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The Missouri River: Law, Politics, and Creatures Caught in the Conflicts

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THE MISSOURI RIVER: LAW, POLITICS, AND CREATURES CAUGHT IN THE CONFLICTS

Brook A. Spear*

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I. INTRODUCTION

The Missouri River's waters have served as a central resource to every society that has occupied its shores.¹ However, in recent years advances in watercraft, architecture and power generation have given rise to the need for new methods of controlling the river.² The ensuing modification of the river brought great economic prosperity to the Midwest.³ Unfortunately, this also brought dire consequences to other residents of the Missouri, i.e. two species of birds and one species of fish that are now listed as endangered.⁴ The Interior Least Tern, Piping Plover and Pallid Sturgeon have suffered from the disappearance of 90% of their wetland habitat on the Missouri River.⁵ In an attempt to restore wetland habitat, efforts pursued have been met with considerable opposition: each quantity of water allocated to conservation purposes is a quantity that is divested from another interest that utilizes the river.⁶ Congress has responded by enacting a number of laws in an attempt to remedy the situation.⁷ However, it is unclear whether these measures will be adequate to reverse the decades of river alteration that have ravaged the Missouri River's ecosystem and thereby save the endangered species from extinction.

¹ U.S. Army Corps of Eng'rs, *Final Supplemental Environmental Impact Statement for the Missouri Fish and Wildlife Mitigation Project-Affected Environment ch. 3*, 6 (2003), http://www.moriverrecovery.org/mrrp/MRRP_PUB_DEV.download_documentation?p_file=568 [hereinafter FSEIS ch. 3].

² COMM. ON MISSOURI RIVER ECOSYSTEM SCIENCE, NAT'L RESEARCH COUNCIL, *THE MISSOURI RIVER ECOSYSTEM: EXPLORING PROSPECTS FOR RECOVERY*, 12 (2002), [hereinafter NAT'L RESEARCH COUNCIL].

³ *Id.*

⁴ U.S. Fish and Wildlife Serv., *Missouri River Final Biological Opinion*, 1 (2000), <http://www.nwd-mr.usace.army.mil/mmanual/finalop/MRBO2000.pdf> [hereinafter 2000 BiOp].

⁵ *Id.*

⁶ Daniel Cusick, *Conflicting Priorities Snare 'Big Muddy' Restoration*, EARTH NEWS, Apr. 8, 2008, at para. 14, <http://www.earthportal.org/news/?p=1017>.

⁷ *See*, Water Resources Development Act of 2007, 33 U.S.C. § 2343 (2009).

II. THE RIVER

Nicknamed ‘the Big Muddy,’ the Missouri River is the longest river in the United States and drains one-sixth of North America’s waters. It has earned the name due to the large quantities of silt it carries throughout its course, causing its water to appear opaque and muddy. The Missouri’s flow begins in Montana and continues in a southeasterly direction through North Dakota, South Dakota, Nebraska, Iowa, Kansas and Missouri, with its mouth emptying into the Mississippi River north of St. Louis.⁸ Its total length from Three Forks, Montana to its mouth is 2,341 miles.⁹

In its natural state, the Missouri River was an untamed waterway that meandered over wide expanses, eroding, depositing and accreting sediments, which gradually changed the river’s shape and course.¹⁰ These processes contributed to the creation of islands, chutes, sandbars, dunes, side channels, oxbow lakes and areas of slack water, which formed the basis for an ecosystem that supported a variety of species.¹¹ The diversity of features that comprise the river enables it to support six habitat types: sand dune, cattail marsh, cottonwood-willow, cottonwood-dogwood, elm-oak and the river itself.¹² The backwater areas are critical to the survival of many fish species because the slower moving currents provide areas for feeding, reproduction and shelter.¹³ At one point in time, the river was able to sustain the populations of

⁸ Donald F. Neil & Anthony Demetriades, *The True Utmost Reaches of the Missouri*, MONTANA OUTDOORS, Jul.-Aug. 2005, at para. 22, available at <http://fwp.mt.gov/mtoutdoors/HTML/articles/2005/MissouriSource.htm>.

⁹ United States Geological Survey Central Region, *The Missouri River Story*, MISSOURI RIVER ENVIRONMENTAL ASSESSMENT PROGRAM, at para. 1 (June, 1998), http://infolink.cr.usgs.gov/The_River/.

¹⁰ U.S. Army Corps of Eng’rs, *Final Supplemental Environmental Impact Statement for the Missouri Fish and Wildlife and Mitigation Project-Introduction ch. 1, 7*, (2003), <http://www.nwk.usace.army.mil/projects/mitigation/fseis/fseis-chapter1.pdf> [hereinafter FSEIS ch. 1].

¹¹ *Id.*; FSEIS ch. 3, *supra* note 1, at 19.

¹² Clifton Stone, *The Big, Muddy Missouri*, S.D. PROJECT WILD NEWSLETTER (S.D. Game, Fish and Parks), Mar. 2007, at 2, <http://www.sdgifp.info/Wildlife/Education/Projwild/DakotaWildMarch07.pdf>.

¹³ FSEIS ch. 3, *supra* note 1, at 19.

160 species of wildlife and 150 species of fish.¹⁴ Because the Missouri River and its ecosystem have changed so dramatically over the past century, these numbers have declined.¹⁵

Prior to the European settlers' arrival, the Missouri River was used by several Native American tribes.¹⁶ The name 'Missouri' originated from an Illinois tribe's name for a Siouan tribe dwelling on the river that they called *ouemessourita*, meaning "those who have dugout canoes."¹⁷ The river and its ecosystem provided the tribes with such resources as fish, water, wood and game.¹⁸ Originally, the Native American tribes were nomadic hunters and gatherers, but horticulture eventually became part of their practices.¹⁹ Even so, there was minimal cultivation of crops near the river's floodplain because of the periodic, yet unpredictable, flooding that would occur there.²⁰

When Europeans eventually began migrating westward, French explorers Louis Jolliet and Jacques Marquette were the first Europeans to lay eyes on the river in 1673, after hearing it rushing into the Mississippi.²¹ The most noteworthy efforts undertaken in the river's discovery were those of James McKay and John Evans in 1795.²² These explorers were enlisted by the Spanish to find a route to the Pacific Ocean via the upper Missouri and oust any British who attempted to lay claim to the area.²³ The map of the

¹⁴ Stone, *supra* note 12, at 2.

¹⁵ *Id.*

¹⁶ FSEIS ch. 3, *supra* note 1, at 6.

¹⁷ *Missouri*, MISSOURI TRAVEL GUIDE, at para. 1 (2009), <http://www.missouri.com.au/> (last visited Jan. 19, 2010).

¹⁸ FSEIS ch. 3, *supra* note 1, at 5.

¹⁹ *Id.* at 82.

²⁰ *Id.* at 17.

²¹ ENCYCLOPEDIA BRITANNICA ONLINE, *Louis Joillette*, at para. 1 (2010), <http://www.britannica.com/EBchecked/topic/305759/Louis-Jolliet> (last visited Jan. 19, 2010); Oliver Chanler, *Along the 'Big Muddy,' the Longest River in the United States*, at para. 5, (2005), <http://www.voanews.com/specialenglish/archive/2005-08/2005-08-09-voa3.cfm>.

²² The Illinois State Museum, *Lewis & Clark in the Illinois Country, The McKay and Evans Map*, at para. 1, (2006), http://www.museum.state.il.us/exhibits/lewis_clark_il/htmls/il_country_exp/preps/mackay_evans_map.html.

²³ *Id.* at para. 1.

upper Missouri they created would eventually be used by Meriwether Lewis and William Clark in their expedition in 1804.²⁴

While dugout canoes were once the primary method of travel on the Missouri, keelboats began to take their place by the early 19th century when Europeans began using the river to facilitate the transportation of goods.²⁵ French trappers had been exploiting the area for pelts and trading them with Native Americans since 1700, but the development of more advanced boats caused the industry to boom, leading to the erection of trading posts along the river.²⁶ The town of Ste. Genevieve, established by the French in the 1730's, was the first permanent settlement on the Missouri.²⁷ As the economy of the river burgeoned, St. Louis became established as a fur trading post in 1764 followed by Westport landing, which later became Kansas City.²⁸

The year 1819 marked the advent of steamboats on the Missouri River.²⁹ This advance accelerated commercial activity in the fur industry by enabling more efficient transportation of goods and people.³⁰ It also contributed to other settlements springing up along the river, such as Independence, Kansas City and St. Joseph.³¹ The United States' policy of westward expansion also led to the development of military forts along the river's path, which served to protect the fur trade for Americans and prevent the British from establishing dominance in the industry.³²

Omaha was established in 1854, and the construction of the first transcontinental railroad during the same time period caused its population to rise along with other cities adjacent to the river.³³

²⁴ *Id.* at para. 4.

²⁵ FSEIS ch. 3, *supra* note 1, at 5.

²⁶ *Id.*

²⁷ *Id.* at 83.

²⁸ *Id.* at 83-84.

²⁹ *Id.*

³⁰ *Id.*

³¹ *Id.*

³² Friends of Fort Atkins, *Fort Atkinson, Nebraska: The History of Fort Atkinson*, NEBRASKAland Magazine, (1987), at para. 8-9, <http://www.fortatkinsononline.org/FortAtkinsonahistory.htm>.

³³ FSEIS ch. 3, *supra* note 1, at 84.

Even with the onset of railroad transportation, steamboats were carrying ever-increasing capacities of goods and people, especially after the discovery of gold deposits in Montana in the 1860's.³⁴ In the 20th century, steamboats were replaced with tugboats and barges, which were able to transport more commodities at less expense.³⁵ Over time, it became apparent that navigation on the Missouri was quite treacherous; hundreds of craft sunk to the bottom due to its swift currents and snags.³⁶ The recurrent loss of life and property set the stage for what would become the first attempts of humans to control the flow of the Big Muddy.³⁷

III. THE ANIMALS

The Missouri River is still used for many of the same purposes it has been throughout its history.³⁸ However, as time progressed, the methods that are used to direct the river toward accommodating these needs have become increasingly complex.³⁹ With little forethought as to how modification of the Big Muddy negatively affected other benefits it supplied, public works projects and private industries that utilized its waters dominated use decision.⁴⁰ Developments of modern society have had dire repercussions for the ecology of the Missouri.⁴¹ As a result, three animals that depend on the river for specialized habitats are now listed as endangered.⁴²

A. The Interior Least Tern

The Interior Least Tern is a species of bird that was listed as federally endangered on June 27, 1985.⁴³ What was once a very

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.* at 5.

³⁷ *Id.*

³⁸ 2000 BiOp, *supra* note 4, at 36.

³⁹ NAT'L RESEARCH COUNCIL, *supra* note 2, at 12.

⁴⁰ *Id.* at 15.

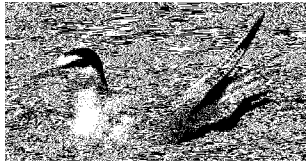
⁴¹ 2000 BiOp, *supra* note 4, at 235.

⁴² *Id.*

⁴³ *Id.* at 81.

common bird has over the last two centuries diminished in number, rebounded and then dropped off again.⁴⁴ During the Lewis and Clark expedition of 1804, the explorers saw the bird frequently.⁴⁵

The species' numbers first began to decline in the late 19th century because the birds' skin and feathers were used in making women's hats.⁴⁶ After the passage of the Migratory Bird Treaty Act of 1918, however, their numbers began to recover up until the 1940s.⁴⁷ Unfortunately, the positive effects of the legislation would be undone by future development in the species' habitat, a large part of which included the Missouri River.⁴⁸ The Interior Least Tern is an indicator species, meaning that the strength of its population signifies whether its ecosystem is healthy.⁴⁹



Barren sandbars in the vicinity of stable food sources are the optimal nesting habitat for Interior Least Terns.⁵⁰ Areas by the shoreline that consist of either sand or pebble substrates are the most suitable, provided that they are well-drained and far enough from the water to avoid occasional upsurges.⁵¹ The birds prefer

⁴⁴ *Least Tern-An Endangered Species*, NEBRASKA PARKS AND GAME COMMISSION, at para. 2-3, <http://www.ngpc.state.ne.us/wildlife/ltern.asp> (last visited Jan. 19, 2010) [hereinafter Tern 1].

⁴⁵ Eileen Dowd Stukel, *Least Tern (Sterna antillarum)*, NORTHERN STATE UNIVERSITY, at para. 6 (1994), <http://www3.northern.edu/natsource/ENDANG1/Leastt1.htm> [hereinafter Tern 2].

⁴⁶ Tern 2, *supra* note 45, at para. 6.

⁴⁷ Tern 1, *supra* note 44, at para. 3.

⁴⁸ *Id.*

⁴⁹ Fair Funding for Wildlife, *Showcase Species: Missouri-Upper Missouri Interior Least Tern*, NATIONAL WILDLIFE FEDERATION, at 46 (2009), <http://www.nwf.org/endangered/pdfs/UMI-LeastTern.pdf> (last visited Jan. 19, 2010).

⁵⁰ *Id.* at 83.

⁵¹ U.S. Fish & Wildlife Serv., *2003 Amendment to the 2000 Biological Opinion on the Operation of the Missouri River Main Stem Reservoir System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation*

nesting sites that have little vegetation because predators may utilize vegetation as cover to hide as they steal the birds' eggs.⁵² Sandbars are not permanent sites, but are continually destroyed and reformed through natural river processes (e.g. erosion, deposition and accretion).⁵³

Barren sandbars, once a dominant feature of the Missouri, are now virtually non-existent from Sioux City, Iowa to St. Louis, Missouri.⁵⁴ They have also been significantly reduced in all other sections of the river.⁵⁵ The most significant contributor to the decline is river stabilization, accomplished through channelization structures such as water diversions, impoundments and dams.⁵⁶

The decrease in natural flows has led to the reduction of the sediment load that travels down the river, resulting in more degradation and less aggradation of the riverbed.⁵⁷ This decrease is the result of reservoirs and pools trapping the sediment loads behind their barriers.⁵⁸ Manmade structures inhibit the natural spring flood pulses from melting snow that aid in the movement of sediments.⁵⁹ When the pulses are not allowed to flow, not only are no new sandbars created, but the ones that do exist become overgrown with vegetation, leading the birds to nest in areas that are subject to frequent intrusions by predators.⁶⁰ This has compelled the Interior Least Tern to nest in non-traditional locations.⁶¹ Reported substitute breeding grounds include dike fields, sand and gravel pits, ash disposal areas of power plants,

Project and Operation of the Kansas River Reservoir System, at 38, (2003), <http://www.nwd-mr.usace.army.mil/mmanual/FinalBO2003.pdf> [hereinafter 2003 BiOp].

⁵² *Id.*

⁵³ 2000 BiOp, *supra* note 4, at 84.

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ *Id.*

⁵⁷ *Id.* at 85.

⁵⁸ *Id.*

⁵⁹ 2003 BiOp, *supra* note 51, at 22

⁶⁰ 2000 BiOp, *supra* note 4, at 85.

⁶¹ *Id.* at 83, 123.

gravel roads, reservoir shores, agricultural fields, parking lots, graveled rooftops, dredge piles and the tops of levees.⁶²

Interior Least Tern breeding begins in early to mid-May.⁶³ When the bird mates, it engages in various courtship displays including nest scraping, vocalizations and postures.⁶⁴ It also takes part in ‘fish flight’ where the male carries a fish in its beak and makes calls while performing an aerial display.⁶⁵ He will be joined by one or two female terns that also maneuver with him in the air.⁶⁶ He will then give the fish to a female, which solidifies their bond.⁶⁷ After courtship, the birds will make a nest scrape in an open area by forming a depression in sand or gravel and disguising it with pebbles or shells.⁶⁸

Females usually lay two to three brown, spotted eggs.⁶⁹ The egg incubation period lasts for twenty days, and both parents aid in incubating, feeding and protecting the nest.⁷⁰ If the nest ever comes under threat by predators, the adults will protect it by dive-bombing, shrieking or defecating on the intruder.⁷¹ After the eggs hatch, it takes another twenty days for the chicks to become fledglings.⁷² The chicks are able to fly in three weeks, but the parents continue to feed them fish until they migrate for the wintering season in August.⁷³

⁶² 2000 BiOp, *supra* note 4, at 83; 2003 BiOp, *supra* note 51, at 41; Missouri Department of Conservation, *Interior Least Tern-Sterna antillarum athalassos*, at para. 11 (1997), <http://www.mdc.mo.gov/nathis/endangered/endanger/tern/> [hereinafter Tern 3].

⁶³ Tern 1, *supra* note 44, at para. 10.

⁶⁴ 2003 BiOp, *supra* note 51, at 29.

⁶⁵ Tern 1, *supra* note 44, at para. 15.

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ *Id.* at para. 16; *The Interior Least Tern*, PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM, at para. 9, <http://www.platteriverprogram.org/AboutPRRIP/Pages/LeastTern.aspx> (last visited Jan. 19, 2010) [hereinafter Tern 4].

⁶⁹ Tern 4, *supra* note 68, at para. 3.

⁷⁰ 2003 BiOp, *supra* note 51, at 29.

⁷¹ Tern 1, *supra* note 44, at para. 11.

⁷² Tern 3, *supra* note 68.

⁷³ Tern 1, *supra* note 44, at para. 19.

The Interior Least Tern is piscivorous, meaning that its diet consists mainly of fish.⁷⁴ Some experts believe that the bird is an opportunistic feeder because it eats an array of species of fish within a certain length range,⁷⁵ usually between one and three inches.⁷⁶ They have been known to eat crustaceans and insects as well.⁷⁷ The Interior Least Tern's food availability presents another hindrance to the species' survival.⁷⁸ Manmade structures in the Missouri River have caused the former abundance of small fish to dwindle.⁷⁹ In one study, the composition of fish species in unaltered areas of the river consisted of 55% small native minnows.⁸⁰ In contrast, minnows comprised only between 3% and 27% of fish species in areas that had undergone structural modification.⁸¹ Part of the reason for this disparity is that reservoirs tend to have colder temperatures, which are not ideal for small fish breeding.⁸² To date, the Missouri's shallow water and low velocity habitat on which small fish species depend has been reduced by as much as 90%.⁸³

Control structures also prevent fish that spawn in the floodplain from reaching the river via spring pulses.⁸⁴ When the river's water level drops, fish in the floodplain migrate to the river where they become available to the Interior Least Tern population.⁸⁵ When levees disrupt the connection between the floodplain and the river, this process is no longer possible.⁸⁶ The decrease in

⁷⁴ 2003 BiOp, *supra* note 51, at 39.

⁷⁵ *Id.*

⁷⁶ Montana Natural Heritage Program & Montana Fish, Wildlife and Parks, *Least Tern — Sternula antillarum*, MONTANA FIELD GUIDE, at para. 7, http://fieldguide.mt.gov/detail_ABNNM08100.aspx (last visited Jan. 19, 2010).

⁷⁷ *Id.*

⁷⁸ 2003 BiOp, *supra* note 51, at 41.

⁷⁹ *Id.*

⁸⁰ *Id.* at 42.

⁸¹ *Id.*

⁸² U.S. Fish & Wildlife Serv., N.D. Field Office, *Least Tern (Sterna antillarum)*, at para. 8 (2008), http://www.fws.gov/northdakotafeldoffice/endspecies/species/least_tern.htm.

⁸³ *See* BiOp 2003, *supra* note 51, at 44.

⁸⁴ *Id.*

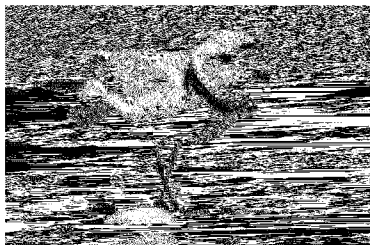
⁸⁵ *Id.*

⁸⁶ *Id.* at 45.

availability of food during times of reproduction has led to a reduction in egg weights, clutch sizes and chick weights.⁸⁷ This result, in turn, leads to lower chick survival and fledgling rates.⁸⁸

B. The Piping Plover

The Piping Plover shares a similar history to that of the Interior Least Tern with respect to its numbers.⁸⁹ The bird's population declined in the 19th century due to the use of its parts in the millinery industry.⁹⁰ The numbers also rebounded because of the Migratory Bird Treaty Act of 1918 and diminished again when manmade structures destroyed their habitat.⁹¹ Consequently, the bird was listed as a federally endangered species on January 10th, 1986.⁹² Like the Interior Least Tern, it is an indicator species of the health of the ecosystem.⁹³



The Piping Plover prefers large, barren sandbars in open channel beds.⁹⁴ It will use sand or gravel substrates, but prefers a

⁸⁷ *Id.* at 41.

⁸⁸ *Id.*

⁸⁹ See *Piping Plovers (Charadrius melodus)*, EDWIN B FORSYTHE NAT'L WILDLIFE REFUGE, U.S. FISH & WILDLIFE SERV., at para. 1 (2009), http://www.fws.gov/northeast/forsythe/piping_plovers.html.

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² See BiOp 2003, *supra* note 51, at 47.

⁹³ *Showcase Species: Missouri-Upper Missouri Piping Plover*, FAIR FUNDING FOR WILDLIFE, NAT'L WILDLIFE FED'N, at 49 (2009), <http://www.nwf.org/endangered/pdfs/UpperMissouri-PipingPlover.pdf> (last visited Jan. 19, 2010) [hereinafter Plover 1].

⁹⁴ 2003 BiOp, *supra* note 51, at 51.

mixture of both, which more effectively camouflages the nest.⁹⁵ The bird favors nests that are higher up from the water to avoid inundation and to have a panoramic view of its nesting site and threats to it.⁹⁶ The same threats from human activity that affect the Interior Least Tern's habitat also impact the Plover's, causing them to have to find less suitable areas outside of the river channel or fail to breed.⁹⁷

Migration to the Piping Plover's breeding ground along the Missouri River begins in March, and their mating behavior begins in mid-April.⁹⁸ Males will select an area to claim as their respective territory and form a nest scrape by digging a depression in the sand with their legs.⁹⁹ The females will survey the scrapes until they select the one they find the most acceptable and then commence camouflaging it with shells and other debris.¹⁰⁰ At this point, she will allow the male to mate with her.¹⁰¹ The male will puff up and begin marching towards the female stomping its legs as a part of its mating ritual.¹⁰² Copulation lasts for a few minutes, and the birds will stay mated with their partner for the entire season.¹⁰³

Normally, the female Plover will lay four mottled eggs, which are protected by the camouflaged nest.¹⁰⁴ Both sexes share

⁹⁵ 2000 BiOp, *supra* note 4, at 91.

⁹⁶ 2003 BiOp, *supra* note 51, at 51.

⁹⁷ 2000 BiOp, *supra* note 4, at 93.

⁹⁸ Cape May Nat'l Wildlife Refuge, U.S. Fish & Wildlife Serv., *Piping Plover* (*Charadrius melodus*), at para. 5 (2009), <http://www.fws.gov/northeast/capemay/pipingplover.html>.

⁹⁹ Plover 1, *supra* note 93, at 48.

¹⁰⁰ Eileen Dowd Stukel, *Piping Plover* (*Charadrius melodus*), at para. 3 (1994), <http://www3.northern.edu/natsource/ENDANG1/Piping1.htm>

¹⁰¹ *Id.*

¹⁰² Tex. Parks and Wildlife Dep't, *Piping Plover* (*Charadrius melodus*), at para. 2 (2009), <http://www.tpwd.state.tx.us/huntwild/wild/species/piplover/>.

¹⁰³ Ill. Natural History Survey, *Piping plover-Charadrius melodus, Life History*, at para. 2, http://www.inhs.illinois.edu/animals_plants/birds/ifwis/birds/piping-plover.html (last visited Jan. 19, 2010); Natural Res. Conservation Serv., U.S. Dep't of Agric., *Threatened and Endangered Species: Piping Plover Charadrius melodus Fact Sheet*, at para. 6, (2005), <http://www.mt.nrcs.usda.gov/news/factsheets/pipingplover.html>.

¹⁰⁴ Plover 1, *supra* note 93, at 49.

in the incubation of the eggs, and they will hatch within a month.¹⁰⁵ Within hours of being born, the chicks are capable of running around and feeding themselves, although some will stay at the nest for a few days.¹⁰⁶ They will be able to fly in four weeks.¹⁰⁷

Piping Plovers eat a variety of animals, including insects, spiders, mollusks, crustaceans, marine worms, minute worms and other small marine animals and their eggs.¹⁰⁸ Most of what they feed on can be found in wet, sandy areas between high tide line and the water level, and they will forage for food by pecking at exposed substrates.¹⁰⁹ Piping Plovers will hunt for food at any time, day or night.¹¹⁰

C. The Pallid Sturgeon

Nicknamed “the ugliest fish in North America,” the Pallid Sturgeon originated in the Cretaceous Period over 70 million years ago.¹¹¹ It was robust enough to survive even the Ice Age, but is now one of the rarest fish in the Missouri and Mississippi River

¹⁰⁵ Montana Natural Heritage Program & Montana Fish, Wildlife and Parks, *Piping Plover - Charadrius melodus*, MONTANA FIELD GUIDE, at para. 22, http://fieldguide.mt.gov/detail_ABNNB03070.aspx (last visited Jan. 19, 2010).

¹⁰⁶ South Dakota Game, Fish and Parks, *Piping Plover-Charadrius melodus*, at para. 2, <http://www.sdgfp.info/Wildlife/WildlifePlans/PPIndex.htm> (last visited Jan. 19, 2010); U.S. Fish & Wildlife Serv., *Piping Plover Fact Sheet*, at para. 4 (2009), <http://www.fws.gov/midwest/endangered/pipingplover/pipingpl.html> [hereinafter Plover 2].

¹⁰⁷ Plover 2, *supra* note 106, at para. 10.

¹⁰⁸ 2000 BiOp, *supra* note 4, at 92; South Dakota Game, Fish and Parks, *Piping Plover-Charadrius melodus*, at para. 2, <http://www.sdgfp.info/Wildlife/WildlifePlans/PPIndex.htm> (last visited Jan. 19, 2010); U.S. Fish & Wildlife Serv., *Piping Plover Fact Sheet*, at para. 4 (2009), <http://www.fws.gov/midwest/endangered/pipingplover/pipingpl.html>.

¹⁰⁹ 2003 BiOp, *supra* note 51, at 51; U.S. Fish & Wildlife Serv., *All About Piping Plovers*, at para. 4, <http://www.fws.gov/plover/facts.html> (last visited Jan. 19, 2010).

¹¹⁰ Nat'l Park Serv., U.S. Dep't of the Interior, *Piping Plover Chicks Hatch at Cape Point*, at para. 9 (2006), <http://www.nps.gov/caha/parknews/piping-plover-chicks-hatch-at-cape-point.htm>.

¹¹¹ U.S. Fish & Wildlife Serv., Mountain-Prairie Region, *The Pallid Sturgeon, a Missouri River "Dinosaur"*, at para. 1-2, <http://www.fws.gov/mountain-prairie/feature/sturgeon.html> (last visited Jan. 19, 2010) [hereinafter Sturgeon 1].

systems.¹¹² Even though the species may live up to 100 years, its numbers have declined markedly.¹¹³ The fish was declared a federally endangered species on September 6, 1990.¹¹⁴ Like the Interior Least Tern and Piping Plover, it is an indicator species for its ecosystem.¹¹⁵



The Pallid Sturgeon's historical range included the Yellowstone, Platte, Kansas, Missouri and middle and lower Mississippi River regions.¹¹⁶ Today, it can be found in most of its original range, though the population has declined dramatically throughout.¹¹⁷ During the months of July through October, the fish travels upstream, and between December and March it travels downstream.¹¹⁸ This migration has been attributed to fluctuating temperatures and discharges of water.¹¹⁹ Due to river modification, the natural pulses do not occur, and the fish cannot migrate to spawning areas as far up the Missouri River as they once did.¹²⁰

¹¹² Becky Latka, *Partnering for Pallid Passage*, WOMEN IN NATURAL RESOURCES, May 2009, at para. 2, <http://www.cnr.uidaho.edu/winr/Latka05.09sides.htm>; Office of Pesticide Programs, U.S. Evtl. Protec. Agency, *Status and Life History of the Pallid Sturgeon*, at 2 (2007), http://www.epa.gov/espp/litstatus/effects/appendix_c_life_history_sturgeon.pdf [hereinafter Sturgeon 2]

¹¹³ Missouri River Institute, Univ. of South Dakota, *Pallid Sturgeon (Scaphirhynchus albus)*, MISSOURI NATIONAL RECREATIONAL RIVER WATER TRAIL FIELD GUIDE, at para. 1, <http://mri.usd.edu/watertrail/FieldGuide/fish.html> (last visited Jan. 19, 2010).

¹¹⁴ Sturgeon 2, *supra* note 112, at 1.

¹¹⁵ See Sturgeon 1, *supra* note 111, at para. 9.

¹¹⁶ 2000 BiOp, *supra* note 4, at 97; 2003 BiOp, *supra* note 51, at 57

¹¹⁷ Jim Riis, SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS, *Pallid Sturgeon (Scaphirhynchus albus)*, at para. 4, (1993), <http://www3.northern.edu/natsource/ENDANG1/Pallid1.htm> [hereinafter Sturgeon 3]

¹¹⁸ 2003 BiOp, *supra* note 51, at 60.

¹¹⁹ *Id.*

¹²⁰ Andrew McKean, *A Whisker Away from Winking Out...Will the pallid sturgeon go extinct on our watch?*, MONTANA OUTDOORS, May-June 2006, at

Pallid Sturgeon prefer large, warm, free-flowing waters with high turbidity.¹²¹ On the upper Missouri, the Pallid Sturgeon has been found mostly in sand bar complexes.¹²² In the middle Missouri, side-channels are the favored habitat.¹²³ In the lower Missouri, the sturgeon occupies deep holes, but has been occasionally spotted in side-channel habitats.¹²⁴ Areas that have complex current patterns, such as wing dike tips, sandbars and drop offs, are ideal; slack water areas seem to be devoid of adult sturgeon.¹²⁵

The channelization of the Missouri River has caused the decrease in the sediment load necessary to create the Pallid Sturgeon's habitat, which prevents side channels, islands and sandbars from forming.¹²⁶ Another consequence of river modification is that the surface area of the river has been reduced by one half, and the velocity of its currents has doubled.¹²⁷ Spawning and rearing habitats have been destroyed, and the lack of sediment, organic materials and woody debris traveling down the river has lowered the turbidity to which the species has adapted.¹²⁸

The Pallid Sturgeon is slow to reach reproductive capability.¹²⁹ Males reach sexual maturity between the ages of seven and nine years; females are able to reproduce between fifteen and twenty years of age.¹³⁰ There are two to three years between spawning events for males, and three to ten for females. Food availability and frequency of flooding events are the critical factors affecting the amount of time between spawning events.

para. 9, <http://fwp.mt.gov/mtoutdoors/HTML/articles/2006/pallidsturgeon.htm> [hereinafter Sturgeon 4].

¹²¹ 2003 BiOp, *supra* note 51, at 55.

¹²² *Id.* at 67.

¹²³ *Id.*

¹²⁴ *Id.*

¹²⁵ *Id.* at 68.

¹²⁶ *Id.* at 73.

¹²⁷ Sturgeon 2, *supra* note 112, at 9.

¹²⁸ Montana Fish, Wildlife & Parks, *Pallid Sturgeon*, at para. 3, <http://fwp.mt.gov/wildthings/tande/pallid.html> (last visited Jan. 19, 2010) [hereinafter Sturgeon 5].

¹²⁹ 2003 BiOp, *supra* note 51, at 55.

¹³⁰ *Id.*

Spawning takes place between June and August.¹³¹ The fish will lay its adhesive eggs on gravel or cobble substrates in areas with moderate current flow.¹³² They will hatch within five to eight days.¹³³ Often times the fish will spawn at the heads of islands, and after hatching, larvae will float downstream to eddy pools and the tips of islands where they will be protected.¹³⁴ When the larvae grow tails they will move to slower moving waters until they are more mature.¹³⁵

Of the thousands of eggs that are laid, only a handful will reach maturity.¹³⁶ This has been attributed to the construction of dams, which prevent substrate sedimentation and the formation of the fish's habitat downstream.¹³⁷ Another physical obstacle is that the newly-hatched Pallid Sturgeons that travel downstream cannot make it past the dams, leaving them to die in reservoirs.¹³⁸ A further impediment to the species' survival is that its population is aging, and it is thought that this has led to fewer spawning events.¹³⁹

During its earliest life stages, the Pallid Sturgeon eats benthic macro-invertebrates.¹⁴⁰ As the fish matures, it eats more fish.¹⁴¹ It is believed that the species is an opportunistic feeder because it will eat certain fish and insects during some seasons and

¹³¹ Sturgeon 2, *supra* note 112, at 6.

¹³² 2003 BiOp, *supra* note 51, at 55.

¹³³ Natural Resources Conservation Service, United States Department of Agriculture, *Threatened and Endangered Species: Pallid Sturgeon Scaphirhynchus Fact Sheet*, at para. 6, (2005), <http://www.mt.nrcs.usda.gov/news/factsheets/pallidsturgeon.html>.

¹³⁴ 2003 BiOp, *supra* note 51, at 58.

¹³⁵ Sturgeon 4, *supra* note 120, at para. 9.

¹³⁶ Ken Burton, *New Hope for the Pallid Sturgeon*, U.S. FISH & WILDLIFE SERVICE ENDANGERED SPECIES BULLETIN, January-April 2000, at 5, *available at* <http://www.fws.gov/endangered/bulletin/2000/01-04/04-05.pdf>.

¹³⁷ Sturgeon 2, *supra* note 112, at 9.

¹³⁸ Montana Natural Heritage Program & Montana Fish, Wildlife and Parks, *Pallid Sturgeon - Scaphirhynchus albus*, MONTANA FIELD GUIDE, at para. 8, http://fieldguide.mt.gov/detail_AFCAA02010.aspx (last visited Jan. 19, 2010).

¹³⁹ Sturgeon 5, *supra* note 128, at para. 5-6.

¹⁴⁰ 2003 BiOp, *supra* note 51, at 56.

¹⁴¹ *Id.*

different ones in others.¹⁴² The Pallid Sturgeon has also been known to stand on its fins and wait for currents to wash food into its mouth.¹⁴³ It is also a suctorial bottom feeder, which means it will use its protrusible mouth to snatch up fish.¹⁴⁴

IV. THE HUMANS

The Missouri River has been a critical resource for all the societies that have developed near its shores.¹⁴⁵ Once European settlers entered the area, the first significant modifications to the river occurred.¹⁴⁶ The river was altered primarily for the purpose of navigation.¹⁴⁷ As previously mentioned, the untamed waterway was treacherous to pilots and their steamboats.¹⁴⁸ Throughout its history, the Missouri River has also been a host to many diverse uses such as irrigation, flood control, water quality control, hydroelectric power, thermal power, recreation, water supply and fish and wildlife conservation.¹⁴⁹ Some of the Missouri's uses are in direct conflict with each other, resulting in politically charged decision-making.¹⁵⁰ Efforts to correct the deleterious effects of river modification on the ecosystem have been met with staunch opposition by groups who feel their interests are being ignored.¹⁵¹

¹⁴² Sturgeon 2, *supra* note 112, at 7.

¹⁴³ 2000 BiOp, *supra* note 4, at 111.

¹⁴⁴ Sturgeon 2, *supra* note 112, at 7.

¹⁴⁵ See FSEIS ch. 3, *supra* note 1, at 4-6.

¹⁴⁶ See *Id.*

¹⁴⁷ *Id.* at 5.

¹⁴⁸ *Id.*

¹⁴⁹ See *Id.*

¹⁵⁰ Peter Sundry, *Fish and Wildlife Coordination Act, United States*, in THE ENCYCLOPEDIA OF EARTH, at para. 1, (Peter Sundry ed., 2009), http://www.eoearth.org/article/Fish_and_Wildlife_Coordination_Act,_United_States.

¹⁵¹ Eric Fowler, *New Life for the Mighty Mo*, NEBRASKALAND, at para. 45-52, <http://www.ngpc.state.ne.us/nebland/articles/outdoors/mightymo.asp> (last visited Jan. 19, 2010).

A. Navigation

Before the Europeans arrived, Native Americans used the Missouri River for travel via buffalo skin ‘bull boats,’ although the extent of use was not considerable.¹⁵² No substantial modification to the river for navigational purposes was undertaken until European settlers began using steamboats.¹⁵³ In 1832, Congress approved measures which would provide for the United States Army Corps of Engineers (Corps) to remove snags to help shallow-draft steamboats navigate safely.¹⁵⁴ Under this authorization, upwards of 16,000 snags would be dislodged between 1843 and 1846.¹⁵⁵ The trees that were removed would be used as fuel for steamboats, which exhausted more than twenty cords of wood per day while traveling upstream.¹⁵⁶ The river’s banks were almost entirely clear cut for steamboat fuel.¹⁵⁷ In the late 1800’s, the Corps’ attempts to make the river’s banks more stable were met with limited success.¹⁵⁸

The next attempt to control the Missouri River came after the passage of the Rivers and Harbors Act of 1912, which authorized the Missouri River Bank Stabilization and Navigation Project (BSNP).¹⁵⁹ This legislation granted authority to the Corps to begin constructing wooden pile dikes and woven-willow and lumber revetments in order to restrain the river’s natural tendency to meander and force it into a 6-foot deep channel.¹⁶⁰ The bends targeted for alteration were between Kansas City, Missouri and St. Louis. However, the undertaking was halted in 1915 because

¹⁵² David L. Galat, Charles R. Berry Jr., Edward J. Peters & Robert G. White, *Missouri River Basin*, in RIVERS OF NORTH AMERICA, 427, 432 (Arthur C. Benke & Colbert E. Cushing eds., 2005).

¹⁵³ *Id.*

¹⁵⁴ *Id.* at 438.

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ *Id.*

¹⁵⁸ Fowler, *supra* note 151, at para. 16.

¹⁵⁹ 2000 BiOp, *supra* note 4, at 120-21.

¹⁶⁰ Galat et al., *supra* note 152, at 439.

Congress failed to appropriate funds.¹⁶¹ The national budget was constrained because the United States was fighting World War I.¹⁶²

With the grant of additional funds in 1927, the Corps was directed to engineer a 6-foot deep channel extending upriver to Sioux City, Iowa.¹⁶³ Finally, in 1945, the project was reauthorized to accommodate a 300-foot wide, 9-foot deep channel from Sioux City to the Mississippi.¹⁶⁴ The goal was to produce a channel that was easily navigable without the use of a lock and dam system.¹⁶⁵ The final product, stretching 735 miles, would not be fully completed until 1981.¹⁶⁶

In the midst of the progression of the BSNP, there was a great drought in the 1930's that caused channels created downstream to be incapable of maintaining the required six-foot depth.¹⁶⁷ Acting in response to the crisis, the Corps recommended a plan to Congress that involved the construction of a dam and reservoir in Fort Peck, Montana.¹⁶⁸ This would allow a significant amount of water to be reserved, and in the event of a drought it could be released so that the lower reaches of the Missouri River would be able to support navigation.¹⁶⁹ The plan would also prevent flooding downstream by withholding excess water behind its barriers.¹⁷⁰ After the passage of the National Industrial Recovery Act, which empowered the president to authorize public works projects, President Franklin D. Roosevelt signed off on the recommendation.¹⁷¹ The dam at Fort Peck was finished in 1939

¹⁶¹ NAT'L RESEARCH COUNCIL, *supra* note 2, at 26.

¹⁶² *Id.*

¹⁶³ NAT'L RESEARCH COUNCIL, *supra* note 2, at 26.

¹⁶⁴ 2000 BiOp, *supra* note 4, at 121.

¹⁶⁵ FSEIS ch. 3, *supra* note 1, at 7.

¹⁶⁶ Missouri River Natural Resources Committee, *Missouri River Environmental Assessment Program: A Proposal to Provide the Scientific Foundation for Missouri River Management*, at para. 21 (1998), http://infolink.cr.usgs.gov/The_River/MORstory.htm [hereinafter BSNP 1].

¹⁶⁷ NAT'L RESEARCH COUNCIL, *supra* note 2, at 28.

¹⁶⁸ *Id.*

¹⁶⁹ *Id.*

¹⁷⁰ 2000 BiOp, *supra* note 4, at 121.

¹⁷¹ NAT'L RESEARCH COUNCIL, *supra* note 2, at 29.

and was built to hold a capacity of 19.5 million acre-feet of water.¹⁷²

The amount of traffic on the Missouri River has declined dramatically since its initial stages of alteration.¹⁷³ In evaluating statistical data, traffic can be characterized as either commercial (which consists of transporting fertilizer or crops) or removal of sand and gravel from mining operations and navigation maintenance operations.¹⁷⁴ Commercial barge traffic reached an annual average of 10.9 million metric tons in 1939.¹⁷⁵ In the year 2000, the total only reached a mere 1.3 million metric tons.¹⁷⁶ By 2007, the total dropped to 500,000 metric tons.¹⁷⁷ This reduction has been associated with the use of less expensive train transportation, a reduction in agricultural products being exported to other countries and purchasers utilizing more local sources.¹⁷⁸

As of 2002, sand and gravel transportation combined with the hauling away of materials from maintaining the navigation channel accounted for about 80% of barge tonnage.¹⁷⁹ The trips made for these commodities are only between one and three miles because the materials are moved from where they are dredged to onshore storage facilities.¹⁸⁰ According to an estimate by the Corps in 1995, the net annual benefits from full-service navigation on the Missouri were less than \$3 million.¹⁸¹ Other competing uses for the water needed to maintain full-service navigation yield substantially greater net benefits.¹⁸²

¹⁷² *Id.*

¹⁷³ *See Id.* at 90.

¹⁷⁴ *Id.*

¹⁷⁵ Galat et al., *supra* note 152, at 439.

¹⁷⁶ C. Phillip Baumel & Jerry Van Der Kamp, *Past and Future Grain Traffic on the Missouri River*, at 1 (July 2003), <http://www.iatp.org/iatp/publications.cfm?accountID=258&refID=36163>.

¹⁷⁷ Cusick, *supra* note 6, at para. 23.

¹⁷⁸ NAT'L RESEARCH COUNCIL, *supra* note 2, at 90.

¹⁷⁹ *Id.* at 91.

¹⁸⁰ *Id.*

¹⁸¹ Galat et al., *supra* note 152, at 439.

¹⁸² Fowler, *supra* note 151, at para. 51-68.

B. Irrigation and Flood Control

When the taming of the ‘Big Muddy’ became more technologically feasible, ideas began to emerge about ways to use it more efficiently to benefit and protect the United States’ economy.¹⁸³ In 1943, the Missouri River was inundated with catastrophic floods.¹⁸⁴ In response, the Corps devised a plan that involved building dams for the purpose of flood control and navigability.¹⁸⁵ Simultaneously, the Bureau of Reclamation had its own plan that also involved dam building, but its main concern was facilitating irrigation.¹⁸⁶ At the time each agency’s recommendation was being presented to Congress, the members had a more unified scheme in mind involving the creation of a Missouri River Authority.¹⁸⁷ Instead of establishing the Authority, the two agencies met to formulate a new strategy that would accommodate the goals of both.¹⁸⁸

The Pick-Sloan Plan resulted, which was a part of the Flood Control Act of 1944, ratified by President Roosevelt.¹⁸⁹ The responsibilities delegated to the Corps under the act included operation of the flood control structures on the Lower Missouri and determination of storage capacities of the Missouri’s dams for flood control and navigation.¹⁹⁰ The Bureau of Reclamation had the duties of constructing and operating all dams on the upper basin and determining irrigation capacity for both existing dams and those that would be built in the future.¹⁹¹ In the end, five more dams were built on the Missouri main stem: the Fort Randall Dam in South Dakota was completed in 1952; the Garrison Dam in North Dakota in 1953; the Gavins Point Dam on the South Dakota/Nebraska border in 1955; the Oahe Dam in South Dakota

¹⁸³ *See id.* at para 17-23.

¹⁸⁴ NAT’L RESEARCH COUNCIL, *supra* note 2, at 27.

¹⁸⁵ *Id.* at 28.

¹⁸⁶ *Id.*

¹⁸⁷ *Id.* at 29.

¹⁸⁸ *Id.*

¹⁸⁹ *See id.* at 29, 32.

¹⁹⁰ *Id.*

¹⁹¹ *Id.*

in 1958; and the Big Bend Dam in South Dakota in 1963.¹⁹² The Pick-Sloan Plan would turn the Missouri River into the largest reservoir system in North America.¹⁹³ After the projects were completed, 35% of the river was impounded, 32% was channelized, and only 33% remained unchannelized.¹⁹⁴ The enterprise was projected to deliver water to over 4.7 million acres of farmland.¹⁹⁵

The Missouri River dam and reservoir system currently has approximately 1600 intakes that draw from the reservoirs for irrigation and other uses including domestic, municipal and Industrial.¹⁹⁶ The responsibilities of the Corps and Bureau of Reclamation have now shifted. The Bureau of Reclamation continues to determine the levels of water that will be used in irrigation, but the Corps is now responsible for operating the dams.¹⁹⁷ There are a series of steps necessary to divert water for irrigation purposes.¹⁹⁸ After evaluating all of the purposes for which the reservoirs' waters are allocated, the Corps verifies that there are sufficient waters that can be diverted for irrigation.¹⁹⁹ The Bureau of Reclamation then seeks authorization from Congress pursuant to its own laws.²⁰⁰ Only after congressional approval will Reclamation be able to control the use of the water.²⁰¹

The scheduling and amounts used for irrigation and these other purposes is governed by the Corps' Missouri River Main Stem System Reservoir Regulation Manual (hereinafter "Master Manual"), which was created as a guide to determine how to best manage the conflicting interests of those that make use of the

¹⁹²2000 BiOp, *supra* note 4, at 121; South Dakota State Historical Soc'y, Dep't of Tourism and State Dev., *Guide to Missouri River Project Records at the South Dakota State Archives*, (1998), <http://history.sd.gov/archives/forms/moriver/chronology.pdf>.

¹⁹³ Craig Fennemore, *Growing Water Demand and Inevitable Litigation: The Missouri and ACF River Basins*, 1 (2005), http://www.uga.edu/water/GWRC/Papers/BlankenauD_GWRCpaper_ACF_Sherk%20revised.pdf.

¹⁹⁴ BSNP 1, *supra* note 166, at para. 4.

¹⁹⁵ Fowler, *supra* note 151, at para. 19.

¹⁹⁶ Galat et al., *supra* note 152, at 439.

¹⁹⁷ 2000 BiOp, *supra* note 4, at 33.

¹⁹⁸ *Id.*

¹⁹⁹ *Id.*

²⁰⁰ *Id.*

²⁰¹ *Id.*

Missouri River.²⁰² While irrigation does not fit within a particular ranking of water use priorities, the Master Manual now incorporates a flexible management approach, which is largely effective in meeting irrigation requirements.²⁰³ This was not always the case. When the Master Manual was instituted between the years of 1960 and 1986, flood control was ranked as the number one priority to be taken into account when decisions on how to manage the dam system were made.²⁰⁴ This was due to the history of calamitous flooding of towns on the lower Missouri River.²⁰⁵

The first major recorded flood on the Missouri River occurred in 1844.²⁰⁶ Flood stages exceeded normal river levels by between twelve and seventeen feet.²⁰⁷ Since then, there have been nine major floods on the Missouri.²⁰⁸ In the late 18th and early 19th centuries, catastrophic loss of life and property led to the enactment of the Flood Control Act of 1917, which was designed to place flood control, along with navigation, as a paramount priority in making management decisions with respect to the Missouri's waters.²⁰⁹ Prior to this legislation, flood control was left in the hands of local authorities.²¹⁰

In 1927, severe flooding again hit the lower Missouri, prompting further legislative action.²¹¹ Congress passed the River and Harbor Act of 1927, which called for a survey of the Missouri River basin in order to assess what types of water development projects could be beneficial to the area.²¹² After the study, certain projects were earmarked by the Corps for construction.²¹³ Another measure taken was the adoption of the Flood Control Act of 1936, a formal declaration that flooding would be the province of the

²⁰² NAT'L RESEARCH COUNCIL, *supra* note 2, at 40.

²⁰³ 2000 BiOp, *supra* note 4, at 40.

²⁰⁴ *Id.* at 36.

²⁰⁵ NAT'L RESEARCH COUNCIL, *supra* note 2, at 40.

²⁰⁶ FSEIS ch. 3, *supra* note 1, at 11.

²⁰⁷ *Id.*

²⁰⁸ *Id.*

²⁰⁹ NAT'L RESEARCH COUNCIL, *supra* note 2, at 27.

²¹⁰ *Id.*

²¹¹ *Id.*

²¹² *Id.*

²¹³ *Id.*

federal government.²¹⁴ Finally, after another devastating flood in 1943, the Corps presented to Congress its plan for the damming of the Missouri River, which resulted in the development of the Pick-Sloan Plan.²¹⁵ Today, the Corps' Missouri River Region Office has a Reservoir Control Center which was established to manage the reservoir system.²¹⁶ District Offices lend support in the areas of reservoir operations, management, and technical advice.²¹⁷

Although the Corps' Master Manual does not have a specific order of water-use priorities, the dominant considerations in managing waters of the modern Missouri River are flood control and navigation.²¹⁸ This is despite the fact that 70% of the economic benefit of the river originates from hydropower and water supply.²¹⁹ Navigation demands will normally only be superseded if reservoir releases need to be reduced due to downstream flooding concerns or if storage in the reservoirs needs to be discharged.²²⁰ Because navigation primarily takes place between Sioux City and St. Louis, the southernmost dam, Gavins Point, is given chief consideration in managing the Missouri's downstream flows.²²¹

The methods used for controlling the downstream flows of the Missouri River have been developed through the experience the Corps has gained through confronting an array of unpredictable natural and human-induced events.²²² The policy for how the Corps responds to the myriad catalysts that trigger surpluses or deficiencies in water supply has been to proceed on an as-needed basis.²²³ Such factors as the magnitude of mountain snowpack runoff and requests for withholding flows for construction are two considerations that need to be taken into account when adjusting reservoir releases.²²⁴

²¹⁴ *Id.*

²¹⁵ *Id.*

²¹⁶ 2000 BiOp, *supra* note 4, at 32.

²¹⁷ *Id.*

²¹⁸ *Id.* at 36.

²¹⁹ *Id.*

²²⁰ *Id.*

²²¹ *Id.* at 37.

²²² *Id.* at 40.

²²³ *Id.*

²²⁴ 2000 BiOp, *supra* note 4, at 50.

Another development in flood control on the Missouri River was the creation of the Missouri River Levee System by the Flood Control Act of 1944. Construction of the levees began in 1947.²²⁵ Originally, the developments created under this legislation were directed toward the defense of agricultural lands.²²⁶ More recently, ever-increasing human intrusion into floodplains has led to more bank stabilization engineered to protect urban areas.²²⁷ The levees constructed today are mostly to protect populated areas against 500-year floods.²²⁸ However, there are still some being built in an attempt to guard agricultural lands.²²⁹

In addition to the levees built under the Flood Control Acts, over 500 non-federal levees have been built by both local governments and individuals.²³⁰ These safeguard both agricultural lands and private residences.²³¹ While a majority of these levees have the capacity to withstand 20-year floods, most cannot endure much more.²³² The Corps has a program entitled PL84-99 which qualifies certain applicants for federal assistance in repairing damaged levees.²³³ Federal levee projects have priority access to funds, but a private levee may receive aid if it can pass a cost-benefit analysis.²³⁴

Human settlement in the floodplain has resulted in grave risks to communities along the Missouri River.²³⁵ The floodplain of the Lower Missouri River includes more than 2,069,000 acres in Nebraska, Iowa, Kansas and Missouri.²³⁶ Of this area, about 929,000 acres depend upon levees for protection from flooding.²³⁷ The floodplain of the Lower Missouri encompasses 1,245,000

²²⁵ 2003 BiOp, *supra* note 51, at 132; FSEIS ch. 3, *supra* note 1, at 12.

²²⁶ *Id.*

²²⁷ BSNP 1, *supra* note 166, at para. 23.

²²⁸ 2000 BiOp, *supra* note 4, at 162.

²²⁹ *Id.*

²³⁰ FSEIS ch. 3, *supra* note 1, at 13.

²³¹ *Id.*

²³² *Id.*

²³³ *Id.*

²³⁴ *Id.*

²³⁵ *Id.* at 17.

²³⁶ *Id.*

²³⁷ *Id.*

acres of agricultural land, 21,000 residences and 4,700 commercial and industrial structures that are subject to possible flooding.²³⁸ The potential damages that would be incurred if the area were ravaged by flooding would total approximately \$15.4 billion.²³⁹

C. Water Quality and Water Supply

Water quality control of the Missouri River is fundamental to ensuring that its waters are safe for such uses as drinking, fishing and swimming.²⁴⁰ The leading authority on water quality control in the Missouri is the Environmental Protection Agency (EPA).²⁴¹ It has a variety of obligations with respect to maintaining water quality standards and enforces federal baseline standards to which state and local jurisdictions must adhere.²⁴² EPA is also responsible for wastewater management.²⁴³ Its Office of Wastewater Management (OWM) ensures that discharges from discrete point sources, such as storm sewers, comply with the Clean Water Act.²⁴⁴ Those responsible for surface water discharges from point sources must obtain a permit under the National Pollutant Discharge Elimination System (NPDES) and comply with federal mandates.²⁴⁵ A majority of states administer the program, if approved by the EPA, through cooperative federalism.²⁴⁶

EPA's Total Maximum Daily Load (TMDL) program also benefits water quality by reducing pollutants from both point sources and non-point sources such as agricultural runoff.²⁴⁷ This

²³⁸ *Id.*

²³⁹ *Id.*

²⁴⁰ See U.S. Env'tl. Prot. Agency, *National Pollutant Discharge Elimination System (NPDES)*, at para. 1 (2009), <http://cfpub.epa.gov/npdes/index.cfm> [hereinafter CWA 1].

²⁴¹ NAT'L RESEARCH COUNCIL, *supra* note 2, at 36.

²⁴² *Id.*

²⁴³ *Id.*

²⁴⁴ See U.S. Env'tl. Prot. Agency, *Wastewater Management*, (2009), <http://water.epa.gov/aboutow/owm/index.cfm>.

²⁴⁵ CWA 1, *supra* note 240, at para. 1.

²⁴⁶ *Id.*

²⁴⁷ Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. § 1313(d) (2006); NAT'L RESEARCH COUNCIL, *supra* note 2, at 36.

scheme designates a set quantity, or load, of a pollutant that may be lawfully allowed in a water body, and any amount that surpasses the limit may render the waters unsafe for a particular human use.²⁴⁸ Entities that discharge point-source pollutants in a water body listed as impaired must obtain the proper permit under the NPDES system.²⁴⁹ These permits contain water quality-based effluent limitations (WQBELs) that are designed to achieve the TMDLs.²⁵⁰

Another water quality control regulation under the Clean Water Act is the Section 404 program which EPA oversees in partnership with the Corps.²⁵¹ In the event that any public or private entity discharges dredged or fill materials into waters of the United States, the program requires the discharger to obtain a permit from the Corps.²⁵² General permits are granted for activities that will have minimal adverse environmental effects and satisfy basic stipulated conditions.²⁵³ Individual permits are granted if the particular activity does not meet general permit requirements.²⁵⁴ The Corps' District Engineer grants individual permits, but EPA's Administrator has the ultimate power to veto the decision if it is found unreasonable.²⁵⁵

The Corps' Master Manual stipulates that water quality demands will be met by maintaining minimum daily flow requirements on the Missouri River as set by state agencies and the EPA.²⁵⁶ These quantities are necessary to maintain the needs of municipal drinking water facilities and power plants.²⁵⁷ Occasionally, extended releases must be made from the reservoir system to

²⁴⁸ *Id.*

²⁴⁹ *Id.*

²⁵⁰ *Id.*

²⁵¹ NAT'L RESEARCH COUNCIL, *supra* note 2, at 36.

²⁵² Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. § 1344(a) (2009)

²⁵³ Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. § 1344(e) (2009).

²⁵⁴ *Id.*

²⁵⁵ U.S. Env'tl. Prot. Agency, *Clean Water Act, Section 404(c), "Veto Authority"*, at para. 2, (2008), available at <http://www.epa.gov/wetlands/pdf/404c.pdf>.

²⁵⁶ 2000 BiOp, *supra* note 4, at 45.

²⁵⁷ *Id.*

maintain the levels these facilities depend upon, despite periods of low-flow.²⁵⁸ The Missouri River Reservoir System's reservoir pool water levels are altered in the same manner as flood control adjustments in order to avoid degradation of the river's water quality.²⁵⁹

Three of the four states on the Lower Missouri River, Nebraska, Iowa and Missouri, have listed the river on their respective Lists of Impaired Water Bodies.²⁶⁰ Listing is pursuant to Section 303(d) of the Water Quality Act, which directs states with authority for enforcing TMDLs, to specify which water bodies do not meet those standards.²⁶¹ From Gavins Point Dam downstream, pollutants have caused the water quality on the Lower Missouri to deteriorate.²⁶² These pollutants increase water temperature, nutrient levels and biological oxygen demand.²⁶³ In addition to interfering with human uses of the river, these changes in water can substantially disrupt the Missouri River's ecosystem.²⁶⁴ High nutrient levels, which can originate from farmland fertilizer runoff, urban runoff and wastewater treatment plants, cause algae to flourish.²⁶⁵ When the algae die, bacteria feed on the remains and consume dissolved oxygen to such an extent that few other species are able to survive.²⁶⁶ What remains is what scientists refer to as a 'dead zone.'²⁶⁷

In addition to water quality, the Missouri River has been managed for water quantity as well.²⁶⁸ The Water Supply Act of 1958 made it the responsibility of states and local governments to supply water to various public and private consumers.²⁶⁹ The

²⁵⁸ *Id.*

²⁵⁹ *Id.*

²⁶⁰ FSEIS ch. 3, *supra* note 1, at 11.

²⁶¹ *Id.* at 10.

²⁶² *Id.*

²⁶³ *Id.* at 10-11.

²⁶⁴ Katherine Harmon, *Murky Waters*, THE COLOMBIA MISSOURIAN, Nov. 10, 2007, at para. 3, available at <http://www.columbiamissourian.com/media/multimedia/2007/pages/bigmuddy/murkywaters1.htm>.

²⁶⁵ *Id.* at para. 28.

²⁶⁶ *Id.*

²⁶⁷ *Id.*

²⁶⁸ 2000 BiOp, *supra* note 4, at 63.

²⁶⁹ *Id.*

Missouri River Reservoir System now provides water to a number of municipal, industrial and rural operations.²⁷⁰ This is accomplished through diversions, pumps and water distribution facilities.²⁷¹ There are twenty one power plants that utilize the Missouri's waters for cooling, seventeen municipal water treatment facilities that deliver water to more than 3.2 million people, and two chemical manufacturers that depend on the water for other uses.²⁷²

The Corps' Master Manual requires each reservoir's permanent pool to be completely filled, and water withdrawals are governed by whether this criterion has been met.²⁷³ In order to maintain this requirement, preparations must be made for the annual inflow.²⁷⁴ Snowmelt and rainfall increase storage in reservoir pools until July. Storage then decreases gradually through winter.²⁷⁵ Each month, release rates are calculated according to the Master Manual to ensure water supply is sufficient and reservoirs are not overwhelmed.²⁷⁶ Conversely, inadequacy of water reserves will lead to drastic consequences for entities that depend upon supply intakes.²⁷⁷ Downstream intakes must be continually monitored to avoid any forecast errors.²⁷⁸

As estimated by the Corps in 1994, water supply benefits totaled \$571.6 million annually from Missouri River water withdrawals.²⁷⁹ This measure is based upon a comparison of how much it would cost for consumers of the river's waters if they used water from other sources.²⁸⁰ Of the total annual water supply benefits, 91.4% was attributed to power savings, 5.6% to municipal water supply savings, and 2.3% to savings for irrigation purposes.²⁸¹

²⁷⁰ *Id.*

²⁷¹ NAT'L RESEARCH COUNCIL, *supra* note 2, at 45.

²⁷² *Id.* at 46.

²⁷³ 2000 BiOp, *supra* note 4, at 43.

²⁷⁴ *Id.*

²⁷⁵ *Id.* at 48.

²⁷⁶ *Id.*

²⁷⁷ *Id.* at 43.

²⁷⁸ *Id.*

²⁷⁹ NAT'L RESEARCH COUNCIL, *supra* note 2, at 93.

²⁸⁰ *Id.*

²⁸¹ *Id.* at 93-4.

Nebraska received nearly half of the savings benefits and Iowa and Missouri received approximately the same amount of benefits, each about 16%.²⁸²

D. Hydroelectric and Thermal Power

In the late 19th century, the Corps was designated as the first authority responsible for allowing hydropower dams to be built on the Missouri River.²⁸³ Subsequently, the Federal Power Act (FPA) of 1920 was passed, which named the Federal Power Commission as the new agency that would regulate the dams.²⁸⁴ Congress shifted control because it reasoned that hydroelectric dam development would be more efficient if it were put in the hands of the private rather than public sector.²⁸⁵ The Federal Power Commission was renamed as the Federal Energy Regulatory Commission (FERC) in 1977 with the passage of the Department of Energy Organization Act.²⁸⁶ The Act consolidated several energy agencies into the Department of Energy (DOE), but FERC remained independent.²⁸⁷ The agency was charged with licensing, inspecting and reviewing private, state and municipal hydroelectric power facilities.²⁸⁸

The Western Area Power Administration (WAPA) is another agency within the DOE that markets and delivers hydropower to fifteen central and western states.²⁸⁹ The states it serves through which the Missouri River runs are Montana, North Dakota, South Dakota, Nebraska, Iowa and Kansas.²⁹⁰ The Bureau of Reclamation, which is a subdivision within the Department of

²⁸² *Id.* at 94.

²⁸³ *Id.* at 27.

²⁸⁴ *Id.*

²⁸⁵ *Id.* at 28.

²⁸⁶ Department of Energy Organization Act, 42 U.S.C. § 7134 (2009).

²⁸⁷ U.S. Dep't of Energy, *Origins and Evolution of the Department of Energy*, at para. 4, <http://www.energy.gov/about/origins.htm> (last visited Jan. 19, 2010).

²⁸⁸ Fed. Energy Regulatory Comm'n, *What FERC Does*, (2010), <http://www.ferc.gov/about/ferc-does.asp>; NAT'L RESEARCH COUNCIL, *supra* note 2, at 36.

²⁸⁹ NAT'L RESEARCH COUNCIL, *supra* note 2, at 37.

²⁹⁰ Western Area Power Administration, *Upper Great Plains Region*, <http://www.wapa.gov/ugp/> (last visited Jan. 19, 2010).

the Interior, is another agency that plays a role in power generation from hydroelectric dams.²⁹¹ Established in 1902, it was created for the purpose of constructing dams, power plants and canals.²⁹² Its presence spans seventeen western states including Montana, North Dakota, South Dakota, Nebraska and Kansas, and it is the largest wholesaler of water in the United States.²⁹³ Reclamation's fifty-eight hydroelectric power plants have enough power to provide electricity to more than 3.5 million residences.²⁹⁴ Its present-day responsibilities involve operating and maintaining its water resource development projects and providing water according to statutory requirements.²⁹⁵

The quantity of power that can be generated from hydroelectric dams on the Missouri can fluctuate year by year.²⁹⁶ Power supply levels are contingent on water supply levels.²⁹⁷ During certain seasons of the year, appropriating waters for more financially beneficial uses other than hydroelectric power will take precedence when making decisions about water allocation.²⁹⁸ For instance, water flows that generate electricity may need to be held back to prevent downstream flooding.²⁹⁹ The assumption is that allowing downstream flooding is more costly than relinquishing the profits that would have been made from power production during that same period of time.³⁰⁰

Overall, hydropower produces more revenue than any other authorized use of the Missouri River.³⁰¹ The hydroelectric dams that were built pursuant to the Pick-Sloan Plan provide power to

²⁹¹ Bureau of Reclamation, U.S. Dep't of the Interior, *Bureau of Reclamation - About Us*, at para. 1 (2009), <http://www.usbr.gov/main/about/>.

²⁹² *Id.*

²⁹³ *Id.*

²⁹⁴ *Id.* at para. 3.

²⁹⁵ Karl F. Stutzman et al., *Water Resources Development under the Fish and Wildlife Coordination Act*, Nov. 2004, at 62, available at DOCSTOC, <http://www.docstoc.com/docs/691440/Water-Resources-Development-Under-the-Fish-and-Wildlife-Coordination-Act>

²⁹⁶ NAT'L RESEARCH COUNCIL, *supra* note 2, at 97.

²⁹⁷ *Id.*

²⁹⁸ *Id.* at 104.

²⁹⁹ *Id.*

³⁰⁰ *Id.*

³⁰¹ *Id.* at 97.

municipalities, agencies, irrigation projects, rural electric cooperatives and public and private utility operations.³⁰² After evaluating all of the gains from alternative authorized uses, the value of benefits derived from the use of hydroelectric dams reached upwards of \$615 million.³⁰³ Municipalities and rural electric cooperatives benefited the most from the power source.³⁰⁴

In addition to hydroelectric facilities, thermal-generating power plants also depend upon minimal river levels to operate.³⁰⁵ Twenty-five thermal power plants use the Missouri River to generate electricity.³⁰⁶ Together, these businesses can generate a capacity of 15,000 megawatts.³⁰⁷ Maintaining minimal river level requirements is critical to satisfying ambient water temperature standards downstream, as required by Section 316 of the Clean Water Act.³⁰⁸ This section governs thermal pollution discharges by establishing effluent limits.³⁰⁹ Any shortage due to the water's allocation to other uses can deplete the thermal plants' electricity supply that is used by millions of people.³¹⁰

Electric power generated from reservoir and dam systems is highly regulated.³¹¹ Beyond the Federal Power Act, builders, operators or licensors of these enterprises must comply with the Fish and Wildlife Coordination Act (FWCA), the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA), to name a few.³¹² The licenses that FERC is responsible for granting under FPA extend to construction, operation and

³⁰² *Id.*

³⁰³ *Id.*

³⁰⁴ *Id.*

³⁰⁵ *Id.* at 93.

³⁰⁶ Galat et al., *supra* note 152, at 439.

³⁰⁷ *Id.*

³⁰⁸ Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. § 1326(a) (2006); NAT'L RESEARCH COUNCIL, *supra* note 2, at 94.

³⁰⁹ *Id.*

³¹⁰ U.S. DEP'T OF ENERGY, ENERGY DEMANDS ON WATER RESOURCES REPORT TO CONGRESS ON THE INTERDEPENDENCY OF ENERGY AND WATER, 30 (2006), available at <http://www.sandia.gov/energy-water/docs/121-RptToCongress-EWwEIAcomments-FINAL.pdf>.

³¹¹ Stutzman et al., *supra* note 295, at 71.

³¹² *Id.*

maintenance for power generation facilities.³¹³ FERC issues licenses for a variety of structures within the system: dams, reservoirs, conduits, power houses and transmission lines.³¹⁴ After the FWCA was amended in 1958, it required FERC to give equal consideration to power conservation, wildlife protection, recreation and environmental quality when making a decision to grant a license.³¹⁵

The Electric Consumers Protection Act of the 1986 amendments to the FPA stipulated that licenses must contain conditions related to the protection of fish or wildlife that may be affected by a project and measures to mitigate any detriment to the ecosystem.³¹⁶ Recommendations on what conditions to include in the license are given by the United States Fish and Wildlife Service (FWS) and state fish and wildlife agencies in accordance with the FWCA.³¹⁷

The first version of the Fish and Wildlife Coordination Act (FWCA) was enacted in 1934 for the purpose of protecting fish and wildlife from the potentially injurious effects that could occur as a consequence of major federal water projects.³¹⁸ The Act gave power to both the Secretary of Agriculture and Secretary of Commerce to assist agencies in proceeding with their respective endeavors as long as the projects did not result in a dramatic impact on the nation's supply of natural resources.³¹⁹ When the federal government would construct a water project, the agency responsible would have to consult with the Bureau of Fisheries (later, the Fish and Wildlife Service) to provide for fish passages in dams, if economically feasible.³²⁰

In 1946, the FWCA was amended to require agencies that permit and license federal water resource developments (in this

³¹³ *Id.* at 66.

³¹⁴ *Id.*

³¹⁵ *Id.*

³¹⁶ *Id.*

³¹⁷ *Id.*

³¹⁸ U.S. Fish & Wildlife Serv. Digest of Fed. Resource Laws, *Fish and Wildlife Coordination Act*, at para. 2, <http://www.fws.gov/laws/lawsdigest/fwcoord.html> (last visited Jan. 19, 2010) [hereinafter FWCA].

³¹⁹ *Id.*

³²⁰ Stutzman et al., *supra* note 295, at 18.

case FERC) to consult with FWS and state wildlife agencies before issuing a permit or license for any “activity involving the impoundment, diversion, deepening, control, or modification of a stream or body of water.”³²¹ FWS was mandated to perform an evaluation to determine what impacts would result from these projects, and the agency had to mitigate any losses.³²² The Act was again amended in 1958, and this version is still in effect.³²³ This reform changed the consideration accorded to wildlife from mitigation to enhancement.³²⁴ Conservation was to be given equal attention as other project goals.³²⁵ With the most recent amendment, reports on the projects sent to Congress must be supplemented with FWS’s recommendations.³²⁶ If the agency does not adopt FWS’s recommendations, it must explain why and participate in dispute resolution with FWS if its reasons are found to be illegitimate.³²⁷

The National Environmental Policy Act (NEPA) was enacted in 1969 in an effort to hold federal agencies responsible for avoiding and mitigating the effects of major federal actions on the environment.³²⁸ In order to comply with NEPA, the agency that plans on initiating the major federal action must first decide whether it needs to prepare only an Environmental Assessment (EA) or a more involved Environmental Impact Statement (EIS).³²⁹ The EA is an appraisal as to whether the federal action will have a significant impact on the environment or whether there is a Finding of No Significant Impact (FONSI).³³⁰ An EIS, on the other hand, entails a detailed description of the possible positive and negative

³²¹ FCWA, *supra* note 318, at para. 4; Sundry, *supra* note 150, at para. 3.

³²² Stutzman et al., *supra* note 295, at 19; U.S. Fish & Wildlife Serv., *Fish and Wildlife Coordination Act*, (2009), <http://www.fws.gov/habitatconservation/fwca.html>.

³²³ *Id.* at 20.

³²⁴ *Id.* at 21.

³²⁵ *Id.* at 22.

³²⁶ *Id.*

³²⁷ *Id.*

³²⁸ COUNCIL ON ENVTL. QUALITY, EXEC. OFFICE OF THE PRESIDENT, A CITIZEN’S GUIDE TO THE NEPA, 2 (2007), *available at* http://www.nepa.gov/nepa/Citizens_Guide_Dec07.pdf.

³²⁹ *Id.*

³³⁰ 40 C.F.R. § 1508.9 (2009).

effects that will result from the federal action and alternatives to the proposed action.³³¹ If a dam and reservoir system were to operate under new procedures or undergo significant maintenance, it might trigger the need for an EIS to be completed.³³²

In 1973, the Endangered Species Act (ESA) was passed.³³³ This legislation not only slows down dam and reservoir construction and operation, but also has the ability to require significant changes in the process.³³⁴ The Act gives the Secretary of the Interior the authority to list a species as threatened or endangered.³³⁵ Upon this designation, it is unlawful for a federal agency to commence any action that would jeopardize the existence of a species or its critical habitat.³³⁶ Prior to undertaking action, federal agencies must consult with the FWS, which will prepare a Biological Opinion that details the repercussions for the species of the agency's plan and gives alternatives and mitigation measures.³³⁷ With FPA, FWCA, NEPA, and ESA taken together, any major decisions by agencies that affect the Missouri River will compel a thorough plan that takes into account conflicting interests.³³⁸

E. Recreation and Conservation

The Missouri River and its surrounding areas are used for fishing, boating, water sports, picnicking, biking, wildlife observation, hunting, swimming, camping, hiking, sunbathing, artifact hunting, photography and visiting historical sites.³³⁹ The Corps is

³³¹*Id.* § 1508.11 (2009); U.S. Env'tl. Prot. Agency, *National Environmental Protection Act (NEPA)*, at para. 1-2, (2009), <http://www.epa.gov/compliance/nepa/>.

³³² NAT'L RESEARCH COUNCIL, *supra* note 2, at 39.

³³³ *See id.* at 40.

³³⁴ *See id.*

³³⁵ *Id.*

³³⁶ *Id.*

³³⁷ *Id.*

³³⁸ *See, e.g., id.*

³³⁹ 2000 BiOp, *supra* note 4, at 45; NAT'L RESEARCH COUNCIL, *supra* note 2, at 95; U.S. Army Corps of Eng'rs, *Final Supplemental Environmental Impact Statement for the Missouri Fish and Wildlife Mitigation Project-Environmental*

responsible for managing approximately 170 recreational sites along the Missouri.³⁴⁰ Recreational activities on the Missouri create an annual economic benefit of \$87 million, which includes both public and private development.³⁴¹ Seventy-eight percent of this is attributable to recreation that takes place in and near reservoirs.³⁴² Northern states benefit the most from recreation: South Dakota receives 36%, North Dakota receives 26% and Nebraska receives 16%.³⁴³ The remaining 22% is split up between seven other states.³⁴⁴

Despite the extent of river modification that has taken place on the Missouri, it continues to be revered for its aesthetic value, notably in areas federally designated as Wild and Scenic Rivers pursuant to the National Wild and Scenic Rivers Act.³⁴⁵ The northernmost portions of the river, from Benton, Montana to the Fred Robinson Bridge, were designated Wild and Scenic in 1976, and are protected in their natural, free-flowing states.³⁴⁶ In 1978, the part of the river between Gavins Point Dam and Ponca State Park in Nebraska was named a 'recreational river' pursuant to the Act.³⁴⁷ It is not protected to the same degree, but is managed according to an agreement between the Department of the Army and Department of Interior.³⁴⁸ Finally, in 1991, Congress declared the section of the Missouri River from Fort Randall Dam to Lewis Clark Lake in South Dakota as a recreation river under the Act.³⁴⁹ The National Park Service manages this region according to a General Management Plan that discourages private development.³⁵⁰

Consequences ch. 4, 36 (2003), http://www.moriverrecovery.org/mrrp/MRRP_PUB_DEV.download_documentation?p_file=569.

³⁴⁰ 2000 BiOp, *supra* note 4, at 46.

³⁴¹ Galat et al., *supra* note 152, at 439.

³⁴² *Id.*

³⁴³ NAT'L RESEARCH COUNCIL, *supra* note 2, at 95.

³⁴⁴ *Id.*

³⁴⁵ See 2000 BiOp, *supra* note 4, at 46.

³⁴⁶ *Id.* at 167.

³⁴⁷ *Id.*

³⁴⁸ See *id.*

³⁴⁹ *Id.*

³⁵⁰ *Id.*

The Pick-Sloan Act was the first legislation to provide for recreation on the Missouri River, authorizing areas for public use and fish and wildlife conservation.³⁵¹ In 1958, the FWCA was amended to include consideration of fish and wildlife enhancement, an important component to recreation, when undertaking federal water development projects.³⁵² The Federal Water Projects Recreation Act was passed in 1965, which specified that outdoor recreation, along with fish and wildlife enhancement, be accorded full consideration when planning for federal water resource projects developments.³⁵³

Between 1960 and 1968, the Corps' Master Manual mandated that recreation and fish and wildlife conservation be subordinate to all other authorized purposes for the Missouri River.³⁵⁴ The major drought that occurred in the mid 1980's highlighted the conflict between upstream and downstream interests.³⁵⁵ Pressure was put on the Corps to update the Master Manual to reflect modern usages of the river, rather than only navigation.³⁵⁶ Today, the Corps' Master Manual requires that recreation and conservation be provided for to the greatest extent possible without interfering with other purposes for which the river is authorized.³⁵⁷ This reflects the marked growth of the recreation industry.³⁵⁸ In the mid 1950's, the number of recreation visitor hours on reservoirs totaled 5 million, annually.³⁵⁹ However, annual averages were 60 million between 1998 to 2000.³⁶⁰ Upstream interests hailed the changes in the Master Manual that gave more consideration to new socioeconomic values for the Missouri.³⁶¹

Even so, conflicts over water allocation for recreation persist because various recreational activities necessitate different

³⁵¹ NAT'L RESEARCH COUNCIL, *supra* note 2, at 35.

³⁵² Stutzman et al., *supra* note 295, at 20.

³⁵³ *Id.* at 190.

³⁵⁴ 2000 BiOp, *supra* note 4, at 36.

³⁵⁵ NAT'L RESEARCH COUNCIL, *supra* note 2, at 50.

³⁵⁶ *Id.*

³⁵⁷ *Id.* at 47.

³⁵⁸ *Id.*

³⁵⁹ *Id.* at 95.

³⁶⁰ *Id.*

³⁶¹ Galat et al., *supra* note 152, at 439.

river water levels.³⁶² To implement certain conservation measures, such as restoring the Missouri River to its original, meandering form, lowering the river level may be required.³⁶³ The resulting increase in wetlands and other habitats builds a stronger ecosystem.³⁶⁴ This, in turn, accommodates the needs of such recreational activities as hunting, fishing and wildlife-watching.³⁶⁵ It also makes the river more accessible to smaller types of water craft.³⁶⁶ Sport-fishing and waterfowl hunting are substantial components of recreational revenues, and it has been determined that changes in the Corps' dam operations could restore the fisheries and waterfowl populations to numbers that are needed to sustain these activities.³⁶⁷

Upstream interests, which include businesses like resort and marina operators, want high, stable lake levels to facilitate revenue generation for water-based recreation.³⁶⁸ Fluctuations sanctioned for other uses threaten the upstream interests' investments.³⁶⁹ If the lake levels decline below a certain point, boat ramps will be unusable.³⁷⁰ It also becomes difficult to maneuver specific types of water craft.³⁷¹ Some visitors will be less inclined to visit during lower lake levels because they are aesthetically unappealing.³⁷² Even some forms of hunting and fishing can become unavailable under these conditions.³⁷³ Generally, the Corps will strive to avoid these dilemmas by maintaining higher lake levels during the peak recreation season, from Memorial Day through Labor Day.³⁷⁴

³⁶² Fowler, *supra* note 151, at para. 57.

³⁶³ 2000 BiOp, *supra* note 4, at 47.

³⁶⁴ See Fowler, *supra* note 151, at para. 3.

³⁶⁵ *Id.* at para. 69.

³⁶⁶ *Id.*

³⁶⁷ See American Rivers, *River Budget-National Priorities for Local River Conservation*, at 14, (2004), <http://www.americanrivers.org/assets/pdfs/river-budget/riverbudget04b6ef.pdf>.

³⁶⁸ 2000 BiOp, *supra* note 4, at 46.

³⁶⁹ *Id.*

³⁷⁰ *Id.*

³⁷¹ *Id.*

³⁷² *Id.*

³⁷³ *Id.*

³⁷⁴ See *id.* at 64.

Conservation groups, such as American Rivers, recognize that the dams that allow these sorts of activities are harmful to fish and wildlife.³⁷⁵ The organization listed the Missouri River on its list of America's Most Endangered Rivers multiple times, including every year from 1997 to 2001.³⁷⁶ There are numerous measures that have been implemented by government agencies as well. The Wetland Reserve Program (WRP) and Emergency Wetland Reserve Program (EWRP) preserve flood-created and wetland habitats on the Missouri River by paying for perpetual easements over the property of private landowners.³⁷⁷ This program is administered by FWS, the Natural Resources Conservation Service (NRCS), the Agricultural Stabilization and Conservation Service (ASCS) and the states of Nebraska, Iowa, Kansas and Missouri.³⁷⁸ Eighty-three percent of the land that is being protected is situated in Missouri and totals approximately 7,000 acres.³⁷⁹ Some of the land managed under the program is maintained as open floodplain, and any levees that are breached will not be repaired.³⁸⁰

FWS also instituted a program to acquire lands that were damaged as a result of the 1993 and 1995 floods.³⁸¹ Lands that were able to be converted into wetland habitat were purchased from willing land owners.³⁸² This effort contributed to restoration of wetland habitat, floodplain function and access to the habitat sites for the public.³⁸³ The Missouri Department of Conservation created a similar program to acquire lands that were flooded by the 1993 flood, and budgeted \$5 million to purchase acreage.³⁸⁴ Seventy-five percent of the lands would be adjacent to the river

³⁷⁵ American Rivers, *supra* note 367, at 17.

³⁷⁶ 2000 BiOp, *supra* note 4, at 161.

³⁷⁷ *Id.*

³⁷⁸ *Id.*

³⁷⁹ *Id.*

³⁸⁰ *Id.*

³⁸¹ *Id.* at 162-63.

³⁸² *Id.* at 163.

³⁸³ *Id.*

³⁸⁴ *Id.* at 173.

and managed for reforestation, while the remainder would be managed as wetlands.³⁸⁵

FWS also manages a number of wildlife refuges on the Missouri River.³⁸⁶ The Big Muddy Fish and Wildlife Refuge, which was established in 1994, has six sections that span from Kansas City to St. Louis.³⁸⁷ The Refuge is authorized to acquire a total of 60,000 acres of land on the Missouri, but to date has purchased only 5,833.³⁸⁸ Together with the Corps, FWS is undertaking reforestation, removing river structures and creating sandbars.³⁸⁹ So far, a host of fish species is already using these constructed habitats, including the endangered Pallid Sturgeon.³⁹⁰

The Karl Mundt National Wildlife Refuge, which is also administered by FWS, is located in Lake Andes, South Dakota.³⁹¹ The National Wildlife Federation began a program to raise money to protect this area, which was known for its diminishing cottonwood riparian forest habitat and bald eagle nesting sites.³⁹² The NWF raised \$250,000 and bought 780 acres of land and gained access to 300 more via purchase of a perpetual easement.³⁹³ It then granted the land to FWS, which plants cottonwoods in an attempt to restore the threatened habitat.³⁹⁴

In North Dakota, FWS maintains the Audubon National Wildlife Refuge that consists of the Audubon Lake, an offshoot of Lake Sakakawea created by the Garrison Dam.³⁹⁵ The entire area includes 14,738 acres and consists of waterfowl production areas, alkali wetlands and over 100 sparsely vegetated island beaches.³⁹⁶ This produces the type of habitat that is favored by the endangered

³⁸⁵ *Id.*

³⁸⁶ *Id.* at 163.

³⁸⁷ *Id.*

³⁸⁸ *Id.*

³⁸⁹ *Id.*

³⁹⁰ *Id.*

³⁹¹ *Id.* at 164.

³⁹² *Id.*

³⁹³ *Id.*

³⁹⁴ *Id.*

³⁹⁵ *Id.*

³⁹⁶ *Id.*

Piping Plover and many other species of waterfowl.³⁹⁷ Employees of the refuge take care to place wired fencing around birds' nests to guard them against predators.³⁹⁸

Finally, the Charles M. Russell National Wildlife Refuge encompasses 1.1 million acres in Fort Peck, Montana, including the Fort Peck Reservoir.³⁹⁹ The refuge is also connected to about twenty-five to thirty miles of one of the few unaltered, meandering sections of the Missouri River.⁴⁰⁰ Because the area continues to undergo the process of sediment erosion and deposition, cottonwood riparian habitat is able to flourish there.⁴⁰¹ It also has an ideal combination of factors for Pallid Sturgeon habitat.⁴⁰²

Another positive advancement for conservation efforts on the Missouri River occurred when FWS initiated an informal consultation with the Kansas City District of the Corps in 1996.⁴⁰³ FWS' main concern was with the Corps' re-issuance of 404 commercial sand and gravel dredging permits under the Clean Water Act.⁴⁰⁴ The Corps presented data to FWS on the amount of sand that was dredged, annually, from Rulo, Nebraska to the mouth of the river.⁴⁰⁵ Quantities of sand dredged totaled 1.7 metric tons in the late 1970's, 3.0 metric tons in the early 1990's and 6.6 metric tons in 1998, alone.⁴⁰⁶ After the consultation, the Corps began to make more restrictive conditions on the re-issuance of the 404 permits to define which stretches of the river may be dredged.⁴⁰⁷ This reduced impacts on shallow water spawning areas used by the Pallid Sturgeon and other fish.⁴⁰⁸

Section 1135 of the Water Resources Development Act of 1986 authorizes the Corps to implement wildlife mitigation

³⁹⁷ *Id.*

³⁹⁸ *Id.*

³⁹⁹ *Id.*

⁴⁰⁰ *Id.*

⁴⁰¹ *Id.*

⁴⁰² *Id.*

⁴⁰³ *Id.* at 165.

⁴⁰⁴ *Id.*

⁴⁰⁵ *Id.*

⁴⁰⁶ *Id.*

⁴⁰⁷ *Id.*

⁴⁰⁸ *Id.*

projects for already existing structures on the Missouri.⁴⁰⁹ The Omaha District of the Corps joined forces with the Papio-Missouri River Natural Resources District of FWS and the Nebraska Parks and Game Commission to revamp the Boyer Chute.⁴¹⁰ This 7-mile historic channel was once connected to the Missouri River but was cut off by a closing structure on one end and a conduit under a roadway at its midpoint.⁴¹¹ The new chute allows natural erosion and deposition processes to create spawning habitat for fish that prefer braided rivers.⁴¹² Now the species that depend on this environment are more numerous.⁴¹³ Other works that can utilize funds under Section 1135 are planned or are forthcoming.⁴¹⁴

V. THE SOLUTION?

Following the completion of the Bank Stabilization and Navigation Project (BSNP) in 1981, a number of issues have arisen between FWS and the Corps due to the project's effects on the Missouri River's ecology.⁴¹⁵ When FWCA was amended in 1958 to require agencies to give equal consideration to fish and wildlife when evaluating projects, it imposed the requirement retroactively to projects that were in progress, but had not yet reached 60% completion.⁴¹⁶ It was determined that at the time the amendment was passed, the BSNP was only 58% completed.⁴¹⁷ This led FWS to look into possible ecological mitigation and enhancement measures that might counteract potential negative impacts on the Missouri River's wildlife.⁴¹⁸

Pursuant to FWCA, the agency prepared the *Missouri River Stabilization and Navigation Project Detailed Fish and Wildlife*

⁴⁰⁹ *Id.* at 166.

⁴¹⁰ *Id.*

⁴¹¹ *Id.* at 166-67.

⁴¹² *Id.*

⁴¹³ *Id.*

⁴¹⁴ *Id.*

⁴¹⁵ FSEIS ch. 3, *supra* note 1, at 33.

⁴¹⁶ FSEIS ch. 1, *supra* note 12, at 3.

⁴¹⁷ *Id.*

⁴¹⁸ *Id.*

Coordination Act Report.⁴¹⁹ The document analyzed the ramifications of the Corps' BSNP on the environment and gave the Corps recommendations to ameliorate the impacts.⁴²⁰ The Corps then responded with its own report entitled *Missouri River Bank Stabilization and Navigation Project Final Feasibility Report and Final Environmental Impact Statement for the Fish and Wildlife Mitigation Plan*.⁴²¹ This EIS, drafted in accordance with NEPA, enumerated alternatives for a project to restore the Missouri River ecosystem.⁴²²

The alternative the Corps thought would be best to remediate impacts included the preservation and restoration of both public and private lands.⁴²³ Of the acquired property, 3,200 acres would be earmarked for aquatic habitat restoration, and 44,900 acres would be managed for terrestrial habitat.⁴²⁴ The Secretary of the Army transmitted the Final EIS and a Feasibility Report to Congress in 1984.⁴²⁵ In the meantime, the Interior Least Tern and Piping Plover were listed as an endangered species.⁴²⁶ In 1986, Congress acted in response to the report by passing the Water Resources Development Act (WRDA86), which authorized the Missouri River Fish and Wildlife Mitigation Project (MRMP).⁴²⁷

A. The Missouri River Mitigation Project

Based on the recommendations of the 1984 report, the authorization for the MRMP allowed the Corps to purchase 48,100 acres of land for habitat restoration at a cost to the federal government of \$51,900,000.⁴²⁸ The Chief of Engineers of the Corps was to submit a report to Congress within three years detailing the need for any additional measures to mitigate effects of

⁴¹⁹ *Id.* at 4.

⁴²⁰ *Id.*

⁴²¹ *Id.* at 2-3.

⁴²² *Id.*

⁴²³ *Id.*

⁴²⁴ *Id.*

⁴²⁵ *Id.*

⁴²⁶ *Id.* at 10.

⁴²⁷ *Id.* at 4.

⁴²⁸ Water Resources Development Act of 1986, 33 U.S.C. § 2201 (2009).

the BSNP on aquatic and terrestrial habitat in the states of Nebraska, Iowa, Kansas and Missouri.⁴²⁹ In 1987, the Corps finished its Final EIS and Record of Decision for the MRMP.⁴³⁰ Pre-construction engineering on the project began in 1989.⁴³¹ In the same year, the Corps sought consultation with FWS under Section 7 of the Endangered Species Act (ESA) regarding its continued operation of the Missouri River Main Stem Reservoir System because of possible threats to endangered species by repair of certain BSNP structures.⁴³²

The Corps next prepared the *Missouri River Bank Stabilization and Navigation Project Fish and Wildlife Mitigation Project Reaffirmation Report* in 1990, which addressed reporting policies, how land would be acquired and scheduling for mitigation activities.⁴³³ Each year the Reaffirmation Report would be updated with Annual Implementation Reports to adjust to certain contingencies, detail the strategies that would be executed in the upcoming year and provide updates on the project's status.⁴³⁴ After each site for the project was acquired, an environmental review would be included in a Definite Project Report.⁴³⁵ The Reaffirmation Report was approved by the Corps' Missouri River Division in the same year.⁴³⁶ It was also in 1990 that the Pallid Sturgeon was listed as an endangered species.⁴³⁷ In 1991, land acquisition and habitat construction was finally initiated.⁴³⁸ The plan involved reconnecting chutes and backwaters, counteracting sedimentation, dredging

⁴²⁹ *Id.*

⁴³⁰ U.S. Army Corps of Eng'rs, *Final Supplemental Environmental Impact Statement for the Missouri Fish and Wildlife and Mitigation Project-Summary*, 2 (2003), http://www.moriverrecovery.org/mrrp/MRRP_PUB_DEV.download_documentation?p_file=565 [hereinafter FSEIS Summary].

⁴³¹ *Id.*

⁴³² 2003 BiOp, *supra* note 51, at 12.

⁴³³ FSEIS Summary, *supra* note 430 at 7

⁴³⁴ *Id.*

⁴³⁵ FSEIS ch. 1, *supra* note 12, at 4.

⁴³⁶ FSEIS Summary, *supra* note 433 at 7

⁴³⁷ Sturgeon 2, *supra* note 112, at 1.

⁴³⁸ FSEIS Summary, *supra* note 430 at 7.

filled-in wetlands, opening side-channels, stabilizing banks, constructing dikes and levees, reforestation and re-vegetation.⁴³⁹

Throughout the next few years, the Corps continued to engage in a number of formal and informal consultations under ESA with FWS regarding the impact of its Current Water Control Plan for its reservoir system operations.⁴⁴⁰ While this communication was ongoing, Congress sought to expand the restoration operations of the MRMP with the passage of the Water Resources Development Act of 1999 (WRDA99).⁴⁴¹ The legislation expanded WRDA86 by adding 118,650 acres to the project, bringing the total to 166,750.⁴⁴² An EIS would be prepared in 2003 to account for the additional acreage.⁴⁴³ Shortly after the authorization was passed, FWS came out with its Biological Opinion on the Corps' reservoir operations in 2000.⁴⁴⁴ The Opinion concluded that the Current Water Control Plan for the operation of the Missouri River Main Stem Reservoir System would put the Interior Least Tern, Piping Plover and Pallid Sturgeon in jeopardy.⁴⁴⁵ The Biological Opinion listed several Reasonable and Prudent Alternatives that the Corps was to incorporate into their fish and wildlife enhancement activities, including adaptive management, habitat restoration and flow enhancement.⁴⁴⁶

Adaptive management is a concept well suited for the unpredictability of ecological systems.⁴⁴⁷ When the environment changes or new information is acquired, the Corps is directed to modify plans accordingly so that the project purposes in which it is engaged continue to be carried out.⁴⁴⁸ If the Corps finds that an activity it has undertaken affects one of the listed species, it is to act in the animal's best interests.⁴⁴⁹

⁴³⁹ 2000 BiOp, *supra* note 4, at 227.

⁴⁴⁰ 2003 BiOp, *supra* note 51, at 12.

⁴⁴¹ FSEIS ch. 1, *supra* note 12, at 4.

⁴⁴² *Id.*

⁴⁴³ 2003 BiOp, *supra* note 51, at 12; *See* FSEIS Summary, *supra* note 430.

⁴⁴⁴ *Id.*

⁴⁴⁵ *Id.*

⁴⁴⁶ 2000 BiOp, *supra* note 4, at 233, 37.

⁴⁴⁷ *Id.*

⁴⁴⁸ *Id.*

⁴⁴⁹ *Id.* at 238.

Habitat restoration includes many of the previously discussed measures the Corps has implemented: the Big Muddy National Wildlife Refuge, Reserve Wetland Programs and its Section 1135 Programs.⁴⁵⁰ Further efforts, such as changes in reservoir operations, chute restoration and floodplain property acquisitions are suggestions of how to comply with this section.⁴⁵¹

Flow enhancement was the most controversial of the recommendations given by FWS.⁴⁵² Because the section of the Missouri River below Gavins Point Dam had the most altered flow, it was a high priority management area and it was critical for releases from the dam during the spring season to mimic the flow that would occur naturally on the Missouri.⁴⁵³ Another crucial component is the withholding of flows during the summer and fall seasons.⁴⁵⁴ This practice was so controversial because navigation interests need high water levels for barge travel.⁴⁵⁵ The Biological Opinion specified that the Corps maintain increased flows from Gavins Point Dam between May first and June fifteenth.⁴⁵⁶ Likewise, it required that the Corps reduce flows from June twenty-first to July fifteenth and further reduce them from July fifteenth to August fifteenth.⁴⁵⁷ The accelerated flows in the spring were intended to wipe out vegetation on existing sandbars and help the Interior Least Terns and Piping Plovers find habitats free from predators.⁴⁵⁸ It would also cause downstream sediment to create new sandbars so an enlarged area would develop to sustain more nests.⁴⁵⁹ Springtime flows would also provide the Pallid Sturgeon with spawning cues critical to breeding.⁴⁶⁰ The first flow reduction would serve to make more sandbar and shallow water habitat available, avoiding nest inundation and mortality of Pallid

⁴⁵⁰ *Id.* at 247.

⁴⁵¹ *Id.*

⁴⁵² Cusick, *supra* note 6, at para. 31.

⁴⁵³ 2000 BiOp, *supra* note 4, at 242.

⁴⁵⁴ *Id.*

⁴⁵⁵ *Id.*

⁴⁵⁶ *Id.*

⁴⁵⁷ *Id.*

⁴⁵⁸ *Id.*

⁴⁵⁹ *Id.*

⁴⁶⁰ *Id.*

Sturgeon larvae.⁴⁶¹ The second reduction would help the birds' fledglings avoid predators and have access to more foraging areas.⁴⁶² It also would provide more slack water areas for young sturgeon to mature.⁴⁶³ Flows were to be increased incrementally after August 15.⁴⁶⁴

The Corps was given until 2003 by FWS to implement these alternatives.⁴⁶⁵ In the meantime, the Water and Science Technology Board of the National Academy of Sciences, which is an independent organization that conducts scientific research, published *The Missouri River Ecosystem: Exploring Prospects for Recovery*.⁴⁶⁶ This study reaffirmed many of the findings in FWS's Biological Opinion, notably that the Missouri River's flows should be altered to simulate more natural flows.⁴⁶⁷ Despite the findings of the Academy and the recommendations of FWS, the Corps sought to challenge this aspect of the Biological Opinion and reinitiated formal consultation with FWS in 2003.⁴⁶⁸

The Corps submitted a proposal to FWS that included a number of additions to its wildlife enhancement activities, but it did not include the Reasonable and Prudent Alternative from the first Opinion that directed specified releases from Gavins Point Dam.⁴⁶⁹ The Corps argued that the spring releases and summer flow retentions were not reasonable or prudent because of "the likely lack of success in creating the desired amount of habitat using the flows required in the 2000 Biological Opinion...."⁴⁷⁰ Further, the allowance of releases during these times would

⁴⁶¹ *Id.*

⁴⁶² *Id.*

⁴⁶³ *Id.*

⁴⁶⁴ *Id.* at 243.

⁴⁶⁵ *Id.*

⁴⁶⁶ FSEIS Chapter 1, *supra* note 12, at 10.

⁴⁶⁷ Paul W. Hansen & Izaak Walton, *Managing the Missouri River-Will Good Science, Economics Prevail in the Missouri River's Future?*, at para. 7 (2006), [http://sports.espn.go.com/outdoors/general/columns/story?columnist=guest_colu
mnist&page=c_col_IWLA_Missouri_River](http://sports.espn.go.com/outdoors/general/columns/story?columnist=guest_columnist&page=c_col_IWLA_Missouri_River).

⁴⁶⁸ 2003 BiOp, *supra* note 51, at 12.

⁴⁶⁹ *Id.*

⁴⁷⁰ *Id.* at 17.

increase sandbar erosion and thus reduce available habitat.⁴⁷¹ It suggested alternatives such as augmenting the efforts to build more shallow water habitat and conducting a series of flow tests.⁴⁷² FWS next responded to the proposal with an amended Biological Opinion in 2003, which presented its determination of whether the new elements of the proposal, in addition to the 2000 Biological Opinion requirements, would jeopardize the three species' survival.⁴⁷³ Ultimately, FWS decided they did not, and the proposal was accepted.⁴⁷⁴

VI. THE CONFLICT

A. American Rivers v. U.S. Army Corps of Engineers

When the time came to execute the Reasonable and Prudent Alternatives of the 2000 Biological Opinion mandated by FWS in 2003, the Corps did not fulfill its obligation.⁴⁷⁵ Instead, it maintained higher flows to help downstream navigation because the 2003 Biological Opinion omitted the flow regime requirements that would help endangered species survive.⁴⁷⁶ American Rivers, along with a number of other environmental groups, brought suit against the Corps, the Secretary of the Army, FWS and the Secretary of the Interior in the United States District Court, District of Columbia.⁴⁷⁷ The groups alleged violations of the Flood Control Act of 1944 (FCA) and the Endangered Species Act (ESA), and they sought a preliminary injunction requiring the Corps to implement the flow regime described in the 2000 Biological Opinion.⁴⁷⁸

⁴⁷¹ *Id.* at 18.

⁴⁷² *Id.*

⁴⁷³ *Id.*

⁴⁷⁴ *Id.* at 12.

⁴⁷⁵ Michael S. Houdyshell, *Missouri River Case: American Rivers v. U.S. Army Corps of Engineers*, 9 GREAT PLAINS NAT. RESOURCES J. 51, 56 (2005).

⁴⁷⁶ *Id.*

⁴⁷⁷ *Id.* at 52.

⁴⁷⁸ *Id.*

The District Court granted the injunction because it found Plaintiffs satisfied the required four-part test.⁴⁷⁹ The test required that Plaintiffs demonstrate “1) a substantial likelihood of success on the merits, 2) that [plaintiff] would suffer irreparable injury if the injunction is not granted, 3) that any injunction would not substantially injure other interested parties, and 4) that the public interest would be served by the injunction.”⁴⁸⁰ Regarding the ESA claim, American Rivers asserted that the decision to mandate the new flow regime described in the 2003 Biological Opinion was arbitrary and capricious, the Opinion did not ensure the endangered species would not be put in jeopardy and that the actions that the Corps would take pursuant to the 2003 Opinion would result in an illegal taking of endangered species under ESA.⁴⁸¹

The Court held that American Rivers was likely to succeed on the merits because the Corps did not give a sufficient explanation as to why the 2003 Opinion ignored the 2000 Opinion’s flow enhancement requirements.⁴⁸² Moreover, the Court held that if the Corps followed the 2003 Opinion, endangered species and their habitats would suffer harm.⁴⁸³ The second requirement for the plaintiff to have suffered irreparable harm would be met because the Corps’ actions would result in the taking of at least 121 endangered birds, and it would harm the Pallid Sturgeon’s habitat and food supply.⁴⁸⁴ While recognizing that the injunction would injure interests of other parties, namely navigation, any injury would not rise to the level required when balancing the purposes of the ESA.⁴⁸⁵ Because Congress envisioned the survival of endangered species as having priority over government agencies’ project purposes, the injury to other interests on the Missouri is

⁴⁷⁹ *Am. Rivers v. U.S. Army Corps of Eng’rs*, 271 F. Supp. 2d 230, 262 (D.D.C. 2003).

⁴⁸⁰ *Id.* at 248 (citing *Katz v. Georgetown Univ.*, 246 F.3d 685, 687-88 (D.C. Cir. 2001)).

⁴⁸¹ Karla Hauk, *Missouri River Case: A River Runs Through It: In re: Operation of the Missouri River System Litigation*, 9 GREAT PLAINS NAT. RESOURCES J. 61, 70 (2005).

⁴⁸² Houdyshell, *supra* note 475, at 57.

⁴⁸³ *Id.* at 58.

⁴⁸⁴ *Id.*

⁴⁸⁵ *Id.* at 59.

subordinate to the injury to the endangered species.⁴⁸⁶ Finally, the Court held that the injunction should be granted because it is in the public's best interest to have agencies comply with congressional mandates.⁴⁸⁷

Following the grant of the injunction, the Corps petitioned the Federal Panel on Multi-District Litigation asking that all the cases regarding the management of the Missouri River be consolidated and transferred to the District of Minnesota.⁴⁸⁸ The cases were transferred.⁴⁸⁹ The Minnesota Court granted summary judgment in favor of the defendants on the FCA claim and found no violations of the ESA.⁴⁹⁰

As far as the FCA claim, plaintiffs contended that the Master Manual, which had been updated in 2004, did not provide for navigation needs, i.e. higher water levels that enable barge traffic but have a negative effect on endangered species.⁴⁹¹ The Corps responded that the 2004 Master Manual requires it to defer to navigation interests, as opposed to upstream interests, in the event of a conflict between the two.⁴⁹² The Court held that the FCA does not require the Corps to come to any particular conclusions with respect to its management of the Missouri River.⁴⁹³ The Corps has discretion to decide whether or not to implement a certain flow regime, as long as it has evaluated all interests and arrived at a decision that it considers will provide the maximum overall benefit to stakeholders.⁴⁹⁴ As such, the Court held that the 2004 Master Manual complied with the FCA.⁴⁹⁵

With respect to American Rivers' ESA claims, the Court held that the 2003 Biological Opinion was not arbitrary or capricious, that there was no jeopardy to the endangered species

⁴⁸⁶ *Id.*

⁴⁸⁷ *Id.*

⁴⁸⁸ *Id.* at 60.

⁴⁸⁹ *Id.*

⁴⁹⁰ Hauk, *supra* note 481, at 70, 73.

⁴⁹¹ *Id.* at 68-9.

⁴⁹² *Id.* at 69.

⁴⁹³ *In re Operation of the Mo. River Sys. Litig.*, 363 F. Supp. 2d 1145, 1153 (D. Minn. 2004).

⁴⁹⁴ *Id.*

⁴⁹⁵ *Id.*

and that there was no illegal taking of endangered species.⁴⁹⁶ The Court held that the decision of FWS to modify the Reasonable and Prudent Alternative from the 2000 Biological Opinion was not arbitrary or capricious because its rational basis for doing so was to avoid further degradation of the endangered species' habitats.⁴⁹⁷ The Court held that FWS reasonably concluded in the 2003 Opinion that the altered flow regime, together with additional habitat restoration, would not jeopardize the survival of the species.⁴⁹⁸ It also held that there was no illegal take of endangered species due to the Corps' compliance with the Opinion.⁴⁹⁹ The document contained an Incidental Take Statement that allowed for a certain number of takes as a result of the Corps' actions as long as the actions were in conformity with the Opinion.⁵⁰⁰ Because the Corps complied with the Opinion, and the Opinion was found to be valid, this operated as an absolute defense to the Plaintiffs' challenges.⁵⁰¹ On appeal to the Eighth Circuit, which decided the case in 2005, the Court affirmed the grant of summary judgment on the FCA claim and declared the remaining ESA claims as moot.⁵⁰²

The decision of the Minnesota Court has been surrounded by considerable controversy.⁵⁰³ Some have criticized the level of scrutiny the tribunal gave to the evidence presented by American Rivers and the other plaintiffs.⁵⁰⁴ Given the thoroughness of the 2000 Biological Opinion and the unanimous conclusions made by independent scientific study groups regarding the flow regime needed to help the Interior Least Tern, Piping Plover and Pallid Sturgeon populations, the departure from the Opinion seems unwarranted.⁵⁰⁵ There are even inconsistencies within the 2003

⁴⁹⁶ Hauk, *supra* note 481, at 70.

⁴⁹⁷ *Id.* at 71.

⁴⁹⁸ *Id.* at 73.

⁴⁹⁹ *Id.*

⁵⁰⁰ *Id.*

⁵⁰¹ *Id.*

⁵⁰² *In re Operation of the Mo. River Sys. Litig.*, 421 F.3d 618, 637-38 (8th Cir. 2005).

⁵⁰³ Hauk, *supra* note 481, at 70.

⁵⁰⁴ *Id.*

⁵⁰⁵ *Id.* at 75.

Opinion that make FWS's recommendations appear arbitrary and capricious.⁵⁰⁶ In one instance, the Opinion says that both habitat construction and a more natural flow regime are critical to the species' survival.⁵⁰⁷ Yet, in the Reasonable and Prudent Alternatives of the same Opinion, no such flow regime recommended.⁵⁰⁸ Clearly, the legislative intent of the ESA is not being realized.

B. The Missouri Clean Water Commission

The Corps continued habitat restoration efforts on the Missouri River.⁵⁰⁹ It was not long before farming and water quality interests became added impediments to the endangered species' survival.⁵¹⁰ Area farmers noticed the commencement of the Mitigation Project and witnessed the Corps dumping sediment into the Missouri's waters to build shallow water habitat.⁵¹¹ Fearing the dumping would put added pressure on the levee protecting their farmland, they approached the Missouri Farm Bureau and the Missouri Clean Water Commission (Commission) for help.⁵¹² The Commission, which is responsible for implementing the Clean Water Act, decided the Corps was in violation of the Act because sediment is classified as a pollutant.⁵¹³ It then issued a cease and desist order on the Corps.⁵¹⁴

The Corps discontinued dumping, although it believed the order to be unenforceable.⁵¹⁵ It contended that it was simply fulfilling the binding obligations of the FWS's 2003 Biological Opinion.⁵¹⁶ The Commission's Chairwoman, Kristen Perry, claims

⁵⁰⁶ *Id.* at 76.

⁵⁰⁷ *Id.*

⁵⁰⁸ *Id.*

⁵⁰⁹ Harmon, *supra* note 264, at para. 38.

⁵¹⁰ *Id.*

⁵¹¹ *Id.*

⁵¹² *Id.*

⁵¹³ *Id.* at para. 33.

⁵¹⁴ *Id.* at para. 65.

⁵¹⁵ Harmon, *supra* note 264, at para. 84.

⁵¹⁶ Sam Hananel, *Dirt Flies in Missouri River Fight*, USA TODAY, Mar. 28, 2008, at para. 7, available at http://www.usatoday.com/money/economy/2008-03-28-3739739721_x.htm.

that the state of Missouri invests upwards of \$40 million annually to keep pollutants, like those the Corps is dumping, out of the Missouri River.⁵¹⁷ Typically, farmers are blamed for dead zones caused by fertilizer runoff that is high in phosphorus and nitrogen.⁵¹⁸ Perry remarked that the government should be held just as responsible for not degrading water quality as everyone else.⁵¹⁹ The Commission also believes that this habitat creation is not helping, but hindering the endangered species' survival.⁵²⁰ The Corps claims that the materials it is introducing to the water are mostly sand, not soil, and thus do not contain high amounts of these substances.⁵²¹

Criticism of the Commission has come from some state legislators, who question the timing of the Commission's concern because the Missouri Department of Natural Resources, which the Commission oversees, was aware of the project for more than a year before it was initiated.⁵²² While the Missouri component to the MRMP is at a standstill, habitat restoration continues in the states of Nebraska, Iowa and Kansas.⁵²³ It is critical that this debate comes out in favor of conservation interests because habitat restoration is critical to the survival of endangered species.⁵²⁴ The controversy has illuminated the confusion surrounding which group ultimately controls the management of the Missouri River.

While Chairwoman Perry believes excess nutrients from the sediment contributes to the dead zone in the Gulf of Mexico, the Corps funded an independent study conducted by the National Academy of Sciences' Water and Science Technology Board to

⁵¹⁷ Cusick, *supra* note 6, at para. 6.

⁵¹⁸ Harmon, *supra* note 264, at para. 71.

⁵¹⁹ *Id.* at para. 78.

⁵²⁰ Cusick, *supra* note 6, at para. 5.

⁵²¹ *Id.* at para. 7.

⁵²² Jacob Luecke, *Corps Halts Big Muddy Dirt Dumps*, COLUMBIA TRIBUNE, Apr. 29, 2007, 2007 WL 8097837, available at <http://www.highbeam.com/doc/1G1-162761404.html>.

⁵²³ Harmon, *supra* note 264.

⁵²⁴ 2003 BiOp, *supra* note 51, at 187.

determine whether this was true.⁵²⁵ The study, which was completed in September, 2010, found that “these projects will not significantly change the extent of the hypoxic area in the Gulf of Mexico.”⁵²⁶ Whether or not the Commission will lift the cease and desist order remains to be seen.

V. THE FUTURE

A. The Missouri River Recovery Implementation Committee

In acknowledgment of how politics has taken center stage in Missouri River management, Congress provided for greater cooperation when it passed the Water Resources Development Act of 2007.⁵²⁷ This legislation authorized the creation of the Missouri River Recovery Implementation Committee (Committee) which is to conduct another study of the Missouri River ecosystem with the Secretary of the Army.⁵²⁸ The Committee is to be comprised of federal agencies, states, water management and fish and wildlife agencies, Indian tribes and other river interests including navigation, irrigation, flood control, conservation, recreation and power supply.⁵²⁹

The Committee has begun a study entitled *The Missouri River Ecosystem Restoration Plan*.⁵³⁰ The group also has the responsibilities of giving assistance to the Corps, agencies or tribes, informing them on how the study will be conducted and on issues that arise with respect to the mitigation project already in progress.⁵³¹ In some of its recent meetings, the Committee worked

⁵²⁵ Harmon, *supra* note 266; *Water and Science Technology Board, Nat'l Academy of Sciences, Missouri River Planning: Recognizing and Incorporating Sediment Management* 122 (2011).

⁵²⁶ *Water and Science Technology Board, supra* note 528.

⁵²⁷ Water Res. Dev. Act of 2007, *supra* note 7.

⁵²⁸ *Id.*

⁵²⁹ *Id.*

⁵³⁰ U.S. Inst. for Env'tl. Conflict Resolution, *Missouri River Recovery Implementation Committee (MRRIC) Charter Planning Group Process*, at para. 2 (2009), <http://missouririver.ecr.gov/>.

⁵³¹ *Id.*

on a variety of issues to help its cause. It formed long-term recovery priorities and commitments for its Recovery Program; it made recommendations on Interior Least Tern and Piping Plover recruitment projects; and it learned about the duties of federal agencies with respect to the water quality of the Missouri River.⁵³²

B. The Missouri River Authorized Purposes Study

Due to the controversy that has arisen with respect to prioritization of uses of the Missouri River, Congress authorized the expenditure of \$25 million to commission the Missouri River Authorized Purposes Study, which began in October 2009.⁵³³ The Corps will be conducting the study to evaluate the project purposes authorized by the Flood Control Act of 1944 to see if changes need to be made in the management of the Missouri River.⁵³⁴ The first step will be to solicit concerns from a variety of stakeholders affected by river management decisions, followed by a period of analyzing the present uses of the river.⁵³⁵ After sufficient data is gathered, trade-offs and alternatives will be assessed to strike the proper balance between competing objectives.⁵³⁶ When the study is completed, it will be submitted to Congress with recommendations as to what management decisions would be optimal.⁵³⁷ From that point, it is anticipated that if Congress deems it necessary, legislation will be passed to address stakeholders' concerns more effectively.⁵³⁸

⁵³² See Missouri River Recovery Implementation Program, *Accomplishments, Fourteenth Meeting, Denver, Colorado, Feb. 14-17, 2011*, (2011), http://www.moriverrecovery.org/mrrp/MRRP_PUB_DEV.download_documentation?p_file=7165.

⁵³³ Omnibus Appropriations Act of 2009, Pub. L. No. 111-8, § 108, 123 Stat. 524, 525 (2009).

⁵³⁴ *Id.*

⁵³⁵ James E. Ducey, *Study to Evaluate Authorized Purposes of Missouri River*, ALL NEWS, Oct. 1, 2009, <http://www.bloggernews.net/122465>.

⁵³⁶ *Id.*

⁵³⁷ *Id.*

⁵³⁸ *Id.*

VII. CONCLUSION

It seems that some positive progress has been made toward cooperative management of the Missouri River. What is most important for the evolution of this decision-making process is the recognition of changing social values. When so much consideration is given to dying industries like navigation, more important objectives become neglected. A healthier ecosystem translates to better water quality, more recreational opportunities and saving species for future generations to behold. It is unlikely that river modifications such as the dam and reservoir system created under the Pick-Sloan Plan are going to be removed anytime soon. The key to regaining the historic ecosystem of the Missouri River involves addressing public concerns, increasing communication between involved organizations, commissioning scientific studies that are accurate and independent and promoting innovative solutions to species and habitat decline. The futures of the Interior Least Tern, Piping Plover and Pallid Sturgeon are unknown, even given the assistance provided by government agencies. However, one thing is for sure—it would be a shame to see a species of fish that survived the Ice Age disappear after only fifty years of activities undertaken by the Corps.