A New Corps of Discovery for Missouri River Management

Sandra B. Zellmer  
University of Nebraska Lincoln, szellmer2@unl.edu

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A New Corps of Discovery for Missouri River Management

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* Associate Professor of Law, University of Nebraska College of Law. B.S., Morningside College; J.D., University of South Dakota College of Law; LL.M., The George Washington University National Law Center. I am grateful to the University of Nebraska for its research support and for sponsoring the First Annual Water Law, Policy, and Science Conference: Finding Solutions to Multi-jurisdictional Water Conflicts (Mar. 4–5, 2004), which resulted in this Symposium issue. I also thank John Davidson, Janice Schneider, and Chad Smith for sharing their thoughts on Missouri River management, and Shannon Brennan for her outstanding research efforts.
I. INTRODUCTION

I am certainly not an advocate for frequent changes in laws and constitutions. But laws and institutions must go hand in hand with the progress of the human mind. As that becomes more developed, more enlightened, as new discoveries are made, new truths discovered and manners and opinions change, ... institutions must advance also to keep pace with the times.

Thomas Jefferson

Two hundred years ago, President Thomas Jefferson sent Meriwether Lewis and William Clark on an expedition along the Missouri River in hopes of discovering an all-water route to the Northwest. Although this dream was not fulfilled, the Corps of Discovery brought back a wealth of scientific information. Its zoological and botanical discoveries, in particular, were beyond any value. Today, at the expedition's bicentennial, the Missouri River continues to defy the government's aspirations for substantial commercial navigation. It remains an ecological treasure trove of endemic fish and wildlife species and plant communities, but these riches have been vastly depleted. Protecting and restoring the river's ecological values, while sustaining realistic economic expectations, will prove to be a task equal to the one undertaken by Lewis and Clark.

The indubitable goal of river management in Jefferson's day and for over a hundred and fifty years afterwards was navigation for purposes of promoting commerce and westward expansion. That goal has begun to evolve for river systems across the nation. The emergent focus is ecosystem health, forced in part by federal requirements for water quality and endangered species. Ecosystem health in turn requires ecological sustainability—maintaining both the physical structure and organization of the river and its inhabitants as well as their function and vitality over time. For river ecosystems, ecological sustainability invariably entails some semblance of natural flow regimes.

1. NAT'L RESEARCH COUNCIL, NAT'L ACADEMIES, THE MISSOURI RIVER ECOSYSTEM: EXPLORING THE PROSPECTS FOR RECOVERY 110 (hereinafter NRC, MISSOURI RIVER REPORT) (citing Letter from Thomas Jefferson, to George Washington (Jan. 4, 1786)).
3. Id.
6. See N. LeRoy Poff et al., The Natural Flow Regime: A Paradigm for River Conservation and Restoration, 47 BioScience 769, 769 (1997) (concluding that streamflow is the "master variable" for rivers, influencing and limiting the abundance and distribution of species in the river system); see also Sandra Postel & Brian
close linkages between ecosystem health and human well-being, but
the law does not fully reflect those linkages. 7

On the Missouri, tensions have run high ever since the Corps of
Discovery explored the river’s furthest reaches in the early 1800s. 8
The conflict between navigation and ecological protection in the Mis-
souri River basin has given rise to a veritable “clash of the titans” dur-
ing these bicentennial years. Upper basin states, are pitted against
lower basin states, and both have had their run-ins with federal agen-
cies. The U.S. Army Corps of Engineers stands at the vortex of the
controversy, with the states, as well as environmental and commercial
associations, demanding contradictory and even mutually exclusive
responses in river operations.

Tensions over river management are by no means isolated to the
Missouri River basin. Conflicts between water users and imperiled
species have been raging across the country for the past quarter-cen-
tury. The flavor of the conflict is somewhat different in the Missouri
River basin than in many regions of the American West, because so
few rely on Missouri River water for consumptive uses. Irrigation
with water from the mainstem river is minimal, and there are few
users with legally protected rights to the water who have an incentive
to jump into the fray. As Professor Dan Tarlock points out, “the Mis-
souri River is a paradox: the amount of water available . . . is inverse
to the number of potential users.” 9

Yet “conflict without scarcity” in terms of water quantity is conflict
nonetheless. 10 Other types of scarcity generate controversy on the
Missouri River: scarcity of keystone species; diminishment of the nat-
ural flow regime; and a paucity of willingness to adapt as necessary to
ensure the long-term viability of human and ecological communities.
These conflicts prompt stakeholders to draw battle lines in the sand,

7. Costanza & Mageau, supra note 5, at 105 (citing ENVIRONMENTAL PROTECTION
AGENCY, SCIENCE ADVISORY BOARD 1990); see POSTEL & RICHTER, supra note 6, at
93 (“[T]he United States has no overarching vision or goal to secure the flows that
rivers need to support the diversity of freshwater life and to sustain ecological
functions.”).

8. See generally JOHN E. THORSON, RIVER OF PROMISE, RIVER OF PERIL: THE POLITICS
OF MANAGING THE MISSOURI RIVER (1994) (providing a detailed history of Mis-
souri River development, challenges, and controversies); John P. Guhin, The Law
of the Missouri, 30 S.D. L. REV. 350 (1985) (describing the legal framework for
Missouri River management up to the 1980s).

GREAT PLAINS NAT. RESOURCES J. 1, 1 (1997).

10. Id.
making them less amenable to adaptive, creative solutions, just as surely as conflict over water scarcity does.

The most recent Missouri River litigation conflagration has drawn in five states, two federal agencies, several Native American tribes, and numerous private litigants over the largest dam and reservoir system on the longest river system in the nation. It implicates three federally protected species, as well as barge operators, shippers, and recreational and commercial interests related to tourism and sport fisheries. Two potentially contradicting federal laws provide the subtext: the Endangered Species Act ("ESA") and the Flood Control Act of 1944. The impetus for litigation has been the Corps of Engineers' ongoing efforts to revise its Master Manual for river operations under the Flood Control Act. The result so far has been dozens of court orders from six different federal courts.

Two separate themes share center stage: state sovereignty and federalism, on one hand, and more to the point for my purposes here, the adaptation of outdated and ill-suited human strategies in the face of long-term ecosystem needs. When the Flood Control Act was adopted in the 1940s, navigational hopes were high and "ecosystem management" had not yet emerged as a fundamental ecological precept. The Flood Control Act, like many of the first generation of federal public land management statutes, imposes a multiple-use requirement that emphasizes commodity production rather than ecological needs.


12. Davidson & Geu, supra note 11, at 836-37.


14. See Hayes & Schneider, supra note 11, at 4-6. Most of the cases were referred for multi-district consolidation by the Judicial Panel on Multi-District Litigation, In re Operation of Missouri River System Litig., 277 F. Supp. 2d 1378 (D. Minn. 2003), and five have been resolved on motions for summary judgment by the District of Minnesota, In re Operation of Missouri River System Litig., No. 03-MD-1555 (PAM), 2004 WL 1402563 (June 21, 2004). See infra notes 160-66 and accompanying text (discussing the District of Minnesota opinion).

Misunderstanding and misallocation have been the inevitable results, perpetuated by the Corps of Engineers, a 200-year-old military agency charged with implementing this archaic statute.

The Missouri River is representative of a nationwide phenomenon. The Law of the River is evolving from water quantity allocation, reflecting well-settled prior appropriation law and decades-old interstate compacts to broader ecologically-based requirements. From sturgeon to salmon to silvery minnows, every major river system in western United States is now managed, at least in part, pursuant to contemporary environmental legislation, which has begun to eclipse traditional water law. Just look to the Rio Grande and the Klamath River for the extensive changes wrought by the ESA. The need for river restoration in order to meet ecological needs has been a compelling force, even on the heavily regulated and over-appropriated Colorado River. Meanwhile, on the Missouri, long-standing navigational directives are being influenced by the ESA and other environmental requirements.

My objective in this Article is two-fold: first, to show that the Master Manual revision process pursuant to the Flood Control Act asks the wrong questions and therefore cannot provide a complete solution for the Missouri River basin; and second, to suggest legislative change. I offer my voice to a long line of distinguished scholarship on Missouri River management with some trepidation, and with full knowledge that this Article is far from the definitive word on this complex and seemingly intractable controversy. To this end, the Article is not intended to be prescriptive but rather a springboard for further discussion.

The Flood Control Act, in attempting to be all things to all people, fails to prioritize or even promote sustainable national, regional, and local interests on the Missouri River. As a result, a long-term, comprehensive management strategy is unlikely to be forged from the long drawn-out revisions to the Master Manual. Neither can the ESA, standing alone, provide the answers.

18. See Grand Canyon Protection Act of 1992, Pub. L. No. 102-575, § 1802, 106 Stat. 4669 (requiring the Secretary of Interior to operate Glen Canyon Dam to mitigate adverse environmental impacts pursuant to the ESA and other relevant law); Tarlock, supra note 9, at 11 (observing that the Bureau of Reclamation is moving toward a science-based management approach on the Colorado River through beach-building flows that replicate seasonal floods).
A new way of thinking, supported by a complete legislative overhaul, is long overdue. A holistic organic act for the Missouri River ecosystem, one which provides a sustainable future for both human and ecological interests, is desperately needed. Such an act might follow the pattern set by the latest generation of organic acts for public lands management. The most recent of these enactments, the National Wildlife Refuge System Improvement Act of 1997 ("Refuge Act"), prioritizes conservation and compatible, sustainable resource use. It provides an exemplary model for consideration.

This Article begins in Part II by highlighting the remarkable ecological discoveries of the Lewis and Clark expedition. Part III describes the origins and implementation of the Flood Control Act, while Part IV details the rise of the modern environmental age in federal legislation, focusing on the ESA. Missouri River litigation trends are assessed in Part V, which reviews cases brought in courts within the basin as well as the District of Columbia. Finally, Part VI illustrates the need for comprehensive federal legislation and lays the groundwork for a new Missouri River Organic Act by drawing on experiences with other federal organic acts and river restoration initiatives.

II. THE JEFFERSONIAN CORPS OF DISCOVERY

When Lewis and Clark traveled up the Missouri River in search of the fabled Northwest Passage, the river basin was a "storehouse of biodiversity." Studies of the few remnant floodplains that still exist today help us visualize conditions as they were two hundred years ago: "a mosaic of aquatic, riparian, and terrestrial communities, including oxbow lakes, ponds, marshes, sand dunes, shorelines, in-channel islands, sand bars, [and] forests." Instead of finding "a great waste, a wilderness unpeopled with any beings except wolves and wandering Indians," as some skeptics had predicted, the expedition discovered and described nearly 200 new species of plants and 120 species of animals in the explorers' journals. Three of the native species most likely encountered include an ancient fish, the pallid sturgeon, and two bird species, the least interior tern and piping

20. NRC, MISSOURI RIVER REPORT, supra note 1, at 79.
23. Cutright, supra note 2, at 423, 447.
plover, each of which is found today on the federal endangered species list.24

When the expedition left St. Louis in 1804 in a large keelboat and two pirogues, with little by way of maps or other navigational aids for the long journey to the Pacific Ocean, their task was indeed a daunting one.25 The Missouri River is the longest river in the United States, extending approximately 2,600 miles from its source in Montana to its mouth near St. Louis.26 It drains over 500,000 square miles of land in nine states and portions of Canada.27 The natural hydrograph of this meandering, braided river was marked by spring and early summer rises in flow from precipitation in the Plains and snowmelt in the Rockies, followed by a late summer decline.28 Dramatic shifts in turbidity and sediment loading were common throughout the seasons, as was periodic and occasionally extreme flooding that kept the connections between the main channel, its tributaries, and its broad floodplain alive.29

Heading upstream in the unpredictable Missouri River environment entails all sorts of difficulties under even the best of circumstances: rapid flow with few clear channels; treacherous and often hidden snags from fallen tree limbs; crumbling, unstable banks; fluctuating depths and flows; highly variable sandbars; inclement weather; and vicious insect infestations.30 In 1804, added to that was

24. See 50 Fed. Reg. 50,726 (Dec. 11, 1985) (listing the plover); 50 Fed. Reg. 21,784 (May 20, 1985) (listing the least tern); 55 Fed. Reg. 36,641 (Sept. 6, 1990) (listing the pallid sturgeon). The federal endangered species list is found at 50 C.F.R. § 17.11 (2003). Of the sixty-seven native fish species in the mainstem river, fifty-one are currently listed as rare or decreasing across all of part of their historic range. NRC, MISSOURI RIVER REPORT, supra note 1, at 3. Imperiled fish species include sicklefin, sturgeon chub, and blue sucker. Id. at 77; Greg Power, The Missouri River System’s “Other” Fish, at http://www.npwrc.usgs.gov/resource/fish/othrfish/othrfish.htm (last visited Nov. 2, 2004).
28. NRC, MISSOURI RIVER REPORT, supra note 1, at 56.
29. Id. at 58–59. Sediment transport was a hallmark of the “Big Muddy.” Prior to the construction of dams and reservoirs, the river carried over 140 million tons of sediment per year, on average, past Sioux City, Iowa, but this was reduced to about four million tons per year in the post-dam era. Id. at 2.
30. Id. at 56–60, 65. Unregulated river flows varied greatly, from a low of around eleven million acre-feet at present day Sioux City, Iowa, generally considered the dividing point between the upper and lower basin, to a high of forty-one million acre-feet at the same point. Davidson & Geu, supra note 11, at 821.
the vast cultural challenge of meeting nearly fifty different Native American tribes, some of whom had encountered non-Indians before with unhappy results, others of whom had never seen Euro-American explorers, and none of whom were entirely aware of Jefferson's designs for their native lands.31

Given the daunting odds of their mission, anyone placing a wager on the success of the Corps of Discovery would surely bet against it. And in one sense, the expedition was a failure—there was no all-water route to the west coast. Yet, from the scientific and social standpoints, the mission had a tremendous impact. It provided a strong base for the nation's storehouse of knowledge about the natural resources of the American West and solidified its determination to settle the area and fulfill its manifest destiny.32

III. OF FAMINE AND FLOODS: THE FLOOD CONTROL ACT OF 1944

Neither hardship nor conflict is new to the Missouri River basin. More than a century after the expedition, the federal government attempted to alleviate harsh conditions and promote economic well-being through legislation authorizing extensive construction and alteration of the river. In doing so, it addressed some problems, particularly flooding in the downstream region, but created many more.

A. The Impetus for the Flood Control Act

The early twentieth century was the Big Dam Building Era in the West.33 Across the nation, rivers have been "controlled and exploited through a concrete maze of dams, reservoirs, canals, diversion facilities, tunnels, aqueducts, pumps, dikes, and navigation locks . . . [to] serve . . . 'a social order based on the intensive, large-scale manipula-

31. See generally Michael L. Lawson, Dammed Indians: The Pick-Sloan Plan and the Missouri River Sioux 1944–1980 xix–xxiii (1982) (describing the effects of twentieth century Missouri River management on Great Plains tribes); Master Manual FEIS, supra note 26, at 7 (stating that thirty tribes are located in the basin today); Davidson & Geu, supra note 11, at 824 n.25 (listing Indian reservations located within the basin as of 2001).

32. Success, like beauty, may be in the eye of the beholder, as settlement of the West had dramatic and in some cases devastating impacts on Native American tribes. LAWSON, supra note 31, at xix–xxiii.

tion of water." Within just a few decades—a mere blink of the eye in geological terms—a “cataclysmic transition” occurred.\textsuperscript{35}

Several forces combined to propel the federal government into action on the Missouri River. The forces of nature played a preeminent role. The Dust Bowl years of the 1930s devastated the economies of the Missouri River states, heavily reliant on agricultural products.\textsuperscript{36} The dry years were followed by a series of devastating floods that occurred on the lower Missouri from 1942 to 1944.\textsuperscript{37} Congress had concerned itself with flood control in previous years, and Missouri River regulation was a logical extension of its interest.\textsuperscript{38} Mainstem dams and reservoirs could provide protection for the population centers and farms in the lower basin.\textsuperscript{39} In addition, such public works projects provided a means of generating economic activity and employing soldiers soon to return from World War II.\textsuperscript{40}

Two federal forces collided and ultimately collaborated on the plan for Missouri River development. The Bureau of Reclamation, represented by William Sloan, became aligned with the upper basin states in striving to bring irrigation water to the thirsty West.\textsuperscript{41} Meanwhile, navigation and flood control—the lower basin’s concerns—occupied the Corps of Engineers, whose long-standing mission has been to provide quality engineering services to the nation.\textsuperscript{42} Colonel Lewis Pick,

\begin{itemize}
\item \textsuperscript{34} Mary Christina Wood, \textit{Reclaiming the Natural Rivers: The Endangered Species Act as Applied to Endangered River Ecosystems}, 40 ARIZ. L. REV. 197, 198 (1998) (quoting DONALD WORSTER, RIVERS OF EMPIRE 7 (1985)).
\item \textsuperscript{35} \textit{Id.} at 199.
\item \textsuperscript{38} See Flood Control Act of 1936, 33 U.S.C. § 701a (2000) (“It is recognized that destructive floods . . . , upsetting orderly processes and causing loss of life and property, . . . and impairing and obstructing navigation, highways, railroads, and other channels of commerce between the States, constitute a menace to national welfare; . . . the Federal Government should improve or participate in the improvement of navigable waters or their tributaries . . . for flood-control purposes if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people are otherwise adversely affected.”).
\item \textsuperscript{39} Thorson, supra note 27, at 17.
\item \textsuperscript{40} \textit{Id.} Dam construction also provided employment for thousands of Corps engineers returning from the war. \textit{Id.} Extensive histories of the events that led to enactment of the Flood Control Act of 1944 are provided in FERRELL, supra note 36. See also LAWSON, supra note 31; THORSON, supra note 8, at 63–67; Guhin, supra note 8, at 354. For a concise description of highlights, see Davidson & Geu, supra note 11, at 827–34.
\item \textsuperscript{41} Davidson & Geu, supra note 11, at 828.
\end{itemize}
representing the Corps, had an edge, because the Corps was a known
quantity with a fifty-year presence on the Missouri River. The rec-
cent floods added a sense of urgency to the Corps's agenda. The two
agencies came together in a classic East versus West clash. The im-
passe was broken when President Franklin D. Roosevelt proposed
that a new agency, a Missouri River Authority, be created to manage
the river, providing a compelling incentive to both the Corps and the
Bureau to iron out their differences.

The Pick and Sloan plans were consolidated to forge the Flood Con-
trol Act of 1944. The Act itself was a "majestic pork-barrel and log-
rolling spree," which purported to provide something for everyone. It
authorized the addition of five mainstem dams to the existing dam
at Fort Peck. The Corps and its interests in navigation and flood
control got priority on the mainstem, while irrigation was to be pro-
moted by projects on the tributaries. Meanwhile, the conversion of
the downstream portion south of Sioux City, Iowa into a nine-foot
channel to enhance navigation by ships and barges in the River was
authorized by the 1945 Rivers and Harbors Act.

Federalism concerns are addressed in section 701-1 of the Flood
Control Act:

[I]t is declared to be the policy of the Congress to recognize the interests and
rights of the States in determining the development of the watersheds within
their borders and likewise their interests and rights in water utilization and
control, as herein authorized to preserve and protect to the fullest possible
extent established and potential uses, for all purposes, of the waters of the
Nation's rivers; to facilitate the consideration of projects on a basis of compre-
prehensive and coordinated development; and to limit the authorization and con-

43. Davidson & Geu, supra note 11, at 828-29.
44. REISNER, supra note 33, at 185. The proposed agency would have been patterned
on the Tennessee Valley Authority. Id.
codified in various provisions of Titles 16, 33 and 43 of the United States Code).
46. Davidson & Geu, supra note 11, at 831 (quoting historian Albert Williams in
SARAH F. BATES ET AL., SEARCHING OUT THE HEADWATERS: CHANGE AND REDIS-
COVERY IN WESTERN WATER POLICY 125 (1993)).
47. ETSI Pipeline Project v. Missouri, 484 U.S. 495 (1988). Fort Peck Dam, one of
the largest earthen dams in the world, was built between 1933 and 1940 for the
purposes of providing Depression-era jobs and flood protection. Kevin R. Quinn,
'Fort Peck Experience' Offers Classic Definition of America, at http://
48. 33 U.S.C. §§ 701-1, 709 (2000); ETSI Pipeline Project, 484 U.S. at 512 n.7 (citing
S. Doc. No. 78-247, at 1 (1944)).
49. Davidson & Geu, supra note 11, at 831. In comparison to systems that rely on
locks to move traffic through shipping channels, as on the Mississippi River and
the St. Lawrence Seaway, open water navigation on the Missouri requires signifi-
cant amounts of water from upstream reservoirs. Id. Along with flow enhance-
ment and dredging to clear the navigation channel, an assortment of structural
devices, such as revetments and dikes, have been installed to maintain the chan-

NRC, MISSOURI RIVER REPORT, supra note 1, at 64.
struction of navigation works to those in which a substantial benefit to navigation will be realized therefrom and which can be operated consistently with appropriate and economic use of the waters of such rivers by other users.50

Within the same section, a provision known as the O'Mahoney–Milliken Amendment purports to protect upstream, western interests by stating that the use of the channel for navigation "shall only be such use as does not conflict with any beneficial consumptive use . . . of such waters for domestic, municipal, stock-water, irrigation, mining, or industrial purposes."51 At the time of enactment, conflict between water users must have seemed highly unlikely on a system with such immense storage capacity.52 Conflicting demands for the flow of the river, however, developed soon after project development.

B. The Implementation of the Flood Control Act

Construction of the mainstem dams and reservoirs was complete by 1967.53 The system is regulated through the Corps's Master Water Control Manual ("Master Manual") along with Annual Operating Plans created each year.54 The Master Manual has become the Law of the River,55 which is a "catalog of principles" for allocating and managing a river.56 On the Missouri, the Law of the River strives to effectuate the myriad purposes of the Flood Control Act.57 In other basins, the Law of the River is comprised of interstate compacts, treaties, legislative allocations, general stream adjudications and adjudication

50. 33 U.S.C. § 701-1. According to the Court of Appeals for the Ninth Circuit, this provision was intended to prohibit the United States from destroying state-created water rights without compensation, as it might otherwise do under the navigational servitude. Turner v. Kings River Conservation Dist., 360 F.2d 184 (9th Cir. 1966). Cf. Lower Brule Sioux Tribe v. United States, 712 F.2d 349 (8th Cir. 1983) (describing condemnation of land from the Lower Brule Indian reservation under a 1962 amendment authorizing the construction of the Big Bend dam and reservoir).

51. 33 U.S.C. § 701-1(b). According to Senator O'Mahoney, the amendment's purpose was to protect long-standing rights of the people of the West to use water. Davidson & Geu, supra note 11, at 832 (citing 90 CONG. REC. 8420 (1944)).

52. Davidson & Geu, supra note 11, at 832.

53. Ferrell, supra note 36, at 184.


55. Davidson & Geu, supra note 11, at 835.


before the Supreme Court, and it is typically aimed at the allocation of water for consumptive uses.\(^5\)

The Master Manual was initially issued in 1960 and subsequently revised four times, with the most recent revision issued in March 2004.\(^5\) The longest-lasting version of the Master Manual, in effect from 1979 through 2004, laid out a general management approach for reservoir operations in Section IX, which directs sequential consideration of various interests, with flood control first:

1) flood control;
2) irrigation and upstream beneficial uses;
3) downstream water supply;
4) navigation and power; and
5) recreation and wildlife.\(^6\)

As for the last item, the 1979 Manual stated, "[I]nsofar as possible without serious interference with the foregoing functions, the reservoirs will be operated for maximum benefit to recreation, fish and wildlife."\(^6\) The 2004 version omits the priorities provision, and, instead, strives to maintain maximum flexibility in Corps's discretion.\(^6\)

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58. Davidson, supra note 56, at 1; Tarlock, supra note 9, at 9 n.36. For a comparison of the Law of the River for the Colorado River, which revolves around the allocation of water, with the Law of the River for the Columbia River, which revolves around the allocation of fish, see Wood, supra note 34, at 221–30.


61. Ubbelohde, 330 F.3d at 1020; see South Dakota v. Bourland, 508 U.S. 679, 689–90 (1993). In South Dakota v. Ubbelohde, the court recognized that, "[a]t the same time, however, the Act recognizes secondary uses of the River including irrigation, recreation, fish, and wildlife." 330 F.3d at 1014 (citing Flood Control Act, Pub. L. No. 78-534, ch. 665, § 4, 58 Stat. 887, 889–90 (1944); 33 U.S.C. § 708 (2000); 43 U.S.C. § 390 (2000)). The House Document noted that the management plan "would also provide for the most efficient utilization of waters of the Missouri River Basin for all purposes, including irrigation, navigation, power, domestic and sanitary purposes, wildlife, and recreation." ETSI Pipeline Project v. Missouri, 484 U.S. 495, 512 (citing H.R. Doc. No. 78-475, at 29 (1944)).

Although the Flood Control Act, together with the O'Mahoney–Milliken Amendment, purports to be everything to everyone, when the Corps began to craft the revisions that eventually resulted in the 2004 Manual, it became obvious that few on the Missouri were happy and the ecological resources of the river were in serious decline. The Corps spent fifteen years drafting, collecting comments, revising, and returning to the drawing board before finally issuing a new version of the Manual.\textsuperscript{63} The ink no sooner dried on the page when opponents lodged a battery of claims against the new Manual.\textsuperscript{64} What went wrong?

Management challenges are not unique to the Missouri River; many other heavily developed rivers face significant tribulations posed by competition for scarce water resources, the needs of imperiled species, or both. Unlike other western rivers, however, the Missouri River has never been particularly well suited for commercial navigation, irrigation, or hydropower generation. Commercial navigation has been the most disappointing of all. Although the projected annual use of the Missouri River was twelve million tons, mostly in grain shipments, actual use hovers around 1.8 million tons.\textsuperscript{65} The total net benefit of current navigational shipping is estimated at only $8 million per year.\textsuperscript{66} In spite of congressional policy "to limit the authorization and construction of navigation works to those in which a substantial benefit to navigation will be realized therefrom,"\textsuperscript{67} the river supports a mere handful of barge operators and carries only a miniscule amount of the grain exported from riparian states.\textsuperscript{68} Commentators have quipped that it would be cheaper for farmers to ship their grain by Federal Express.\textsuperscript{69}

Likewise, irrigation never developed as expected.\textsuperscript{70} Although agriculture is the dominant commercial activity in the basin, widely known as the nation's breadbasket, irrigated agriculture accounts for less use of surface water today than it did before the majority of the

\begin{itemize}
  \item \textsuperscript{63} See \textit{In re} Operation of Missouri River System Litig., 305 F. Supp. 2d 1096, 1097–99 (D. Min. 2004) (detailing and criticizing the years of delay and missed deadlines experienced in revising the Master Manual).
  \item \textsuperscript{64} Missouri River Plan Unlikely to Survive Unscathed, \textit{Megawatt Daily}, Mar. 23, 2004, at 1; see infra Part V (describing litigation).
  \item \textsuperscript{65} NRC, \textit{Missouri River Report}, supra note 1, at 92.
  \item \textsuperscript{66} Id.
  \item \textsuperscript{67} 33 U.S.C. § 701-1 (2000).
  \item \textsuperscript{69} Id.
  \item \textsuperscript{70} See \textit{Peter Carrels}, Uphill Against Water: The Great Dakota Water War (1999) (describing the trials and travails of irrigation in the Missouri River basin).
\end{itemize}
mainstem reservoirs were constructed in 1944. Irrigated acreage comprises less than 10% of the projected amount due to fewer exports than anticipated, poor soils, and harsh climate in upper basin. Altogether, irrigated agriculture provides 1% of aggregate economic returns from the river system. Meanwhile, groundwater use has grown exponentially—by 2,000%—since the 1940s, with the advent of the centrifugal pump and center pivot irrigation systems.

Of all project purposes on the Missouri, hydropower has provided the greatest national economic benefit, yet there are few high-quality reservoir sites in the basin capable of generating significant amounts of power without inundating hundreds of thousands of acres of land. The mainstem reservoirs on the Missouri River impound 75 million acre feet of water and generate 3,300 megawatts of hydroelectricity. In contrast, Columbia River reservoirs impound only 41 million acre feet of water but produce 22,000 megawatts. Hydropower from Missouri River dams provides about 9% of the region's energy, to the tune of $615 million per year. The principal beneficiaries are Nebraska and South Dakota, with Minnesota taking a share as well.

The reservoir system has provided considerable flood control benefits by preventing around $414 million in annual flood damage. De-
velopment in the floodplain has continued apace, however, and in 1993 the system proved inadequate to the task. Heavy rains caused extensive flooding in the upper Mississippi and lower Missouri River basins, representing 100- to 500-year recurrence intervals. Damage occurred in floodplains as well as upland areas, and many areas were under water for months. An interagency committee reviewed the situation and recommended a shift in floodplain management away from dams, levees, and other structural devices to nonstructural management, such as wetland acquisition and restoration to control runoff.

The system also provides several significant, but largely unanticipated, incidental benefits. Millions of dollars of recreational use, based largely on a prolific walleye fishery, have been generated by the impoundment of vast quantities of water in reservoirs in the upper basin. Meanwhile, in the lower basin, steady flows supply water for fifty-seven municipal intakes, providing domestic supply for around three million people, mostly in Nebraska. Flows also contribute water for cooling and pollution dilution for coal-fired power plants dotted along the river in the lower basin. These incidental, yet substantial, upper and lower basin interests depend largely on keeping water instream on both ends of the basin. This is proving to be an impossible task, made all the more challenging when the ecological needs of endemic species are factored into the management equation.

IV. THE ENVIRONMENTAL ERA: ALL CREATURES GREAT AND SMALL

Ecological interests on the river gained a toehold when Congress enacted a suite of environmentally protective legislation in the 1970s. The most remarkable of these modern statutes is the Endangered Species Act of 1973 ("ESA"), notable both for its unequivocal prioritiza-
tion of imperiled species and their habitats and for its simple and nearly uncompromising regulatory approach. The ESA "has become a focal point for broad societal debates over such fundamental issues as the limits of regulatory power over private property; the respective roles of local, state, and federal governments in environmental protection; and the extent to which individual citizens should be able to influence environmental policy." 89 Although the ESA is excoriated by developers as the "pitbull" of federal environmental law, it is widely popular across the nation, and many states have adopted legislative counterparts.90

The ESA, in tandem with the Clean Water Act91 and other federal environmental laws,92 has begun to push river management toward a broader goal of ecosystem health. This promotes sustainability over time, even in the face of external stress, and requires the maintenance of both the physical structure and organization of the ecosystem and its inhabitants, as well as their function and vigor.93 One critical component of ecosystem function and vigor is flow—the "master variable" of river ecology.94

The dramatic alteration of Missouri River flows pursuant to the Flood Control Act led to the inclusion of three species on the federal endangered species list between 1985 and 1990: the piping plover, least interior tern, and pallid sturgeon.95 As of 2003, the piping plover

90. RUTH S. MUSGRAVE & MARY ANNE STEIN, STATE WILDLIFE LAWS HANDBOOK (1993). Over eighty species on the Missouri have been listed under state statutes as rare, threatened, or endangered, including twenty-four fish, twenty-two birds, fourteen plants, six reptiles, six mammals, six insects, and two mussels. NRC, MISSOURI RIVER REPORT, supra note 1, at 79 & app. B at 169–170.
92. Fish and Wildlife Coordination Act, 16 U.S.C. §§ 661–666c (2000) (requiring that wildlife conservation be given “equal consideration” in water resource development); Federal Power Act § 4(e), 16 U.S.C. § 797(e) (2000) (requiring “equal consideration” in the issuance of licenses for construction of dams to “the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality”). North Dakota brought suit to enforce its water quality standards for cold water fisheries in Lake Sakakawea, but its claims were found to be preempted to the extent they interfered with the FCA. In re Operation of Missouri River System Litig., 350 F. Supp. 2d 873 (D. Minn. 2004).
93. Costanza & Mageau, supra note 5, at 106.
94. Poff et al., supra note 6, at 769.
95. See supra note 24 (citing species’ listing information). The bald eagle is federally listed as well, due largely to the effects of persistent pesticides rather than dam and reservoir systems. See NRC, MISSOURI RIVER REPORT, supra note 1, app. B at
population on the Missouri River consisted of about 2,000 birds, while
the tern population hovered around 7,000.\textsuperscript{96} The sturgeon’s plight is
even more grim. There are less than 2,000 wild pallid sturgeon alive
in the United States, primarily in the Missouri River, leaving the stur-
geon “on the brink of extinction.”\textsuperscript{97} The listing decision for the stur-
geon explained that “damming, channelization, altered and/or
degraded water quality, and altered flow regimes” had been extremely
detrimental to the fish.\textsuperscript{98}

Two major provisions of the ESA are most at issue in the Missouri
River context. Both kick in once a species is included as endangered
or threatened on the federal list.\textsuperscript{99} First, federal agencies must con-
sult with the U.S. Fish and Wildlife Service (“FWS”) to insure that
their actions will not jeopardize the continued existence of the species
or adversely modify their critical habitat.\textsuperscript{100} This requirement entails
both a procedural requirement to consult as well as a substantive duty
to avoid jeopardy.\textsuperscript{101} Agency decisions under the ESA must be based
on the “best scientific . . . data available.”\textsuperscript{102} Second, the ESA prohib-
its any person from taking endangered species, either directly by
hunting, harassing, or killing, or indirectly by altering habitat in a
way that would harm the species.\textsuperscript{103}

The Corps and the FWS began to consult on river operations
shortly after the Corps began its Master Manual revision process. The
biological opinion ("BO") produced by FWS in 2000 concluded that the "status quo"—continued operations—would cause jeopardy to the continued existence of all three species. In particular, high summer flow, while desirable for commercial navigation in the lower basin, results in the flooding of plover and tern nests and diminishes the ability of both juvenile birds and sturgeon to forage for food. The 2000 BO concluded that low summer flow, by holding back water in one or more reservoirs, was necessary to allow juveniles to feed in shallow eddies and sandbars. It also found that, in the springtime, higher flows released from upper basin reservoirs were required to ensure the continuing existence and recovery of the species by creating deposits, or sandbars, essential to spawning and nesting.

As required by the ESA, FWS recommended a reasonable and prudent alternative ("RPA") that would enable the Corps to avoid jeopardy to the sturgeon, plover, and tern. The central feature of the RPA called for "pulses" from the reservoirs to replicate at least a semblance of the natural river hydrograph, with low summer flow and high spring flow. In addition, FWS called for adaptive management ("AM"), through continuous monitoring of the effects of RPA implementation, with modifications as necessary to respond to new scientific information and environmental conditions.

These findings generated a good deal of dissent, particularly from lower basin interests. Representatives of both the Corps and the U.S. Environmental Protection Agency requested that a panel of the Na-


105. Am. Rivers v. U.S. Army Corps of Eng'rs, 271 F. Supp. 2d 230, 243 (D. D.C. 2003) (citing 2000 BO, supra note 104, at 2–3). The 2000 BO reviewed the effects of a draft revised Master Manual on listed species. Id. It concluded that a more natural flow, with decreases in flow every summer, as well as increases in the spring of at least one of every three years, was necessary to encourage springtime breeding of the bird species, to avoid flooding of their nests and habitat and killing of their chicks in the summer, and to increase suitable habitat and numbers of prey fish available for juvenile pallid sturgeon to feed on. Id. at 237.

106. Id. at 237.

107. Id. at 243, 259 (citing 2000 BO, supra note 104, at 2–3, 241–43).

108. Id. at 243 (citing 2000 BO, supra note 104, at 2–3).


110. Id. at 243 (citing 2000 BO, supra note 104, at 2–3).

111. Id.; see infra notes 277–87 and accompanying text (discussing requirements of AM).
tional Academy of Sciences’ National Research Council ("NRC") subject the draft Master Manual and supporting documents to rigorous scientific review. The NRC agreed with the FWS regarding the adverse effects of current operations on listed and other native species and reached a "strong consensus" that restoration of a more natural river hydrograph was imperative.

The NRC Report concluded by recommending a moratorium on Master Manual revisions, along with comprehensive legislative action to compel river restoration, AM, and collaboration among agencies and stakeholders.

Rather than concede the point, the Corps asked FWS to reconsider its BO in light of continuing drought conditions in the basin. FWS softened its position, at least for the short term, by suspending the 2000 BO for the 2003 water year and issuing a supplemental BO, which allowed the Corps to maintain high water levels during the summer to support commercial navigation. It cited improved fledge ratios for the tern and plover in concluding that the species would survive one more year of "status quo" operations, even though a number of individuals could be killed.

Meanwhile, the Corps continued drafting a revised Master Manual, and the FWS continued with consultation on the draft. In October 2003, Bush Administration officials removed the FWS’s Missouri River experts from the job of producing an amended BO on the final iteration of the Manual. The task was assigned to a new collection of scientists, dubbed the “SWAT” team because it had been called in on several occasions to resolve national disputes and reach a quick and conclusive judgment.

112. See NRC, MISSOURI RIVER REPORT, supra note 1. The NRC panel was charged with reviewing the ecological status of the River and its floodplain, describing the state of existing science and crucial information gaps, and commenting on "policies and institutional arrangements... that could promote an adaptive management approach to Missouri River and floodplain ecosystem management." Id. at 5, 14–12.
113. Id. at viii, 1–3.
114. Id. at 9.
117. Id. at 256. The Supplemental BO concluded that seventy-one plovers and fifty terns could be killed under status quo operations. Id. at 245 (citing 2003 AMENDED BO, supra note 115, at 15).
119. Only a few weeks before the “changing of the guard,” the administration had prohibited FWS scientists from seeking independent peer review for its new BO. Id; see UNION OF CONCERNED SCIENTISTS, SCIENTIFIC INTEGRITY IN POLICYMAKING: AN INVESTIGATION INTO THE BUSH ADMINISTRATION’S MISUSE OF SCIENCE 16 (Mar.
An Amended BO on the Master Manual draft was issued in December 2003. The Amended BO confirmed the 2000 BO's determination that restoration of a more natural river hydrograph was necessary to avoid jeopardy to the three species. Yet, in a dramatic departure from the 2000 BO, the Amended BO included an RPA that allows the Corps to maintain high summer flows by placing increased reliance on habitat creation. This result calmed the fears of downstream interests, but it set the stage for continued unrest among the upstream interests and environmental groups.

V. THE CLASH OF THE TITANS: ENGINEERS, BARGES, BIRDS, AND FISH

Navigational interests, consumers concerned about water quality and quantity, endangered species, and ecological interests have been on a collision course in the Missouri River basin for decades. Tensions within the basin were exacerbated by two prolonged droughts from 1988 to 1992 and from 2000 to the present. Litigation spawned by the pervasive discontent over Missouri River management has mushroomed, with the Flood Control Act and more recent environmental legislation, particularly the ESA, at the forefront of the legal theories. There are basically two separate tracks of litigation: upper basin states versus lower basin states and the Corps in various federal courts within the Eighth Circuit, and environmental groups versus the Corps in the District of Columbia.

A. Track One: The States' Flood Control Act Litigation

Eighth Circuit litigation has centered on the Flood Control Act. The initial wave of lawsuits began in 1990 when the upper basin states, South Dakota, North Dakota, and Montana, sued to prevent the Corps from releasing water from Oahe Reservoir at a rate greater

122. Id. at Exec. Summ. 1-3, 237, 265. The RPA allows the Corps to avoid diminished summer flows if it constructs additional shallow water habitat and if habitat suitability can be optimized through higher flows. Id. at 233. The 2003 Amended BO once again cites improved fledge ratios on certain segments of the river during the latest drought as a justification for departure from its previous conclusions related to the bird species, even though, according to the same document, the improvements are, at best, transitory. Id. at Exec. Summ. 2, 32.
123. NRC, MISSOURI RIVER REPORT, supra note 1, at 13; Davidson & Geu, supra note 11, at 832. Congress directed the Corps to review its 1979 Master Manual after the 1988–1992 drought. NRC, MISSOURI RIVER REPORT, supra 1, at 13.
than existing inflows, hoping to protect successful springtime spawning of sport and forage fish.\textsuperscript{124} According to the district court, the Corps had been arbitrary and capricious in favoring navigation over other uses of water and a preliminary injunction was warranted to preclude Oahe releases.\textsuperscript{125} The Eighth Circuit vacated the injunction, finding that the controversy was moot as the spawning season had passed by the time the case was heard on appeal.\textsuperscript{126}

Subsequently, during the 2000 drought, South Dakota sued the Corps once again to protect fisheries in the reservoirs situated within its borders.\textsuperscript{127} The State's legal theory was that the Flood Control Act required the Corps to maximize all benefits of the Missouri River system. History repeated itself when the district court concluded that the Corps had arbitrarily favored navigation over recreational users and issued two orders enjoining the Corps from lowering Oahe and Lake Francis Case until the spawning season was complete.\textsuperscript{128}

The South Dakota injunctions had a "cascading effect."\textsuperscript{129} To maintain downstream flows while complying with the court's order, the Corps announced a plan to release water from Lake Sakakawea in North Dakota, and North Dakota promptly sought injunctive relief in its federal district court.\textsuperscript{130} The court obliged by entering a temporary restraining order requiring the Corps to maintain water levels in Sakakawea.\textsuperscript{131} One day later, Nebraska sued in the District Court for the District of Nebraska claiming that the Corps must act according to the priorities established in its 1979 Master Manual, which identified navigation and flood control as top considerations.\textsuperscript{132} The district

\begin{itemize}
\item \textsuperscript{124} South Dakota v. Hazen, 914 F.2d 147 (8th Cir. 1990). Releases from Oahe would arguably diminish the success of the rainbow smelt spawn, an important food source for the lucrative walleye fishery in the lake. See South Dakota v. Ubbelohde, 330 F.3d 1014, 1021 (8th Cir. 2003). See also Brian Morris, Unanswered Prayers: The Upper Missouri River Basin States Take on the U.S. Army Corps of Engineers, 68 N.D. L. Rev. 897, 924–30 (1992) (describing litigation in the early 1990s).
\item \textsuperscript{125} South Dakota v. Hazen, No. A1-90-097, at 3 (D. N.D. May 9, 1990).
\item \textsuperscript{126} Hazen, 914 F.2d at 150–51. The court cited the Corps's ongoing efforts to revise the 1979 Manual in reaching its decision. Id at 151.
\item \textsuperscript{127} Ubbelohde, 330 F.3d at 1021 (describing complaint and district court proceedings).
\item \textsuperscript{128} Id.
\item \textsuperscript{129} Id.
\item \textsuperscript{130} Id. at 1022. North Dakota also sued the Corps for violating its water quality standards for Lake Sakakawea, but the claims were dismissed on preemption grounds. In re Operation of Missouri River System Litig., 330 F. Supp. 2d 873, 878 (D. Minn. 2004).
\item \textsuperscript{131} Ubbelohde, 330 F.3d at 1022. Montana followed suit and obtained an injunction preventing releases from Fort Peck. Id. at 1022 n.2.
\item \textsuperscript{132} Id. at 1022. Nebraska and various commercial interests had moved to intervene in the South Dakota case, alleging harm to power plants dependent on high flows for cooling purposes, drinking water intakes, and navigation, but the court denied
\end{itemize}
court agreed that the Corps was bound by its Manual and could proceed with releases from the upstream dam to sustain flows in the navigational channel downstream.133

The cases were consolidated on appeal to the Court of Appeals for the Eighth Circuit, which issued an order in favor of Nebraska and navigation, on grounds that the Corps was bound to operate the river in accordance with its Manual.134 The Eighth Circuit explicitly rejected North Dakota's theory that the Corps was precluded from favoring navigation over recreation, stating that all evidence pointed to the opposite conclusion: navigation and flood control come first.135 After a detailed assessment of the Act and its legislative history, as well as the 1979 Master Manual, the court concluded that these priorities do not, however, result in a specific management formula. Instead, the Corps must simply give consideration to all interests protected by the Act, including navigation, flood control, irrigation, power, domestic purposes, wildlife, and recreation.136

B. Track Two: The Environmental Groups' ESA Litigation

Not content to argue the finer points of the Flood Control Act in courts of the Eighth Circuit, American Rivers and other environmental groups initiated a second track of litigation in the District of Columbia, alleging that the Corps's 2003 Annual Operating Plan violated the ESA.137 The district court wasted little time in enjoining the Corps from continuing with business as usual on the Missouri River, regardless of the priorities specified in the Manual.138

The court agreed with the Eighth Circuit cases that the Flood Control Act "gives a good deal of discretion to the Corps in the manage-

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133. Id. at 1028 (citing 2004 MASTER MANUAL, supra note 59, § 9.3).
134. Id. at 1020, 1027–28 (citing ETSI Pipeline Project v. Missouri, 484 U.S. 495, 512 (1988)). The court noted that the dominant functions of the Flood Control Act were to control flooding and maintain downstream navigation, but secondary uses, including irrigation, recreation, fish, and wildlife, were also to be supported. See supra note 60 and accompanying text (describing priorities).
135. Ubbelohde, 330 F.2d at 1032. In reaching this conclusion, the court approved of the Corps's sequential listing of priorities in the 1979 version of the Master Manual: flood control; irrigation and upstream beneficial uses; downstream water supply; navigation and power; and recreation and wildlife. Id. at 1028, 1032.
136. Id at 1027, 1031. The court concluded that it could only review the Corps's decisions to ensure that it considered each interest before making a decision in operating the River, and that "[e]qual consideration does not mean equal results." Id at 1031.
138. Id.
ment of the river.'"139 It went on to find that the Corps's discretion, however, is not unconstrained. Although flood control and navigation are dominant functions under the Flood Control Act, other interests, including the needs of listed species, must be considered and factored into the appropriate management balance.140 If a federal agency possesses statutory discretion over the contested action, as the Corps does under the Flood Control Act, it has both the authority and the responsibility to comply with the ESA.141 Indeed, according to the district court and the U.S. Supreme Court, the Corps must elevate ESA requirements over other objectives in operating the river: the ESA "reveal[s] a conscious decision by Congress to give endangered species priority over the 'primary missions' of federal agencies."142

The D.C. district court concluded that the Corps's Annual Operating Plan had violated the ESA by following the Supplemental BO, which "failed to articulate any reasonable explanation for its departure from—not to say abandonment of—the analysis contained in the 2000 [BO]."143 The 2000 BO, considered by all parties to be "the controlling biological opinion"144 on the Missouri River system at the time, unequivocally provided that the Corps must implement low summer flow, along with habitat construction and all other measures of the RPA, no later than 2003 in order to protect the three species

139. Id. at 252 (quoting Ubbelohde, 330 F.3d at 1027).
140. Id.
141. Id. at 251. See Rio Grande Silvery Minnow v. Keys, 333 F.3d 1109, 1129 (10th Cir. 2003) (finding that Bureau of Reclamation had "discretion under . . . contracts to determine the 'available water' to allocate" and therefore must fulfill its ESA obligations); Klamath Water Users Protective Ass'n v. Patterson, 204 F.3d 1206, 1213 (9th Cir. 1999) (affirming that irrigators' contract rights to water were "subservient to the ESA," because the Bureau of Reclamation had retained discretion for dam management and ownership under the contracts); Riverside Irrigation Dist. v. Andrews, 568 F. Supp. 583, 590 (D. Colo. 1983) (holding that dam construction permit could be denied on CWA grounds and must be denied under the ESA, in spite of a preexisting interstate compact), aff'd, 758 F.2d 508 (10th Cir. 1985); see also 50 C.F.R. § 402.03 (2003) ("Section 7 and the requirements of this part apply to all actions in which there is discretionary Federal involvement or control.") (emphasis added).
143. Id. at 255 (citing NAACP v. FCC, 682 F.2d 993, 998 (D.C. Cir. 1982)) (holding that agency reversal of a previous policy is only rational if the agency has "articulated permissible reasons for that change," such as data showing a change in circumstances); see Motor Vehicle Ass'n v. State Farm, 463 U.S. 29, 34 (1983) (holding that an agency had "failed to present an adequate basis and explanation" for its reversal of a previously adopted safety requirement); Nat'l Audubon Soc'y v. Hester, 801 F.2d 405, 408 (D.C. Cir. 1986) (holding that alterations to agency policy are arbitrary and capricious if the agency does not "satisfactorily explain" its reasons).
from jeopardy.145 Yet FWS turned full circle in its Supplemental BO, by concluding “that the revised [Annual Operating Plan] . . . , in combination with all other aspects of the RPA from the [2000 BO], is a suitable replacement for the summer low flow component of the RPA.”146 The court held that this remarkable change of heart, unsupported by explicit reasons, was arbitrary and capricious.147

In response to the government’s arguments that improved fledge ratios for the least tern and piping plover warranted the change, the court questioned how improvements over only a few years could “warrant[] such a dramatic departure from the conclusions of the 2000 [BO] requiring low summer flow. . . . based on literally decades of data and supported by multiple scientific panels,” particularly when fledge ratios were only one of many factors contributing to the species’ continued existence and recovery.148 Further, although FWS had found that allowing one year of take during the 2003 operating season would not cause the species’ extinction, the court found that the Supplemental BO had failed to address how river operations would affect the ultimate recovery of the species, as required by FWS regulations defining jeopardy as any action that would “reduce appreciably the likelihood of both the survival and recovery of a listed species.”149 The effects of continued river operations on the sturgeon were of particular concern. “Given the extremely weakened state of the pallid sturgeon population on the Missouri River,” the District Court for the District of Columbia concluded that “any potential harm from delaying implementation of summer low flow is irreparable and must be avoided.”150

Even beyond the needs of listed species, the court concluded that an injunction against the Corps would “serve to protect the entire Missouri River Basin ecosystem,”151 because until management of the basin is returned to a more natural state, “[d]egradation of the . . .

145. Id. (citing 2000 BO, supra note 104, at 243). See supra note 109 (listing the five RPA requirements of the 2000 BO).
146. Id. at 256 (quoting 2003 AMENDED BO, supra note 115, at 13).
148. Id. The court noted that all of the parties debated the scientific propriety of relying on improved fledge ratios, given that unusual drought conditions were responsible for increased tern and plover habitat. Id. at 259. It also remarked that, in contrast to the 2000 BO, which had been reviewed by the NRC, “not only has the 2003 Supplemental [BO] not undergone similar peer review, the Federal Defendants did not even allow public comment on it.” Id. at 256.
149. Id. at 256 (quoting 50 C.F.R. § 402.02 (1973)); see also Natural Res. Def. Council v. Evans, 232 F. Supp. 2d 1003, 1047–48 (N.D. Cal. 2002) (concluding that NMFS had likely acted arbitrarily and capriciously by failing to examine whether the contested action was “likely to adversely affect . . . recovery”).
151. Id. at 261.
ecosystem will continue."\(^{152}\) It went on to state, "loss of the least
tern, piping plover, and pallid sturgeon cannot be translated into . . .
simple economic terms, because, as the Supreme Court has noted, the
'value [of] this genetic heritage is, quite literally, incalculable."\(^{153}\)
When the benefits of a more natural flow regime are weighed against
temporary economic harm to seven barge companies, hydroelectric power in-
terests, and consumers, especially in light of the total net economic benefits,
the balance must be struck in favor of "the overwhelming need to devote
whatever effort and resources [are] necessary to avoid further diminution of
national and worldwide wildlife resources."\(^{154}\)

The Corps refused to comply, claiming that it was bound by the
Nebraska decision that prioritized navigation.\(^{155}\) Unimpressed, the
district court ordered sanctions of $500,000 per day until the Corps
complied by altering the river's flow to attain a more natural
hydrograph for the remainder of the season.\(^{156}\) At the request of the
Corps, the Federal Panel on Multi-District Litigation transferred all
cases to the District Court for the District of Minnesota, a "neutral"
forum within the Eighth Circuit that had seen none of the preceding
litigation.\(^{157}\) The Minnesota court agreed that the D.C. court's injunc-
tion requiring lower flows remained in effect.\(^{158}\) Finally, in August
2003, the Corps held back releases until the end of the summer sea-
son—a mere three days later.\(^{159}\)


The District Court for the District of Minnesota ordered the Corps
to complete its Master Manual revisions and 2004 Annual Operating
Plan by March 2004, so that the parties could complete briefing the

\(^{152}\) Id. at 262 (quoting NRC, MISSOURI RIVER REPORT, supra note 1, at 3) (first altera-
tion in original).

\(^{153}\) Id. at 261 (quoting Tennessee Valley Auth. v. Hill, 437 U.S. 153, 178 (1973)).
"Congress has indeed 'spoken in the plainest of words,' making it abundantly
clear that it has given the policy of conservation of endangered species 'the high-
est of priorities.'" Id. (quoting Hill, 437 U.S. at 194).

\(^{154}\) Id. (quoting Hill, 437 U.S. at 177) (alteration in original). The court noted the
Corps's determination that implementing a management plan with low summer
flows would produce an overall net economic benefit to the entire Basin. Id. at
260 (citing NORTHWESTERN DIV., U.S. ARMY CORPS OF ENG'RS, REVISED ENVIRON-
MENTAL IMPACT STATEMENT 5–131 & tbl.5.13–1 (estimating a $8.8 million annual
net economic benefit)).

2003) (reviewing the Corps's position).

\(^{156}\) Id. at 71.

\(^{157}\) In re Operation of Missouri River System Litig., No. 03-MD-1555 PAM, 2003 WL

\(^{158}\) Id. at *2. The Nebraska injunctions requiring the Corps to maintain downstream
flows had been stayed pending appeal. Id. at *1.

\(^{159}\) Bill Lambrecht, Corps Lowers Missouri River Level to Aid Endangered Species;
merits of the case in time for the navigational season.\textsuperscript{160} After an extremely truncated review period, the 2004 Master Manual was unveiled.\textsuperscript{161} In reliance on the FWS's Amended BO,\textsuperscript{162} the 2004 Manual deviated from the previously recommended high spring and low summer flows and instead adopted several key operational changes: (1) intra-system reservoir "unbalancing" among the upper three reservoirs on a three-year cycle to promote resident fish production; (2) conservation measures to retain water in upper reservoirs during droughts; and (3) minimum flows during nonnavigational periods to provide a water supply for power plants and other water supply intakes.\textsuperscript{163} Implementation of these operational changes is to proceed under an AM concept, including monitoring and implementation of information gleaned from the changes.\textsuperscript{164}

The court ultimately signed off on the 2004 Manual by granting summary judgment in favor of the Corps.\textsuperscript{165} According to the court, the Corps was entitled to deference under both the ESA, which allowed it to place its reliance on the FWS's Amended BO, and the Flood Control Act, which requires it to consider all interests in an effort to "secure the maximum benefits" to all Missouri River users.\textsuperscript{166}

Whether or not the environmental groups appeal, the Minnesota court's opinion is unlikely to be the final word on Missouri River management. The ESA analysis, in particular, leaves much to be desired.\textsuperscript{167} In marked contrast to the District Court for the District of Columbia's probing review of the 2003 Supplemental BO, the Minnesota court was unwilling to engage in an in-depth analysis of the find-

\textsuperscript{160} In re Operation of Missouri River System Litig., 305 F. Supp. 2d 1096, 1099 (D. Minn. 2004).

\textsuperscript{161} Id.

\textsuperscript{162} See supra notes 120--22 and accompanying text (describing the 2003 Amended BO).


\textsuperscript{164} Id. at 3.


\textsuperscript{166} Id. at *3--*4.

\textsuperscript{167} The Minnesota opinion gives cause for concern from a procedural standpoint as well. The court's requirement for a streamlined process under the National Environmental Policy Act ("NEPA"), 42 U.S.C. § 4332(C) (2000), may have been understandable given the repeated delays in the Master Manual revision process, but it greatly diminished opportunities for informed public input on the profound changes adopted by the agencies since 2003. See In re Operation of Missouri River System Litig., 2004 WL 1402563, at *1 n.1. Moreover, the court refused to entertain any challenges to the sufficiency of the NEPA review period. Id.
ings in the subsequent Amended BO. The D.C. opinion is more true to the language and intent of Section 7 of the ESA, which requires federal agencies to *insure* that their actions do not jeopardize listed species or inhibit their recovery, based on the best available science. Speculative mitigation efforts, such as the construction of simulated habitat, cannot meet this standard, as there must be a "reasonable certainty" that jeopardy will be avoided. The Corps, as the action agency, has an independent duty under the ESA to insure against jeopardy, and its reliance on the dramatically Amended BO to fulfill this duty is suspect.

Granted, the Minnesota court's extreme deference is not entirely surprising. The ESA's failure to provide explicit scientific criteria to guide the consultation process leaves the agencies with tremendous discretion. Moreover, complex scientific questions often result in the most deferential judicial review. As a result, many courts are reluctant to engage in probing review of jeopardy opinions.

168. Compare *In re Operation of Missouri River System Litig.*, 2004 WL 1402563, at *6-*11 (finding that the agencies had articulated a rational basis for their conclusions that eliminating flow changes and accelerating the construction of shallow water habitat would avoid jeopardy), *with Am. Rivers v. U.S. Army Corps of Eng'rs*, 271 F. Supp. 2d 230, 253-58 (D. D.C. 2003) (scrutinizing the findings and conclusions of 2003 Supplemental BO and Annual Operating Plan and holding that their abrupt departure from previous requirements for flow changes, which had been deemed essential for avoiding jeopardy, was arbitrary and capricious).


171. *See Pyramid Lake Paiute Tribe v. U.S. Dep't of Navy*, 898 F.2d 1410, 1415 (9th Cir. 1990) (stating that an action agency may not arbitrarily place reliance on a BO in executing its substantive duty to avoid jeopardy); *Haw. Longline Ass'n v. Nat'l Marine Fisheries Serv.*, 281 F. Supp. 2d 1, 25 (D. D.C. 2003) (holding that regulations governing the longline fishing industry were arbitrary and capricious where the action agency had not done an independent assessment to ensure satisfaction of its substantive ESA obligations but instead relied on a BO that had been vacated on procedural grounds), *appeal dismissed*, No. 03-5347, 2004 WL 1052989 (D.C. Cir. May 07, 2004). Action agencies cannot satisfy their section 7 obligations by adopting only modest, incremental, "slightly less" harmful measures in lieu of their existing, jeopardy-causing operations. *Aluminum Co. v. Bonneville Power Admin.*, 175 F.3d 1156, 1162 (9th Cir. 1999).

172. *See Baltimore Gas & Elec. Co. v. Natural Res. Def. Council*, 462 U.S. 87, 103 (1983) (instructing courts to be most deferential when it comes to an agency's "scientific determination, as opposed to simple findings of fact").

173. *Wood, supra* note 34, at 255-56. Although the ESA does not specify what is to be utilized as the "best" science, the FWS's own policy delineates certain principles, including the use of primary and original sources as the basis for agency recommendations; management-level review of documents developed by Service biolo-
This case is distinct, in that the Minnesota court had the benefit of the preexisting 2000 BO and an extensive analysis by an independent blue ribbon NRC panel of unbiased experts, all of which emphasized the need to restore a more natural river hydrograph to prevent jeopardy to all three listed species. The court gave these analyses short shrift, due to its belief that to scrutinize the revised BO and Master Manual would be tantamount to "judicial entanglement in abstract policy disagreements which courts lack both expertise and information to resolve." The BO and Master Manual are far from abstract, however; they are quite concrete and not only set the stage but also govern all aspects of Missouri River operations for years. The ESA, in turn, is far more than a mere statement of policy. As the District Court for the District of Columbia acknowledged, the Supreme Court has spoken unequivocally: the needs of listed species prevail over other agency missions. Other circuits have followed suit when faced with jeopardy determinations for fish species imperiled by river

gists to assure the quality of the science; and evaluation and documentation of biological, ecological, and any other information that disputes official positions. Notice of Interagency Cooperative Policy on Information Standards under the Endangered Species Act, 59 Fed. Reg. 34,271 (July 1, 1994). A failure to observe these principles could be remanded by a court as arbitrary and capricious.

174. See supra Part IV (describing findings of the NRC and the 2000 BO).

175. See In re Operation of Missouri River System Litig., No. 03-MD-1555 PAM, 2004 WL 1402563, at *8-11 (D. Minn. June 21, 2004). The court's sole reference to the NRC report is included within a list of documents considered by the FWS in issuing its revised BO; the opinion provides no analysis of the NRC's extensive findings or of the Service's rationale for departing from its recommendations for flow changes. In contrast, the D.C. Circuit Courts have given NRC reports great weight. See Nuclear Energy Inst., Inc. v. Envtl. Prot. Agency, 373 F.3d 1251, 1267-73 (D.C. Cir. 2004) (holding that the Environmental Protection Agency's use of a 10,000-year compliance period for radiation exposure standards for a long-term nuclear waste repository violated the Energy Policy Act, where the Act directed the agency to choose standards consistent with the National Academy of Sciences' recommendations, which were based on a one-million-year timeline); Am. Rivers v. U.S. Army Corps of Eng'rs, 271 F. Supp. 2d 230, 256, 262 (D. D.C. 2003) (citing with approval NRC, MISSOURI RIVER REPORT, supra note 1).


177. See South Dakota v. Ubbelohde, 330 F.3d 1014, 1029 (8th Cir. 2003) (concluding that the Corps's operational discretion was limited by the 1979 Master Manual), cert. denied, 124 S. Ct. 2015 (2004); In re Operation of Missouri River System Litig., 2004 WL 1402563, at *5 (stating that the Manual "is binding on the Corps to the extent that the parties may seek judicial review to ensure that the Corps' operations conform").

178. See Tennessee Valley Auth. v. Hill, 437 U.S. 153 (1978) (enjoining a $100 million dam just before the floodgates were to be closed to avoid jeopardy to the endangered snail darter).
management. The Court of Appeals for the Ninth Circuit held that the ESA places the needs of Klamath River salmon over irrigators, regardless of state property rights and Bureau of Reclamation contracts.\textsuperscript{179} Similarly, on the Rio Grande, the needs of the silvery minnow have required operational changes in the delivery of water under Reclamation contracts.\textsuperscript{180} The ESA compels agencies to protect listed species unless their governing statutes leave them no discretion to do so.\textsuperscript{181}

Oddly enough, the Corps's broad-ranging discretion is at the root of the problem on the Missouri River. Under the Minnesota court's assessment of the Flood Control Act, anything goes when it comes to the Corps's management and balancing of competing interests on the river, and the ESA provides little solace as long as the Corps or other executive branch members can convince FWS to sign off on continued operations.\textsuperscript{182} The outcome is consistent with the overall course of Missouri River litigation in the Court of Appeals for the Eighth Circuit over the years, yet it fails to effectuate the clearly articulated and well reasoned recommendations of the NRC and the 2000 BO. In the end, giving the Corps carte blanche over the river does not lend itself to a long-term, sustainable solution.

\textsuperscript{179.} See Klamath Water Users Protective Ass'n v. Patterson, 204 F.3d 1206, 1213 (9th Cir. 1999) (affirming that irrigators' contract rights to water were "subservient to the ESA" because the Bureau of Reclamation had retained discretion for dam management under the contracts). The ESA recognizes state primacy in the administration of water rights and calls for cooperation with states during the course of section 7 consultations, 16 U.S.C. § 1531(c)(2) (2000), but cooperation does not entail co-management or veto power. United States v. Glenn-Colusa Irrigation Dist., 788 F. Supp. 1126, 1134 (E.D. Cal. 1992). Cf. Clean Water Act § 101(g), 33 U.S.C. § 1251(g) (2000) (providing congressional policy that state authorities for water allocation not be impaired).

\textsuperscript{180.} See Rio Grande Silvery Minnow v. Keys, No. 02-2254, 2003 WL 21357246, *14 (10th Cir. June 12, 2003) (finding that the Bureau of Reclamation had "discretion under these negotiated contracts to determine the 'available water' to allocate" and therefore must fulfill its ESA obligations).

\textsuperscript{181.} Am. Rivers v. U.S. Army Corps of Eng'rs, 271 F. Supp. 2d 230, 251 (D. D.C. 2003); see Platte River Whooping Crane Critical Habitat Maint. Trust v. Fed. Energy Regulatory Comm'n, 962 F.2d 27, 34 (D.C. Cir. 1992) (stating that the ESA directs agencies to "utilize their authorities" to carry out ESA objectives but does not expand the powers conferred by the agency's enabling act, which in this case provided that long-term licenses could only be altered "upon mutual agreement," 16 U.S.C. § 799 (2000), thereby precluding the agency from unilaterally imposing new requirements); Am. Forest & Paper Ass'n v. Envtl. Prot. Agency, 137 F.3d 291, 299 (5th Cir. 1998) (concluding that the ESA is not "a font of new authority, but . . . a directive to agencies to channel their existing authority in a particular direction").

\textsuperscript{182.} See In re Operation of Missouri River System Litig., 2004 WL 1402563, at *4, *25 (finding that the balance struck by the Corps in its development of the Manual and its 2004 Annual Operating Plan was within its discretion).
VI. A NEW CORPS OF DISCOVERY: AN ORGANIC ACT FOR A SUSTAINABLE MANAGEMENT PARADIGM

Crisis can breed long-lasting solutions that transcend immediate pressures and political maneuvering. The smoldering Cuyahoga River provided momentum for the passage of the modern Clean Water Act.\textsuperscript{183} Congressional impasse over Superfund was broken with the discovery of toxic chemicals seeping into people's basements and schoolyards at Love Canal.\textsuperscript{184} In spite of the difficulties of seeing environmental legislation through to enactment, the continuing crisis on the Missouri River may likewise foster comprehensive legislative action.\textsuperscript{185} As for the likelihood of passage in a highly polarized political climate, Professor Fischman's assessment of the 1997 Refuge Act provides a glimmer of hope.\textsuperscript{186}

A. The Law of the Missouri River

The Law of the River for the Missouri, as reflected in the Master Manual, comes up short in almost every significant procedural and substantive way.\textsuperscript{187} The administrative process that created the 2004 Manual was both inefficient and ultimately unsatisfactory.\textsuperscript{188} As much as the Corps has strived to account for all views, its fifteen-year revision process has only served to exacerbate conflicts among the

\begin{itemize}
  \item \textsuperscript{184} 42 U.S.C. §§ 9601–9675 (2000); WILLIAM H. RODGERS, JR., \textit{ENVIRONMENTAL LAW} 682 (2d ed. 1994).
  \item \textsuperscript{185} It would not be much of a stretch to suggest that collective crises on the Klamath, Columbia, Colorado, Missouri, and other imperiled rivers could provide the impetus for comprehensive reform of all federal authorities related to the river management across the country. See generally Gerald E. Calloway, \textit{Perspectives on a National Water Policy}, 126 WATER RESOURCES UPDATE 6, 6, 9–10 (2003) (observing that the jumble of laws in the United States falls short of providing a true water policy and calling for a new, more clearly defined federal vision). Although I leave the exploration of that possibility for another day, a bold, sustainable response on the Missouri River could serve as a bellwether for change.
  \item \textsuperscript{187} Davidson, supra note 56, at 17.
  \item \textsuperscript{188} See id. (stating that, on the Missouri, “we are faced with what is at best an elusive administrative process and at its worst an absence of process”). In contrast, in other basins, the Law of the River provides relatively “defined processes for conflict resolution: stream-wide adjudications, compacts, judicial precedent and Supreme Court review.” Id.
\end{itemize}
Missouri River basin states and between the states and the federal government. The lack of an effective decisionmaking and dispute resolution framework was perhaps inevitable, given the lack of clear management parameters or an allocation formula that encompasses both ecological and anthropocentric needs.

In spite of its flaws, the Corps and the FWS have exhibited extreme reluctance to disturb the expectations arising from the Law of the River. Nationwide, FWS has fairly consistently adopted “compromise approaches,” such as habitat construction, monitoring, and other “soft alternatives,” to allow the project in question to proceed. For example, the experiences on the Columbia and the Colorado Rivers evidence a “clear pattern of historical behavior on the part of the Services and river operating agencies marked by false optimism, regulatory delay, and resistance to implementing statutory mandates.” As a result, RPAs allowing fish stocking or habitat construction rather than design or operational changes are typically adopted, often to the detriment of listed species.

This tendency is evident on the Missouri River. The 2004 Master Manual and Annual Operating Plan avoid flow alterations almost entirely, even though the NRC panel and virtually every BO issued since 1990 unequivocally recognize that replicating the River’s natural hydrograph is essential to avoid jeopardy to the tern, the plover, and the sturgeon. Continued reliance on the existing Law of the River would be a mistake, quite possibly an irreversible one.

189. See Thorson, supra note 4, at 128–29 (predicting that the long, drawn-out revision process would become a “farce”).
190. See Wood, supra note 34, at 225 (describing FWS’s reluctance to disturb expectations fostered by the Law of the River in other basins). This has been true of NOAA–Fisheries, the agency responsible for marine and anadromous species, as well. Id.
192. Wood, supra note 34, at 237.
193. See Houck, supra note 191, at 323 (stating that measures adopted by the Services “reflect the bare minimum . . . necessary to keep those species that are listed hanging on, unrecovered, for an indeterminate time”); Wood, supra note 34, at 228, 234–39 (describing modest fish transportation and instream flow appropriation measures adopted in the Columbia and Colorado River basins respectively).
194. See NRC, MISSOURI RIVER REPORT, supra note 1, at 4 (stating that, absent changes to the flow regime, the Missouri River ecosystem “faces the prospect of irreversible extinction of species”); id. at 114–15 (concluding that construction of man-made habitat, without changes in physical processes, “is not likely to yield substantial ecological improvements”); 2000 BO, supra note 104, at 2–3, 227–48, 253–54 (concluding that flow alterations are necessary to avoid jeopardy). See also Am. Rivers v. U.S. Army Corps of Eng’rs, 271 F. Supp. 2d 230, 242–44 (8th Cir. 2003) (describing the 1990 and 2000 BOs).
The Master Manual and operating plans flow from the Flood Control Act, which, at the time of enactment, aspired to address all critical needs of the people of the basin. In retrospect, it seems obvious that the Missouri River reservoir system, cobbled together in an effort to appease both upper and lower basin states, had limited prospects for success from the very beginning. Its flaws have been laid bare, from the economic perspective, by the failures of navigation and irrigation, and, from an ecological standpoint, by the decline of native fish and wildlife species. As a result, plaintiffs, motivated by these glaring deficiencies, have become the modern-day river masters on the Missouri. Neither stoic resistance to change nor reactionary operational responses prompted by litigation or the fear of litigation are an appropriate way to coexist within this complex ecosystem. Such ad hoc management is no management at all and provides no hope of restoring and maintaining the ecosystem for either humans or other species.

Through the litigation and the long, drawn-out Master Manual revision process, it has become exceedingly clear that the Flood Control Act, which merely lists preferred uses and gives the Corps sweeping discretion in prioritizing and managing them, no longer does the job. The demands of the upper and lower basin states, which were contradictory from the outset, have become far too polarized for the Corps—an administrative agency subject to strong political pressure from nearly every federal, state, and local quarter—to resolve without more concrete congressional guidance. The Corps’s current attempt to rely solely on habitat mitigation, without flow restoration, is an understandable but unworkable and short-sighted “band-aid” approach motivated by a desire to maintain the status quo. Habitat mitigation measures have been adopted and implemented on various segments of the Missouri since the mid-1970s, yet they have not prevented species from further declines. Habitat construction has taken place in a relatively piecemeal fashion with little coordination across the basin and no clearly articulated restoration goals, schedules, or priorities. The Master Manual does not assure that these deficiencies will be corrected, and even if they would be, the overwhelming consensus of the

195. Thorson, supra note 27, at 17. “[T]he proposals formed an irrational combination, for one ‘wanted to spread the river over fields while the other insisted on letting it flow in deep, steady currents in order to float commercial traffic.’” Klein, supra note 33, at 682 (quoting DONALD WORSTER, RIVERS OF EMPIRE 268 (1985)).

196. NRC, MISSOURI RIVER REPORT, supra note 1, at 5, 115–17. See Sittler supra note 82, at 8 (discussing habitat mitigation projects). Exacerbating the problem, only minimal funding has been provided to monitor the results of previous habitat restoration efforts. NRC MISSOURI RIVER REPORT, supra note 1, at 116. The 1986 Water Resources Development Act provided authorization and substantial funding for habitat acquisition and development but little to encourage monitoring or AM. NRC, MISSOURI RIVER Report, supra note 1, at 115–16.

197. Id at 116.
NRC Panel and river ecologists around the world is that habitat construction, without restoration of a river's fundamental physical processes, will not prevent further ecosystem-wide decline.¹⁹⁸ But the Corps is in an untenable position—between rip-rap and a hard place—and the situation cries out for congressional salvation. Without a congressional "buffer," the Corps can do little but throw up its collective hands and maintain the status quo, like a deer frozen in the headlights.

B. A Federal Missouri River Organic Act

The NRC concluded that administrative solutions alone would not resolve the crisis on the Missouri River and recommended the enactment of a federal Missouri River Protection and Recovery Act to clarify the authority of the Corps and other involved agencies.¹⁹⁹ Few could dispute that the Flood Control Act is in need of a complete and comprehensive congressional overhaul. The Act is out of touch with human and ecological needs and with the past thirty years of environmental legislation. Although it provides broad enough discretion to operate the river in a more ecologically sustainable manner,²⁰⁰ the expectations fostered by the Act pressure the Corps to operate the river as a cash register that accounts for only immediate, conventional monetary returns rather than contemporary, but less readily monetized, ecosystem services and values.²⁰¹

¹⁹⁸. Id. at 95–96; POSTEL & RICHTER, supra note 6, at 50–51; Poff et al., supra note 6, at 769. See NRC, MISSOURI RIVER REPORT, supra note 1, at 129 ("[T]he compass direction for restoring the Missouri is clear. It points toward re-creating to some degree the river's natural high and low flows, as well as allowing a portion of the Missouri to meander again.").

¹⁹⁹. See NRC, MISSOURI RIVER REPORT, supra note 1, at 143.

²⁰⁰. Id. at 135. See United States v. Alaska, 503 U.S. 569 (1992) (upholding the Corps's regulations specifying broad public interest factors to be considered in permitting decisions under the Rivers and Harbors Act); United States v. Members of Estate of Boothby, 16 F.3d 19 (1st Cir. 1994) (upholding the Corps's policy of examining ecological concerns while evaluating permit applications under the Rivers and Harbors Act, which precludes unauthorized obstructions to navigable capacity of waters of United States); see also 33 C.F.R. § 320.4 (2003) (listing as public interest factors "conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people").

²⁰¹. See Tarlock, supra note 9, at 10 (observing that the agencies had operated the Glen Canyon Dam as if it were cash register prior to congressional mandates for river restoration); infra notes 318–19 and accompanying text (detailing ecosystem services provided by a more naturally functioning river). The established expectations of navigational and other currently favored interests, along with the Corps's own interpretation of the Act, present a significant obstacle to administrative initiatives that would upset the status quo. See Missouri River Div., U.S.
Some might argue that the ESA, rather than the Flood Control Act, is in need of amendment or even outright rescission. The ESA has come under fire on Capitol Hill but has been largely impervious to attack. Congress has never entertained a serious initiative to rescind it or to denigrate the key regulatory provisions, although it has adopted several amendments to alleviate the potentially extreme consequences of strict enforcement. In its 1978 amendments, Congress provided a statutory "safety valve" to section 7 by creating an Endangered Species Committee, commonly known as the "God Squad." The Committee "shall" grant an exemption if it determines that: (1) there are no reasonable and prudent alternatives to a jeopardy-causing action; (2) the societal benefits of the action clearly outweigh the benefits of more conservation-oriented alternatives; (3) the action is of regional or national significance; and (4) there was no "irreversible or irretrievable commitment of resources" during consultation. This interjects flexibility into the implementation of the ESA, at least for the most meritorious projects, and can be utilized as a process of last resort for agencies and project proponents.

Even absent ESA concerns, management difficulties are inherent in such a complex, large ecosystem as the Missouri River. But the Flood Control Act exacerbates, rather than alleviates, the problems by emphasizing navigation, while providing few constraints on federal agencies' management discretion. The Supreme Court has clarified one salient point with respect to Missouri River management in *ETSI Pipeline Project v. Missouri*, namely that the Corps has the upper hand. In 1982, the Secretary of the Interior agreed to allow the ETSI Pipeline Project to withdraw up to 20,000 acre-feet of water annually from Lake Oahe for a coal slurry pipeline that would transport coal from Wyoming to the southeastern United States. The State of South Dakota already had granted ETSI a permit to use the water. The Court concluded that the Secretary of the Interior lacked the power to authorize the project without obtaining the approval of the Secretary of the Army, because the Flood Control Act had plainly given the

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204. 484 U.S. 495 (1988).
Army Corps predominant authority over the mainstem projects.\textsuperscript{205} Although both the Supreme Court and the Court of Appeals for the Eighth Circuit have declared that the dominant functions of the Flood Control Act were to maintain downstream navigation and avoid flooding, followed by secondary uses of irrigation, recreation, fish, and wildlife, both courts have underscored the expansive discretion of the Corps.\textsuperscript{206} The Minnesota district court simply followed their lead in \textit{In re Operation of the Missouri River System Litigation}.\textsuperscript{207}

A comprehensive organic act for the Missouri River could address the crisis in management. In contrast to the Flood Control Act, and even more generally the Law of the River in the Missouri and other basins, programmatic enactments that create or empower administrative agencies and specify their overarching mission are generally known as organic, or sometimes enabling, acts.\textsuperscript{208} An organic act is, in effect, "a charter" for the agency or for the lands and resources it administers.\textsuperscript{209} A comprehensive organic act provides an overarching mission or purpose statement, which is supported by identifying both the designated uses and substantive management criteria, and by requiring comprehensive planning and public participation.\textsuperscript{210} Together, these provisions work to consolidate an otherwise disparate collection of federal management mandates into a comprehensive system that is far greater than the sum of its parts.\textsuperscript{211}

Neither the Corps nor the Missouri River system has a true organic act. The modern-day Corps is the product of various enactments and executive orders, with powers scattered throughout several titles of the U.S. Code.\textsuperscript{212} The Flood Control Act is just one authorization of

\textsuperscript{205} Id. at 505–06. The Court reviewed the Pick Plan, which provided that the agency "with primary interest in the dominant function of any feature proposed in the plan should construct and operate that feature, giving full recognition, in the design, construction, and operation, to the needs of other agencies with minor interests," and the Sloan Plan, which recognized that the "dominant function" of Lake Oahe and the other main-stem reservoir projects would be flood control and navigation, and found that these projects would come under the jurisdiction of the Army and its Corps of Engineers. \textit{Id.} at 512 (citing S. Doc. No. 78–247, at 4, 11 (1944)).

\textsuperscript{206} \textit{ETSI Pipeline Project}, 484 U.S. at 512; South Dakota v. Ubbelohde, 330 F.3d 1014, 1030–31 (8th Cir. 2003), cert. denied, 124 S. Ct. 2015 (2004). See supra notes 127–36 and accompanying text (discussing \textit{Ubbelohde}).


\textsuperscript{209} \textsc{Fischman, supra} note 186, at 503.

\textsuperscript{210} \textit{See id.} at 510–12, 516 (describing five "hallmarks" of organic legislation).

\textsuperscript{211} \textit{Id.} at 510.

\textsuperscript{212} \textsc{Jerry L. Mashaw et al., Administrative Law: The American Public Law System} 12 (4th ed. 1998). The Corps was initially founded in 1802 as military acad-
the Corps's authority among many. It is an example of a "first generation" multiple-use statute that authorizes management for a broad array of economic purposes.213 Such statutes are common in federal public lands law.214 While the historic thrust of laws governing the use of public lands was to produce sustained yields of various commodities, beginning in the 1960s, multiple-use mandates were added to temper the production-oriented focus.215 Multiple use is generally defined as "a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources."216 At best, "multiple use management" is a deceptively simple term that describes the enormously complicated task of striking a balance among the many competing uses to which land can be put."217 At worst, absent specific management parameters or baselines, it can be a recipe for disaster.

By the 1970s, environmental concerns began to provide management parameters for multiple use management, and this is reflected in the next generation of organic acts for the public lands, most notably as the National Forest Management Act ("NFMA")218 and the Fed-
eral Lands Policy and Management Act ("FLPMA"), both enacted in 1976. NFMA directs the Forest Service to strike a balance of uses on National Forest system lands, including minerals, recreation, grazing, timber harvest, watershed protection, wildlife, fish, and wilderness. A concrete baseline for striking that balance is specified in NFMA's requirement that the Forest Service promote diversity of plant and animal communities through forest planning. Similarly, FLPMA proclaims that the public lands under the jurisdiction of the Bureau of Land Management ("BLM") should be managed "in a manner which recognizes the Nation's need for domestic sources of minerals, food, timber, and fiber." It explicitly requires protection of "the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, [and] water resource[s]," and forbids "unnecessary or undue degradation" of the land and resources.

The newest addition to the federal collection of organic acts is the National Wildlife Refuge System Improvement Act of 1997 ("Refuge Act"). The Refuge Act can be characterized as a "third generation" organic statute, as it moves beyond NFMA and FLPMA in significant respects. Like NFMA and FLPMA, the Refuge Act provides for a multitude of uses. In a marked departure from those statutes and the Flood Control Act, however, the Refuge Act specifies a hierarchy of uses and explicitly requires that all uses be compatible its highest priority or dominant use—wildlife conservation. The conservation mandate requires the Fish and Wildlife Service "to sustain and, where
appropriate, restore and enhance, healthy populations of fish, wildlife, and plants.”

More specifically, the Act directs the Service to ensure the system’s “biological integrity, diversity, and environmental health.” In doing so, it promotes both quantitative goals (viable numbers of wildlife populations) and qualitative goals (ecosystem composition, structure, and function).

After conservation, wildlife-dependent recreation, such as hunting, fishing, and education, occupies the next tier in the hierarchy of uses. It was given this special place in the hierarchy, because hunters were a primary force behind the creation and expansion of the Refuge System. Wildlife-dependent recreation is followed by other types of recreation and, finally, economic activities, such as logging, grazing, and mineral development. All activities within the Refuge system must be compatible with the conservation mission, unless an individual refuge unit’s establishment act specifies a different priority.

228. 16 U.S.C. § 668ee(4). The definition requires the Service to “utilize[e] . . . methods and procedures associated with modern scientific resource programs” in achieving the conservation mission. Id.

229. Id. § 668dd(a)(4)(B).


232. See Fischman, supra note 186, at 532–35 (citing the Act’s provisions favoring hunters and describing the impetus for them).

233. See Final Compatibility Policy Pursuant to the National Wildlife Refuge System Improvement Act of 1997, 65 Fed. Reg. at 62,490 (Oct. 18, 2000) (stating that refuge managers must resolve conflicts between uses by evaluating which best support refuge purposes and the conservation mission of the System); Fischman, supra note 186, at 526–38 (organizing the Act’s provisions into five categories: individual refuge purposes; conservation; wildlife-dependent recreation; other recreational uses, such as snowmobiling and off-road vehicle use; and economic activities).

234. 16 U.S.C. § 668dd(a)(4)(D). This provision reflects the political trade-offs that were necessary for the establishment of many individual refuge units, especially recent additions that support pre-existing economic uses. Fischman, supra note 186, at 593–94. Professor Fischman notes that the Act’s failure to elevate the conservation mission of the system as a whole over the priorities specified for individual units in their establishment acts may undermine the Refuge Act’s efficacy as a comprehensive, system-wide organic act. Id. at 515–16, 526, 592–96.
ally interfere with or detract from the fulfillment of the mission of the System or the purposes of the refuge.\textsuperscript{235}

In spite of its eco-centric thrust, the Act retains a utilitarian theme by requiring conservation "for the benefit of present and future generations of Americans."\textsuperscript{236} This phrase is reminiscent of the language used in the National Park Service Organic Act of 1916,\textsuperscript{237} which also provides for conservation and enjoyment of park resources "in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."\textsuperscript{238} Both statutes represent the congressional view that the conservation of parks, wildlife and ecological integrity provides nationwide benefits and that resources should be utilized to satisfy present-day needs in a manner that does not compromise future generations.\textsuperscript{239} The Refuge Act, however, invigorates the conservation mandate with science-based goals.\textsuperscript{240}

By elevating conservation over nearly all other uses, while still prioritizing wildlife-dependent recreation, the Wildlife Refuge Act provides a path-breaking example of a statute well-grounded in long-term ecological requirements and sustainable human needs. Professor Robert Fischman characterizes the Refuge Act as both an expression of the prevailing congressional attitude toward public lands in this era of divided government and a bellwether for future legal reforms.\textsuperscript{241} As such, the Refuge Act could serve a useful precedent for Missouri River management reform—protecting fundamental, sustainable purposes of the system while promoting the overall integrity of the river’s ecology.

\textsuperscript{235} 16 U.S.C. § 668ee(1) (2000). The compatibility determination is left to the "sound professional judgment" of the U.S. Fish and Wildlife Service, based on available science. \textit{Id.} This is probably a reference to traditional game management principles, rather than contemporary tenets of conservation biology. \textit{See} Fischman, \textit{supra} note 186, at 552–58 (describing the "sound professional judgment" requirement as one that entails a great deal of agency discretion, but that is tempered by the Act’s overall attention to biological and environmental integrity, diversity, and health).

\textsuperscript{236} 16 U.S.C. § 668dd(a)(2).

\textsuperscript{237} \textit{Id.} § 1.

\textsuperscript{238} \textit{Id.} § 1.

\textsuperscript{239} \textit{See} Federico Cheever, \textit{The United States Forest Service and National Park Service: Paradoxical Mandates, Powerful Founders, and the Rise and Fall of Agency Discretion}, 74 \textit{Denv. U. L. Rev.} 625, 646–48 (1997) (analyzing the Park Service Organic Act and concluding that Congress intended for preservation to take top priority); Fischman, \textit{supra} note 186, at 524 (analyzing the Refuge Act and concluding that it does not require a cost–benefit analysis as a condition of management decisions but instead simply evidences the congressional belief that conservation is a benefit in and of itself).

\textsuperscript{240} \textit{See} Fischman, \textit{supra} note 186, at 524; \textit{supra} note 230 and accompanying text (describing the Act’s quantitative and qualitative goals).

\textsuperscript{241} Fischman, \textit{supra} note 186, at 514.
In contrast to the Flood Control Act, all three public lands organic acts—NFMA, FLPMA and the Refuge Act—allow multiple uses while providing for ecosystem protection by directing that diversity be maintained, undue degradation be avoided, or uses be compatible with conservation objectives. Yet, all three afford enough agency discretion and flexibility to adapt to changing needs and conditions. Whether the multiple-use paradigm of NFMA and FLPMA serves to sustain the land and its ecological and economic resources is the subject of much debate, but their concrete provisions for ecological needs, coupled with their inherent flexibility and opportunities for judicial review, have made these statutes durable management guideposts. With the overlay of the ESA, requiring protection and recovery of imperiled species, the Wilderness Act, requiring the preservation of “untrammeled” wild lands, and pollution control statutes like the Clean Water Act, the multiple-use concept on public lands has undoubtedly evolved from its commodity-driven origins. It is being pushed toward a dominant purpose of sustainable development, a concept embraced in international environmental instruments as one which “meets the needs of the present without compromising the ability of future generations to meet their own needs.”

242. See 16 U.S.C. § 1604(g)(3)(B) (2000) (requiring that forest plans provide for diversity of plant and animal communities); see also id. § 529 (requiring that recreation, watersheds, fisheries, and wildlife be given “due consideration” in forest management). NFMA also provides detailed requirements for sustainable timber harvest. See id. § 1604(g)(3)(E).


247. Id. §§ 1131–1137.


250. See Fischman, supra note 186, at 620–21 (stating that the compatibility standard of the Refuge Act, along with mandates to maintain biological integrity, diversity, and environmental health, indicate a step toward sustainable development); Zellmer, supra note 215 (manuscript at 23) (describing emergence of sustainable development as a principle for public lands management).

expression that sustainability—through conservation—is the preferred direction for the Refuge System. Formal regulations, informal agency, and caselaw arising from citizens' suits indicate that sustainable development is the preferred direction for public lands as well.  

Water management strategies have also "taken on the mantle of sustainable development" by integrating the economic, social, and environmental aspects of water development projects and requiring consideration of both the conventional economic benefits and the linkages between human and natural capital. The obvious distinction between the Wildlife Refuge Act, FLPMA, and NFMA and a Missouri River Organic Act is that lands governed by the former are owned by the United States, while lands within the Missouri basin are largely in private or state ownership. The states own the submerged lands underlying the River, while various private, tribal, and state entities own most of the land along the shoreline. Federally owned lands, such as wildlife refuges, are subject to Congress's Property Clause power, which provides exceedingly broad, even plenary, regulatory authority. Although the Property Clause applies to federal lands belonging to the Corps or other federal agencies along the River, the primary source of federal authority in the Missouri basin is the Commerce Clause power.

252. See Zellmer, supra note 215 (manuscript at 23–24) (describing regulations and caselaw tending toward sustainable development on National Forest System and Bureau of Land Management lands).


256. See U.S. CONST. art. IV, § 3, cl. 2. See infra notes 290–94 and accompanying text (discussing federal navigational powers).
Nonfederal ownership does not preclude Congress from adopting a dominant-use organic act for the Missouri River. In fact, the mixed ownership patterns in the basin make comprehensive legislation, with clear parameters on agency discretion, all the more imperative. In 1944, Congress recognized the need for coordination on the River when it emphasized that the “consideration of projects” should only proceed on the “basis of comprehensive and coordinated development.” The time has come to effectuate that policy more fully. In crafting an organic act for the Missouri, the states’ interests in water management and the protection of existing private rights will weigh at least as heavily as they did in the enactment of the Wildlife Refuge Act. Congress expressed its concern for these interests in the Flood Control Act by articulating a policy to recognize the interests and rights of the States in determining the development of the watersheds within their borders and likewise their interests and rights in water utilization and control . . . [and] to preserve and protect to the fullest possible extent established and potential uses, for all purposes, of the waters of the Nation’s rivers.

Like the Refuge Act, these interests can be accommodated in the context of a more sustainable, ecologically appropriate organic act for Missouri River management, and, like the Refuge System, the widely varying physical and cultural aspects of various river segments throughout the basin could become more than the “sum of their parts” through a Missouri River Organic Act.

C. The Basic Organic Act Principles

While the precise parameters of a Missouri River Organic Act are beyond the scope of this Article, a basic premise can be identified. The overarching mission of the organic act must be management for long-term sustainability, as directed by science and with biodiversity con-

259. See Fischman, supra note 186, at 621 (concluding that a comprehensive network of biologically diverse lands and waters will be necessary to achieve a conservation mission and that “compatibility, along with the policy principles [of the Refuge Act] prohibiting habitat fragmentation and requiring coordination to respond to external threats, is a conservation tool that the federal government can demonstrate for the benefit of other jurisdictions struggling to achieve sustainable development”). Bradley C. Karkkainen, Biodiversity and Land, 83 CORNELL L. REV. 1 (1997) (advocating a comprehensive strategy for biodiversity protection on public and private lands).


261. See Fischman, supra note 186, at 461, 525 (describing the Act as part of the ongoing federal effort to balance wildlife conservation needs with local interests). Like water resource allocation, the states have historically asserted a predominant interest in fish and game management, and section 5 of the Refuge Act, 16 U.S.C. § 668dd(a)(4)(E) (2000), reflects federal sensitivity to this dynamic by providing for coordination with states in refuge administration and planning.

servation serving as the baseline. Restoration of natural flows and improvement of overall ecological structure and function go hand-in-hand with this principle.

Flow restoration is catching on across the nation, in part due to ESA and in part due to water quality concerns. The idea entails replicating natural flows to meet the needs of native species, while coordinating river operations to the extent possible to continue providing other important human benefits, such as flood control and power generation. Flow restoration promotes and maintains habitat conservation and restoration. On the Missouri, reconnecting the mainstem with its floodplain could occur as a result of flow adjustments, but preservation and re-construction of oxbows and wetlands will likely be necessary as well. The bottom line: both strategies—replicating natural flows and habitat restoration—are essential to the sustainability of the system.

The restoration and improvement of physical and biological conditions in a compromised aquatic ecosystem, including but not limited to flow regime, have become the centerpiece of a notable initiative in the Great Lakes region. Annex 2001, an agreement adopted by the governors and premiers of the Great Lakes region, commits the parties to update the region's water management system in a manner that ensures that the Great Lakes are conserved and restored for future generations. The Annex has been developed into a draft interstate compact for consideration and possible ratification by the state, pro-

263. Professors Tarlock, Doremus, and Wood have developed various aspects of this principle in their path-breaking work on river restoration and adaptive management. See Tarlock, supra note 9, at 8–9 (outlining a "flow maintenance vision" that calls for adapting the agencies' regulatory mission to emphasize the ecological integrity of systems, while emphasizing post-construction valuable uses of the river's flow and broader instream values like ecosystem function, recreation, and hydropower, as well as an equitable distribution of the risks and benefits of large-scale bioregional experimentation among stakeholders); Wood, supra note 34, at 252–86 (describing deficiencies of existing management approaches and institutions on the Colorado and Columbia Rivers and advocating river restoration, reallocation of economic benefits from river operations, and an enhanced judicial role in ESA implementation); infra notes 306–11 and accompanying text (discussing Doremus's proposals for institutional reform).

264. See supra note 6 (providing authorities for flow restoration efforts).


The draft compact includes standards and processes for the approval of consumptive uses or diversion of waters of the basin. Proposals involving large amounts of water must meet requirements related to both water conservation and the improvement of water and water-dependent natural resources of the basin. The provisions related to resource improvement are virtually unprecedented in water management. Improvement is defined as additional beneficial, restorative effects to the physical, chemical and biological integrity of the Waters and Water Dependent Natural Resources of the Basin, resulting from... Conservation Measures, enhancement or restoration measures which include, but are not limited to, such practices as mitigating adverse effects of existing Water Withdrawals, restoring environmentally sensitive areas or implementing Environmentally Sound and Economically Feasible Water Conservation Measures.

The draft compact is remarkable in that it requires the applicant for large consumptive uses or diversions to not only avoid or mitigate adverse impacts in the project area but also to propose improvements “in areas or facilities that are not part of the specific proposal undertaken by or on behalf of the withdrawing." In this fashion, consumptive uses and diversions can occur, but direct and indirect ef-

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268. DRAFT: GREAT LAKES BASIN WATER RESOURCES COMPACT, supra note 267, art. III, VIII, IX.

269. See id. at art. VIII, § 8.2 (governing diversions of one million gallons per day or larger), § 8.3 (governing consumptive uses of five million gallons per day or larger). The 2000 amendments to the federal Water Resources Development Act encouraged basin authorities to adopt an improvement standard. See 42 U.S.C. § 1962d-20(b)(2) (2000) (articulating a congressional policy “to encourage the Great Lakes States, in consultation with the Provinces of Ontario and Quebec, to develop and implement a mechanism that provides a common conservation standard embodying the principles of water conservation and resource improvement for making decisions concerning the withdrawal and use of water from the Great Lakes Basin”).


271. DRAFT: GREAT LAKES BASIN WATER RESOURCES COMPACT, supra note 267, at art. I, § 1.2. See id. §§ 8.2(6), 8.3(6) (imposing the improvement requirement on withdrawals for consumptive use and/or diversion).

272. See id. §§ 8.2(4), 8.3(4) (requiring that withdrawals for consumptive use and/or diversion “result in no significant individual or cumulative adverse impacts to the quantity or quality of the Waters and Water Dependent Natural Resources of the Great Lakes Basin”).

273. Id. § 1.2 (emphasis added).
fects will be avoided, and restoration, through resource improvement, will occur.

The trick is learning how to proceed with restoration and improvement strategies in the face of vast scientific uncertainty. Because river ecosystems are inherently complex and because uncertainties raised by the complexities of an altered ecosystem favor the status quo, the FWS has been under immense political pressure during the course of the Missouri River Master Manual consultations to soften its findings and allow continued, virtually unaltered operations. Yet, the FWS routinely faces limited information and inconclusive data in fulfilling its responsibilities under the ESA; indeed, uncertainty is inherent in most scientific issues.

Adaptive Management can provide a viable framework for making sustainable decisions in the face of both scientific uncertainty and the legal and political constraints imposed by established expectations in an altered ecosystem like the Missouri River. AM is no management panacea, nor is it an end unto itself. Rather, it is a tool for ensuring progress toward a measurable set of goals established within a broader ecosystem management strategy and for moving the decision-making process along the path toward ecologically-based, sustainable objectives. It moves beyond mere "trial and error" toward an iterative process of "learning by doing." AM assimilates historic data on natural processes such as erosion, nutrient cycles, flooding, and

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275. See supra notes 118-19 (describing replacement of seasoned Missouri River biologists with national SWAT team).

276. See NAT'L RESEARCH COUNCIL COMM. ON SCIENTIFIC ISSUES IN THE ENDANGERED SPECIES ACT, NAT'L ACADEMIES, SCIENCE AND THE ENDANGERED SPECIES ACT 14, 159-60 (1995) [hereinafter COMM. ON SCIENTIFIC ISSUES IN ENDANGERED SPECIES ACT] (discussing uncertainties in ESA implementation); see also Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 590 (1993) ("[I]t would be unreasonable to conclude that the subject of scientific testimony must be 'known' to a certainty; arguably, there are no certainties in science.").

277. Tarlock, supra note 9, at 11-12; see NRC, MISSOURI RIVER REPORT, supra note 1, at 5, 134 (describing AM's strengths as a management paradigm); Davidson & Geu, supra note 11, at 890 (concluding that AM will find a space to operate on the Missouri River in areas of uncommitted resources); see also Doremus, supra note 89, at 71 ("[AM] is most sorely needed when the resource is suffering under the status quo, we do not fully understand why or what changes will most effectively remedy the situation, and we are under heavy economic or political pressure to minimize changes to the status quo," such as the Columbia River and Florida Everglades.).

278. NRC, MISSOURI RIVER REPORT, supra note 1, at 5; see Oliver A. Houck, On the Law of Biodiversity and Ecosystem Management, 81 MINN. L. REV. 869, 952-53 (1997) (cautioning that without clear and objective scientifically based criteria, ecosystem management becomes whatever humans want it to be).

279. NRC, MISSOURI RIVER REPORT, supra note 1, at 5; Doremus, supra note 89, at 52 (quoting Carl J. Walters & C.S. Holling, Large-Scale Management Experiments
other flow patterns with both present experimental data and future 
projections (typically through modeling) of the overall quality and res-
toration potential of an altered ecosystem.\textsuperscript{280} Natural processes are 
used as standards against which to measure and mitigate the effects 
of human-generated alterations.\textsuperscript{281} Data gleaned from experimenta-
tion and sustained monitoring of ecological conditions is then utilized 
to adjust management strategies and inform the policy choices 
throughout implementation.\textsuperscript{282}

The experiments employed throughout the life of a decisionmaking 
process must be carefully designed, of course, with control factors and 
other basic requirements of scientific study, but they must also be bold 

enough to result in a discernible response. Managers are less likely to 
discover significant new information from timid experiments.\textsuperscript{283} Examples of 
successes in river restoration through bold AM experiments 
include flooding from Glen Canyon Dam to restore habitat on a stretch 
of the Colorado River and removing a fifty-mile-long channel to re-
store meanders on the Kissimmee River.\textsuperscript{284}

AM is not cheap, and it requires a sustained commitment from 
managers and stakeholders who would much prefer finality. Accord-
ingly, it will encounter resistance. AM is most promising for complex 
regulatory initiatives, but the highly political nature of many regula-
tory decisions can be a significant impediment. To boost public confi-
dence in their decisions and to buffer them from political firestorms, 
agencies and congressional members have increasingly turned to the

\begin{footnotes}
280. Doremus, \textit{supra} note 89, at 52; Carl Walters, \textit{Challenges in Adaptive Manage-
ment of Riparian and Coastal Ecosystems}, \textit{1 Conservation Ecology} 1 (1997), 

281. Tarlock, \textit{supra} note 9, at 11.

282. Doremus, \textit{supra} note 89, at 52; R. Edward Grumbine, \textit{What is Ecosystem Manage-
ment?}, \textit{8 Conservation Biology} 27-38 (1994); Walters, \textit{supra} note 280.

283. Doremus, \textit{supra} note 89, at 78. In some cases, the presence and precariousness of 
a listed species may inhibit bold experimentation and small, incremental steps 
may be required. This may entail more time and expense, but AM can still be 
implemented successfully. \textit{See id.} at 79–80 (discussing how the endangered 
Kanab ambersnail limited the size of experimental flooding on the Colorado River 
in Glen Canyon, but concluding that the experiment was nonetheless a successful 
case of AM, which improved conditions for native fish and enhanced knowledge of 
the dynamics of the system); \textit{id.} at 66–67, 80 (noting that numerous salmon runs 
in the Columbia River Basin have been listed since AM was adopted in the 1980s; 
no clear consensus as to the primary cause of the declines has emerged, and only 
tentative steps, such as barging the salmon, have been implemented).

284. \textit{See Tom Kenworthy, River Flow Limits in Grand Canyon Made Permanent, 
Wash. Post, Oct. 10, 1996, at A16} (reporting that experimental alterations in 
flow successfully created beaches and backwater habitat for endangered fish); \textit{see also Postel \& Richter, \textit{supra} note 6, at 120–22 \& tbl.4-1 (listing flow restoration 
projects and their ecological purposes). For the discussion of the restoration of 
the Kissimmee River, \textit{see infra} notes 295–300 and accompanying text.\end{footnotes}
nation’s premier scientific entity, the National Academy of Sciences, to review their work.\textsuperscript{285} The NRC, an entity within the Academy, has empanelled scientists and experts from other disciplines to review operations on the Missouri River, as well as the Platte, Columbia, and Klamath Rivers and the Florida Everglades.\textsuperscript{286} The NRC panels have consistently concluded that AM is an important component of river restoration and sustainable ecosystem management.\textsuperscript{287}

The Missouri River may in fact be more amenable to adaptive, ecosystem management strategies than other western rivers. The Colorado River system, for example, faces similar ESA constraints, but its challenges are, if anything, more difficult to resolve. Irrigators and other users in the Colorado River basin have expectations, and in many cases vested property rights, in Colorado River water under western prior appropriation water law.\textsuperscript{288} Conversely, very few irrigators in the Missouri River basin have vested rights to the water.\textsuperscript{289} Meanwhile, navigation, the first of Congress’s Commerce Clause powers to withstand legal challenge, is highly susceptible to federal regulation and even curtailment.\textsuperscript{290}

\textsuperscript{285.} See J.B. Ruhl, supra note 102. The Academy has even been asked to prepare a review of the role of science in overall ESA implementation. See \textsc{Comm. on Scientific Issues in Endangered Species Act}, supra note 276.

\textsuperscript{286.} See, e.g., NRC, \textit{Missouri River Report}, supra note 1, at 14; \textsc{Nat’l Research Council, Nat’l Academies, Endangered and Threatened Species of the Platte River} (2004), available at http://www.nap.edu/catalog/10978.html?onpi_newsdoc04282004 (concluding that the deterioration and loss of habitat in the central Platte River are adversely affecting species’ survival and recovery and recommending a systematic inventory of actions contributing to species’ decline and an approach to decisionmaking that considers multiple species and related habitats, with the burden of conservation measures to be shared by water users).

\textsuperscript{287.} NRC, \textit{Missouri River Report}, supra note 1, at 6. In most instances, the NRC confirmed the need for a more natural flow regime, but in one case the panel determined that the Services had required too much water to be reserved for fish instead of farms. See Michael Milstein, \textit{Drought of Research Fouled Klamath}, \textsc{Oregonian}, Feb. 13 2002.

\textsuperscript{288.} Prior appropriation water laws have been adopted in every western state, but water rights on the Colorado River are also affected and defined in part by federal legislation and reclamation contracts for the delivery of water. See generally David H. Getches, \textit{Colorado River Governance: Sharing Federal Authority as an Incentive to Create a New Federal Institution}, 68 U. COLO. L. REV. 573, 574-78, 582-83 (1997).

\textsuperscript{289.} See supra notes 70-74 and accompanying text (describing irrigation uses in the Missouri River basin).

\textsuperscript{290.} U.S. \textsc{Const.} art. I, § 8, cl. 3. See United States v. Chi., Milwaukee, St. Paul, & Pac. R.R., 312 U.S. 592, 596-97 (1941) (affirming the federal government’s authority to flood a railroad right-of-way to promote navigational improvement; the government’s dominant power for navigation extends to all land below the ordinary high-water mark, i.e., the “entire bed of a stream”); Gibbons v. Ogden, 22 U.S. (9 Wheat.) 1, 190-91, 195 (1824) (holding that state law granting an exclusive franchise for steamships passing between New York and New Jersey was preempted by the plenary Commerce Clause power over navigation between
Navigational context is sweeping, and private property rights are subordinate to the dominant power of the federal government to prohibit obstructions as well as to improve navigability. The control of floods in navigable rivers goes hand-in-hand with the control of navigation, and the United States possesses the dominant authority in the waters of a navigable stream for flood control purposes. As a result, the federal government is not liable to compensate riparian owners for a diminution of flows in a navigable stream, both because of this "navigational servitude" and because instream flows are generally not considered private property.

Kissimmee River restoration provides a leading example of federal efforts to coordinate conservation efforts on multi-jurisdictional lands and waters. The plan involved reversing the adverse effects of a flood control project that had converted a hundred-mile river into a fifty-mile canal. The canal, completed in 1971, caused thousands of acres of wetlands to dry up, over ninety percent of the waterfowl to disappear, native fisheries to crash, and tons of contaminated runoff to find its way to Lake Okeechobee. Congress authorized the Corps, which was working closely with the State of Florida, to backfill a portion of the canal, raze two of its six control structures, and

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291. Chi., Milwaukee, St. Paul, & Pac. R.R., 312 U.S. at 596-97. Navigable waters "are incapable of ordinary and private occupation, cultivation and improvement; and their natural and primary uses are public in their nature, for highways of navigation and commerce, domestic and foreign, and for the purpose of fishing . . . ." Shively v. Bowlby, 152 U.S. 1, 11 (1893).


294. A. Dan Tarlock, Law of Water Rights and Resources § 5.28 (2003). See United States v. Chandler, 229 U.S. 53, 69 (1913) (decrying as "inconceivable" the notion that "running water in a great navigable stream is capable of private ownership"). Most prior appropriation states, including all of the western states in the Missouri River Basin, have adopted provisions to protect instream flows, but acquisition of flows is limited to public entities. Tarlock, supra § 5.28.

295. Postel & Richter, supra note 6, at 64, 197 (describing potential benefits of AM in Kissimmee River restoration); Michael Grunwald, An Environmental Reversal of Fortune; The Kissimmee’s Revival Could Provide Lessons for Restoring the Everglades, Wash. Post, June 26, 2002, at A01 (describing successes of the Corps’s Kissimmee restoration project, and its potential as a precedent for the more ambitious Everglades restoration effort).

296. Grunwald, supra note 295, at A01.
purchase vulnerable properties from willing sellers. The benefits to the river have been described as “instant and obvious”: wading birds and sportfish are thriving and water quality has improved significantly. The Kissimmee project has taken place on a much smaller scale than would Missouri River restoration, but it has already been looked to as precedent for the more ambitious Everglades restoration plan. Neither example is a perfect analogy and, in the end, neither may turn out to be a perfect restoration legislation success story, but both can serve as useful learning tools for the Missouri River basin.

Institutional reform will likely be necessary to achieve sustainable AM on the Missouri River. River managers must have the expertise, the flexibility, and the fortitude to implement AM strategies, while still providing some degree of certainty and closure. Ideally, the management institution will also reflect the biological reality of linkages across the landscape, rather than political and property lines.

Proposals for various basin-wide Missouri River authorities have been floated before, and some have been initiated, but with little effect. The Corps, a military agency with a strong penchant for engineering solutions and physical construction, may not be the best candidate to continue as the leader in restoring natural flows and promoting the full range of ecosystem benefits in the basin. Yet, it has

297. Id.
298. Id.
301. Doremus, supra note 89, at 52. See Wood, supra note 34, at 222 (describing strengths and weaknesses of Columbia River institutions fostered by the Pacific Northwest Electric Power Planning and Conservation Act).
303. See Sittler, supra note 82, at 5–9; Tarlock, supra note 9, at 3–4;.
304. See Ben Shouse, River Restoration Not Easy, History Shows, ARGUS LEADER, Sept. 1, 2003, at A1 (quoting Casey Kruse, a Corps biologist, as saying that the science of ecological restoration is “a much more random world than an engineer-
developed a good deal of expertise on reservoir operations and on both
the human and ecological components of the Missouri River ecosystem
over the years, and it has begun to prove itself as an effective force in
the restoration of other degraded river systems.305 If institutional re-
form were to be embraced through a Missouri River Organic Act, it
should build on this existing expertise.

Institutional design must also accommodate, encourage, and incor-
porate public input. Citizen suits have proven to be a critical element
of success for environmental and conservation-oriented statutes.306
They can effectively compel implementation of statutory requirements
and provide “political cover” for agencies to deflect criticism and re-
ponsibility for controversial decisions.307 The ESA’s citizen suit pro-
vision, for example, has served as a “robust, durable institutional
mechanism for constraining the inevitable tendency of agencies to
avoid political controversy by softening protective mechanisms.”308

AM, however, may be ill-suited for effective utilization of citizen
suits, which typically work best where agency action is prescribed by
specific, discrete statutory requirements or limitations.309 Absent
specific goals and criteria, AM could become a tool for “adaptive eva-
sion” of agency responsibility—a smokescreen that mollifies demands

305. See Benjamin H. Grumbles & Kenneth J. Kopocis, The Water Resources Develop-
ment Act of 1992: Expanding the “Corps Of Environmental Engineers,” 23 ENVTL.
L. REP. 10379, 10389 (Envtl. L. Inst. 1993) (noting the Corps’s expertise “in water
management, wetlands protection, and other issues addressing both water quality
and quantity”); Grunwald, supra note 295, at A01 (describing the Corps’s role
in the Kissimmee and Everglades restoration projects).


307. Doremus, supra note 89, at 84 (concluding that citizen suits can “counterbalance political
asymmetries” between highly motivated economic interests and diffuse environ-
mental interests, as agencies will be “less likely to give in to political pressures if
doing so would risk citizen litigation”).

308. Id. at 66; see id. at 84 (concluding that citizen suits can “counterbalance political
asymmetries” between highly motivated economic interests and diffuse environ-
mental interests, as agencies will be “less likely to give in to political pressures if
doing so would risk citizen litigation”).

citizens’ claim that BLM failed to protect wilderness study areas on grounds that
it failed to allege violations of specific, nondiscretionary action).
for environmental protection while evading public and judicial scrutiny.\textsuperscript{310} An effective organic act for the Missouri River would include clearly defined boundaries, triggering thresholds, events, or formulas for management adjustments (\textit{i.e.}, procedural or substantive steps to be taken if monitoring indicates that species or ecological functions continue to decline), along with provisions for information collection and dissemination and, finally, periodic review and revision of management plans.\textsuperscript{311} These elements would enhance opportunities for judicial review.

Citizen participation could be effectuated through the NRC's recommendations for consensus-based decisionmaking.\textsuperscript{312} The NRC called for a framework that would facilitate and incorporate stakeholder participation throughout the decisionmaking process, presumably from crafting initial management strategies through implementation.\textsuperscript{313} Although at first blush this seems unobjectionable and even highly desirable, consensus-based or collaborative management entails certain dangers. Inefficiency is the most obvious disadvantage, but inefficiency alone is not a sufficient reason to forego an inclusive approach for managing a resource that means so much to so many. Marc Reisner, a preeminent analyst on the construction and effects of dams in the West, wrote: "There is a simple little problem with consensus: it is hardly ever achievable in a lasting sense . . . especially . . . with an issue as volatile as water and especially in a region as balkanized as ours, where the most perfervid Ed Abbeys and doctrinaire Wise Users try to coexist."\textsuperscript{314} The divergent views and balkanization between upper and lower basin states make this especially true in the Missouri basin. Reisner summed up the deficiencies of collaborative management as follows:

One result . . . is that we abdicate our ability to make something happen whenever an outspoken, insistent minority does not want it. Another, more pernicious result is that we waste tons of money on solutions everyone can buy into but that achieve little. Consensus-seeking makes us all feel good. But, in Margaret Thatcher's apt phrase, it is another term for lack of leadership; it

\begin{itemize}
\item \textsuperscript{310} Doremus, \textit{supra} note 89, at 52–53.
\item \textsuperscript{311} See \textit{id.} at 84–85. NFMA's provisions for land and resource management plans governing National Forest System activities, which require revision whenever conditions have significantly changed and at least every fifteen years, may provide a workable starting point. 16 U.S.C. § 1604(f)(5) (2000).
\item \textsuperscript{312} NRC, \textit{Missouri River Report}, \textit{supra} note 1, at 137–38.
\item \textsuperscript{313} \textit{id.} at 137–38, 140. The NRC panel also recommended independent scientific review as a component of the stakeholder group. \textit{id.} at 138–39. Peer review by an independent panel is also embraced by Professor Doremus as one component of successful AM. Doremus, \textit{supra} note 89, at 82–83.
\item \textsuperscript{314} Marc Reisner, \textit{The New Water Agenda: Restoration, Deconstruction, and the Limits to Consensus}, 20 J. LAND RESOURCES & ENVTL. L. 1, 10 (2000). Reisner concluded that the desire to attain consensus, a "concept . . . taken to an almost ludicrous extreme," has effectively "hamstrung efforts to inaugurate a modern water era in the arid West." \textit{id.}
means you must accept minority tyranny over majority will whenever an im-
placable few have gummed the works.315

Collaboration with interested and knowledgeable stakeholders is a
necessary element of the formula for attaining a sustainable solu-
tion,316 and will be especially useful in forging recommendations for
legislation to forward congressional sponsors, but the desire for a con-
sensus-based approach cannot be allowed to foster blame-shifting and
foot-dragging or to ultimately stand in the way of bold, visionary ac-
tion based on objective, ecologically-based criteria.317 An effective citi-
zens’ suit provision, coupled with clear-cut requirements for
information dissemination and enforceable substantive standards,
will likely be the best means of assuring and incorporating citizen in-
put throughout decisionmaking and implementation.

Last but not least, a Missouri River Organic Act that incorporates
AM will require long-term funding. Federal appropriations may help
ease the transition by subsidizing the retirement or relocation of com-
mmercial barge operators, augmenting the water supply, and obtaining
title or conservation easements to land in the floodplain. Restoring a
more natural river hydrograph may itself provide a funding source.
The implementation of the flow changes and habitat restoration speci-
fied in the Service’s 2000 BO and the NRC Report would result in sig-
nificant economic benefits to the entire basin as a result of the

315. Id. (citation omitted).
316. See Klein, supra note 33, at 732–33 (arguing that public participation can provide
the necessary link between democracy and science in decisions related to dams); Thorson,
supra note 27, at 26 (concluding that “[t]he Corps should continue to strive for consensus among basin states” and, in turn, the states should suppress the “purely parochial interests” that have been exacerbated by “disparity in popu-
lation and political power”); see also Sittler, supra note 82, at 8 (discussing advan-
tages of collaboration with Missouri River farmers). Sittler and others are
preparing an assessment of collaborative, integrated alternatives for adaptive
management on a pilot stretch of the River. E-mail communication with Meghan
(holding that the Park Service had improperly delegated decisionmaking power
for the administration of a designated section of the Niobrara River to a council
comprised of riparian property owners, county commissioners, representatives of
Natural Resource Districts, timber, and recreational industries, and other federal
and state agencies); George Cameron Coggins, “Devolution” in Federal and Land
Law: Abdication by Any Other Name . . . , 3 Hastings W.-Nw. J. Envtl. L. &
Pol’y 211, 213–14 (1996) (discussing how collaborative decisionmaking can di-
minish governmental accountability by allowing abdication of duties to make con-
troversial decisions); Reisner, supra note 314, at 10 (arguing that dedication to
consensus-based management typically results in “endless debate, inaction, and
ultimate paralysis”). Cf. Bradley C. Karkkainen, Collaborative Ecosystem Gov-
(2002) (assessing the strengths and weaknesses of newly emergent collaborative
ecosystem management models and concluding the model holds distinct advan-
tages but must overcome many obstacles if it is to succeed).
ecosystem services provided by a healthier river system.\footnote{18} Providing greater support for natural functions will ultimately enhance human dimensions through recreational benefits; proliferation and diversity of game species and nongame native species; purified air, ground, and surface water; groundwater recharge; soil fertility; food supply; and cultural and aesthetic qualities.\footnote{19} It may be possible to redistribute some of the economic gains from these improvements to alleviate the hardships of a transition to a new management paradigm.

D. Other Options, from Most to Least Drastic

Other than comprehensive organic legislation for the Missouri River, there is an array of structural, operational, and procedural possibilities for managing a complex river basin. A few options considered in other basins include dam removal, negotiation of interstate compacts, and adoption of Habitat Conservation Plans ("HCP"). These and other options could be considered independently or in some combination. These three options are raised briefly here merely to illustrate that none could provide a complete solution absent an overarching Missouri River Organic Act.

Dam removal has become popular, even beyond fervorid Edward Abbey fans.\footnote{20} Physical alterations, including total removal, of dams have become a leading but highly controversial facet of river restoration strategies across the nation. Like any artificial structure, dams have a finite life expectancy, and can become obsolete over time due to structural vulnerabilities and reservoir sedimentation, which de-

\footnote{18}{See NRC, Missouri River Report, supra note 1, at 115 (concluding that flood control and water supply would experience only minimal effects if a more natural flow regime were adopted and that a $2 to $3 million loss in navigational benefits would be offset by increases in annual hydropower benefits and ecosystem services). The Corps itself estimated that implementing more natural flows would result in $8.8 million in annual net economic benefits. Am. Rivers v. U.S. Army Corps of Eng'rs, 271 F. Supp. 2d 230, 261 (citing Northwestern Div., U.S. Army Corps of Eng'rs, Revised Environmental Impact Statement 5–131 & tbl. 5.13–1).}

\footnote{19}{See NRC, Missouri River Report, supra note 1, at 2, 83 (describing extensive ecosystem services, or "natural capital," provided by naturally functioning rivers, but concluding that, in the past, "little effort was made to give these values parity with fully monetized costs and benefits," such as navigation, hydropower, flood control, and irrigation); Postel & Richter, supra note 6, at 2–3, 6–8, 170 (describing ecosystem services provided by natural river flows as providing greater net benefits to society than conventional water development projects).}

creases storage capacity and productivity. Several older dams have been or will soon be removed, including the Edwards Dam in Maine and two dams on the Elwha River in Washington. Arguably, dam removal could be part of the mix on the Missouri River, but entire ecosystems and economies have evolved around the mainstem reservoirs, which continue to provide important recreational and flood control benefits. Although outright removal is unlikely, a comprehensive study on options and long-term effects of structural alterations on mainstem and tributary dams would be a useful component of a broader restoration strategy.

Instead of an organic act, the basin states could get together to negotiate an interstate compact to address upstream and downstream states' concerns by allocating the flow of the river. A compact has several advantages and would be a significant addition to the existing Law of the River.

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322. See NRC, Missouri River Report, supra note 1, at 1 (reporting that the removal of the Edwards Dam resulted in an increased abundance of fish and bird species); Carey Goldberg, Fish are Victorious over Dam as U.S. Agency Orders Shutdown, N.Y. Times, Nov. 26, 1997, at A16 (reporting that the Federal Energy Regulatory Commission had denied relicensing and ordered removal of the Edwards Dam); Pyle, supra note 321, at 121–22 (describing congressional authorization for dam removal on the Elwha River to promote ecosystem restoration); see also Gregory W. Griggs, Plans to Remove Dam Advance: A Federal Bill to Help Fund the Ventura River Restoration Project Moves to the Full Senate, L.A. Times, June 25, 2004, at B1 (reporting that federal funding is likely for removal of the 190-foot-high, fifty-six-year-old Matilija Dam on the Ventura River in California to replenish eroding beaches and revive spawning areas for endangered steelhead trout); Tim Holt, Persistence Frees the Mokelumne, High Country News, Mar. 15, 2004, at 6 (reporting that Pacific Gas and Electric had agreed to remove three dams on Mokelumne River tributaries under a relicensing agreement).

323. In 2001, while surveying the Missouri River Breaks National Monument with President Clinton, Stephen Ambrose said, "I don't know when and I don't know how, but I'm certain that by the end of the 21st century, all the great dams—Fort Peck, Oahe, all of them—will be gone. This is what the people want." Harold W. Andersen, "Wild" River Would Have Downside, Omaha World-Herald, Dec. 3, 2000, at 11B.


tors with a seat at the table than they otherwise might if Congress were to take unilateral legislative action. Also, as a contract, a compact can include terms that are either as detailed or as open-ended as the parties wish, which might provide opportunities for sustainable management that best reflects human and ecosystem needs. At the same time, however, the pressure for individual states to place their own immediate economic interests over long-term ecosystem needs is tremendous, and the compact would likely reflect this. Accordingly, compacts can be parochial, meaning that local or, at best, regional interests rule the day while national interests are not well-represented. Moreover, once ratified by Congress, a compact among numerous states can become even more entrenched and intractable than unilateral federal legislation, making AM all the more difficult.\(^3\) Of course, provisions governing dispute resolution, compact amendment, and termination could be included in the compact,\(^4\) and the compact could address AM by specifying a triggering event or formula for adjustments along the way, along with monetary resources for monitoring and implementation.

An effective Missouri River Compact may be especially difficult to forge. Compacts have been the most effective where member states have similar needs, such as consumption of water for irrigation or other beneficial uses, and can simply divvy up an allotted amount. Interests are far more diverse and complex in the Missouri River basin, with few users interested in appropriations of water for consumption and many users interested in maintaining the flow in different portions of the system for vastly different purposes. Moreover, compact negotiations should include all nine interested states, along with as many as thirty Indian tribes, raising potentially prohibitive logistical impediments.

As a short-term remedy, the Corps, the states, and other affected parties could negotiate an HCP with the FWS to address ESA challenges raised by ongoing operations under the 2004 Master Manual. HCPs are a requirement of obtaining an incidental take permit under section 10 of the ESA and are intended to allow economic activity in a

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326. See Paul T. Hardy, Interstate Compacts: The Ties That Bind 10, 21 (1982) (noting the difficulties of revising compacts due to the need to re-negotiate and obtain state and federal ratification); Getches, supra note 253, at 9–10 (explaining that, in spite of tremendous factual inaccuracies about the amount of water available for use, both the Colorado and Pecos River Compacts remain the law, having created “relatively immutable and inflexible demands for water deliveries and expectations of certainty”).

327. Hardy, supra note 326, at 21.
manner consistent with conservation.\textsuperscript{328} This option may be the most expedient and would likely pose the least disruption to the status quo.\textsuperscript{329} However, the Corps and downstream states are unlikely to take restrictive conservation measures seriously without a big incentive (or, conversely, a big stick) to encourage earnest negotiation and long-term compliance.\textsuperscript{330} The greatest incentive for affected landowners and commercial interests is also one of the biggest downsides to HCPs—provisions that ensure "no surprises" and therefore no new requirements for unforeseen circumstances.\textsuperscript{331} The "no surprises" policy reflects the nearly irresistible pressure to favor the status quo, as it excuses signatories from changing their ways, even if monitoring over the life of the project shows that the HCP's measures are not, in fact, preventing adverse impacts.\textsuperscript{332} HCPs have procedural disadvantages as well, in that HCP negotiations between project applicants and the Services have a tendency to sideline important interests: environmental groups and Indian tribes. An organic act could address local, regional, and national interests in a more comprehensive, equitable, and sustainable fashion.

VII. CONCLUSION

The Corps is faced with an "insurmountable task" under the Flood Control Act, which directs it to achieve, at best, "illusory perfection."\textsuperscript{333} The system has not lived up to the unrealistic and largely contradictory expectations placed on it. Meanwhile, the ecological resources of the basin are in steep decline. Absent an overarching mis-

\begin{itemize}
\item \textsuperscript{329} \textit{See} Notice of Availability of a Final Addendum to the Handbook for Habitat Conservation Planning and Incidental Take Permitting Process, 65 Fed. Reg. 35,242 (June 1, 2000). It might appear that an HCP is also a highly flexible option; however, flexibility is by no means assured, as HCPs lasting as long as 100 years or even indefinitely have been approved. \textit{See} Doremus, \textit{supra} note 89, at 69.
\item \textsuperscript{330} The potential for enforcement of the ESA's take prohibition alone is unlikely to bring reluctant parties to the table when the take in question turns solely on habitat modification, as is the case for the three species at issue on the Missouri River. Although habitat modification can be considered a take, \textit{see} Sweet Home of Cmtys. for a Greater Or. v. Babbitt, 515 U.S. 687 (1995), the Services rarely enforce penalties for such takes against private actors. \textit{See} Doremus, \textit{supra} note 89, at 63.
\item \textsuperscript{332} Doremus, \textit{supra} note 89, at 72. The problems generated by the policy are exacerbated by the lack of sufficient information about the potential effects of the proposed activity at the time the HCP is executed. \textit{Id.}
\item \textsuperscript{333} \textit{In re Operation of Missouri River System Litig.}, No. 03-MD-1555 PAM, 2004 WL 1402563, at *24 (D. Minn. June 21, 2004).
\end{itemize}
sion statement and a concrete and sustainable ecological baseline to assist agencies, courts, and stakeholders in resolving ambiguities and conflicts between upper and lower basin states, the communities in the Missouri River basin will continue to be whip-sawed by short-term and, in all likelihood, unsustainable navigation interests and politically driven preferences.

The time to embark on a new Corps of Discovery is at hand. Aquatic ecosystems, particularly rivers, are the "biological engines of the planet," and river restoration on the nation's longest river is an eminently worthwhile pursuit. A comprehensive Missouri River Organic Act that includes adaptive, sustainable management requirements would not only be a path-breaking endeavor on the Missouri River, but the lessons learned also could make a significant contribution to the body of knowledge on river restoration and sustainable riparian communities, illuminating river management across the country. The Corps of Discovery's bicentennial, along with the recent Master Manual revision, together present a rare impetus for crafting a comprehensive legislative solution, one that is as bold and visionary as the expedition that concluded 200 years ago.

334. NRC, Missouri River Report, supra note 1, at 11 (quoting World Comm. on Dams, Dams and Development: A New Framework for Development (2000)).