

# S U M M A R Y

# MISSOURI RIVER

## Final Environmental Impact Statement

Master Water Control Manual Review and Update

March 2004



U.S. Army Corps of Engineers  
Northwestern Division

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**U.S. Army Corps of Engineers  
Northwestern Division**

**Dear Stakeholders and Concerned Citizens:**

The Missouri River Master Water Control Manual (Master Manual) is the guide used by the U.S. Army Corps of Engineers (Corps) to operate the system of six dams on the Missouri River Mainstem Reservoir System (System) – Fort Peck, Garrison, Oahe, Big Bend, Fort Randall, and Gavins Point.

Fourteen years ago, when the basin experienced its first major drought since the System became operational, the Corps undertook the revision of the Master Manual. The listing of three Missouri River species – the interior least tern, piping plover, and pallid sturgeon – under the Federal Endangered Species Act (ESA) underscored the need to revisit the Master Manual. The Corps is also very aware of its responsibilities to American Indian Tribes and their unique status as dependent sovereign nations. The Corps' objectives for the Master Manual have been to develop a Water Control Plan that meets the contemporary needs of the basin, fulfills its responsibilities to American Indian Tribes, and complies with environmental laws, including the ESA.

The Final Environmental Impact Statement (FEIS) presents a Preferred Alternative (PA) that the Corps believes accomplishes these objectives. The PA includes measures that conserve more water in the upper three reservoirs during droughts and varies levels in those reservoirs for fish and wildlife.

The PA is also a part of a more comprehensive set of measures that the Corps is proposing at this time. The proposed Missouri River Recovery Implementation Program (MRRIP) includes a set of integrated measures directed toward recovery of Missouri River species provided protection under the ESA and the ecosystem on which they depend. Stakeholder participation in MRRIP is critical to ensure that public values are considered in recovery measures. Therefore, the Corps is proposing a Missouri River Recovery Implementation Committee (MRRIC) with broad stakeholder representation to make recommendations to the Federal agencies regarding recovery measures.

The Corps' role in the Master Manual revision has been that of an honest broker, serving the Nation and its citizens. The Missouri River is a National treasure that must be protected, and the dams are National investments that should serve the needs of the Missouri River basin and the Nation. As stewards of both the river and the dams, the Corps' challenge has been to develop a flow management plan that best serves both.

I urge you to read this Summary and provide your comments. For more information about available documents, other sources of information, and the comment procedures, please refer to pages 36, 37, and the back cover of this Summary.

Finally, as we begin the commemoration of the historic expedition of Lewis and Clark up the Missouri River, I encourage you to join in a new journey and actively participate in Missouri River recovery!

Sincerely,

**William T. Grisoli**  
Brigadier General, U.S. Army  
Division Engineer

**Deposition**-The process of laying down sediments after a transportation process (sedimentation).

**Drawdown**-The distance that the water surface of a reservoir is lowered from a given elevation as water is released from the reservoir. Also refers to the act of lowering reservoir levels.

**Drought Conservation**-Reduction of releases from the Mainstem Reservoir System to conserve water in the reservoirs for authorized project purposes.

**Endangered**-A plant or animal species that is in danger of extinction throughout all, or a significant portion, of its range. The U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) designates endangered species.

**Erosion**-The wearing away of a land surface or river channel by water, wind, ice, gravity, or other geological activities.

**Eutrophication**-The build-up of nutrients in a water body that promotes excessive algal growth.

**Flat Release**-Constant release of water from Gavins Point Dam to meet a prescribed release requirement (flat release for endangered species during the summer) or a subsequent minimum flow requirement downstream (navigation target requirements from May through August).

**Floodplain Connectivity**-Flooding of lands along the river to flush nutrients, an aquatic food source, into the river. Historically, flood flows in the spring caused this to happen on a fairly regular basis.

**Habitat**-The environment occupied by individuals of a particular species, population, or community.

**Levee**-A dike or embankment that protects land from flooding.

**Lower River**-The segment of the Missouri River that extends from Gavins Point Dam to the mouth of the river near St. Louis.

**Mainstem Reservoir System**-The portion of the Missouri River from the headwaters of Fort Peck Lake to Gavins Point Dam that includes the six large dams and their reservoirs.

**Master Manual**-The document that describes the Mainstem Reservoir System, including its Water Control Plan. The document establishes operational policy for the multiple project purposes of flood control, hydropower, water supply, water quality, irrigation, navigation, recreation, and fish and wildlife.

**Navigation Season**-The period of time that flow support is provided to serve navigation on the Lower River from Sioux City to the mouth near St. Louis. The length of a normal navigation season is 8 months (April 1 through December 1).

**Navigation Service**-The release of water from the Mainstem Reservoir System necessary to maintain 8 to 9 feet of water depth in the navigation channel between Sioux City and St. Louis.

**Permanent Pool**-The minimum water level necessary to allow the hydropower plants to operate and provide minimum service to recreation and fish and wildlife. The permanent pool also provides reserved space for sediment storage.

**Release of Water**-The controlled discharge of water from a reservoir to serve one or more authorized purposes.

**Reservoir**-An artificial body of surface water retained by a dam.

**Riparian Habitat**-The area adjacent to a stream channel, a reservoir, or wetland that supports the growth of woody vegetation that is not adapted for life in saturated soil conditions.

**Run of River**-Flows that are basically uncontrolled.

**Sedimentation**-The process of deposition of sediment.

**Shallow Water Habitat**-Areas along the river that are less than 5 feet deep, flowing at no more than 2.5 feet per second.

**Spawning Cue**-River conditions that prompt fish to spawn. For the pallid sturgeon and other native river fish, a spring rise on the Lower River may prompt spawning.

**Tailwater**-The river reach immediately downstream from a dam.

**Threatened**-Legal status afforded to a plant or animal species likely to become endangered within the foreseeable future throughout all or a significant portion of its range, as determined by the USFWS or the NMFS.

**Upper Reservoirs**-The three most upstream Missouri River reservoirs formed by Fort Peck Dam, Garrison Dam, and Oahe Dam.

**Water Control Plan**-A detailed plan outlining the guidelines for operation of the Mainstem Reservoir System that is contained in the Master Manual.

**Wetland Habitat**-Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support vegetation adapted for life in saturated soil conditions.

## Acronyms/Abbreviations

AOP	Annual Operating Plan	MW	megawatt
BA	Biological Assessment	MWh	megawatt-hours
BiOp	Biological Opinion	NEPA	National Environmental Policy Act
Corps	U.S. Army Corps of Engineers	PA	Preferred Alternative
CWCP	current Water Control Plan	PDEIS	Preliminary Draft Environmental Impact Statement
DEIS	Draft Environmental Impact Statement	PRDEIS	Preliminary Revised Draft Environmental Impact Statement
ESA	Endangered Species Act	RDEIS	Revised Draft Environmental Impact Statement
FEIS	Final Environmental Impact Statement	RHM	Reservoir Habitat Model
GIS	Geographic Information System	ROD	Record of Decision
kcfs	thousand cubic feet per second	ROR	run of river
MAF	million acre-feet	Study	Master Water Control Manual Review and Update
Master Manual	Missouri River Master Water Control Manual	System	Missouri River Mainstem Reservoir System
MCP	Modified Conservation Plan	USFWS	U.S. Fish and Wildlife Service
MRRIC	Missouri River Recovery Implementation Committee	WAPA	Western Area Power Administration
MRRIP	Missouri River Recovery Implementation Program		

# INTRODUCTION

The purpose of this Summary is to provide an overview of the findings developed for the Missouri River Master Water Control Manual Review and Update (Study) Final Environmental Impact Statement (FEIS). For detailed information, please refer to the FEIS and the supporting technical documents. The U.S. Army Corps of Engineers (Corps) initiated the Study during the first major drought (1987 to 1993) the Missouri River basin experienced since the Missouri River Mainstem Reservoir System (System) became fully operational in 1967.

The objectives of the Study are to identify a Water Control Plan that: (1) serves the contemporary needs of the basin; (2) complies with environmental laws, including the Endangered Species Act (ESA); (3) serves Congressionally authorized project purposes; and (4) fulfills the Corps' responsibilities to Federally recognized American Indian Tribes. The primary purpose of the FEIS is to present the results of the Corps' analysis of the environmental effects of the Preferred Alternative (PA) Water Control Plan for the Missouri River Master Water Control Manual (Master Manual).

The Corps invites interested parties to review this Summary (and the full FEIS if more detailed information is desired) and to submit written and electronic comments during the 30-day comment period following publication of the FEIS. Following the 30-day comment period, the Corps will issue a Record of Decision (ROD). This ROD will include the Corps' conclusions and determinations on how it intends to meet the objectives of the Study.

# The JOURNEY Continues...

A Revised Draft Environmental Impact Statement (RDEIS) was published in August 2001. The RDEIS evaluated six alternatives: the current Water Control Plan (CWCP), a Modified Conservation Plan (MCP), and four different flow regimes for ESA listed species. A 6-month public comment period followed the release of the RDEIS. The Corps hosted workshops and public hearings at numerous locations throughout the Missouri River basin, including Tribal Reservations, and some Mississippi River locations. Nearly 54,000 Tribal and public comment documents were received. The Corps conducted several additional analyses in response to comments and further evaluated impacts to key resources and uses.

In selecting a PA, the Corps considered additional information obtained subsequent to the RDEIS. In January 2002, the National Academy of Sciences' National Research Council published a report entitled "The Missouri River: Exploring the Prospects of Recovery," which underscores the importance of restoring river form and function and highlights adoption of an adaptive management approach, including broad stakeholder participation. During this time, the Corps and the U.S. Fish and Wildlife Service (USFWS) continued consultation under the ESA. The Corps completed new engineering analyses of previous USFWS recommendations and piping plover critical habitat was designated. The engineering studies concluded that the recommended flow regimes for listed species would not provide the anticipated physical attributes and biological effects likely to avoid jeopardy to the species. Additionally, scientific uncertainty remains about the lifecycle requirements of the pallid sturgeon.

The Corps concluded that recovery of Missouri River listed species would require a broader array of measures to ensure the physical attributes and biological effects necessary to increase the likelihood of the continued existence of the threatened and endangered species. On November 3, 2003, the Corps provided the USFWS a Biological Assessment (BA) that identified the Corps' proposed action for operation of the Missouri River Mainstem Reservoir System, Missouri River Bank Stabilization and Navigation Project, and Kansas River Reservoir System. ESA consultation was officially reinitiated at that time. The BA proposed the proposed action in combination with a comprehensive Missouri River Recovery Implementation Program (MRRIP), which includes multiple measures to benefit the species in an adaptive management framework. The framework includes a Missouri River Recovery Implementation Committee (MRRIC) to ensure that public values are incorporated into recovery measures (see pages 34 and 35 of this Summary for a more detailed description of MRRIP).

The Corps concluded that the selected PA, in combination with the other measures of MRRIP, is not likely to jeopardize the continued existence of Missouri River listed species or adversely modify their critical habitat.

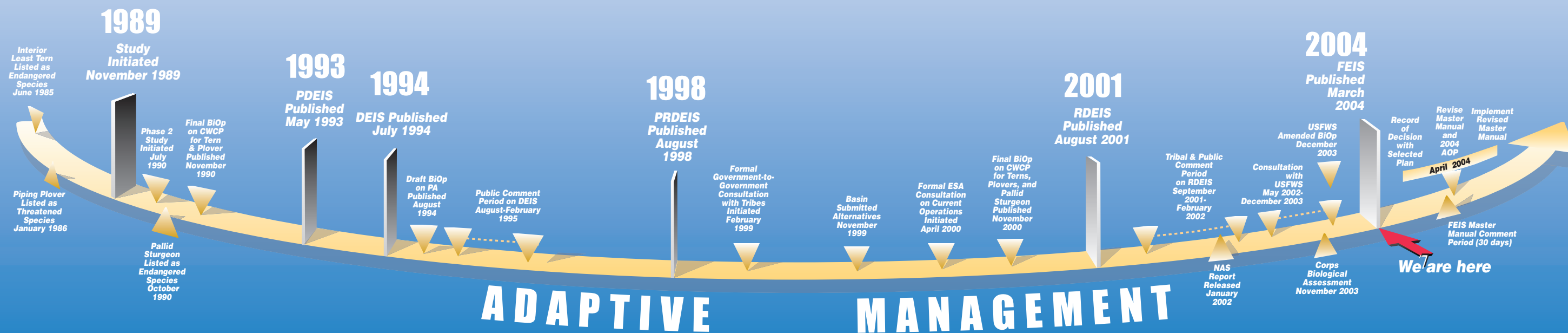
On December 16, 2003, the USFWS provided the Corps an amendment to its November 2000 Biological Opinion (BiOp) on the Operation of the Missouri River Mainstem Reservoir System, Missouri River Bank Stabilization and Navigation Project, and Kansas River Reservoir System. The amended BiOp and comments received in response to this FEIS will be considered in the Corps' decision regarding a selected plan, which will be announced in the Corps' Record of Decision following the FEIS comment period.

Also following the RDEIS, the Corps continued to work extensively with the basin states to identify acceptable drought conservation measures while meeting the Study objectives. The PA includes drought conservation measures that conserve more water in the upper three reservoirs during extended droughts while continuing to provide for Congressionally authorized downstream uses.

The Corps coordinated with the American Indian Tribes in the basin to meet its Tribal trust responsibilities, including Government-to-Government consultation and the protection of cultural resources. Many Tribes provided substantive comments throughout the process, and consultation with the Tribes will continue into the future.

The rationale for selecting the PA is a composite of analyses, information briefings, technical expertise, and comments concerning the resources evaluated as part of the Study. The Corps believes that the PA, when combined with the other measures under MRRIP, conserves more water in the upper three reservoirs during extended droughts, meets the needs of ESA listed fish and wildlife species, is consistent with the Corps' responsibilities under environmental laws and Tribal trust responsibilities, and provides for the Congressionally authorized uses of the System.

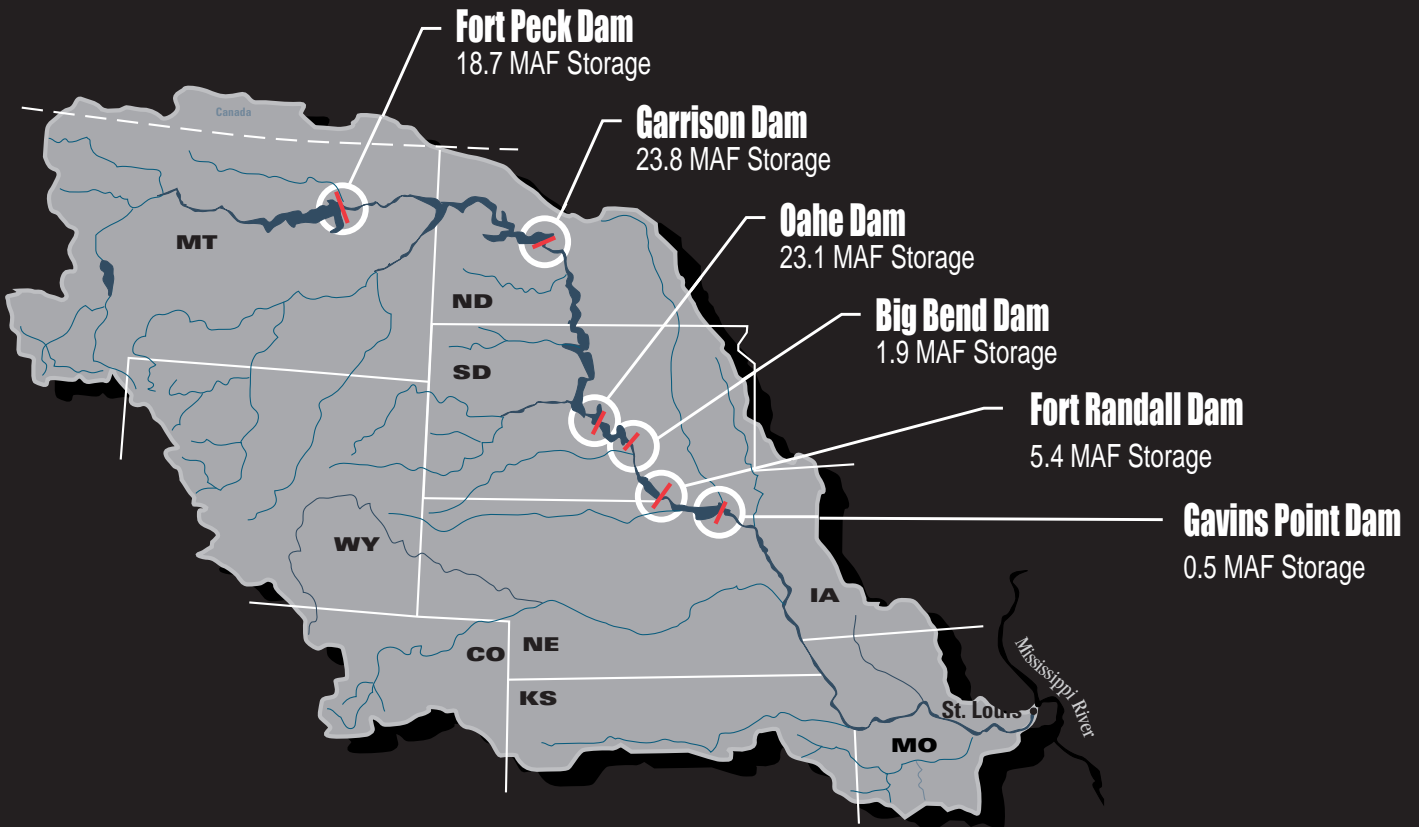
Following a 30-day public comment period on the FEIS, the Corps will prepare a ROD, revise the Master Manual, develop an Annual Operating Plan (AOP) that conforms to the guidelines established under the revised Master Manual, and implement the new Water Control Plan.





# The Missouri River

# DAMS & RESERVOIRS



The Missouri River extends 2,619 miles from its source at Hell Roaring Creek and 2,321 miles from Three Forks, Montana where the Jefferson, Madison, and Gallatin Rivers converge. The Missouri River is the longest river in the United States, draining one sixth of the country. The System consists of six dams and reservoirs located in Montana, North Dakota, South Dakota, and Nebraska. It has a capacity to store 73.4 million acre-feet (MAF) of water, which makes it the largest reservoir system in North America. The Corps operates the System to serve Congressionally authorized project purposes of flood control, navigation, irrigation, hydropower, water supply, water quality, recreation, and fish and wildlife. Runoff from above the System dams is stored in the six reservoirs, where it serves several of the project purposes. Water is released from the System as needed for downstream purposes. Released water from the lowest dam in the System, Gavins Point Dam, flows down the Lower River, which includes the Bank Stabilization and Navigation Project from Sioux City, Iowa to St. Louis, Missouri.

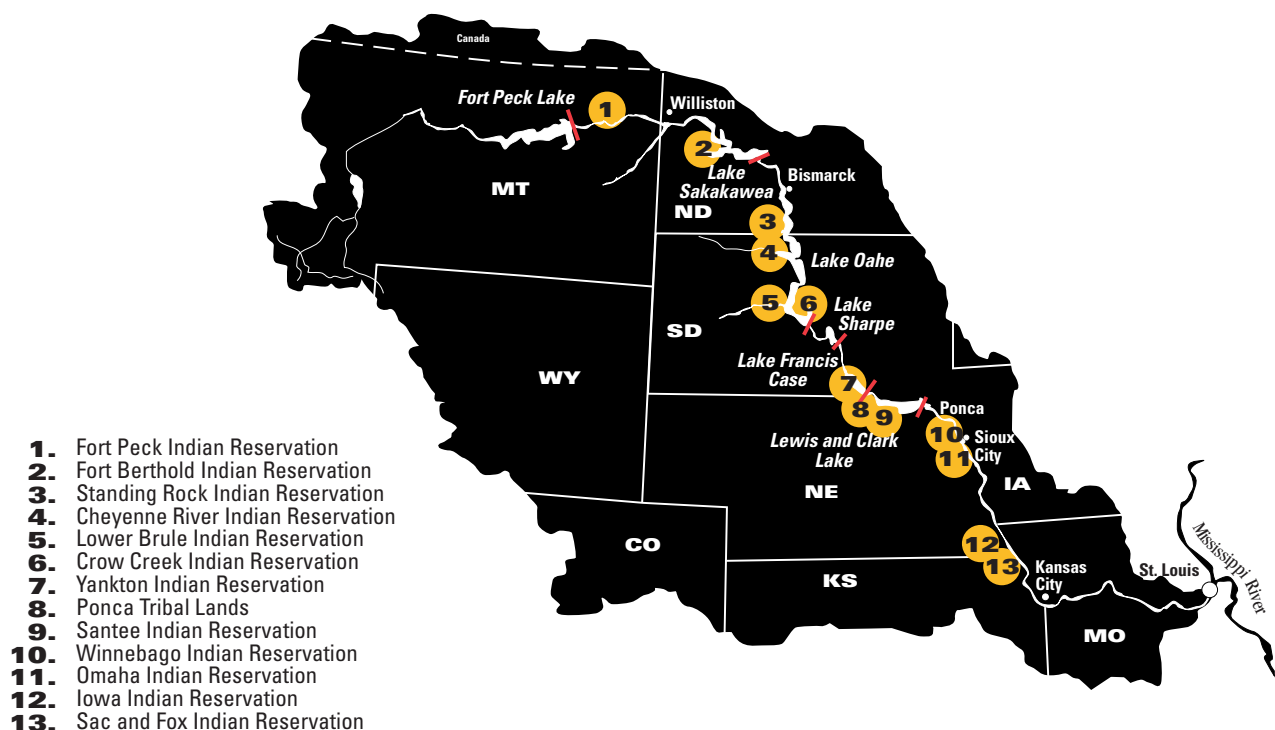
# AMERICAN INDIANS and the Master Manual Revisions

Thirty American Indian Tribes are located within the Missouri River basin. Thirteen Tribal Reservations or Tribal Lands are located directly on the System, the river reaches between the dams, and downstream of the System along the Lower River. The Tribes are dependent sovereign Nations, and the Corps is currently in Government-to-Government consultation with basin Tribes. Because of this Government-to-Government relationship with the Corps and because the Corps has a Trust responsibility to the Tribes, they are given special consideration in the FEIS. For the Tribal Reservations located on the Missouri River, the FEIS identifies impacts to Tribal resources resulting from the PA. The FEIS also includes a Tribal Appendix that addresses Master Manual issues important to the Tribes, presents the consultation history and process to date, and contains all written comments the Corps has received from the Tribes to date. Following publication of the RDEIS, the Corps held several workshops and hearings in partnership with the Tribes.

Following the RDEIS comment period, a Tribal Summit was held on April 16, 2002 in Rapid City, South Dakota. Eighteen basin Tribes were represented at the Summit. The Tribes expressed concerns about many Missouri River issues, including water rights and impacts to cultural resources resulting from the operation of the System, which continue to be major Tribal issues.

On October 31, 2003, a Tribal Summit was also held in Rapid City, South Dakota. Representatives of eight Tribes were present at the meeting, with the issues being similar to those expressed at previous summits.

Consultation with basin Tribes on the Study will continue throughout the National Environmental Policy Act (NEPA) process. In addition, the Corps recognizes that consultation with the Tribes on many significant issues relating to management of the Missouri River will continue well into the future and that the Tribes will have an important role in MRRIP. The Corps urges all basin Tribes to continue participation in Government-to-Government consultations.





# Features of the Preferred Alternative

Three Water Control Plan features will be changed in the Master Manual to allow implementation of the PA. These three features are drought conservation criteria, summer non-navigation service level, and System storage unbalancing. They are described below.

## Drought Conservation Measures

The PA has more stringent drought conservation measures than the CWCP. Conservation during droughts under the PA would be similar to that provided by the MCP outlined in detail in the RDEIS. Many basin stakeholders raised specific concerns regarding how this level of conservation was attained, and the Corps did some refinement of the conservation measures to address these concerns. As under the MCP, navigation service during extended droughts would be curtailed more under the PA than it is under the CWCP. This would allow more water to be stored in the upper three reservoirs. During severe droughts, such as the 1930 to 1941 drought, releases for navigation would be suspended at a higher total System storage level than under the CWCP.

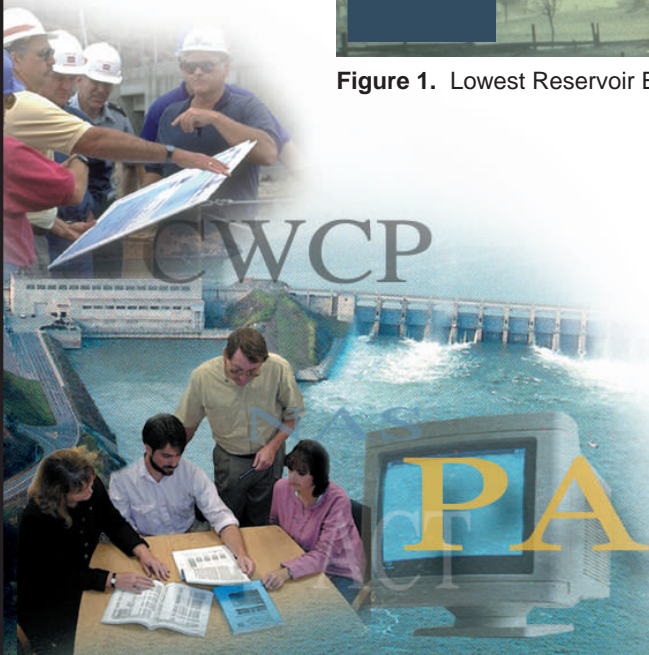
**Figure 1** compares the lowest reservoir elevations that would have occurred under the PA and CWCP for each of the upper three (largest) reservoirs during the 1987 to 1993 drought. The figure also contains the minimum storage for the CWCP if the current drought conservation measures had been strictly followed. Inclusion of the measures contained in the PA would increase total System storage from 40.2 to 42.1 MAF during a similar drought.

Alternatives	Fort Peck Lake	Lake Sakakawea	Lake Oahe	Storage (MAF)
CWCP	2,206	1,813	1,585	40.2
PA	2,208	1,817	1,587	42.1

Figure 1. Lowest Reservoir Elevations (1980s Drought)~(Feet)

## Summer Non-Navigation Service Level

Non-navigation service levels are specified for periods when navigation is not supported during droughts. The summer non-navigation service level for the Lower River under the CWCP is 9 kcfs, and this level would be raised to 18 kcfs to better serve the other authorized System project purposes. This change and the more stringent drought conservation measures combine to increase the number of non-navigation years from 1 for the CWCP to 4 for the PA in a repeat of the 1930 to 1941 drought.

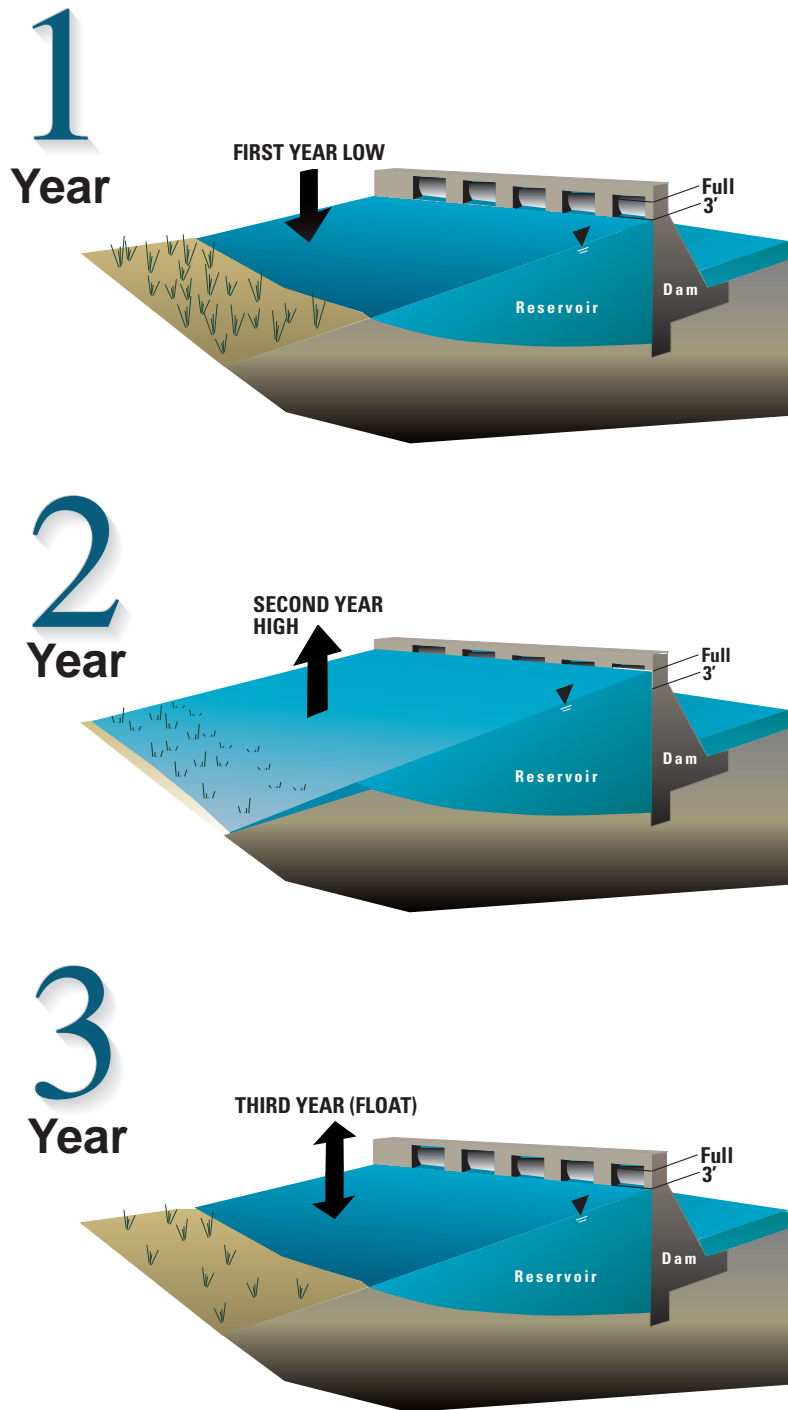


# PREFERRED ALTERNATIVE

## Unbalancing the Upper Three Reservoirs

Under the CWCP, when System inflows are above or below normal, the amount of water in the upper three reservoirs is balanced so that the effects are shared equally among these reservoirs. To preclude jeopardy for the listed species, the PA includes a more defined method of unbalancing the amount of water in these reservoirs as long as an extended drought (more than 1 year long) or an extremely high runoff into the System is not occurring. Unbalancing also provides benefits to young fish in these three reservoirs.

Unbalancing under the PA consists of purposefully lowering one of the upper three reservoirs approximately 3 feet to allow vegetation to grow around the rim, and then refilling the reservoir to inundate the vegetation (See **Figure 2**). The unbalancing would rotate among the three reservoirs on a 3-year cycle. Higher spring releases would fill the downstream reservoir and provide a rising reservoir level for game and forage fish spawning. The subsequent 2 years of lower flows would expose bare sandbar habitat in the river reach between the two lakes for use by the ESA-protected birds. Unbalancing would also provide more bare sandbar habitat around the perimeter of the reservoirs for the listed birds in the drawdown year. In subsequent years, the inundated vegetation around the perimeter of the reservoir would be used by adult fish for spawning and by young reservoir fish to hide from predators.



**Figure 2.**  
Unbalancing the Upper Three Reservoirs  
for ESA Species

# Impacts of the Preferred Alternative on

# KEY USES / RESOURCES

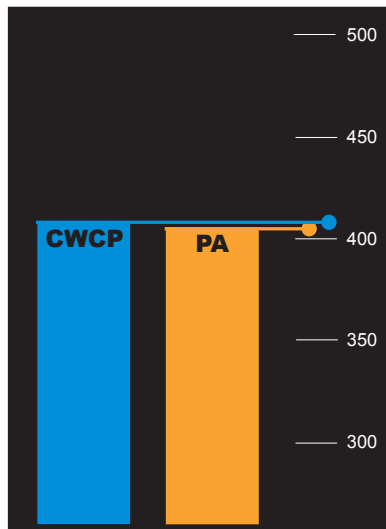
The CWCP and the PA would have different effects on several important economic uses and environmental resources in the Missouri River basin and on Mississippi River navigation economics. Comparisons of average annual effects of the PA and CWCP are presented for most uses/resources. These effects were analyzed for the 100-year simulation period for most resources. Results of the various impact models are briefly discussed below, and a summary of impacts is provided in figure format (page 32). Relative differences between the CWCP and PA are important to understand, and the summary of impacts figure (Figure 19) presents percent changes from the CWCP to focus on this perspective.

## Flood Control

Agricultural lands, residential areas, business districts, and navigation benefit from flood control provided by the System. Approximately 1.4 million acres of farmland are subject to flooding along the mainstem Missouri River. There are approximately 30,400 residential and 5,345 nonresidential buildings with an approximate worth of \$17.6 billion located within identified flood zones.

Flood control benefits for the CWCP and PA were determined by calculating the damage reduction from a scenario simulating a System operation that passes inflows without storing them, referred to as the Run of River (ROR). The analysis was conducted for the entire 100-year period of record for all river reaches downstream from Fort Peck Dam and the four largest reservoirs. In general, approximately 80 percent of the benefits resulting from System operation are provided to non-cropland and 20 percent to cropland.

**Figure 3** presents the flood control benefits for the PA and CWCP. The PA provides an average of \$410.2 million annually, nearly identical to the CWCP, which provides \$410.3 million annually.



**Figure 3.** Average Annual Flood Control Benefits for the Alternatives (\$ millions)

### Interior Drainage and Groundwater

Interior drainage impacts for the CWCP were determined by calculating the crop damages resulting from water ponding at the drainage outlets through the levees to the river. The analysis was conducted for a 45-year period, from 1950 to 1995, using current-day economic values. Ponding of water at drainage structures for six representative leveed areas along the Lower River was studied. Crop production through the season for an equal distribution of corn and soybeans was tracked to compute the costs of interior drainage ponding on the crops.

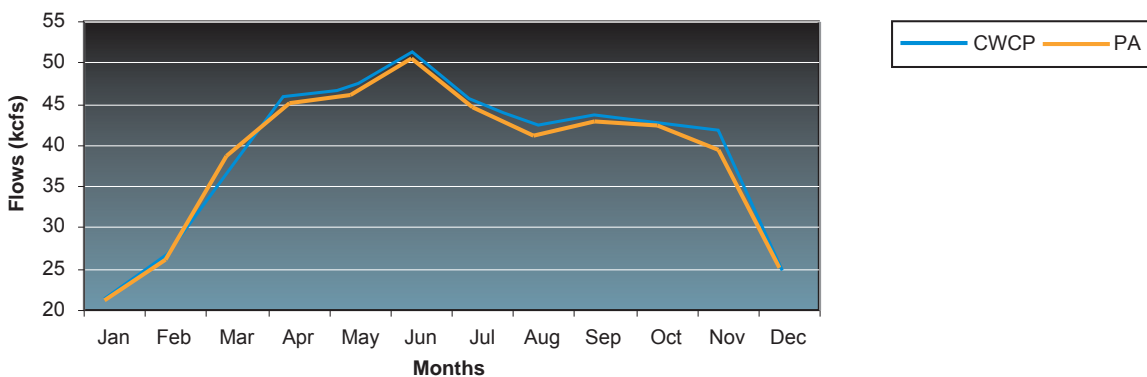
Total average annual interior drainage costs (negative impact) in millions of dollars per year were computed for the six sites. Damages are \$1.34 million per year for the CWCP. Analysis of the Nebraska City flows for the PA indicates that interior drainage costs would be expected to be comparable to or less than the CWCP.

Groundwater impacts for the CWCP were determined by calculating the crop damages resulting from high groundwater levels. High groundwater levels limit crop planting and production, and the resulting increased costs of putting in the crop or harvesting a lower yield were computed as damages. The analysis was conducted for the period of 1970 to 1979 using current-day economic values. Three leveed areas and one unleveed area along the Lower River were studied to determine the impact to drainage and recharge of the water table resulting from flow differences among the alternatives.

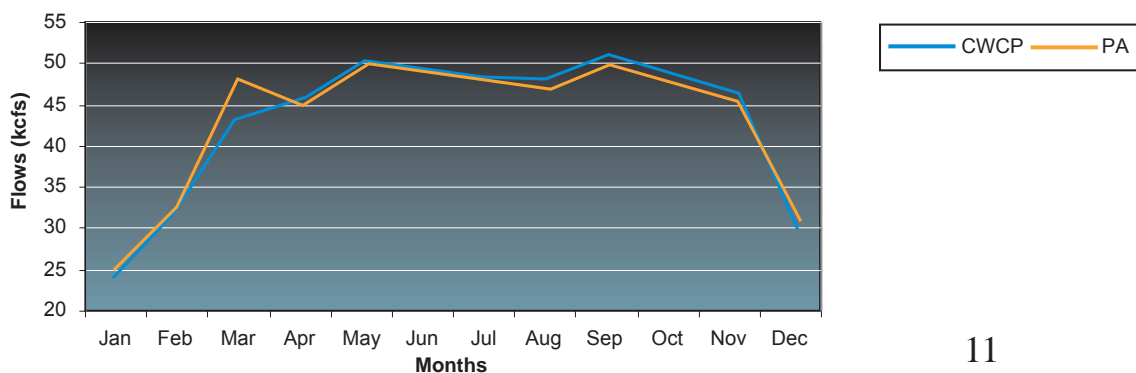
Groundwater damage impacts are \$4.52 million annually for the CWCP. Analysis of the Nebraska City flows for the PA indicates that groundwater damages would be expected to be comparable to or less than the CWCP.

Figures 4 and 5 present average monthly flows at Nebraska City for the PA and the CWCP. These two figures show that the average monthly flows on the Lower River are, generally, slightly less during the crop planting and growing season of April through August; this supports the conclusion that interior drainage and groundwater effects on crop damages would be comparable or slightly less for the PA. Data for individual years were also examined.

**Figure 4.**  
Average Monthly Flow at Nebraska City, Nebraska for the Interior Drainage Modeling Period of 1950 to 1994



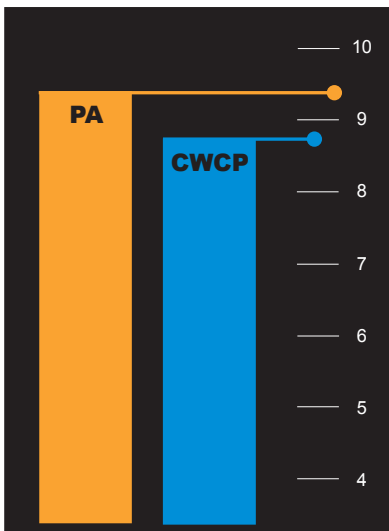
**Figure 5.**  
Average Monthly Flow at Nebraska City, Nebraska for the Groundwater Modeling Period of 1970 to 1979



### Navigation

Navigation on the Missouri River occurs from Sioux City, Iowa to the mouth near St. Louis, Missouri, a distance of 735 miles. The Missouri River Bank Stabilization and Navigation Project is authorized to provide a 9-foot-deep by minimum of 300-foot-wide navigation channel. Navigation flow support is provided to maintain an 8- to 9-foot depth in the navigation channel, depending on the amount of water stored in the System. An update of the navigation analysis was conducted following the release of the RDEIS using 1999 data on navigation movements on the Missouri River. The primary reason for this re-analysis was to better understand the potential navigation impacts of having reduced summer flows. These reduced flows were contained in some of the alternatives under consideration. In 1999, total commercial traffic moved by barge on the Missouri River reached a record peak of 9.25 million tons. Commercial tonnage, not including sand, gravel, and waterway materials, accounted for 1.58 million tons.

The CWCP has an \$8.8 million average annual navigation benefit. The navigation benefit under the PA is \$9.3 million annually. **Figure 6** presents the benefits to navigation in millions of dollars per year for the PA and CWCP.



**Figure 6.**  
Average Annual Navigation Benefits  
(\$ millions)

## Hydropower

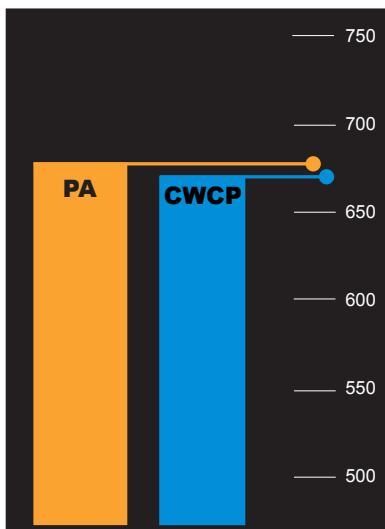
The six mainstem dams support 36 hydropower units with a combined plant capacity of 2,436 megawatts (MW) of potential power generation. These units provide an average of 10 million megawatt hours (MWh) of energy per year. Power generation at the six mainstem dams generally must follow the seasonal pattern of water movement through the System; however, adjustments are made, when possible, to provide maximum power production during summer and winter when demand is high.

An analysis of the impacts of the PA on the total annual hydropower benefits to the Nation was conducted. This analysis presents the energy values (a measure of the amount of power generated in a specified period of time) and capacity values (the amount of generation capacity available from the hydropower units) of the PA and CWCP in millions of dollars per year. **Figure 7** presents the total economic hydropower benefits for the PA and CWCP. Total annual benefits are \$674.3 million under the PA and \$668.0 million under the CWCP. Overall, when compared to the CWCP, the addition of more stringent drought conservation measures, which retain more water in the System for use during extended drought periods, increases hydropower benefits to the Nation.

Annual marketing of energy by the Western Area Power Administration (WAPA) faces greater monthly variability in energy costs than is reflected by the Corps' hydropower analysis, which is based on long-term energy rates. WAPA is also a cooperating agency for this NEPA process. In response to concerns about the effect of some RDEIS alternatives on its annual marketing, WAPA conducted an analysis based on rates it may face as it markets power in the future.

Total marketed energy is broken down into two components—firm energy and the energy generated in excess of that amount. When the available energy falls short of the firm energy commitment, WAPA must purchase the difference; when excess energy is available, WAPA sells it. Energy demand varies throughout the year, which affects the value of this energy from month to month.

The net effect of the redistribution of these shortfall purchases and excess sales affects the net revenues, which are used by WAPA to repay the Federal Treasury. When compared to the net revenues of the CWCP, the PA provides about \$1.3 million less in annual revenues.



**Figure 7.**  
Average Annual Hydropower Benefits  
(\$ millions)



### Water Supply

The Missouri River and its mainstem reservoirs are a source of water for municipal water supply; irrigation; cooling water; and commercial, industrial, and domestic uses. Approximately 1,600 water intakes of widely varying size are located on the System and the Lower River. Access to water is a key concern because low water levels increase the cost of getting water from the reservoirs or river. Twenty-five coal-fired and nuclear powerplants with a combined generating capacity of 15,084 MW draw cooling water from the System and the Lower River. The flow in the river and the river's water temperature affect a powerplant's ability to operate within water quality standards for discharges to the river. Low flows in the river may, therefore, force cutbacks in power production. Water supply benefits for the intake facilities along the System and the Lower River were determined for all reservoirs and river reaches from Fort Peck Lake to the mouth.

Figure 8 presents Missouri River water supply benefits in millions of dollars per year for the PA and CWCP. Benefits for the PA are \$611.3 million compared to \$610.1 million for the CWCP.

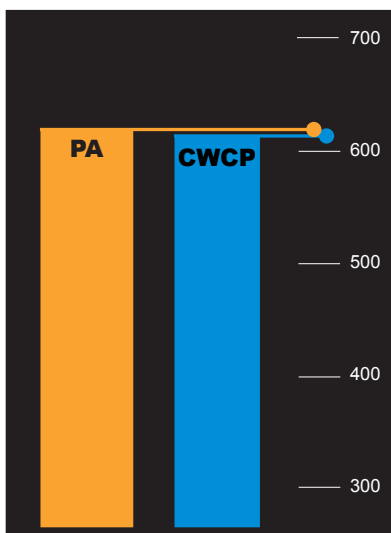
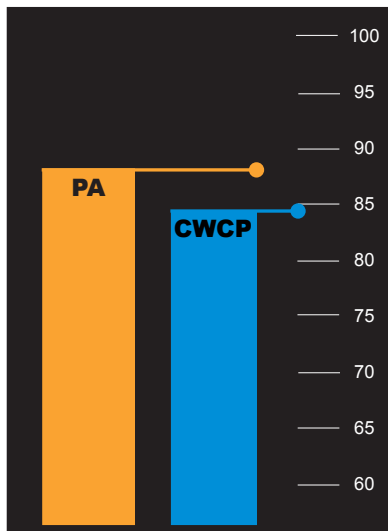


Figure 8.  
Average Annual Water Supply Benefits  
(\$ millions)

### Recreation

The six large reservoirs of the System, the reaches of the Missouri River between the reservoirs, and the Lower River provide considerable recreation opportunities to residents of the States through which the river flows, as well as to neighboring States. These opportunities include boating, fishing, hunting, camping, sightseeing, and swimming. Sport fishing is a major source of recreation along the entire System. The wetlands along the river corridor provide waterfowl habitat, and waterfowl hunting is popular. Water levels are a key factor in recreational use of the reservoirs and river reaches. At low reservoir levels, some boat ramps are unusable and recreational areas at the upper ends of the reservoirs may not provide access to the reservoirs. Low river flows affect boat access and maneuverability. Certain kinds of fishing and hunting depend upon adequate reservoir levels and river flow. Visitors are also less likely to frequent reservoirs and river reaches at low water for aesthetic reasons.



**Figure 9.**  
Average Annual Recreation Benefits  
(\$ millions)

Recreation benefits are presented in millions of dollars per year. **Figure 9** presents the benefits for the PA and CWCP. Overall, inclusion of more stringent drought conservation measures in the PA increases recreation benefits from \$84.7 million annually to \$87.4 million annually. Higher recreation benefits during drought periods at the upper three reservoirs largely account for the increase.

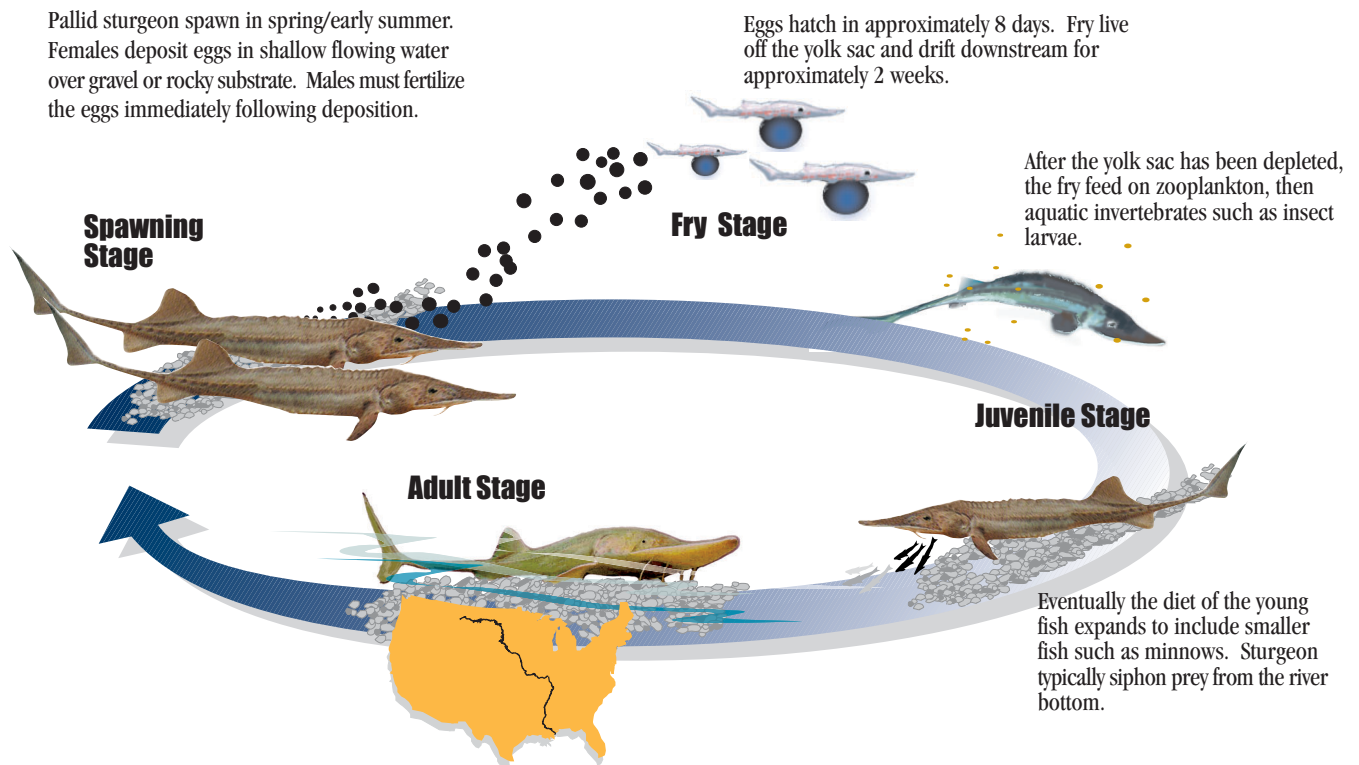
A common comparison made regarding recreation benefits is to compare these benefits versus navigation benefits (\$85 million versus \$9 million for the CWCP). It would be more appropriate to compare average annual recreation benefits that would increase with additional drought conservation (those for the upper three reservoirs — \$32 million under the CWCP) with the recreation benefits that would decrease (the Fort Randall downstream reach and the Lower River — \$21 million). When the decrease in navigation average annual benefits of \$9 million is added to the decrease in recreation benefits on the two river reaches, the resulting comparison is \$32 million (average annual benefits that could be increased by a change from the CWCP) versus \$30 million (average annual benefits that could be decreased by a change from the CWCP). While these types of comparisons may serve a need, it is extremely important to recognize that the Corps does not focus on the absolute values when it compares alternatives. The most appropriate comparison from the Corps' perspective is the relative changes that occur for each use or resource among the alternative plans, as shown below and in Figure 19 on page 32.

	PA
Flood Control	0
Navigation	6
Hydropower	1
Water Supply	0
Recreation	3
Young-of-Year Fish Production	7
Coldwater Fish Habitat in Reservoirs	4
Coldwater Fish Habitat in River	1
Warmwater Fish Habitat in River	-5
Physical Habitat for Native Fishes	0
Tern and Plover Habitat (River)	38
Tern and Plover Habitat (Reservoirs)	24
Wetland Habitat	1
Riparian Habitat	0
Historic Properties	-2
Mississippi River Navigation	0

**Fish**

Currently, 156 fish species are known to occur in the Missouri River and System. These include native species and many that have been introduced over the years. The native river fish have declined because of migration obstruction, loss of habitat, change in habitat, and competition from new, non-native species. One native species, the pallid sturgeon, is listed as an endangered species protected under the ESA (**Figure 10**). A diverse community of coldwater, coolwater, and warmwater fish inhabit the six reservoirs of the System. The upper three reservoirs have been stocked with coldwater game and forage species to take advantage of the cold water retained through the summer and fall in the deeper waters of the reservoirs.

**Figure 10.** Pallid Sturgeon Lifecycle



The success of the fish in the System and the Lower River depends on habitat conditions. Water levels, inflow, and outflow are important factors in the reservoirs. In the upper three reservoirs, low water levels in droughts limit coldwater fish habitat and shallow spawning and rearing habitat of warmwater and coolwater species. In the lower three reservoirs, high inflow and outflow reduce reservoir productivity and cause young fish to be flushed from the reservoirs. Native fish in the river reaches are naturally adapted to the high, warm, and muddy spring and early summer flows, and the lower late summer and fall flows characteristic of the historic Missouri River. Cold, clear tailwaters of the upper three dams are more conducive to trout and salmon, but not the paddlefish, pallid sturgeon, and other native river fishes.

Effects of alternatives on fisheries were initially accomplished using five models. These models predict young fish production in all six reservoirs, coldwater fish habitat in four reservoirs, coldwater fish habitat in two river reaches, warmwater fish habitat in three river reaches, and physical habitat for native river fish in nine river reaches. During formal ESA consultation in 2000, three more models for native river fish were developed that look in more detail at factors addressed in the physical habitat model — connectivity of the river to adjacent, low-lying lands; amount of shallow water habitat; and spawning cue.

### Reservoir Fish

#### Young-of-Year Fish Production

Index values for total young-of-year fish production in the reservoirs are a combination of young-of-year fish production computed for each year and the relative value of indices for each lake. Larger reservoirs have larger indices and smaller reservoirs have smaller indices.

**Figure 11A** presents total relative index values for young-of-year fish production in all six of the mainstem reservoirs for the PA and CWCP. Young-of-year fish production values are higher for the PA. Inclusion of the unbalancing of the upper three reservoirs and greater drought conservation measures in the PA would benefit young-of-year fish production.

#### Coldwater Fish Habitat in the Reservoirs

The minimum volume of coldwater fish habitat available from July through October in the upper three reservoirs and Lake Francis Case was estimated for each year. **Figure 11B** presents total coldwater fish habitat in MAF for the PA and CWCP. Inclusion of the more stringent drought conservation measures in the PA improves total average annual coldwater fish habitat in the reservoirs.

### River Fish

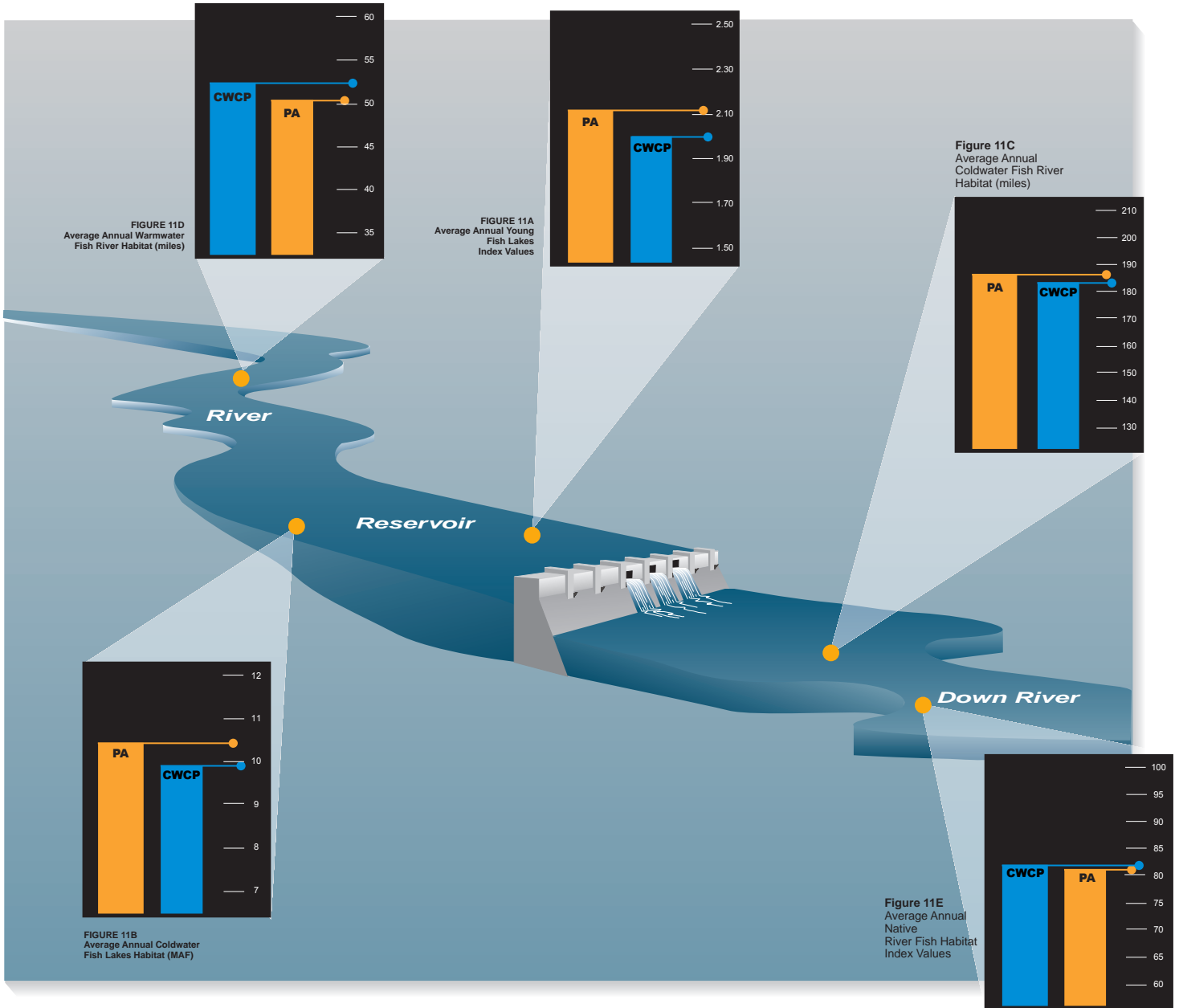
#### Coldwater and Warmwater Fish Habitat in the River

Coldwater fish habitat in river reaches was estimated for the river reaches downstream from Fort Peck and Garrison Dams. The habitat value selected for this resource was the minimum value computed for the months of April through September of each year. The amount of water released from the upstream dam and the water temperature and dissolved oxygen levels were the factors used to determine the amount of habitat.

**Figure 11C** presents coldwater river fish habitat values in total miles for the PA and CWCP. Inclusion of greater drought conservation measures in the PA results in more coldwater habitat in the upper two reservoirs, which in turn provides more coldwater river habitat below Fort Peck and Garrison Dams.

The number of miles of warmwater river fish habitat downstream from Fort Peck, Garrison, and Fort Randall Dams in April through August was also modeled. In general, the amount of warmwater river habitat is lower for an alternative that has higher amounts of water in storage, which is the opposite of the effects expected for fish requiring coldwater habitat.

**Figure 11D** presents warmwater river fish habitat values in miles for the PA and CWCP. The PA, which has the higher drought conservation measures, has lower values than the CWCP.



**Figure 11**  
Comparison of the impacts of the preferred alternative on the Missouri River fish habitats.

### **Physical Habitat for Native River Fish**

Physical habitat values for native river fish were computed for river reaches downstream from four of the dams and for five reaches of the Lower River downstream from Sioux City. An index value was computed for each month based on comparisons of the velocity distribution across the channel under the flow conditions for each of the alternatives, and velocity values that existed under natural flow conditions and pre-System channel cross sections. In April, May, and June the habitat value is dependent on the potential for overbank flooding in each reach. The total value is the sum of the value for all 12 months in a year. The PA has an index value of 81.4 compared to 81.5 for the CWCP (Figure 11E). Upon closer examination, unbalanced storage in the upper three reservoirs under the PA increases the value of the physical habitat index in the upper reaches compared to the CWCP. This gain is offset by losses in the river reaches downstream from Sioux City to the mouth.

### **Floodplain Connectivity, Spawning Cue, and Shallow Water Habitat**

These three attributes for the pallid sturgeon were discussed in the RDEIS. Because the PA is very similar to the MCP discussed in the RDEIS, repeating what was learned about the MCP can illustrate effects of the PA on these three attributes. Generally, the PA will not increase or improve any of these attributes. Significant floodplain connectivity will not occur with any of the alternatives evaluated to date, including the PA. The PA will not effectively increase the number of years a spawning cue occurs. Finally, shallow water habitat will be essentially the same for the CWCP and the PA. Creation of shallow water habitat will need to occur by constructing this habitat, just as it would have had to be accomplished under all alternatives considered to date. Connectivity will also increase as a result of this construction.



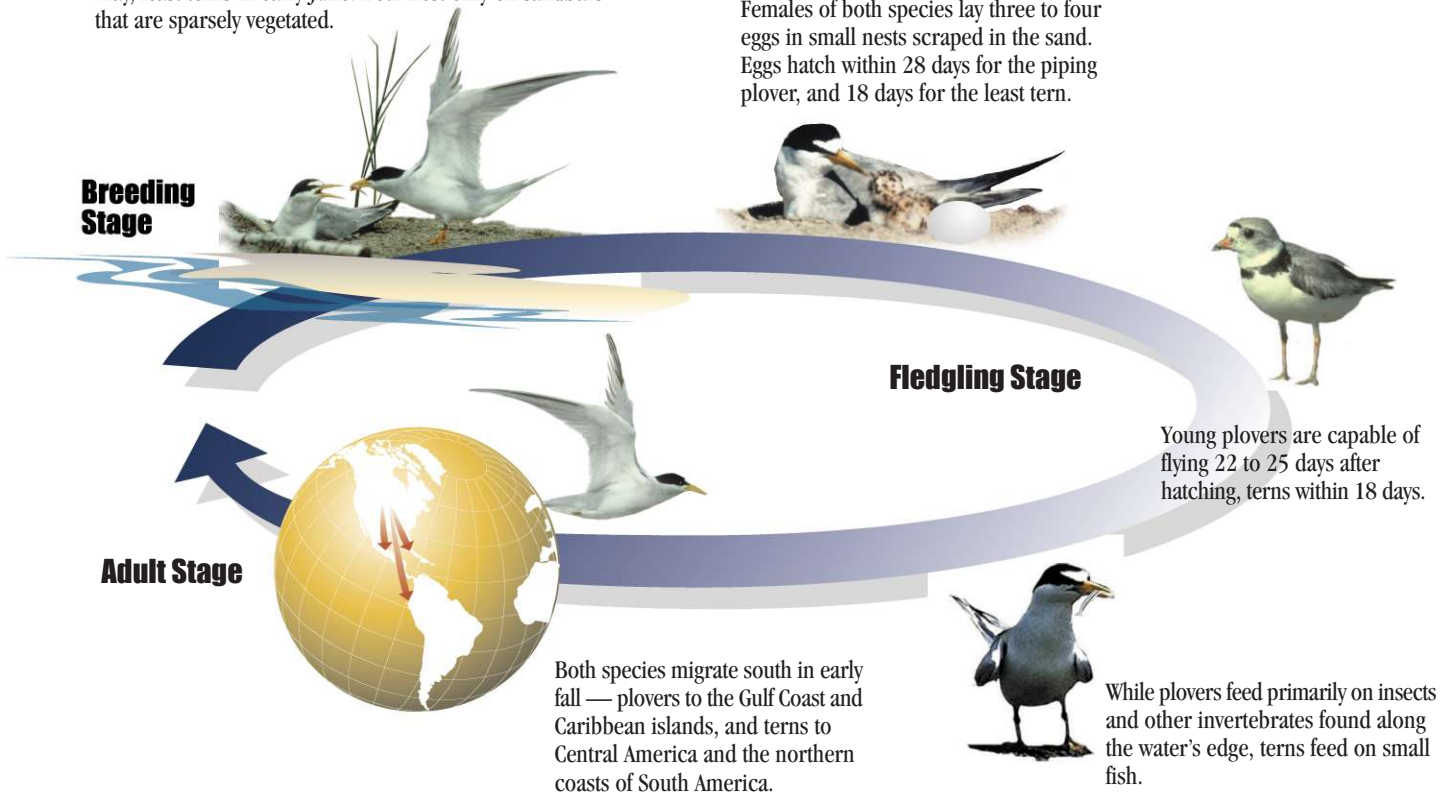
## Tern and Plover Habitat

While the Missouri River provides habitat for a wide variety of wildlife species, the endangered least tern and threatened piping plover are of particular importance. They depend on unvegetated sandbars and islands in the river for nesting and are directly affected by water level changes (**Figure 12**). These birds typically nest in colonies on river sandbars, sandy shorelines of reservoirs, or in sandpits along the river. Important nesting reaches are below Fort Peck, Garrison, Fort Randall, and Gavins Point Dams, and on Lake Oahe and Lake Sakakawea. River hydrology and channel characteristics influence the composition and distribution of tern and plover habitat along the river. Seasonal river flow and water level patterns dictate the frequency and duration of habitat flooding and the scouring of sandbar vegetation. Bank erosion and sediment movement in the riverbed also affect the creation and removal of sandbar and island habitat. Declining reservoir levels result in exposed bare shoreline.

**Figure 12.** Piping Plover/Least Tern Lifecycles

Both species have similar breeding and habitat requirements. Piping plovers begin nesting along the Missouri River in May, least terns in early June. Both nest only on sandbars that are sparsely vegetated.

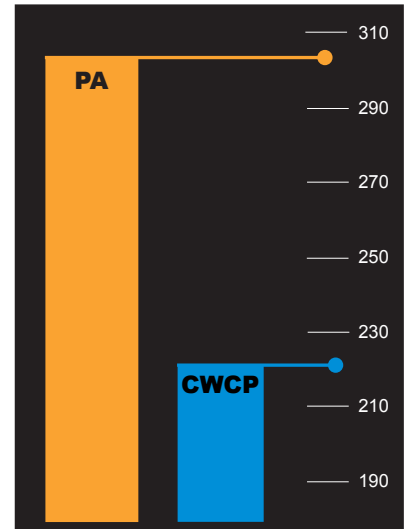
Females of both species lay three to four eggs in small nests scraped in the sand. Eggs hatch within 28 days for the piping plover, and 18 days for the least tern.



### Riverine Habitat

Because the endangered interior least tern and threatened piping plover are directly affected by Missouri River flows, effects on these species were modeled. Impacts to wetland and riparian acreages provide insight into the effects of alternatives on other wildlife. Tern and plover impacts are presented in terms of number of acres of available habitat for the 100-year period of record. Because the riverine tern and plover habitat model does not include geomorphic processes, the number of acres of habitat is a representative figure used to compare alternatives and does not represent the actual number of acres of nesting habitat available for each alternative.

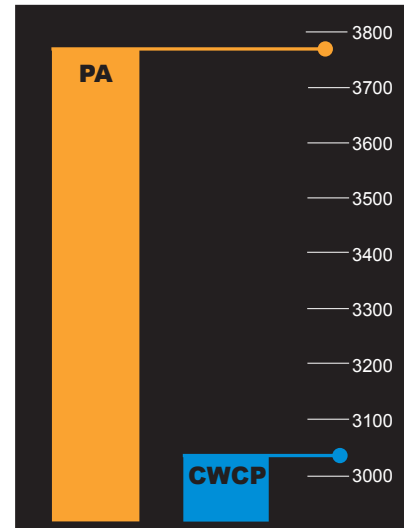
**Figure 13** presents the riverine tern and plover habitat in acres and shows a 38 percent improvement in habitat under the PA.



**Figure 13.** Average Annual Riverine Tern and Plover Habitat (acres)

### Reservoir Habitat

In response to RDEIS comments, the Corps developed a Reservoir Habitat Model (RHM) to compare least tern and piping plover habitat on Lakes Sakakawea and Oahe among the alternatives. These two reservoirs were selected for modeling because the majority of terns and plovers nesting on the reservoirs use these two reservoirs. The birds also nest along the shores of Lewis and Clark Lake; however, due to its small size, the operation of Lewis and Clark Lake is unaffected by changes in the operating plan. The RHM combines Geographic Information System (GIS) and water surface elevation data to compare acres of habitat for the PA and the CWCP for the 100-year period of record to compute the number of acres of reservoir habitat on 25 percent of the two reservoirs. **Figure 14** presents the combined model output of average annual acres of habitat for Lake Sakakawea and Lake Oahe under the PA and CWCP. There is an overall net increase in reservoir habitat for Garrison and Oahe Reservoirs with the PA. The PA increases total reservoir habitat by 24 percent, with the majority of the increase occurring on Lake Sakakawea.



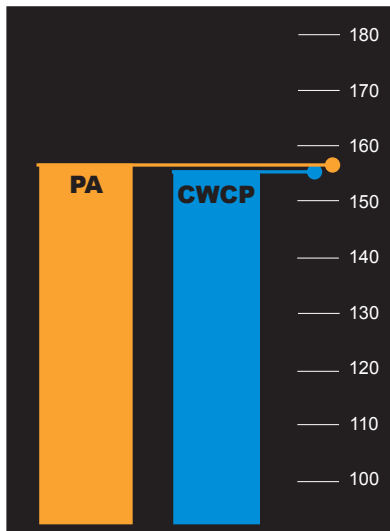
**Figure 14.** Average Annual Reservoir Tern and Plover Habitat for 25 Percent of Lake Sakakawea and Lake Oahe (acres)

### Wetland and Riparian Habitat

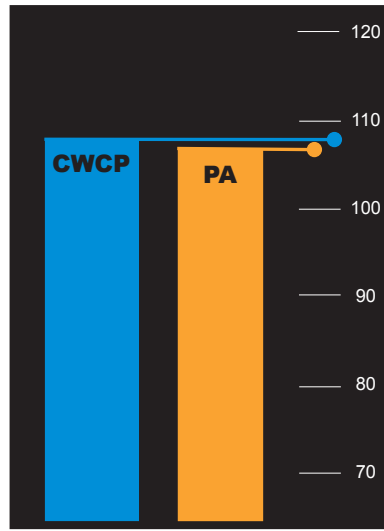
A survey of 44 wetland sites along the System and Lower River was completed in 1991. This survey identified 113,000 acres of wetlands, 60,000 acres of exposed shoreline, and 193,000 acres of riparian vegetation, which generally has a woody composition and is less resistant to shallow groundwater levels. The deltas of the mainstem reservoirs support varying amounts of wetlands depending on reservoir levels. Near the end of the 1991 drought, there were 59,000 acres of wetlands in the deltas of the mainstem reservoirs. After the floods in 1993 and a return to near normal reservoir levels, most of the wetlands in the upper three reservoirs were flooded and new wetlands began forming at higher elevations in the deltas. The floods changed the character of the wetland and riparian vegetation along the Lower River. The riparian habitat in the river reaches between the mainstem reservoirs is limited because cottonwood trees have not regenerated under the controlled flow regimes. In the Lower River, wetland and riparian habitats are limited by channelization and bank stabilization. Wetlands are concentrated in remaining oxbows (isolated bends in the river) and backwaters.

Impacts to wetlands and riparian habitat under the PA and CWCP were determined by relating hydrology for the 100-year period of record to potential changes in wetland and riparian acreage inventoried. **Figure 15** presents total wetland habitat in thousands of acres for the PA and CWCP. The PA results in 157.6 thousand acres compared to 156.1 thousand acres under the CWCP.

**Figure 16** presents total riparian habitat in thousands of acres. The PA results in 107.8 thousand acres compared to 108.1 thousand acres under the CWCP.



**Figure 15.**  
Average Annual Wetland Habitat  
(thousands of acres)

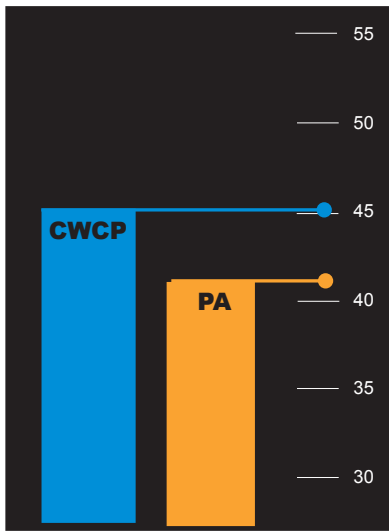


**Figure 16.**  
Average Annual Riparian Habitat  
(thousands of acres)

### Mississippi River Impacts

Differences in the operating criteria for the PA change the Missouri River release patterns from Gavins Point Dam. The change affects Mississippi River flows. Because of concerns regarding impacts of Missouri River operations on the Mississippi River, an analysis was conducted to determine potential impacts of the PA on the Mississippi River navigation economics.

**Figure 17** presents total (shallow and deep draft) Mississippi River lost navigation efficiency costs in millions of dollars per year for the PA and CWCP. The higher the costs, the greater the negative impacts on navigation efficiency. Redistributing the annual Gavins Point Dam releases under the PA decreases costs by \$3.6 million. When considered from the viewpoint of Mississippi River navigation benefits, there is virtually no change between the two alternatives.



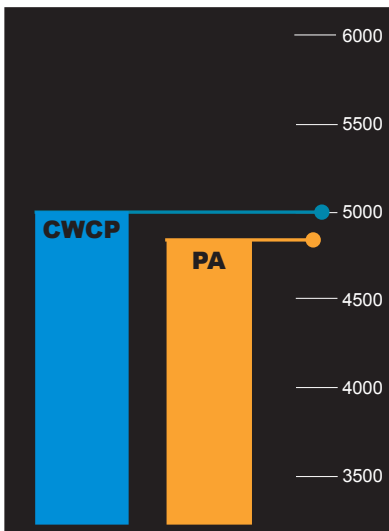
**Figure 17.** Total Mississippi River Lost Efficiency Costs (\$ millions)



### Historic Properties (Cultural Resources)

Historic properties, as defined by the National Historic Preservation Act, include historic and prehistoric archaeological sites, historic architectural and engineering features and structures, and resources of traditional cultural or heritage significance to American Indians and other social or cultural groups. Paleontological resources include fossils of prehistoric plants and animals. Significant paleontological resources are found in the Fort Peck region. A variety of archeological sites, including historic forts and homesteads, are found within the reservoirs, along their shorelines, along the river reaches, and on adjacent uplands. Archaeological surveys have discovered nearly 4,000 sites along the System. Shoreline and bluff erosion is a constant threat to many of these sites. Some sites within the reservoirs are threatened by exposure during low-water periods. Impacts of each alternative on historic properties were determined by computing an index value that is based on the number of months known sites are subject to shoreline erosion at the upper three reservoirs. The higher the index values, the less impact to known historic properties.

**Figure 18** presents the index values for the PA and CWCP. Inclusion of drought conservation measures in the PA increases the adverse impact to historic properties, because reservoirs are retained at a higher level. This increases the potential for erosion of known historic sites. Under the CWCP, the reservoirs are drawn down more significantly during droughts, and as a result there is less impact to known cultural resources. Although not modeled, the lower reservoir levels could expose unknown sites at lower elevations.



**Figure 18.**  
Average Annual Historic Properties Index Values

Section 106 of the National Historic Preservation Act requires Federal agencies to take into account the effects of their undertakings on historic properties. The Corps is working with the basin Tribes in the development of a Programmatic Agreement for implementation of the Corps' responsibilities under Section 106. This comprehensive agreement would apply to cultural resources along the entire Missouri River corridor. Signatories to the Programmatic Agreement would include the Advisory Council on Historic Preservation, basin Tribes, several State Historic Preservation Officers, and the National Trust for Historic Preservation. The Programmatic Agreement is now in draft form, and it is scheduled to be finalized in early 2004. This unprecedented effort is a substantial step forward in the Corps' efforts to meet Tribal trust responsibilities.

### Water Quality

Water quality in the System is generally good, with only minor problems. In the upper reservoirs, summer oxygen levels in the deeper, colder waters are a potential problem, especially in droughts when the volume of the deeper coldwater layer is reduced. Water temperature is a concern in the river reaches, particularly in the Lower River where the water used for cooling by many powerplants is controlled under discharge water temperature permits. In extreme cases, cutbacks in power production would be required to maintain water temperature standards in the river. Water quality impacts resulting from the alternatives are discussed qualitatively in the FEIS.

Eutrophication and the loss of coldwater habitat in the upper three reservoirs are the only two water quality issues that appear to be affected by the PA. Both of these water quality problems are made worse by declining lake levels. The PA has increased conservation (retention of water in the reservoirs) during droughts. Increased conservation should decrease the loss of coldwater habitat and reduce the concentration of nutrients that can result in excessive algal blooms.

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### Sedimentation, Erosion, and Ice Processes

System operations have the potential to noticeably impact sedimentation and erosion processes and, generally, high flows are more erosive than low flows. Although releases cause erosion, high annual runoff volumes, such as those experienced in 1997, have a much greater effect. A Corps study initiated in 1995 to quantify the potential effects of releases on erosion examined data the Corps has gathered over the past 50 years in four reaches (downstream from Fort Peck, Garrison, Fort Randall, and Gavins Point Dams). The study found no relationship between the annual distribution of flows and the erosion of channel features affected by sediment erosion and deposition. Annual erosion was found to be more a function of the total annual volume than the distribution of that volume.

Ice formation and movements were also studied. The PA and CWCP have the same minimum winter flow downstream from Gavins Point Dam and, therefore, a net difference is not expected. Higher flows, and in particular, the transition to higher flows, create icing problems.



# Summary of IMPACTS of the PREFERRED ALTERNATIVE

**Figure 19** shows the percent change of the PA compared to the CWCP for the Missouri River and Mississippi River resources and uses presented in this Summary. Effects that represent a positive change from the CWCP of greater than 1 percent are shaded a light blue, and negative changes greater than 1 percent are shaded orange. This figure provides the opportunity to see all of the effects of the PA on a relative change basis from the values computed for the CWCP. The Corps continues to emphasize that relative changes are more important to understand than the absolute values of changes.

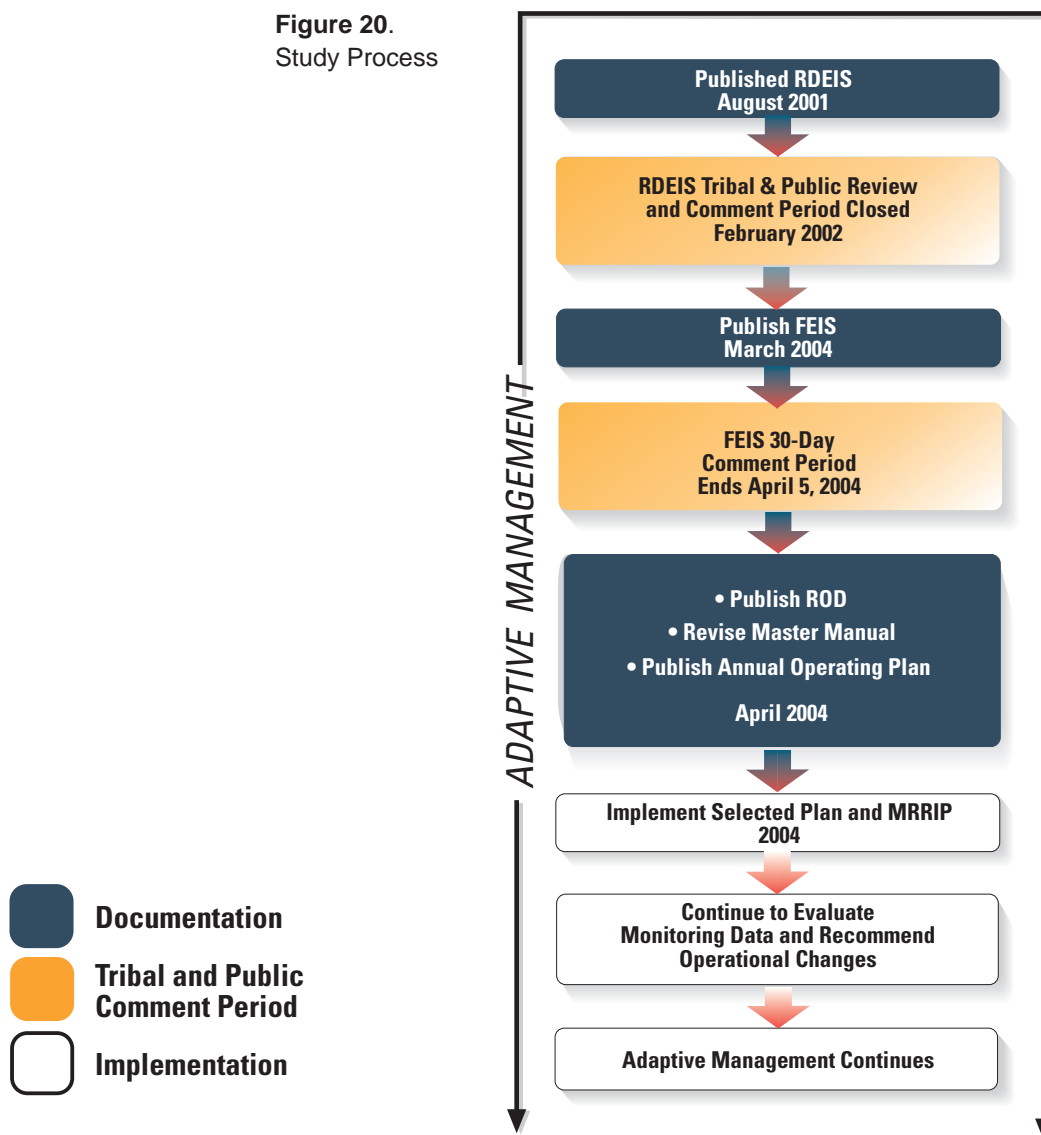
**Figure 19.**  
Impacts Summary for the PA  
(percent change from CWCP)

	PA
<b>Flood Control</b>	0
<b>Navigation</b>	6
<b>Hydropower</b>	1
<b>Water Supply</b>	0
<b>Recreation</b>	3
<b>Young-of-Year Fish Production</b>	7
<b>Coldwater Fish Habitat in Reservoirs</b>	4
<b>Coldwater Fish Habitat in River</b>	1
<b>Warmwater Fish Habitat in River</b>	-5
<b>Physical Habitat for Native Fishes</b>	0
<b>Tern and Plover Habitat (River)</b>	38
<b>Tern and Plover Habitat (Reservoirs)</b>	24
<b>Wetland Habitat</b>	1
<b>Riparian Habitat</b>	0
<b>Historic Properties</b>	-2
<b>Mississippi River Navigation</b>	0

# The NEXT STEPS

A 30-day comment period will follow publication of the FEIS. No workshops or hearings are scheduled during the comment period. Following this review period, the Corps will prepare a ROD (which will include a summary of substantive comments on the FEIS and consider the USFWS' December 2003 Amended BiOp), revise the Master Manual, develop an Annual Operating Plan that conforms to the revised Master Manual, and implement the selected plan. **Figure 20** depicts these steps for completion of the Study EIS and implementation of a selected plan.

**Figure 20.**  
Study Process



# Missouri River Recovery Implementation PROGRAM



Although MRRIP is not a direct component of the PA, a brief description of MRRIP follows to provide some perspective on how the PA fits within this more comprehensive approach for the basin as the Corps undertakes measures to benefit species under the ESA.

## Measures Included in the MRRIP

MRRIP is a comprehensive and integrated set of measures to be undertaken by the Corps in collaboration with the USFWS, working with the States, Tribes, and other stakeholders in the basin. MRRIP will be undertaken to protect and contribute to the recovery of threatened and endangered species listed under the ESA and the ecosystem upon which they depend.

MRRIP will include recovery measures on the mainstem of the Missouri River from Three Forks, Montana to St. Louis, Missouri, and on selected tributaries of the Missouri River, including the Kansas River, while taking into consideration other Congressionally authorized and traditional uses of the river. The measures undertaken for MRRIP will be relied on by the Corps, USFWS, and others to avoid the likelihood of: 1) jeopardy to the three listed species (piping plover, least tern, and pallid sturgeon) in the Missouri River, 2) adverse modification to designated critical habitat, and 3) violation of the take prohibitions of Section 9 of the ESA.

## The Basic Measures in MRRIP Include:

- **Habitat creation, enhancement, and maintenance for pallid sturgeon, piping plover, and least tern.**

Under this measure, the Corps' existing efforts to create shallow water habitat for the pallid sturgeon and emergent sandbar habitat for the least tern and piping plover will continue and, for shallow water habitat, be accelerated. Additional habitat enhancement efforts will be undertaken to provide even more and potentially better habitat for all three species.

- **Hatchery support, including facility improvements, accelerated brood stock collection, and accelerated stocking for the pallid sturgeon.**

The Corps is enhancing pallid sturgeon propagation activities at six rearing facilities to assist in achieving annual stocking goals. The facilities have been able to upgrade water systems, fish transport units, holding and rearing capabilities, and a variety of miscellaneous items. The continuation and enhancement of these activities as part of MRRIP will enable propagation and augmentation efforts to be maintained and expanded. Successful collection, spawning, rearing, and stocking will partially offset the lack of natural reproduction.

# Missouri River Recovery Implementation PROGRAM

- **Population assessments of the pallid sturgeon, piping plover, and least tern.**

The Corps has implemented a comprehensive least tern and piping plover monitoring program, which has provided state-of-the-art information on the birds and their habitat. For this reason, it has become critical to river management decisions. With this measure, the Corps will continue this successful assessment program and seek ways to improve and modernize the monitoring and evaluation techniques and data delivery and communication tools. Sampling efforts for the pallid sturgeon population assessment have been initiated and will continue to expand. Crews will conduct standardized assessments of all of the high priority reaches.

- **Intense research, monitoring, and evaluation of all three species.**

The Corps recognizes that a complete monitoring and evaluation program should be a central and operational component of all management activities. As a focal point of this measure, the Corps will incorporate a monitoring and evaluation program that provides data to further the understanding and resolve uncertainties.

- **Flow tests as part of an adaptive management strategy.**

Flow tests to create and condition emergent sandbar habitat are included in MRRIP. Due to their experimental nature, any future flow tests would be addressed in an adaptive management strategy.

- **Implementation of the revised Water Control Plan.**

MRRIP will be reviewed, modified, and implemented through coordination with the MRRIC, which will include broad and diverse stakeholder representation to ensure that public values are incorporated into recovery implementation.

- MRRIC will provide recommendations to the Federal agencies regarding recovery implementation and will be developed cooperatively with entities having an interest in recovery of listed species and the ecosystem on which they depend.

- Representation on MRRIC will include the full spectrum of basin interests. Committee membership will be comprised of representatives of Tribal and State governments and of other governmental and non-governmental organizations that have an interest in the management of the river and recovery of the species and ecosystem.

# FEIS Materials Available to the Public

In addition to this Summary document, the following FEIS materials are available to members of the public upon request:

## Bound Copies

- **Volume I, FEIS, Part 1**—This volume contains Chapters 1 through 5 of the FEIS.
- **Volume II, FEIS, Part 2**—This volume contains Chapters 6 through 13 of the FEIS.
- **Volume III, Appendix A, Tribal, Part 1**—This volume describes Tribal consultation regarding the Master Manual Study, contains a record of Tribal communications, and contains copies of the actual correspondence with the Tribes.
- **Volume IV, Appendix A, Tribal, Part 2**—This volume contains copies of the remaining correspondence with the Tribes.
- **Volume V, Appendix B, Water Quality and Appendix C, Biological Assessment**—This volume contains detailed water quality information and the Corps' Final Biological Assessment on the operation of the Missouri River Mainstem Reservoir System, the Operation and Maintenance of the Bank Stabilization and Navigation Project, and the Operation of the Kansas River Reservoir System.
- **Volume VI, Appendix D, RDEIS Comments and Responses, Part 1**—This volume contains an overview of the RDEIS public comment process, a summary of the public comments received, and responses to public comments.
- **Volume VII, Appendix D, RDEIS Comments and Responses, Part 2**—This volume contains copies of RDEIS comment letters from Federal agencies, Tribal groups, State agencies, local agencies, non-governmental organizations, and businesses.
- **Volume VIII, Appendix D, RDEIS Comments and Responses, Part 3**—This volume contains copies of RDEIS comment letters from private citizens.
- **Volume IX, Appendix D, RDEIS Comments and Responses, Part 4**—This volume contains copies of the RDEIS public hearing transcripts.

## CDs

- **CD 1** contains Volumes I through V (FEIS and Appendices A-C).
- **CD 2** contains Volumes VI through IX (Appendix D, RDEIS Comments and Responses).

To request a copy of any of the FEIS materials described here, please contact the Corps using one of the contact methods described on the back cover (For More Information). These materials are also available for review at a number of libraries throughout the region. Please log on to our Web site to find the library nearest you: <http://www.usace.army.mil>



S U M M A R Y

# MISSOURI RIVER

**Final Environmental Impact Statement**

Master Water Control Manual Review and Update

## Your Opportunity to Participate

The Missouri River is important to many people. Over the past 14 years, basin Tribes; citizens; stakeholders; and local, State, and Federal agencies have participated extensively in the Study. The Corps recognizes that the decisions made as a result of this Study will have wide-ranging effects, and we encourage you to make your opinions known. The Corps will accept written and electronic comments until

**April 5, 2004.**



# For More INFORMATION

You can request more information about the Study, submit your comments, and become more involved in System operations by:

- **Visiting the Northwestern Division home page at: <http://www.nwd.usace.army.mil> and selecting the Master Manual button on the left side of the page (or selecting the Water Management bar for current operations data)**
- **E-mailing your comments to:  
[Mastermanual@usace.army.mil](mailto:Mastermanual@usace.army.mil)**
- **Mailing your comments to:  
U.S. Army Corps of Engineers,  
Northwestern Division  
Attention: Missouri River  
Master Manual FEIS  
12565 West Center Road  
Omaha, NE 68144-3869**
- **Faxing your comments to:  
U.S. Army Corps of Engineers,  
Northwestern Division  
Attention: Missouri River  
Master Manual FEIS  
FAX number: (402) 697-2504**