

# SUMMARY

Courtesy IDNR



## *MISSOURI RIVER FISH AND WILDLIFE MITIGATION PROJECT*

FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

U.S. ARMY CORPS OF ENGINEERS  
KANSAS CITY AND OMAHA DISTRICTS



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# SUMMARY

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## OVERVIEW

The Kansas City and Omaha Districts of the U.S. Army Corps of Engineers (Corps) are undertaking the Missouri River Fish and Wildlife Mitigation Project (Mitigation Project) as a result of two Congressional authorizations, the Water Resources Development Act of 1986 (WRDA86) and 1999 (WRDA99). The original Mitigation Project, authorized by WRDA86, included the development of 48,100 acres of fish and wildlife habitat along the Lower Missouri River. The Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) on the original Mitigation Project were completed in 1987. The original Mitigation Project has been substantially modified by Congressional authorization in WRDA99 and, therefore, requires evaluation that is the subject of the Supplemental Environmental Impact Statement (SEIS).

The SEIS for the modified Mitigation Project is prepared in accordance with the National Environmental Policy Act (NEPA), the

Council on Environmental Quality (CEQ) regulations implementing NEPA (Title 40, CFR Parts 1500-1508), and Corps' regulation ER 200-2-2 that provides guidance for implementing NEPA for the civil works program of the Corps. This SEIS is programmatic in nature, and site-specific environmental review would be conducted in Definite Project Reports (DPR) following site acquisition.

This Summary provides a discussion of the need for the modified Mitigation Project, a summary of the original Mitigation Project efforts, a description of the alternatives considered including the Preferred Action, and a summary of the results of the analyses contained in the SEIS. The anticipated environmental effects are presented by major resource categories. A brief discussion of the multi-agency involvement process that has occurred and will continue through the life of the Mitigation Project is summarized. Finally, the remaining steps that will be undertaken and opportunities for the public to participate are identified.

### THE NEED

The need for the Mitigation Project can be found in the loss of over one-half million acres of terrestrial and aquatic habitat of the historic floodplain ecosystem along the Lower Missouri River that today is only represented by minor fragments of this once diverse, vast, and unique ecological resource. The primary purpose of the Mitigation Project is to mitigate the habitat lost as a result of the Missouri River Bank

Stabilization and Navigation Project (BSNP). The Mitigation Project area is shown in Figure S-1. The Mitigation Project will improve the quantity and quality of fish and wildlife habitat and increase fish and wildlife populations and recreational opportunity along the Lower Missouri River. The reestablishment of a viable Missouri River ecosystem that would benefit indigenous species and listed threatened and endangered species depends on the ability of the Federal government to acquire

**Figure S-1  
Modified Mitigation Project Area**



private lands, and to develop these and available public lands, in cooperation with the states of Iowa, Kansas, Missouri, and Nebraska, as fish and wildlife habitat mitigation sites.

Prior to construction of the BSNP, the Lower Missouri River was uncontrolled. In geologically recent time, it meandered across a part of the floodplain known as the meander belt and created a highly dynamic environment through natural river physical processes. It was estimated that the Lower Missouri River channel typically occupied roughly 300,000 acres and consisted of numerous islands, channels, chutes, sandbars, and slack water supporting vegetation in various stages of succession, great wildlife diversity and an abundant fishery (Corps, 1981; USFWS, 1980). As a result of the BSNP, the natural channel will be reduced to an area of approximately

112,000 acres by 2003 (Corps, 1981). It is also estimated that the meander belt consisted of an area of approximately 606,000 acres adjacent to the natural channel, of which an estimated 354,000 acres will be lost by 2003 (Corps, 1981). This area consisted of successional wetlands, various types of herbaceous and woody habitats, as well as limited agricultural use. It was further estimated that a total of approximately 522,000 acres of aquatic and terrestrial habitat will have been eliminated from the natural channel and meander belt by the year 2003 (Corps, 1981; Table S-1). The U.S. Fish and Wildlife Service (USFWS) estimated that 474,600 acres of fish and wildlife habitat were lost between 1912 and 1980 due to the BSNP (USFWS, 1980). The BSNP has altered or destroyed much of the floodplain ecosystem that existed prior to its construction.

<b>Table S-1 Habitat Losses (in acres) Due to the Missouri River BSNP, 1912-2003</b>				
	<b>Natural Channel</b>		<b>Meander Belt</b>	
<b>State</b>	<b>Aquatic</b>	<b>Terrestrial</b>	<b>Terrestrial</b>	<b>Total</b>
<b>Missouri</b>	55,800	27,700	221,400	<b>304,900</b>
<b>Iowa</b>	17,100	18,700	29,600	<b>65,400</b>
<b>Kansas</b>	9,100	2,000	44,000	<b>55,100</b>
<b>Nebraska</b>	18,200	19,400	59,000	<b>96,600</b>
<b>Total</b>	<b>100,200</b>	<b>67,800</b>	<b>354,000</b>	<b>522,000</b>

Source: Corps, 1981

Development of the 48,100 acres of the original Mitigation Project would, in itself, only reestablish approximately three percent of the lost aquatic acres and approximately seven percent of the lost terrestrial acres. The modified Mitigation Project would significantly expand the acquisition and development of fish and wildlife habitat to a total of 166,750 acres, representing approximately 32 percent of the fish and wildlife habitat lost by 2003. This modified Mitigation Project is vital to reestablishment of a viable Missouri River ecosystem.

The Lower Missouri River fishery, prior to construction of the BSNP, contained large numbers of fishes and a diversity of species. The most obvious impact to the fishery is a general reduction in the number and poundage of fish. This reduction is a direct result of the area of surface water lost and the variety of critical aquatic habitats lost. Many mammals, reptiles, amphibians, songbirds, and waterfowl utilized the Missouri River and the associated habitats. The greatest impact to wildlife populations is a general reduction in wildlife numbers resulting from changes to the floodplain ecosystem, specifically in the quantity of habitat and the variety of habitats. By 2003, total losses are estimated to be over 654,800 individuals of key terrestrial wildlife

species, as well as over 15 million pounds of fish, that could have been supported at any one time if BSNP had not been constructed (Corps, 1981). Impacts on habitat and fish and wildlife populations associated with the BSNP also affect opportunities for human use of the resource. It was estimated that as many as 772,000 days of recreation will also be lost annually by the year 2003 due to the reduction of habitat and fish and wildlife populations (Corps, 1981).

Since the original WRDA86 authorization, the pallid sturgeon has been Federally listed as an endangered species under the Endangered Species Act (ESA). In 2000, the USFWS completed a Biological Opinion (BiOp) regarding the Corps' operation of the Missouri River Mainstem Reservoir System, BSNP, and Kansas River operations. The USFWS identified aquatic habitat development as a critical element of the reasonable and prudent alternative contained in the BiOp. Other prior listed species that utilize Missouri River habitats include the interior least tern, piping plover, and the bald eagle. In addition to reestablishment of a part of the natural river ecology, the modified Mitigation Project represents one of the best tools for compliance with the ESA on the channelized portion of the Missouri River.

In January 2002, the Water Science and Technology Board of the National Research Council (NRC), part of the National Academy of Sciences, published its report on the Missouri River ecosystem. The NRC stated *“the Missouri River ecosystem is in a marked state of decline that is causing a reduction of goods and services and the potential loss of species”* (NRC, 2002). The NRC included extensive bank stabilization and channelization as one of the changes to the Missouri River that jeopardize its fundamental natural processes. Missouri River ecosystem recovery actions recommended by the NRC included making land riverward of Federal levees in the channelized reach of the river available for seasonal flooding each year and also obtaining the entire width of the floodplain for meandering at certain points along the channelized river. Such actions would serve to reconnect the Missouri River with its floodplain, however, they would also require the acquisition of lands. These scientific recommendations regarding the need for recovery of the Missouri River ecosystem also demonstrate the need for the Mitigation Project. The modified Mitigation Project, including development of shallow water habitat, is vital to mitigate the ecosystem decline of the last 90 years.

Management of the Missouri River has always reflected the Nation’s desires for use of the great Missouri River resource. The need for the modified Mitigation Project is supported by current societal values regarding the natural environment, indigenous and protected species, and the intrinsic aesthetic beauty of natural areas. These values continue to grow in importance. Implementation of the modified Mitigation Project would meet the needs identified, and would fulfill the purpose by providing the acreage of natural habitat conditions important to the expansion and survival of individual species and restoration of the Lower Missouri River floodplain ecosystem.

## **ORIGINAL MITIGATION PROJECT**

The original Mitigation Project was authorized by WRDA86, and included the acquisition and development of fish and wildlife habitat on 29,900 acres of non-public land and on 18,200 acres of existing public lands to mitigate for the loss of habitat that had occurred as a result of the BSNP between Sioux City, Iowa and the mouth at St. Louis, Missouri. The original authorization was based on a report of the Chief of Engineers entitled *Missouri River Bank Stabilization and Navigation Project Final Feasibility Report and Final*

*Environmental Impact Statement for the Fish and Wildlife Mitigation Plan* (Corps, 1981).

Preconstruction engineering and design for the original Mitigation Project was initiated in December 1989. The Corps' Missouri River Division approved a Reaffirmation Report for implementation of the Mitigation Project in 1990. The purpose of the Reaffirmation Report was to confirm that the plan recommended in the 1984 Feasibility Report and FEIS was still viable. Land acquisition and construction activities began in 1991. As of September 30, 2001 approximately 5,000 acres of private land remain to be acquired.

Early Mitigation Project activities focused on land acquisition, with a special emphasis on protecting and restoring bottomland timber. Habitat restoration activities also included development of shallow water aquatic habitat, creation of wetlands, and creation of terrestrial habitat including native floodplain prairie grasses and tree plantings. To date, habitat restoration activities have been completed or are underway at nearly 30 sites in Iowa, Kansas, Missouri, and Nebraska as shown on Figure S-2. Natural resource agencies

from the four states and the USFWS are participating by providing oversight through the Mitigation Project coordination team and by managing and maintaining the sites.

## **THE MODIFIED MITIGATION PROJECT**

In WRDA99, Congress authorized the modification of the original Mitigation Project to include the acquisition and development of additional acreage for fish and wildlife habitat. The modified Mitigation Project is located in the Lower Missouri River floodplain, a length of 735 miles from Sioux City to the mouth near St Louis and includes portions of the states of Iowa, Kansas, Missouri, and Nebraska as shown on Figure S-1. This is also the area of the BSNP. The modified Mitigation Project would include the acquisition of 118,650 acres in the Missouri River floodplain and tributaries to restore or preserve fish and wildlife habitat of the Lower Missouri River floodplain ecosystem. The modified Mitigation Project would be implemented over at least 30 years.

Section 334(b) of WRDA99 required that the Corps conduct a cost study on the modified Mitigation Project and report back

to Congress. The report to Congress was submitted in April 2002 (Corps, 2002a). The Corps estimated a range of \$740 million to \$1.33 billion as the cost of the modified Mitigation Project. The cost range was dependent on the amount of shallow water habitat restoration included in the modified Mitigation Project. The lower cost was based on the creation of approximately 7,000 acres of shallow water habitat and the higher cost was based on developing approximately 20,000 acres of shallow water habitat. The USFWS BiOp included a jeopardy opinion for three Missouri River

species, and stated that the Missouri River operations, including the BSNP, jeopardized the continued existence of the pallid sturgeon and recommended the restoration of 20,000 acres of shallow water habitat to achieve a goal of 20-30 acres per mile along the area of the BSNP.

### ALTERNATIVES CONSIDERED

Seven alternatives were considered for the modified Mitigation Project (Table S-2). Four of these alternatives were eliminated from further consideration because they

**Figure S-2  
Existing Mitigation Project Sites**

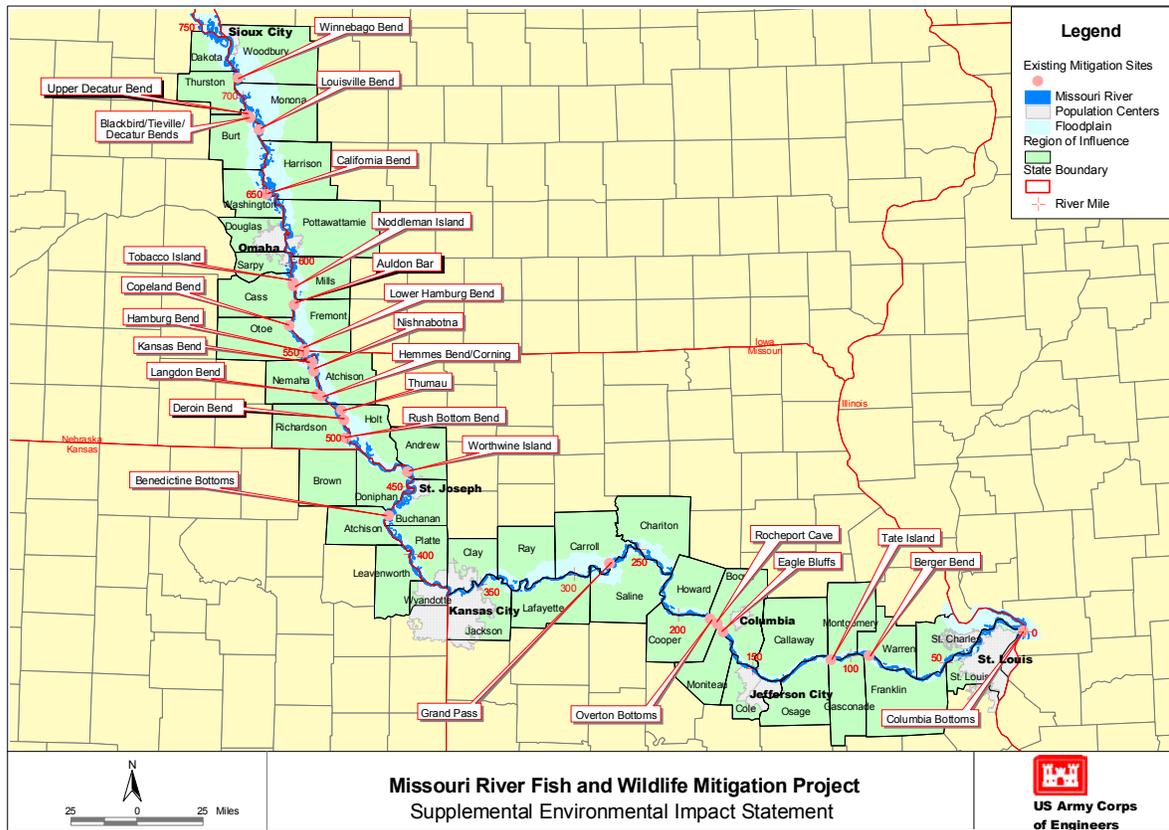


Table S-2 Summary of Alternatives Considered		
Alternative Identified	Description	Shallow Water Habitat (acres)
A.	118,650 acres including 7,000 to 20,000 acres of Shallow Water Habitat (Preferred Action)	7,000 - 20,000
B.	118,650 acres with no habitat development	0
C.	No Action	0
D.	20,000 acres Shallow Water Habitat	20,000
E.	50,000 acres	unspecified
F.	50,000 acres including 7,000 to 20,000 acres Shallow Water Habitat	7,000 - 20,000
G.	473,900 acres (Full Mitigation)	unspecified

were not considered technically reliable; not justifiable by tangible and/or intangible benefits; were not socially and/or environmentally acceptable; or would not fulfill the project purpose. The remaining three alternatives, Alternative A (118,650 acres including 7,000 to 20,000 acres of shallow water habitat), Alternative B (118,650 acres with no habitat development), and Alternative C (No Action), were evaluated in detail in the SEIS.

**Alternative A** would increase mitigation efforts by 118,650 acres to a total of 166,750 acres as authorized by WRDA99.

The additional 118,650 acres authorized under WRDA99 represents 25 percent of the fish and wildlife habitat that was estimated to have been lost between 1912 and 1980 by the USFWS (1980). Representatives of the Mitigation Project coordination team determined that this level of mitigation would provide a significant level of restoration for the Lower Missouri River floodplain ecosystem. Shallow water habitat would be included in the 118,650 acres and could potentially range from a minimum of 7,000 acres to a maximum of 20,000 acres. The modified Mitigation Project under Alternative A would be a continuation of the original Mitigation

Project authorized by WRDA86. Implementation of Alternative A would be a long-term process, is anticipated to be in excess of 30 years, and would be dependent on funding levels. Mitigation sites would vary in the types of habitats restored depending on site characteristics. In general, restored habitat types would include wetlands, bottomland forest, native prairie, chutes and side channels, backwater areas, and slack water habitats.

As with the original Mitigation Project, the Corps would continue to acquire land on a fee title basis from willing sellers or donated easements on public lands. Depending on future Corps policy, lands may also be acquired by purchasing permanent easements from willing sellers. Under Alternative A, future mitigation sites would continue to be located along the Lower Missouri River; however, the Corps would retain the potential to acquire lands for mitigation sites at suitable locations along the tributaries of the Lower Missouri River. A payment in lieu of taxes (PILT) would be paid to local governments for lands acquired in fee title by the Corps. The resource agencies of the four states and the USFWS have expressed interest in administering the areas to be acquired after development. Where this would be the case, the Corps would license the

operational management of mitigation lands to the appropriate state agency or USFWS. The Corps would fund operations and maintenance costs for the life of the Mitigation Project. For these sites, management decisions regarding authorized public uses would be proposed by the relevant state natural resource agency or USFWS and approved by the Corps. However, as a Federal project, the Corps may desire to retain complete management responsibilities of some select mitigation sites. As part of the modified Mitigation Project, the Corps would utilize an adaptive management approach to the identification, development, construction, and operation of mitigation sites. Alternative A would include biological and hydrologic monitoring programs at representative mitigation sites in order to determine their effectiveness. Monitoring programs would be dependent on the types of habitats restored or preserved and the information pertinent to adaptive management of the mitigation sites.

**Alternative B** would be the same as Alternative A in that it would increase mitigation efforts by an additional 118,650 acres to a total of 166,750 acres as authorized by WRDA99. The additional 118,650 acres would be obtained through acquisition of private land in fee title from

willing sellers or, depending on future Corps policy, obtaining permanent easements in lieu of fee title from private landowners. Under Alternative B there would be no habitat development following land acquisition. Therefore, activities described in Alternative A, such as the construction of chutes, wetland cells, installation of pumps and other water delivery systems, tree planting, and levee setbacks would not occur as part of this alternative. The 118,650 acres would be allowed to develop naturally over a period of time primarily as terrestrial habitat with limited wetlands. Current farmed wetlands on the acquired sites would no longer be cultivated and would be allowed to reestablish as natural wetlands. Because there would be no construction, Alternative B would not include the 7,000 to 20,000 acres of shallow water aquatic habitat that is included as part of Alternative A. Alternative B would not achieve USFWS goals of developing shallow water habitat to avoid continued jeopardy of the endangered pallid sturgeon. As with Alternative A, implementation of Alternative B would be a long-term process and is anticipated to be in excess of 30 years and would be dependent on funding levels.

**Alternative C** would not involve any Federal action authorized by WRDA99.

Under the No Action alternative, the additional 118,650 acres proposed for development for aquatic and terrestrial habitat mitigation along the 735 miles of the BSNP would not be acquired or developed. The only fish and wildlife habitat mitigation site development on the Lower Missouri River that would occur as part of the Corps' Mitigation Project would be the 48,100 acres that was previously authorized by WRDA86 and evaluated in the original Feasibility Report and FEIS.

The Corps determined Alternative A to be its Preferred Action in the SEIS. The Corps considers Alternative A necessary to achieve a significant level of recovery of the Missouri River floodplain ecosystem. The coordination team expects the modified Mitigation Project will provide significant benefits to the fish and wildlife resources of the Missouri River, including the Federally listed pallid sturgeon.



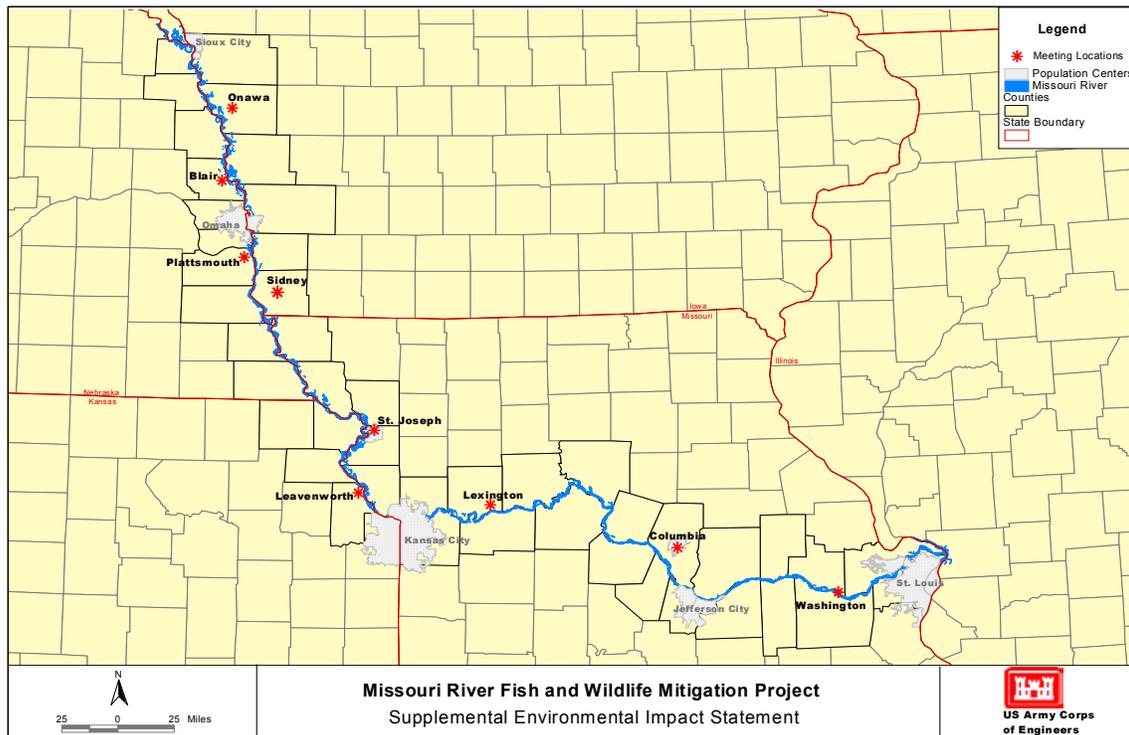
## PUBLIC INVOLVEMENT

As part of the SEIS process, nine public scoping meetings were conducted (Figure S-3) to solicit comments on the scope of the SEIS from individuals, Native American tribes, organizations, and agencies. A Notice of Intent (NOI) was published in the November 2, 2001 Federal Register (Volume 66, Number 213). The Corps issued a news release to various forms of media, including newspaper, television, and radio. In addition, a legal notice was published in various local and regional newspapers to announce that, as the lead Federal agency, the Corps would be

seeking input on the project at public scoping meetings. The legal notices were published in 13 local newspapers located along the Missouri River.

A mail flyer was sent out to approximately 1,900 individuals, organizations, Native American tribes, government agencies, and elected officials. The flyer detailed the modified Mitigation Project, including the project needs, proposed action, and potential issues. The flyer provided an overview of the original Mitigation Project and an anticipated schedule for completion. The flyer also solicited comments from the

**Figure S-3  
Location of Public Scoping Meetings**



public on the scope of the SEIS, included the dates, times, and locations of the public scoping meetings, and provided information to allow the public to send comments by mail. Nine public scoping meetings were held in communities along the Lower Missouri River and the comments received were used to help define the issues regarding the modified Mitigation Project and the scope of this SEIS.

## THE ISSUES

Based on input from public scoping, the following issues will be addressed either generally or through a specific evaluation in the SEIS:

- Increase in non-taxable land
- Tax impacts to local economies
- Increased tax burden on remaining landowners
- Payment in lieu of taxes
- Cumulative effect of multiple government agencies acquiring land in the floodplain
- Corps' land appraisals
- Provide access to mitigation sites and river
- Use of all-terrain vehicles
- Increased trespassing on adjacent private lands

- Increased flooding on adjacent private lands
- Increased levee assessments
- Loss of lands to provide access
- Adjacent landowners being forced to sell their land
- Impacts to levees and flood control structures
- Levee relocations
- Monitoring of mitigation sites
- Impacts to navigation
- Desire for increased fish and wildlife habitat
- Desire for increased threatened and endangered species habitat
- Water quality and ice formation
- Potential for mitigation sites on tributaries
- Size of project

The following issues were not addressed in the SEIS. Reasons for whether or not an issue was to be included in the SEIS are discussed in the Public Scoping Issues Identification Report (Appendix D of the SEIS):

- Capital gains tax relief
- Evaluate land acquisition policies

- Develop a land acquisition plan

The public comment period for the Draft SEIS officially began with publishing the Notice of Availability (NOA) in the Federal Register on September 20, 2002. Prior to publishing the NOA, approximately 2,000 mail flyers were sent to individuals, organizations, Native American tribes, and agencies announcing the availability of the Draft SEIS, the location of libraries where copies of the Draft SEIS were sent, and giving notice on the public comment period including a schedule of public open houses and hearings. In addition, approximately 140 copies of the Draft SEIS were sent to individuals, organizations, Native American tribes, and agencies. The availability of the Draft SEIS was announced on the Mitigation Project website and electronic versions of the Draft SEIS were also made available for download from the website. Hard copies of the Draft SEIS were deposited in 31 libraries in locations along the Lower Missouri River for public review.

Six public open houses, each followed by a public hearing, were held at locations along the Lower Missouri River during the public comment period. Testimony recorded during these public hearings and responses to testimony comments are included in Appendix E. Written comments post-marked by November 4, 2002 were also

accepted. All written comments received along with responses to those comments are included in Appendix E. The public comment period on the Draft SEIS lasted 45 days and closed on November 4, 2002.

## ENVIRONMENTAL EFFECTS

The modified Mitigation Project would occur on the Lower Missouri River between Sioux City and the mouth at St. Louis. The Lower Missouri River valley floodplain extends 735 miles and encompasses approximately 2,069,000 acres in the general project area. Specific analyses consider a defined Region of Influence (ROI) as the floodplain of the Lower Missouri River, or for some resources (e.g. socioeconomics) the 46 counties contiguous to the Lower Missouri River in Nebraska, Iowa, Kansas, and Missouri (Figure S-4). Twenty-five counties are in Missouri, ten in Nebraska, six in Iowa, and five in Kansas. The ROI was divided into the following four regions for purposes of describing the existing environment and evaluating environmental impacts:

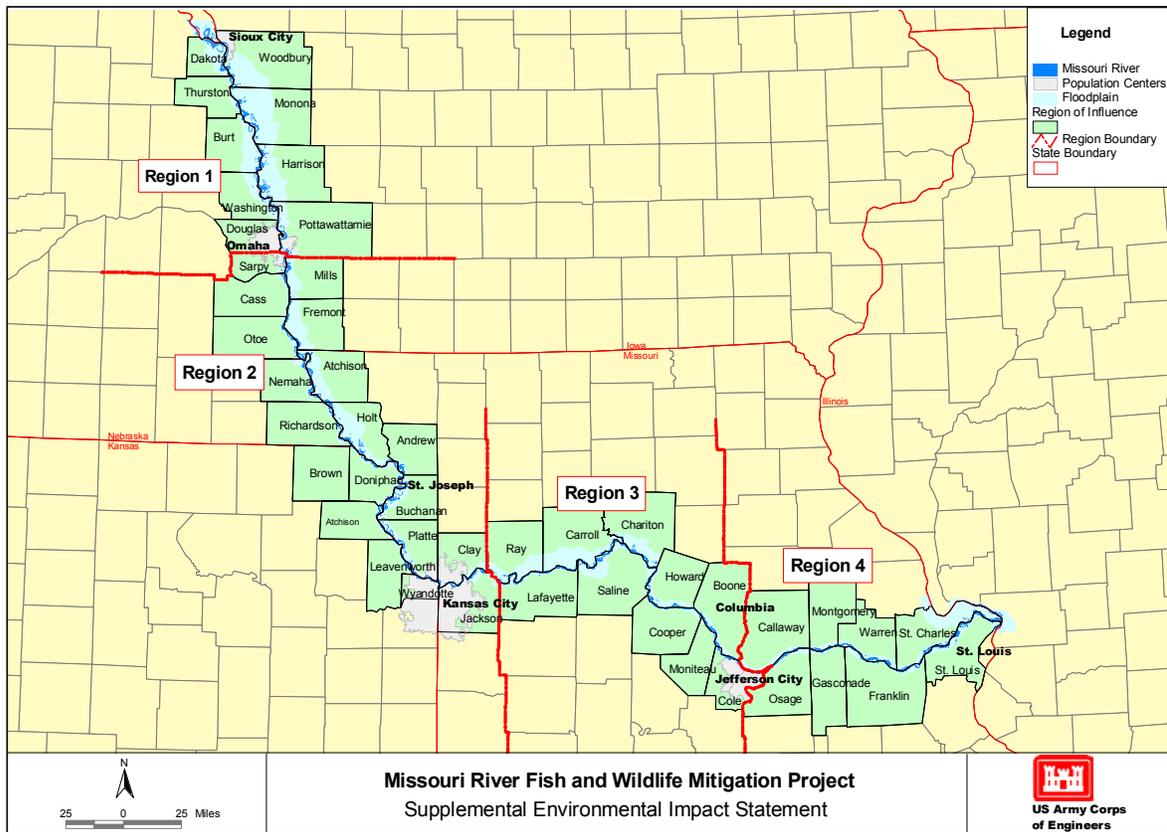
- Region 1: Sioux City, Iowa to Omaha, Nebraska
- Region 2: Omaha, Nebraska to Kansas City, Missouri
- Region 3: Kansas City, Missouri to Jefferson City, Missouri

- Region 4: Jefferson City, Missouri to St. Louis, Missouri

The environmental impacts analyses of the SEIS determined the level of impact anticipated to result from implementation of the Preferred Action, No Development alternative, and No Action alternative. The impacts for the Preferred Action and the No Development alternative are very similar. The exceptions under the No Development alternative are that there would be no impacts from construction to facilitate terrestrial and aquatic habitat development as is proposed under the Preferred Action

alternative. Under the No Development alternative, there would be no funds spent for construction of chutes, wetland cells, installation of pumps, tree planting, and levee setbacks. With no construction, there would be no impacts to navigation, no increase in flood storage capacity, no short-term impacts to water quality from construction related silt and erosion, and no benefits to fish habitat from shallow water development projects. The following presents the adverse and beneficial impacts associated with the three alternatives, and are summarized in Table S-3.

**Figure S-4  
Region of Influence**



<b>Table S-3. Summary of Potential Environmental Effects</b>			
<b>Environmental &amp; Socioeconomic Resources</b>	<b>Preferred Action</b>	<b>No Development Alternative</b>	<b>No Action Alternative</b>
Missouri River/Groundwater Hydrology			
Water Quality - Short Term - Long Term	 	 	 
Flood Control			
Wetlands - Short Term - Long Term	 	 	
Vegetation - Short Term - Long Term	 	 	
Wildlife - Short Term - Long Term	 	 	
Fisheries - Short Term - Long Term	 	 	
Threatened and Endangered Species			
Land Use			
Land Ownership			
Prime Farmland			
Access and Recreation			
Agriculture			
Taxes			
Levee and Drainage Districts			
Environmental Justice			
Local Economics and Recreation			
Native American Resources			
Navigation			
Cultural Resources			
Air Quality - Short Term - Long Term	 	 	
Noise - Short Term - Long Term	 	 	
Solid and Hazardous Waste			

**No Impact**    
 **Less than Significant Adverse Impact**    
 **Significant Adverse Impact**  
**Beneficial Impact**    
 **Significant Beneficial Impact**

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## Water Resources

Water resources include Missouri River hydrology, groundwater hydrology, water quality, and flood control. The hydrology of the Missouri River is greatly altered from its natural state. Implementation of the Preferred Action would allow more natural floodplain dynamics and alluvial processes at many of the mitigation sites. The restoration or construction of chutes could potentially result in a minor decrease in river flow in the main channel at those locations. The Preferred Action would potentially restore moisture levels and the groundwater table at mitigation sites to conditions similar to what existed prior to construction of the BSNP. There would be potential for a local increase in the water table on adjacent lands due to the creation of wetlands and increased inundation on mitigation sites. Water quality would be improved due to the removal of land from agricultural use and the beneficial filtration functions of wetlands. The acquisition and development of mitigation sites would likely provide an increase in flood storage capacity of the Lower Missouri River floodplain. Under the No Development alternative, there would be no habitat development or construction activities, therefore, there would be no impacts to water resources within the ROI with the

exception of a long-term benefit to water quality due to a decrease in agricultural runoff.

## Biological Resources

Biological resources within the ROI include wetlands, vegetation, wildlife, fisheries, and threatened and endangered species. Wetland habitat within the floodplain has been greatly reduced due to habitat alteration and drainage for agricultural use. Other native habitats such as bottomland forest, prairie, and sandbars have also been greatly reduced within the floodplain. The dominant vegetation types within the floodplain are corn and soybeans. The floodplain historically provided a diversity of wildlife habitat. The area is particularly important as resting, feeding, and nesting habitat for waterfowl. Ninety-one fish species are currently found in the Lower Missouri River although the elimination of shallow water habitat due to bank stabilization and channelization has had a detrimental impact on the fishery of the Lower Missouri River. Seventeen plant or animal species that occur in the ROI are listed as Federally threatened or endangered, or are candidates for listing under the ESA. Most notably are the pallid sturgeon, interior least tern, and piping

plover, for which the USFWS BiOp issued jeopardy decisions.

The implementation of the Preferred Action would have significant long-term beneficial impacts to biological resources located within the Lower Missouri River floodplain. There would be a net increase in the acres of wetlands within the study area. The effect on vegetation would primarily be a conversion from row crops to native vegetation of the floodplain. The development of 118,650 acres of fish and wildlife habitat, including 7,000 to 20,000 acres of shallow water habitat to reach a goal of 20-30 acres per mile, would provide significant benefits to fish and wildlife species dependent upon the Lower Missouri River floodplain ecosystem. Reestablishing connectivity between the floodplain and the main channel would also increase the nutrient flow into the river. In particular, the creation of additional shallow water habitat would provide a significant benefit to the Federally endangered pallid sturgeon. The No Development alternative would result in beneficial impacts to wetlands, vegetation, and wildlife within the ROI; however, it would not create any chutes or shallow water habitat, consequently, there would be a significant adverse impact to fisheries and the pallid sturgeon.

## Land Use, Ownership, and Recreation

Agriculture is the primary land use within the ROI and generally comprises 60 to 90 percent of the total land within the ROI counties. The BSNP has caused a significant alteration of land use in the ROI over the past 90 years through the construction of revetments and transverse dikes to stabilize the river into a single channel. Construction of the BSNP has allowed the conversion of a dynamic river ecosystem to predominately new agricultural land. By the year 2003, it is estimated that 522,000 acres of aquatic and terrestrial habitat will have been eliminated from the natural channel and meander belt for primarily agricultural use (Corps, 1981; Table S-1). The BSNP has removed or altered significant areas of the river ecosystem that existed prior to BSNP construction. The Preferred Action would result in a conversion of approximately 1 percent of the agricultural land in the ROI. This is considered a less than significant impact.

Most of the land within the 46 ROI counties is in private ownership. Federal and state governments own approximately 0.7 percent of the total land area in the ROI and approximately 5.5 percent of the land within the floodplain. The Preferred Action would

result in the conversion of up to 118,650 acres of generally privately owned land to public ownership, however, existing public lands would also be developed for the Preferred Action. This is considered a less than significant impact.

Prime farmlands within the Lower Missouri River floodplain include the cropland that is protected from flooding by levees. It was estimated that 708,500 acres of cropland within the ROI floodplain would potentially be prime farmland. The reduction of prime farmland within the ROI from the Preferred Action would be a less than significant impact.

There are 74 public access points along the Lower Missouri River, and recreational uses include hunting, fishing, boating, and other uses. Although no Federal funds would be spent on recreation related features/facilities, increased public access and recreational opportunities in the ROI would be a significant beneficial impact as a result of the Preferred Action.

The No Development alternative would result in similar impacts to land use, ownership, and recreation as the Preferred Action.

## Socioeconomic Resources

The total population of the ROI counties was approximately 4,073,000 in 2000. This was approximately 32 percent of the population of the four states. Historically, the economy of the region has been primarily based on agriculture and agribusiness. The ROI has 25 counties that are primarily rural. The economic trend in the region's agricultural sector is towards larger but fewer farms. From the period 1987 to 1997, the number of farms declined from about 40,300 to 35,500 representing about 500 farms per year. The number of farmers listed with their principal occupation as farming has also declined from a regional average of 511 per county in 1987 to 404 in 1997.

Socioeconomic impacts as a result of the purchase of 118,650 acres would include both beneficial and adverse impacts to local economies and communities in the ROI. Potential beneficial impacts would include additional income and employment generated locally from the development and operation of the mitigation sites. Although not a recreation project, some indirect beneficial impacts would result such as increased recreational opportunities and indirect economic benefit from increased spending by recreational users. Adverse

impacts would include reduced land in agricultural production, a potential for a decrease in the tax base for individual counties, an increase in the tax rates paid by levee and drainage districts, and the potential for environmental justice impacts on lower income and disadvantaged populations located in the Missouri River ROI.

The purchase of up to 118,650 acres of land in the ROI river floodplain for the Preferred Action would result in an estimated loss of up to 90,530 acres in cropland and a loss in crop revenue of up to approximately \$22 million annually, which represents less than 1 percent of the total value of farm products sold in the ROI. This is considered a less than significant impact.

The removal of land from the tax rolls in the ROI would affect tax revenues in individual counties with tax revenue losses ranging as high as 2.5 percent, but generally below 1.5 percent of a county's total tax revenues. The potential tax impacts are considered less than significant.

Levee and drainage districts in the ROI range in size from 200 acres to 25,000 acres. Districts assess members from approximately \$1.00 per acre up to \$8.00

per acre depending on the debt level the district has incurred from previous flood damage. The cost of mowing and general maintenance on the levee usually averages about \$2 per acre for individual members.

The purchase of Mitigation Project land in a levee district could have a potential significant impact on the remaining members by causing a proportional shift of cost to remaining levee district members. However, the degree of impact would be determined on a site-specific basis and would be based on the amount of a levee district that would be acquired and the amount of increased burden the remaining levee district members would have to incur. Measures to minimize adverse effects could include limiting the amount of land in a levee or drainage district that would be acquired, or working with the district and landowners to develop an agreeable levee realignment under the Preferred Action. Therefore, additional impact evaluation should be conducted on a site-specific basis, and the appropriate measure to minimize adverse effects could be employed.

The minority population percentage in the ROI was less than 3 percent in the majority of the smaller rural counties and ranged from 14 percent to 48 percent for the larger

primarily urban counties. Thurston County, Nebraska was the exception among small rural counties, with a minority population of 55 percent. Thurston County also had the highest percentage of residents below the ROI average poverty level of the rural counties. The relatively low per capita income also raises concern for the potential loss of any tax base because it would result in increased taxes on the remaining private landowners. Therefore, potential environmental justice impacts were analyzed for Thurston County, Nebraska. The analysis indicated that the purchase of approximately 1,600 acres of taxable land for the modified Mitigation Project would result in a loss of \$21,870 or 2.46 percent after PILT against an annual locally generated tax revenue base of \$890,000. However, because almost all of the floodplain is within the Omaha and Winnebago Reservations, it is unlikely that the Preferred Action would result in acquisition of private lands that would adversely affect the Thurston County tax base and low-income taxpayers. Therefore, there would be no impact to the minority population in Thurston County.

The total cost of the Preferred Action was estimated to be between \$740 million and \$1.33 billion. Local economies would potentially benefit from the expenditure of

up to \$80 million for on-site monitoring and evaluation, subject to the availability of funds, and engineering and construction expenditures of up to \$900 million. Annual operations and maintenance costs for the fully constructed 118,650-acre Preferred Action were estimated initially to range from \$3 to \$5 million annually with cost declining in future years as the habitat developed becomes more self-sustaining and adaptive management practices allow for more passive management of the individual sites. For a 3,000-acre mitigation site under the Preferred Action, the one-time engineering, construction, and monitoring cost could range from \$14 million to as high as \$25 million. Annual operations and maintenance costs on a 3,000-acre site could potentially be as high as \$126,000 per year, which would have a positive impact on the local economy.

Based on a recreation user survey (Fleener, 1989) it was estimated that recreation on the Missouri River was worth approximately \$40.60 per acre in current dollars. This would generate an estimated \$40,600 annually in recreation site benefits on a 1,000-acre mitigation site, and up to \$121,800 for a mitigation site of up to 3,000 acres. Therefore, the potential expenditures and indirect economic benefits from increased recreational

opportunities could have positive benefits to local economies.

The No Development alternative would result in fewer local economic benefits than the Preferred Action. There would be no economic benefits as a result of the expenditure of between \$500 and \$900 million for engineering and construction as there would be under the Preferred Action. In addition, operations and maintenance expenditures would also be reduced under the No Development alternative.

## Native American Resources

Historically, the Missouri River has been an important resource for Native American cultures. Presently, four reservations are located along the Lower Missouri River. The Omaha and Winnebago Reservations are located on the west bank between Dakota City and Decatur, Nebraska. The Omaha Reservation also owns land on the east bank, west of Onawa, Iowa. The Iowa and the Sac and Fox Reservations are located on the west bank south of Rulo, Nebraska. The Tribal governments for these reservations are sovereign entities with rights to set their own laws and develop and manage Native American lands and other resources. The Tribal governments have the right to be involved

in any Federal decisions or activities that could potentially affect these rights that have been established through treaties, Acts of Congress, and other administrative actions.

Cultural, natural, and agricultural resources exist on the reservations that are critical to the heritage, future, and economic well being of the people who reside there. Cultural resources include traditional religious sites and burial grounds, historic archaeological sites and architectural structures, as well as other cultural sites and objects preserved within individual reservations. The potential for modified Mitigation Project impacts on Tribal lands would be similar as for adjacent landowners and farm operators in terms of trespassing from recreation users, increased foraging on cropland by wildlife, and the potential increase in groundwater levels should a site be developed as aquatic habitat adjacent to tribal lands. Some beneficial impacts could result by increasing fish, wildlife, and vegetation resources important to Native American cultures. Site-specific environmental analyses would be conducted to determine the degree of impact to Native American resources and to identify appropriate measures to minimize adverse effects. The Preferred Action and No Development alternative would result in

an increase in opportunities for recreational and traditional activities. The Preferred Action and No Development alternative would comply with all treaty and other agreements between the Tribal and Federal governments.

## Navigation

Navigation on the Lower Missouri River has been accomplished by the BSNP, which was authorized by Congress in a series of Rivers and Harbors Acts (RHA) beginning in 1912. Since 1945, the Corps has maintained a navigation channel nine feet deep and 300 feet wide between Sioux City and the mouth. The transportation of freight commodities (not including rock, sand, and gravel) between Sioux City and St. Louis grew from the period 1940 to 1980, however, there has been a decline in the levels of freight commodities shipped on the Lower Missouri River since 1980, and recent years have dropped below 1960 tonnage levels.

Under the Preferred Action, construction of project features such as inlet and outlet controls and chutes to create shallow water habitat may require modification of BSNP structures to direct some flow from the main channel without impacting the navigation channel. The limitations of acceptable

diversions are site-specific. The design phase of mitigation site development would include hydrologic modeling to ensure that design modifications of these structures would not adversely affect Missouri River channel morphology and commercial river navigation. The Preferred Action is not anticipated to adversely affect navigation on the Lower Missouri River. Development of specific mitigation sites will include evaluation and modeling of modification to existing structures and construction of new structures to avoid impacting the navigation channel. Under the No Development alternative, there would be no construction of chutes or shallow water habitat; therefore, there would be no impacts to navigation on the Lower Missouri River.

## Cultural Resources

Cultural resources located in the Lower Missouri River floodplain include numerous historical and archaeological sites or properties that would be considered in the location of mitigation sites. Construction activities are not anticipated to cause significant impacts to any cultural resources. Site-specific cultural resource investigations would be conducted on each site. If cultural resources are identified, consultation with appropriate state and Tribal authorities will be conducted. It is

anticipated that any cultural resources encountered would be avoided by construction activities, or appropriate mitigation measures would be taken to protect the resource. A potential benefit would be that any cultural resources located on land acquired for the Preferred Action or No Development alternative would receive additional protection due to Federal ownership of the land.

## **Air Quality and Noise**

Under the Preferred Action, construction related air quality impacts would tend to be very localized and temporary in nature. Such impacts would be due to relatively minor amounts of combustion related emissions from vehicle engine exhausts, and fugitive dust from earthmoving operations. Most of the affected river-bottom land is currently farmed, and therefore has these same types of emissions, but on a more “permanent” basis. Therefore, the construction related impacts are expected to be less than significant. After project implementation, there should be a net reduction in combustion related emissions, and in fugitive dust emissions related to prior tilling and harvesting farming operations. The No Development alternative would have no short-term impacts to air quality because no

habitat development or construction activities would occur. The Preferred Action and No Development alternatives are expected to have a positive, though minimal, long-term impact on air quality in the ROI, due to the elimination of farming related emissions on the affected land areas.

The principal source of noise currently in the ROI is from farming activities, motor vehicle traffic along major highways and at urban areas, and to a lesser extent from railroad traffic. Construction activities to develop habitat may require use of earthmoving equipment that would produce some temporary noise. However, it is not anticipated that construction activities would increase noise levels beyond that typical of farming operations in the vicinity. Therefore, construction related noise effects are anticipated to be less than significant. After construction of the habitat at the Mitigation Project sites, the only noise anticipated to be generated from Mitigation Project related activities would be from recreational use and small amounts of traffic to the Mitigation Project sites. The Preferred Action is not anticipated to generate discernable noise effects on sensitive receptors and there could be a long-term positive impact on noise because of the removal of farm equipment. The No

Development alternative would have no short-term noise impacts and there could also be a long-term positive impact on noise in the ROI.

## Solid and Hazardous Waste

Within the ROI, there are approximately eight licensed landfills in Iowa, 11 in Kansas, 14 in Missouri, and 11 in Nebraska. It is not known how many of these facilities are located in the floodplain of the Missouri River or tributaries. There are also numerous solid waste transfer stations, composting facilities, materials recovery facilities and recycling facilities in the ROI.

Solid waste facilities would be avoided when selecting areas for acquisition and modification. Acquisition of land for the Preferred Action would not directly affect solid waste facilities and no impact is anticipated.

The EPA has identified eight hazardous waste sites in the floodplain of the Missouri River and two are in floodplains of tributaries to the Missouri River that are suspected of having some level of contamination and are listed in the CERCLA Information System (CERCLIS; EPA, 2002). Acquisition of land for the

modified Mitigation Project would not include the purchase of contaminated properties, such as hazardous waste facilities and CERCLA sites; therefore, no impact is anticipated.

## Summary of Impacts by Alternative

A comparison of impacts resulting from each alternative is presented in Table S-4. Measures to minimize adverse impacts resulting from the Preferred Action and No Development alternative are presented in Table S-5. The Preferred Action would include the development of 118,650 acres of fish and wildlife habitat along the Lower Missouri River between Sioux City and St. Louis, as authorized by WRDA99. The No Development alternative would also acquire 118,650 acres along the Lower Missouri River; however, there would be no habitat development or construction activities. The No Action alternative would not acquire any additional acreage for fish and wildlife habitat mitigation along the Lower Missouri River except for that which was previously authorized under WRDA86 and the subject of the original Feasibility Report and FEIS. It should be noted that the environmental consequences described herein refer to the potential impacts resulting from the modified Mitigation Project. The potential

**Table S-4  
Comparison of Environmental Consequences of Alternatives Evaluated**

Environmental and Socioeconomic Resources	Potential Effect Alternative A – Preferred Action (118,650 acres including 7,000 – 20,000 acres of shallow water habitat)	Potential Effect Alternative B – No Development (118,650 acres with no habitat development)	Potential Effect Alternative C – No Action
<b>Water Resources</b>			
Missouri River Hydrology	Less than significant impact to hydrology and hydraulics. Potential benefits to river hydrology from restoring natural riverine functions.	No impact to hydrology or hydraulics.	No impact. No further benefits to Missouri River hydrology would occur.
Groundwater Hydrology	Less than significant impact. Potential for localized increase of water table.	No impact.	No impact.
Water Quality	Less than significant short-term impact due to increased sediment. Some long-term improvements to water quality would occur due to the construction of wetlands.	No short-term impacts to water quality. Long-term benefit to water quality from reduced agricultural runoff.	No impact. No further benefits to water quality would occur.
Flood Control	Increased floodplain storage capacity would be a beneficial impact by reducing downstream flood potential.	No impact. Existing flood potential would remain.	No impact. Existing flood potential would remain.
<b>Biological Resources</b>			
Wetlands	Less than significant short-term impact from construction. Significant net increase in wetlands within the Lower Missouri River floodplain.	Long-term beneficial impacts from reestablishment of farmed wetlands and other opportunistic wetlands.	Significant adverse impact. No additional wetlands would be constructed, restored, or preserved.
Vegetation	Less than significant short-term impact from construction. Significant increase in native vegetation	Significant long-term beneficial impacts from an increase in native vegetation.	Significant adverse impact.
Wildlife	Less than significant short-term impact from construction. Significant beneficial increase in wildlife habitat.	Significant long-term beneficial impact from increase in wildlife habitat.	Significant adverse impact.
Fisheries	Less than significant short-term impact from construction. Significant beneficial increase in shallow water habitat.	Significant adverse impact due to no new aquatic habitat and continued degraded state of Missouri River fishery.	Significant adverse impact.
Threatened and Endangered Species	No short-term impact. Increase in potential threatened and endangered species habitat. Increase in shallow water habitat for the pallid sturgeon as recommended by the BiOp.	Significant adverse impact. Pallid sturgeon would remain in jeopardy based on USFWS BiOp. Beneficial impacts but less than under the Preferred Action. This alternative would provide floodplain habitat for T&E species.	Significant adverse impact. Pallid sturgeon would remain in jeopardy based on USFWS BiOp.

<b>Table S-4 (continued)</b>			
<b>Comparison of Environmental Consequences of Alternatives Evaluated</b>			
<b>Environmental and Socioeconomic Resources</b>	<b>Potential Effect Alternative A – Preferred Action (118,650 acres including 7,000 – 20,000 acres of shallow water habitat)</b>	<b>Potential Effect Alternative B – No Development (118,650 acres with no habitat development)</b>	<b>Potential Effect Alternative C – No Action</b>
<b>Land Use and Ownership</b>			
Land Use	Less than significant adverse impact. Would result in the conversion of less than one percent of the agricultural land within the ROI to fish and wildlife habitat.	Less than significant adverse impact similar to the Preferred Action. Potential for conversion of more agricultural land than under the Preferred Action because all acquisition would be from private landowners.	No impact.
Land Ownership	Less than significant adverse impact. Would result in less than one percent of privately owned land converted to governmental ownership.	Less than significant adverse impact. Potential for conversion of more privately owned land to public ownership than under the Preferred Action because all acquisition would be from private landowners. No public land would be acquired for mitigation sites under the No Development alternative.	No impact.
Prime Farmland	Less than significant adverse impact. Would result in the conversion of less than 5.7 percent of the prime farmland in the floodplain to fish and wildlife habitat.	Less than significant adverse impact. Potential for conversion of more prime farmland than under the Preferred Action because land acquisition is only from private landowners.	No impact.
Access and Recreation	Significant beneficial increase in access and recreational opportunity due to the acquisition and development of mitigation sites.	Significant beneficial impact. Same as for Preferred Action.	Significant adverse impact.
<b>Socioeconomic Resources</b>			
Agriculture	Less than significant impact. Loss of cropland in ROI counties could range from 0.5 percent to 2 percent. Loss of retail sales from farm purchases in ROI counties could range from 0.04 percent to 1.66 percent.	Less than significant adverse impact. Potential for conversion of more privately owned agricultural land to public ownership than under the Preferred Action because land acquisition would only be from private landowners. No public land will be acquired for mitigation sites under the No Development alternative.	No impact.
Taxes	Less than significant adverse impact. Potential loss of county tax revenue of less than 1.8 percent.	Less than significant adverse impact. Potential for greater loss of tax base from the conversion of more privately owned land to public ownership than under the Preferred Action. Under the No Development alternative, land acquisition would only be from private landowners.	No impact.
Levee and Drainage Districts	Impacts would depend on site. Less than significant to potential significant adverse impacts on remaining levee district landowners, depending on amount of land acquired in levee district.	Impacts would depend on site. Less than significant to potential significant adverse impacts on remaining levee district landowners, depending on amount of land acquired in levee district.	No impact.

**Table S-4 (continued)**  
**Comparison of Environmental Consequences of Alternatives Evaluated.**

Environmental and Socioeconomic Resources	Potential Effect Alternative A – Preferred Action (118,650 acres including 7,000 – 20,000 acres of shallow water habitat)	Potential Effect Alternative B – No Development (118,650 acres with no habitat development)	Potential Effect Alternative C – No Action
Environmental Justice	No impact to minority population of Thurston County, Nebraska.	Same as Preferred Action.	No impact.
Local Economics	Local economic benefits from project-induced spending during construction, monitoring, and operation and maintenance of the mitigation sites.	Local economic benefits for the No Development alternative would be less than for the Preferred Action. The No Development alternative would not include between \$500 and \$900 million for engineering and construction of mitigation sites. Annual O&M cost and monitoring/ evaluation expenditures would also be less under this alternative.	No impact.
Recreation Economics	Local economic benefits from project-induced spending from recreation users.	Same as the Preferred Action.	No impact.
Project Cost	Total project cost in the range of \$740,000,000 to \$1.3 billion plus an estimated \$3 to \$5 million in annual operations and maintenance costs.	Total project cost in the range of \$240,000,000 to \$430,000,000. Annual operations and maintenance costs would be less than the Preferred Action but are currently undetermined.	No cost.
<b>Other Resources</b>			
Native American Resources	Less than significant adverse impacts. Potential beneficial impacts to fish and wildlife resources and opportunities for recreational and traditional activities.	Same as the Preferred Action.	No impact.
Navigation	No impact; Corps is required to maintain navigation channel.	No impact.	No impact.
Cultural Resources	Beneficial impact. Land acquisition would provide Federal protection for cultural resources located on the acquired site.	Same as the Preferred Action.	No impact. Cultural resources within the floodplain would not receive any additional protection.
Air Quality	Less than significant short-term impact during construction. Beneficial long-term impact.	No short-term impacts to air quality. Beneficial long-term impact.	No impact.
Noise	Less than significant short-term impact during construction. Beneficial long-term impact.	No short-term impact to noise. Beneficial long-term impact.	No impact.
Solid Waste	No impact.	No impact.	No impact.
Hazardous Waste	No impact.	No impact.	No impact.

**Table S-5. Summary of Measures to Minimize Adverse Impacts.**

<b>Environmental &amp; Socioeconomic Resources</b>	<b>Preferred Action</b>	<b>No Development Alternative</b>
Missouri River Hydrology	Not required	Not required
Groundwater Hydrology	Not required, however, DPR/EA will evaluate site-specific concerns and determine appropriate mitigation such as increasing site size to provide buffer or lease buffer area.	Not required
Water Quality	Not Required; BMPs during construction	Not required
Flood Control	Not required, however, DPR/EA will evaluate site-specific changes to flood control structures.	Not required
Wetlands	Not required	Not required
Vegetation	Not required	Not required
Wildlife	Not required	Not required
Fisheries	Not required	Not required
Threatened and Endangered Species	Not required	Not required
Land Use	Not required	Not required
Land Ownership	Not required	Not required
Prime Farmland	Not required	Not required
Access and Recreation	Not required. Site development should not adversely affect existing access and recreation facilities.	Not required
Agriculture	Not required, however, site management would include noxious weed control, proper signage, and coordination with landowners and public officials as to site use.	Not required, however, site management would include noxious weed control, proper signage, and coordination with landowners and public officials as to site use.
Taxes	Not required beyond PILT to states.	Not required beyond PILT to states.
Levee and Drainage Districts	Specific measures would be determined on a site-specific basis during development of DPR/EA; could include limiting amount of a district that would be acquired or reconfigure levee.	Consider buying entire levee districts if possible.
Environmental Justice	Not required	Not required
Local Economics	Not required	Not required
Recreation Economics	Not required	Not required
Native American Resources	Not required; DPR/EA will evaluate site-specific concerns and determine any appropriate mitigation.	Not required
Navigation	Not required	Not required
Cultural Resources	Not required	Not required
Air Quality	Not required; BMPs during construction.	Not required
Noise	Not required	Not required
Solid/Hazardous Waste	Not required	Not required

impacts associated with the 48,100 acres of fish and wildlife habitat mitigation authorized under WRDA86 were addressed in the original Feasibility Report and FEIS for the Mitigation Project.

## Cumulative Impacts

There are potential beneficial and adverse cumulative effects that could occur as a result of implementing the modified Mitigation Project of converting up to 118,650 acres of primarily agricultural land in the ROI to conservation use. Consideration of potential cumulative effects are important because of other conservation and agricultural programs currently being implemented along the Missouri River including:

- WRDA86 original Mitigation Project – 48,100 acres,
- USFWS – Big Muddy National Fish and Wildlife Refuge (NFWR) – potentially 60,000 acres; Boyer Chute National Wildlife Refuge (NWR) – potentially 10,000 acres,
- Corps Section 1135 and 206 projects,
- Natural Resource Conservation Service (NRCS) Wetland Reserve Program (WRP) and Emergency Wetland Reserve Program (EWRP) and,

- NRCS Conservation Reserve Program.

All of these programs have impacts to varying degrees on the local agricultural sector, local tax base, and rural economies as a result of removing agricultural land, either on a temporary or permanent basis. Conversely, there are also cumulative beneficial impacts to the river floodplain ecology, surrounding upland habitats, and local economies as a result of increased access and recreational opportunities on the Missouri River.

The potential cumulative effects of land acquisition were considered in the context of the amount of privately owned land in the ROI, the purpose of the land acquisition, and the amount of habitat loss that is being mitigated. Table S-6 summarizes the historic habitat lost in each state and the ROI by the BSNP, and compares that acreage with the various governmental land acquisition actions that have occurred and are planned in the ROI.

Assuming all planned projects would acquire the maximum acreage authorized, a total of approximately 299,000 acres of government owned land would exist in the ROI in the future. This would represent only 1.8 percent of the total ROI land area and varies by state from 0.9 percent

(Kansas) to 2.1 percent (Missouri). Based on this analysis, it was determined that the acquisition of private agricultural land for conversion to public conservation use would have a significant cumulative beneficial impact on recreation.

Because of the relatively low percentage of land that would be removed from the tax base by the various government projects, the potential cumulative impact is anticipated to be a less than significant impact on tax revenues for individual counties in the ROI.

The modified Mitigation Project, when

combined with other projects, would increase the access and recreational opportunities in the ROI. The addition of more recreation sites and river access sites along the Missouri River would also provide the opportunity to develop more diverse recreational opportunities, thus increasing the overall appeal of the river and floodplain for local recreation users as well as attracting more long distance destination vacationers. The increase in recreation would have a significant beneficial impact on local economies. The additional recreation related spending in the ROI would have a beneficial impact on local economies.

	Iowa	Kansas	Missouri	Nebraska	ROI
<b>Habitat Lost by BSNP</b>	65,400	55,100	304,900	96,600	522,000
<b>Existing Public Lands<sup>1</sup></b>	26,907	2,172	70,028	15,443	114,550
<b>Additional original Mit. Proj. Land to be Acquired<sup>2</sup></b>	3,909	239	702	135	4,985
<b>Modified Mitigation Project<sup>3</sup></b>	14,120	9,280	75,717	19,533	118,650
<b>Additional USFWS Refuge Land to be Acquired<sup>4</sup></b>	NA	NA	53,155	7,607	60,762
<b>Total Future Public Lands</b>	44,936	11,691	199,602	42,718	298,947
<b>Future Private Lands in the ROI</b>	2,639,172	1,286,609	9,382,871	2,705,997	16,014,649
<b>Total Land in ROI<sup>4</sup></b>	2,684,108	1,298,300	9,582,473	2,748,715	16,313,596
<b>Percent of ROI that would be Owned by Government</b>	1.7	0.9	2.1	1.6	1.8

<sup>1</sup> Includes original Mitigation Project, Big Muddy NFWR, Boyer Chute NWR, and various state-owned lands (USGS, 2001).

<sup>2</sup> Corps, 2002.

<sup>3</sup> Assumes land acquisition will be in equal proportions based on riverbank miles, and no public land used.

<sup>4</sup> USGS, Columbia Environmental Research Center, 2001.

Note: Does not include land in government programs such as CRP, EWRP, and WRP that is not owned in fee title.

Other projects considered with the modified Mitigation Project are not anticipated to cause a cumulative impact on navigation.

The modified Mitigation Project, when combined with WRP, the Big Muddy NFWR, and other conservation programs would reduce the overall pollution loadings from nitrogen, phosphorous, and pesticides currently introduced to the floodplain from current agricultural use. The restoration of side channels and the connection of wetlands to the river will provide water quality benefits by removing nutrients and contaminants from the river flow.

The modified Mitigation Project combined with other conservation projects in the floodplain such as the WRP and Big Muddy NFWR would increase the river and floodplain storage capacity. Potential adverse impacts from modification to flood control structures are not anticipated from the modified Mitigation Project. However, modification to flood control structures by the Preferred Action could increase the flood storage capacity by setbacks of some levees. Changes in operation of the Mainstem Reservoir System could affect flood potential along the Lower Missouri River depending on the operational alternative selected. However, the modified

Mitigation Project would be managed to accommodate changes to operation of the Mainstem Reservoir System.

## AGENCY INVOLVEMENT

The Corps is responsible for coordination and consultation with appropriate state and Federal agencies, and to fund operation and maintenance of the mitigation features for the life of the Mitigation Project. A coordination team was established for the Mitigation Project, which includes representatives from the USFWS, U.S. Environmental Protection Agency (EPA), U.S. Department of Agriculture (USDA) – Natural Resource Conservation Service (NRCS), Iowa Department of Natural Resources (IDNR), Kansas Department of Wildlife and Parks (KDWP), Missouri Department of Conservation (MDC), Missouri Department of Natural Resources (MDNR), and Nebraska Game and Parks Commission (NGPC), along with the Kansas City District and the Omaha District of the Corps. The initial responsibility of the coordination team was to develop selection criteria for screening and prioritizing the site selection process. The coordination team reviewed the issues identified in public scoping and provided guidance for evaluation in the SEIS. The coordination

team continues to meet periodically to discuss future activities, priorities, funding and other issues related to implementing, managing, and monitoring the Mitigation Project.

In addition to the coordination team involvement with the Mitigation Project, the USFWS, EPA, MDC, KDWP, IDNR, and NGPC are serving as cooperating agencies for the preparation of the SEIS.