

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—Bourmont, 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



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. His-

torically, 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.

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.



Dugan Smith/NPS

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

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 stop-over 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.

