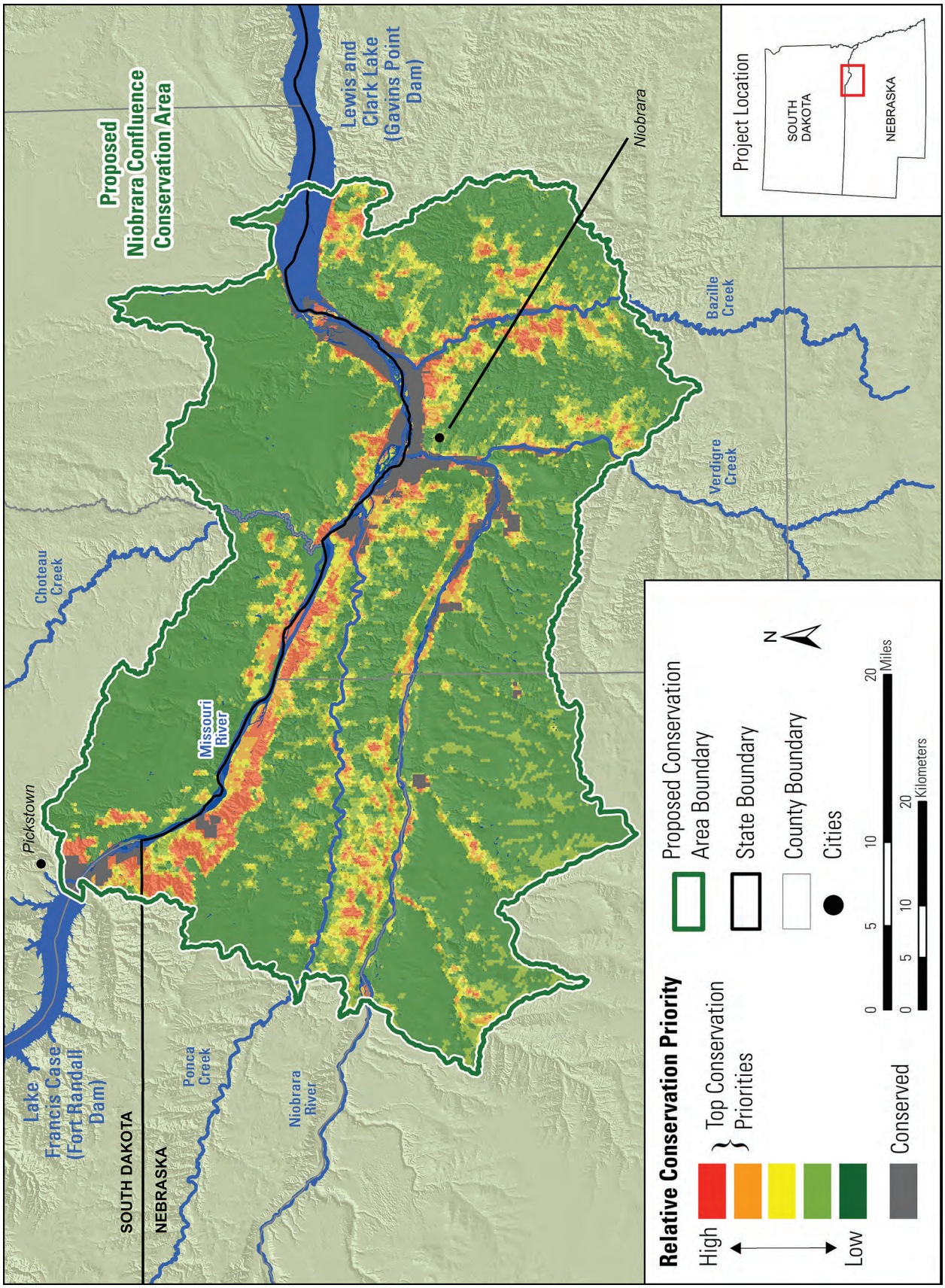

Figure 10. Prioritization map for the proposed Niobrara Confluence Conservation Area, Nebraska and South Dakota.

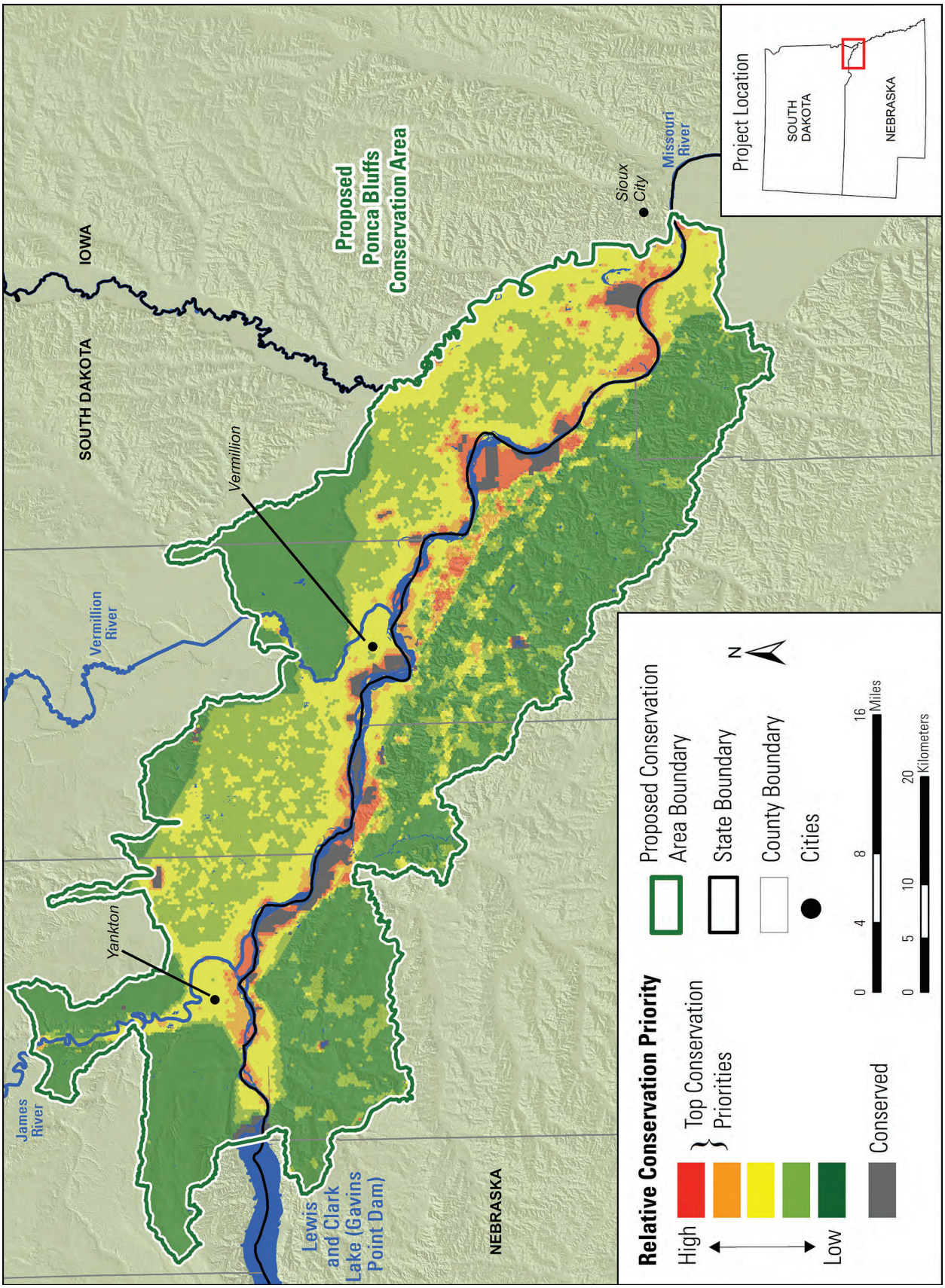

Figure 11. Prioritization map for the proposed Ponca Bluffs Conservation Area, Nebraska and South Dakota.

tegic Habitat Conservation entails strategic biological planning and conservation design integrated with conservation delivery, monitoring, and research at ecoregional scales (figure 12). Some elements of Strategic Habitat Conservation have been addressed in individual species recovery plans developed for federally listed species.

Biological Planning

Biological planning requires the identification of specific biological objectives for focal species so that the relative success of a strategy can be assessed following implementation. The focal species identified to guide prioritization of the NCCA and PBCA were chosen because of our obligations to them as Federal trust species (candidate, threatened, and endangered species and migratory birds), and because land protection undertaken to help these species is likely to have conservation benefits for other species of conservation concern, such as species that are State-listed as threatened or endangered, FWS-designated Birds of Conservation Concern, and FWS-designated Migratory Birds focal species. For example, millions of migratory waterfowl use this portion of the Missouri River as a migratory stopover site or nest and raise their young here. Consequently, by providing for overall river health and function, the NCCA and PBCA project would help these waterfowl species and would contribute to achieving their population objectives as established by the North American Waterfowl Management Plan.

The focal species were chosen with the knowledge that there are gaps in existing data and that the habitat in the action area is likely to evolve over time in response to environmental changes and changes in human water use. As new data become available or as conditions change to the point that this conservation strategy is no longer effective, biological planning would be revisited.

Conservation Design

Preventing loss of habitats identified for the suite of focal species is the goal of the prioritization scheme outlined in section 4.5. That process, which would guide the conservation design of the NCCA and PBCA, is intended to maximize the limited available funds while protecting the optimum configuration of available parcels. While the consensus conservation model is primarily meant to guide effective land acquisition, the individual species maps are intended to guide conservation delivery for those species.

Nick Kaczor / FWS

Upland sandpipers are found in the project area.

Targets set forth in species recovery plans are pivotal factors in conservation design. The recovery plan for interior least tern requires a minimum of 400 adults along the Missouri River in Nebraska and South Dakota, along with 200 adults along the Niobrara River (FWS 1990). The recovery plan for piping plover requires a minimum of 350 breeding pairs in South Dakota and 465 breeding pairs in Nebraska; however, these numbers are based on statewide goals and are not specific to the NCCA and PBCA (FWS 1988). The population recovery goal for pallid sturgeon is based on an adaptive management approach; many of the populations in the NCCA and PBCA are supplemented by hatchery-raised fish because spawning habitat is limited (FWS 1993). However, the tributaries of the Missouri River (especially the Niobrara River) are suggested to be potential spawning areas.

In the absence of specific population goals for the other focal species, no acreage numbers or breeding pair densities have been identified. Following the principle that between 25 and 75 percent of a region must be conserved to meet targets for biodiversity (Noss et al. 2012), the initial target for easement delivery is to protect 50 percent of priority habitat for the other focal species that now exists on private lands. As evolving survey data inform the role of the NCCA and PBCA in meeting specific regional or continental population objectives for other species, the delivery of easement and limited fee-title acquisition can be adjusted accordingly.

Conservation Delivery

Strategic conservation easements and minimal fee-title acquisition are an effective means to conserve rivers, grasslands, and forestland habitats and aid in restoration efforts. However, programs like the FWS's Partner's for Fish and Wildlife are also avail-

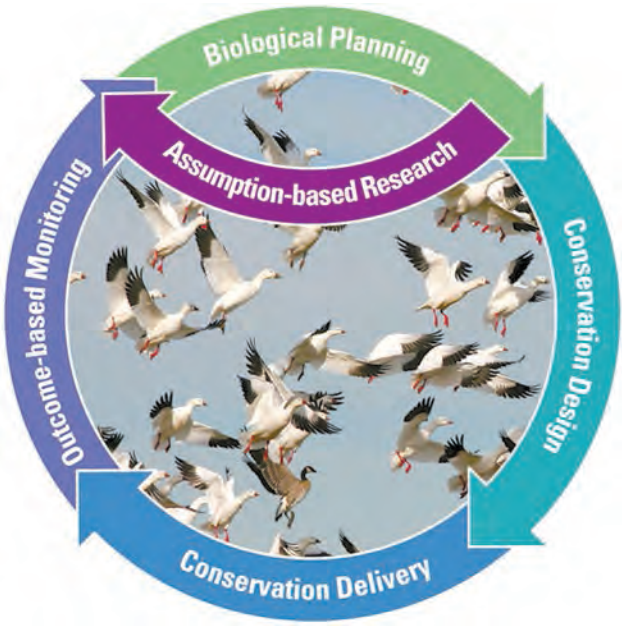

Figure 12. Strategic habitat conservation.

able to work with landowners if a conservation easement or fee-title acquisition is not an option for the landowner. Application of the Strategic Habitat Conservation framework would build on existing partnerships and support the development of new partnerships for delivering conservation throughout the ecoregion.

Conservation design would continue to involve the development of spatially explicit decision support tools for targeting conservation delivery actions. Research and monitoring results would be used to update the modeling parameters that necessary to develop future conservation priorities.

Monitoring and Research

An effective monitoring program is an essential component of strategic habitat conservation Rigorous monitoring ensures that conservation delivery is resulting in net positive benefits for the focal species. Monitoring of populations would help ensure the efficacy of the program; if negative population trends for any of the focal species are detected in the conservation areas or at a regional or continental scale, then further literature review or targeted research can be applied to adjust conservation planning for the NCCA and PBCA.

Some of the monitoring phase of strategic habitat conservation can be carried out using the capacity of the refuge or park biologist and the FWS's Inventory and Monitoring assistance. However, it is important to recognize that similar monitoring would be carried out by partner agencies, and communication among these agencies is crucial for effective monitoring in the face of limited staff and financial resources. Furthermore, staff should leverage biological expertise at regional academic institutions to facilitate basic and applied research while addressing research gaps as they are identified.

Specifically, monitoring and research should include the following:

- Develop, improve, and assess landscape models for focal species. Emphasis would be placed on the highest priority species with the greatest degree of uncertainty regarding limiting factors and the effectiveness of management actions—including easement and land acquisition in the conservation areas—at minimizing and reducing the limiting factors for those species. Data from existing surveys such as Breeding Bird Survey routes and the long-term pallid sturgeon population assessment program in the conservation areas would be evaluated and incorporated into spatial models. When necessary, more data would be collected to evaluate assumptions used in the modeling process, and assessments would be adjusted accordingly. These methods would provide an estimate of the population response of trust species on easement lands and non-easement properties. Similar modeling approaches may be developed or incorporated for priority nontrust species in cooperation with partners such as State wildlife agencies, nongovernmental organizations, and universities.

- Evaluate assumptions and address uncertainties identified through the biological planning, conservation design, and conservation delivery elements.

- Identify appropriate population goals for focal species and assess the contribution of land protection toward meeting the population goals. Results of this analysis would allow us and our conservation partners to refine conservation delivery to ensure maximum effectiveness.

4.7 Sociocultural Consideration

The human population in the conservation areas is generally sparse, and towns are widely scattered. Farm and ranch ownerships vary widely, ranging from 160- to 5,000-acre blocks; this diversity of ownership helps maintain a heterogeneous landscape. The ranchers' livelihoods depend on natural resources—grass, water, and open space—and the key to protecting the NCCA and PBCA lies primarily in sustaining the current pattern of ranching. However, this area provides an extensive recreational destination for many residents in the four-state area. Maintaining a proper balance between existing agricultural production and recreational opportunities would be a crucial component of the LPP's success. We plan to use conservation easements for approximately 80 percent of all conservation actions to keep working ranches on the landscape, keep private lands on the local tax rolls, and maintain the rural aesthetic that characterizes the area.

4.8 Public Involvement and Coordination

Scoping

Public scoping began in February 2012 when we published a notice of intent to prepare an LPP and EIS in the Federal Register on February 15, 2012. We conducted five public meetings during scoping, mailed a planning update, posted information on the LPP Web page, and coordinated with Federal, State, and local agencies and Native American tribes.

An important consideration in the development of this plan—including the vision, goals, objectives, and strategies—is the opinions, perspectives, and values of all interested citizens, agencies, and organized groups. While there are no requirements to base management decisions on public opinion, we value and consider input from the public. As detailed in appendix B, we have consulted with Native American tribes and actively involved Federal and State agencies, local governments, organizations, and private citizens throughout the process.

Draft EIS and LPP

Following publication of the notice of availability in the Federal Register, there will be a 60-day public comment period of the draft EIS and LPP. In addition we will hold public meetings to talk about the EIS and draft LPP and gather public comments. Public comments may be submitted at the public meetings, to the project Web site, or by email or hardcopy at the locations below. All public comments must be received by the dates listed in the notice of availability or public news releases.

4.9 Distribution and Availability

We are distributing the EIS (with the associated draft LPP in the same volume) to the project mailing list, which includes Federal and State legislative delegations, tribes, agencies, landowners, private groups, and other interested individuals. Copies can be requested.

Copies of the EIS and information about public meetings are available by visiting the project Web site or by contacting the FWS by email, postal mail, phone, or in person.

- *Web site*—http://www.parkplanning.nps.gov/niob-ponca
- *Email*—niobrara_ponca@fws.gov
- *Telephone*—303 / 236 4387
- *Address*—
  U.S. Fish and Wildlife Service
  Attention: Nick Kaczor
  Division of Refuge Planning
  134 Union Boulevard, Suite 300
  Lakewood, CO 80228

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