



US Army Corps  
of Engineers®

## Missouri River Bank Stabilization and Navigation Project, Fish and Wildlife Mitigation Project

---



*View of the new palustrine wetland habitat completed in FY04 at the Tieville-Decatur mitigation site, Burt County, Nebraska and Monona County, Iowa*

**Annual Implementation Report  
December 2004**



**TABLE OF CONTENTS**

page

TABLE OF CONTENTS..... iii

LIST OF TABLES .....v

INTRODUCTION .....1

    Authority .....1

    Background .....1

    Report Purpose and Format .....3

PAST MITIGATION EFFORTS FOR FY04 AND PRIOR.....5

    Funding .....5

    Real Estate .....6

    Habitat Development .....12

    Operation and Maintenance .....20

    Monitoring and Evaluation .....24

PLANNED MITIGATION EFFORTS FOR FY05. ....25

    Funding .....25

    Real Estate .....26

    Habitat Development .....28

    Operation and Maintenance .....30

    Monitoring and Evaluation .....30

FUTURE MITIGATION EFFORTS, FY06 TO COMPLETION. ....31

    Funding .....31

    Real Estate .....32

    Habitat Development .....33

    Operation and Maintenance .....33

    Monitoring and Evaluation .....34

APPENDIX 1, SITE LOCATION MAPS

APPENDIX 2, DETAILED SITE DESCRIPTIONS/INFORMATION PAPERS



## LIST OF TABLES

TABLE 1. TOTAL COSTS TO DATE (AS OF 30 SEP 04).....	5
TABLE 2. TOTAL LANDS AUTHORIZED FOR PROJECT, DISTRIBUTION BY STATE (AS OF 30 SEP 04) .....	6
TABLE 3. LANDS ACQUIRED WITHIN STATE OF IOWA, DISTRIBUTION BY SITE (AS OF 30 SEP 04) .....	7
TABLE 4. LANDS ACQUIRED WITHIN STATE OF NEBRASKA, DISTRIBUTION BY SITE (AS OF 30 SEP 04) .....	9
TABLE 5. LANDS ACQUIRED WITHIN STATE OF KANSAS, DISTRIBUTION BY SITE (AS OF 30 SEP 04) .....	10
TABLE 6. LANDS ACQUIRED WITHIN STATE OF MISSOURI, DISTRIBUTION BY SITE (AS OF 30 SEP 04) .....	10
TABLE 7. SUMMARY OF ALL LANDS ACQUIRED (AS OF 30 SEP 04).....	12
TABLE 8. HABITAT DEVELOPMENT ACTIVITIES BY SITE (AS OF 30 SEP 04).....	15
TABLE 9. PROJECT HABITAT CLASSIFICATION SYSTEM.....	17
TABLE 10. ACREAGE AMOUNT OF HABITATS, DISTRIBUTION BY SITE, (AS OF 30 SEP 04).....	19
TABLE 11. OPERATION AND MAINTENANCE ACTIVITIES BY SITE, (AS OF 30 SEP 04).....	21
TABLE 12. ESTIMATED FUNDING FOR FY05.....	26
TABLE 13. ESTIMATED COSTS FROM REPORT TO CONGRESS.....	31
TABLE 14. CURRENT BUDGET FOR FY06 TO COMPLETION .....	32



## INTRODUCTION

### AUTHORITY

This report presents the current status and future plans for implementation of the Missouri River Fish and Wildlife Mitigation Project, Iowa, Nebraska, Kansas, and Missouri, hereinafter referred to as the "Project". Congress first authorized construction of the Project in Section 601(a) of the Water Resources Development Act of 1986 (Public Law 99-662). Section 334(a) of the Water Resources Development Act of 1999 (Public Law (106-53) modified the Project by increasing the amount of acreage to be acquired and/or mitigated. The total amount of land authorized for mitigation is currently 166,750 acres.

The current authorization is to mitigate for the losses attributed to construction of the Missouri River Bank Stabilization and Navigation Project (BSNP). The Project will acquire, develop and preserve native aquatic, wetland, and upland habitats on individual mitigation sites. The Project location is in and adjacent to the Missouri River from Sioux City, Iowa to the mouth near St. Louis, Missouri, a distance of 735 river miles.

### BACKGROUND

The original authorization for the Project was based upon a report of the US Army Corps of Engineers, Chief of Engineers, dated April 24, 1984, entitled "Missouri River Bank Stabilization and Navigation Project, Final Feasibility Report and Final EIS for the Fish and Wildlife Mitigation Plan". The authority to prepare the Feasibility Report was the 1958 Fish and Wildlife Coordination Act (P.L. 85-624). The Final Feasibility Report described the fish and wildlife and habitat losses that have occurred due to the BSNP. Also described in the Report are various measures to mitigate for these losses and a recommended plan to mitigate, preserve, or develop 48,100 acres of habitat. During the public involvement process for the EIS and Feasibility Report for the Project, a policy of obtaining lands only from willing sellers was established.

Preconstruction Engineering and Design (PED) for the Project was initiated in December 1989. As a part of PED work, the Corps completed the "Missouri River Bank Stabilization and Navigation Fish and Wildlife Mitigation Reaffirmation Report, July 1990". The purpose of the Reaffirmation Report was to confirm that the plan recommended in the 1984 Feasibility Report and Final EIS was still viable. PED was completed in September 1991 and the Project has been in a "Construction" status since that time. The Reaffirmation Report explains the various aspects of the Project such as the approval process, funding levels, costs, schedules, documentation and involvement of other State and Federal agencies.

The "Missouri River Fish and Wildlife Mitigation Project; Iowa, Nebraska, Kansas, and Missouri; Project Management Plan" (PMP) was completed by the Corps in November 1992. This PMP still guides the execution of the Project. The PMP determined that approximately 60 percent of the Project is within the Kansas City District (CENWK) and 40 percent within the Omaha District (CENWO). For ease of dealing with the affected states, CENWK is responsible for overall management of the Project as well as implementation on the individual sites located in Missouri and Kansas. CENWO is responsible for implementation on the individual sites located in Nebraska and Iowa. The PMP also required Annual Implementation Reports (such as this document) be created to track the progress, schedule, and costs through completion.

An additional portion of the Project Management Plan was dedicated to the establishment of roles and responsibilities for execution of the program in accordance with an Agency Coordination Team. Because the BSNP was constructed and maintained by Federal action, the Project is 100 percent Federally funded. However, even though there is not a cost share sponsor, Federal and State fish and wildlife agencies participate in the implementation of the Project. The agency participation is primarily through an Agency Coordination Team that was developed to formulate and decide upon the various acquisition sites and appropriate mitigation for the sites. The members of the Agency Coordination Team are the Iowa Department of Natural Resources, the Nebraska Game and Parks Commission, the Kansas Department of Wildlife and Parks, the Missouri Department of Conservation, the Environmental Protection Agency, and the U.S. Fish and Wildlife Service. Other agencies have also been invited to participate in team meetings.

"Real Estate Design Memorandum No. 1" was completed by CENWK in March 1990. This report was endorsed by the Corps of Engineers' Missouri River Division in July 1990, and approved by Corps of Engineers' Headquarters in May 1991. This report established the real estate requirements for the acquisition in fee or easement of 29,900 acres of privately owned lands and for any real estate requirements for development of 18,200 acres of existing public lands within the four affected States.

WRDA 99 expanded the amount of acres authorized for the Project from 48,100 acres to a new total of 166,750 acres. As directed in the authorization, the Corps of Engineers worked with the Agency Coordination Team to develop a cost estimate to implement the additional acres authorized by WRDA99. In December 2001, the Corps completed a document titled "Missouri River Mitigation Project, Missouri, Kansas, Iowa, and Nebraska, Report to Congress, in Compliance with the Water Resources Development Act of 1999". This document presented a cost range for the modified Project from \$740 million (includes development of 7,000 acres of shallow water habitat) to \$1.33 billion (includes development of 20,000 acres of shallow water habitat). Also included was a ceiling of 6% of the total mitigation efforts to be expended on monitoring efforts.

In September 2002, the Corps published "Supplement No. 1 to Real Estate Design Memorandum No. 1". This update included the new acres of the expanded mitigation program. This document stated that the acquisition of additional lands for the Project would not reflect a defined amount to be acquired between public or private acres. Also, this document assumed

that the additional acres would be equally proportioned by state based on the amount of riverbank miles.

Since the expanded authorization of WRDA99 resulted in a significant change to the Project, from August 2001 to June 2003, the Corps of Engineers prepared a Supplemental Environmental Impact Statement (SEIS) for the Project. The draft SEIS was published in September 2002. The Final SEIS was published March 1, 2003. The Corps of Engineers issued their Record of Decision on June 12, 2003. This decision, along with the Final SEIS, reflects the programmatic plan for implementation of the current mitigation program.

## **REPORT PURPOSE AND FORMAT**

Programmatic updates of the Project Management Plan are accomplished through Annual Implementation Reports. This document is the eleventh such report. The purpose of the Annual Implementation Reports is to create an administrative record of mitigation efforts that have already occurred, communicate the status of the mitigation efforts that are underway, and outline a plan for continued mitigation in the future.

This report is divided into three main parts: Past Mitigation Efforts for FY04 and Prior, Planned Mitigation Efforts for FY05, and Future Mitigation Efforts FY06 to Completion. Within these three main parts, the four main elements of the Project (Real Estate, Habitat Development, Operation and Maintenance, and Monitoring) are detailed. Thus, this report is a programmatic effort to explain the past activities, current status, and future activities for the Project for both the Omaha and Kansas City Districts.



**PAST MITIGATION EFFORTS  
FOR FY04 AND PRIOR**

**FUNDING (FY04 and Prior)**

From Fiscal Year (FY) 90 to FY91, the Project was in a PED phase. Corps of Engineers PED funding was used to fund the mitigation activities during this period. An amount of \$700,000 in GI funds was expended on the Project during this period.

Beginning in FY92, the Project began to receive Corps of Engineers Construction, General (CG) funds. At this point, the Project was considered to have moved into a construction phase. The CG funding for the Project is divided into broad categories: Land Acquisition; Planning, Engineering and Design; Habitat Development; Construction Management; O&M During Construction; and Monitoring costs. From FY92 through FY04, the Corps expended a total amount of \$98,626,000 in CG funds on the mitigation efforts. Table 1 gives a breakdown of costs expended by category.

**TABLE 1**

**TOTAL COSTS TO DATE  
(AS OF 30 SEP 04)**

Cost	CENWK (1,000)	CENWO (1,000)	TOTAL (1,000)	% of Total Cost
Land Acquisition	\$22,951	\$16,789	\$39,740	40
Planning, Engineering, and Design	10,208	5,328	15,536	16
Habitat Development	17,350	19,425	36,775	37
Construction Management	1,615	2,403	4,018	4
O&M During Construction	1,032	820	1,852	2
Monitoring (1)	572	133	705	1
<b>TOTAL</b>	<b>\$53,728</b>	<b>\$44,898</b>	<b>\$98,626</b>	<b>100</b>

(1) Prior to FY03, monitoring was considered a very limited part of the therefore any funds expended on monitoring were provided using Design and Construction Management categories. In the future, monitoring funds will not exceed 5% of annual appropriations.

**REAL ESTATE (FY04 and Prior)**

Section 334(a) of the Water Resources Development Act of 1986 (WRDA86) and Section 334(a) of the Water Resources Development Act of 1999 (Public Law (106-53) authorized acquisition of 166,750 acres for the Project. In accordance with the Real Estate DM approved for the Project, the lands are acquired from willing sellers. There are three different acquisition types approved for the Project. The lands may be acquired in fee title from private landowners, in sloughing easements from private landowners, or in no cost fish and wildlife easements from government agencies on existing public lands.

During the Feasibility effort for the Project, a breakdown of the originally authorized 48,100 acres was established. This was completed through coordination with the four affected States and the U.S. Fish and Wildlife Service. The original authorized acres were divided up between the States proportional to the amount of fish and wildlife losses attributed to each State. After WRDA99 expanded the authorization by 118,650 acres, the additional acres were also broken down during the effort to update the Supplemental Environmental Impact Statement for the Project. In the SEIS, affects of dividing the additional acres between the States proportionally to the amount of river bank miles was evaluated. The current distribution of lands authorized in both WRDA86 and WRDA99 is reflected in Table 2.

**TABLE 2**  
**TOTAL LANDS AUTHORIZED FOR PROJECT,**  
**DISTRIBUTION BY STATE,**  
**(AS OF 30 SEP 04)**

<b>State</b>	<b>Non-Public Lands Authorized WRDA86 (ac)</b>	<b>Existing Public Lands Authorized WRDA86 (ac)</b>	<b>All Lands Authorized WRDA99 (ac)</b>	<b>Total Authorized (ac)</b>
<b>Iowa</b>	7,200	2,400	14,125	23,725
<b>Nebraska</b>	7,150	50	19,452	26,652
<b>Kansas</b>	2,350	0	9,282	11,632
<b>Missouri</b>	13,200	15,750	75,791	104,741
<b>TOTAL</b>	<b>29,900</b>	<b>18,200</b>	<b>118,650</b>	<b>166,750</b>

Throughout the remainder of the Project, the Corps will be working with the Agency Coordination Team to track acquisitions. As the acquisitions progress over the life of the Project, changes to this distribution of the authorized acres may be necessary. Any changes will be approved by the Agency Coordination Team and presented annually in future Annual Implementation Reports.

The current process for acquiring lands begins with working with the Agency Coordination Team to identify sites that have potential for restoration. The Corps completes a survey of willing sellers (both public and private) near the areas with the most restoration potential. These planning efforts have led to the acquisition of lands at 36 individual sites to date. The 34 sites are located in all four affected States. The locations of the 36 sites established to date are shown on the Location Maps included in this report as a part of e Appendix 1.

As of 30 Sep 04, there have been 41,734 acres acquired for the Project. This consists of fee title acquired on 28,598 acres that was formerly private land and no cost easements and/or licenses on 13,146 acres of existing public land. A total of 25% of the authorized 166,750 acres has been acquired. As shown in Table 1, the Corps of Engineers has expended 40% of the funds received for the Project, or \$39,740,000, on Real Estate activities. Tables 3, 4, 5, and 6 reflect the acreage distribution by site for the States of Iowa, Nebraska, Kansas and Missouri, respectively. Table 7 is a summary of the entire acquisition program to date.

**TABLE 3**  
**LANDS ACQUIRED WITHIN STATE OF IOWA,**  
**DISTRIBUTION BY SITE**  
**(AS OF 30 SEP 04)**

Site	Location	Non-Public Lands Acquired (ac)	Public Lands Acquired (ac)	Total Acquired (ac)
Winnebago Bend	Woodbury County, RM 713 – 708, Left Bank	0	1,300 (1)	1,300
Blackbird Bend	Monona County, RM 697 – 694, Left Bank	223	799 (2)	1,022
Tieville-Decatur Bends (3)	Monona County, RM 698 – 686, Left Bank	94 (4)	964 (2)	1,058

**TABLE 3, Continued**

<b>Site</b>	<b>Location</b>	<b>Non-Public Lands Acquired (ac)</b>	<b>Public Lands Acquired (ac)</b>	<b>Total Acquired (ac)</b>
Louisville Bend	Monona County, RM 685 – 682, Left Bank	84	1,012 (2)	1,096
California Bend	Harrison County, RM 652 – 649, Left Bank	0	420 (2)	420
Noddleman Island	Mills County, RM 587 – 583, Left Bank	1,232	0	1,232
St. Mary's Island	Mills County, RM 597 – 594, Left Bank	1,324	0	1,324
Auldon Bar	Harrison County, RM 580 – 577, Left Bank	588	0	588
Copeland Bend	Fremont County, RM 571 – 565, Left Bank	1,314	625 (2)	1,939
Lower Hamburg Bend (5)	Fremont County, RM 554 – 546, Left Bank	321	0	321
<b>TOTAL</b>		<b>5,180</b>	<b>5,120</b>	<b>10,300</b>

- (1) Reflects amount of lands mitigated on previously held Corps land.
- (2) No cost easement obtained from State of Iowa.
- (3) Only Iowa acres shown here (this site extends into Nebraska, see Table 4)
- (4) Includes 3 acres of channel improvement easement and 91 acres of fee title.
- (5) Only Iowa acres shown here (this site extends into Missouri, see Table 6)

**TABLE 4**  
**LANDS ACQUIRED WITHIN STATE OF NEBRASKA,**  
**DISTRIBUTION BY SITE**  
**(AS OF 30 SEP 04)**

Site	Location	Private Lands Acquired (ac)	Public Lands Acquired (ac)	Total Acquired (ac)
Tieville-Decatur Bends (1)	Burt County, RM 698 – 686, Left Bank	1,890	133 (2)	2,023
Tobacco Island	Cass County, RM 589 – 586, Right Bank	1,604	0	1,604
Hamburg Bend	Otoe County, RM 556 – 552, Right Bank	1,544	0	1,544
Kansas Bend	Nemaha County, RM 547 – 544, Right Bank	1,056	0	1,056
Nishnabotna (3)	Nemaha County, RM 545 – 537, Left Bank	2	0	2
Langdon Bend	Nemaha County, RM 532 – 528, Right Bank	1,312	0	1,312
<b>TOTAL</b>		<b>7,408</b>	<b>133</b>	<b>7,541</b>

- (1) Only Nebraska acres shown here (this site extends into Iowa, see Table 3)  
(2) No cost right of entry easement obtained from State of Nebraska.  
(3) Only Nebraska acres shown here (this site extends into Missouri, see Table 6)

**TABLE 5**  
**LANDS ACQUIRED WITHIN STATE OF KANSAS,**  
**DISTRIBUTION BY SITE**  
**(AS OF 30 SEP 04)**

Site	Location	Private Lands Acquired (ac)	Public Lands Acquired (ac)	Total Acquired (ac)
Benedictine Bottoms	Atchison County, RM 429 – 424, Right Bank	2,111	0	2,111
<b>TOTAL</b>		<b>2,111</b>	<b>0</b>	<b>2,111</b>

**TABLE 6**  
**LANDS ACQUIRED WITHIN STATE OF MISSOURI,**  
**DISTRIBUTION BY SITE**  
**(AS OF 30 SEP 04)**

Site	Location	Private Lands Acquired (ac)	Public Lands Acquired (ac)	Total Acquired (ac)
Lower Hamburg Bend (1)	Atchison County, RM 554 – 546, Left Bank	2,265	0	2,265
Nishnabotna (2)	Atchison County, RM 545 – 537, Left Bank	1,282	0	1,282
Deroin Bend	Atchison/Holt Counties, RM 520 – 517, Left Bank	0	1,082 (3)	1,082
Corning	Holt County, RM 516 – 514, Left Bank	1,193	695 (4)	1,888
Thurnau	Holt County, RM 512 – 508, Left Bank	1,372	0	1,372

**TABLE 6, Continued**

<b>Site</b>	<b>Location</b>	<b>Private Lands Acquired (ac)</b>	<b>Public Lands Acquired (ac)</b>	<b>Total Acquired (ac)</b>
Rush Bottom Bend	Holt County, RM 502 – 499, Left Bank	774	37 <sup>(5)</sup>	811
Wolf Creek Bend	Holt County, RM 479 – 477, Left Bank	503	0	503
Monkey Mountain	Holt, Andrew Counties, RM 466 – 464, Left Bank	657	0	657
Worthwine Island	Andrew County, RM 460 – 456, Left Bank	0	585 <sup>(3)</sup>	585
Weston Bend	Platte County, RM 404 - 403, Left Bank	0	12 <sup>(3)</sup>	12
Grand Pass	Saline County, RM 273 – 266, Right Bank	0	35 <sup>(5)</sup>	35
Franklin Island	Howard County, RM 196 – 193, Left Bank	0	54 <sup>(6)</sup>	54
Diana Bend	Howard County, RM 190 – 187, Left Bank	0	54 <sup>(6)</sup>	54
Overton Bottoms - North	Cooper County, RM 188 – 185, Right Bank	1,355	332 <sup>(8)</sup>	1,687
Overton Bottoms - South	Cooper/Moniteau Counties, RM 185 – 178, Right Bank	3,662	0	3,662
Rocheport Cave	Boone County, RM 183, Left Bank	0	51 <sup>(3)</sup>	51
Eagle Bluffs	Boone County, RM 174 – 170, Left Bank	0	571 <sup>(3)</sup>	571
Plowboy Bend	Moniteau County, RM 172 – 169, Right Bank	0	45 <sup>(7)</sup>	45
Marion Bottoms	Cole County, RM 164 – 158, Right Bank	0	54 <sup>(6)(7)</sup>	54
Tate Island	Callaway County, RM 113 – 110, Left Bank	422	0	422

**TABLE 6, Continued**

Site	Location	Private Lands Acquired (ac)	Public Lands Acquired (ac)	Total Acquired (ac)
Berger Bend	Franklin County, RM 93 - 90, Right Bank	414	60 (4)	474
Columbia Bottom	St. Louis County, RM 4 - 0, Right Bank	0	4,226 (3)	4,226
<b>TOTAL</b>		<b>13,899</b>	<b>7,893</b>	<b>21,792</b>

- (1) Only Missouri acres shown here (this site extends into Iowa, see Table 3).
- (2) Only Missouri acres shown here (this site extends into Nebraska, see Table 4).
- (3) No cost permanent easement obtained from State of Missouri.
- (4) Acquisition reflects residual fee purchased from private landowner on lands that already have existing public NRCS-WRP easement.
- (5) Includes 5 acres of no cost permanent and 125 acres of temporary easement obtained from State of Missouri.
- (6) No cost temporary construction easement obtained from State of Missouri.
- (7) Acreage includes lands considered 'Navigational Servitude'.
- (8) No cost license obtained from USFWS.

**TABLE 7**

**SUMMARY OF ALL LANDS ACQUIRED  
(AS OF 30 SEP 04)**

State	Non-Public Lands Acquired (ac)	Public Lands Acquired (ac)	Total Lands Acquired (ac)	Authorized Amount (ac)	Percentage of Authorized Amount (%)
Iowa	5,180	5,120	10,300	23,725	43
Nebraska	7,408	133	7,541	26,652	28
Kansas	2,111	0	2,111	11,632	18
Missouri	13,899	7,893	21,792	104,741	21
<b>TOTAL</b>	<b>28,598</b>	<b>13,146</b>	<b>41,744</b>	<b>166,750</b>	<b>25</b>

## **HABITAT DEVELOPMENT (FY04 and Prior)**

### **Habitat Development Goals**

In accordance with the existing Project Management Plan, the Preferred Alternative of the Supplemental Environmental Impact Statement and other documents created during the course of this Project, habitat goals have been developed. The Project will preserve existing or restore lost and degraded natural habitats along the Missouri River. The natural habitats consist of riverine, wetland and upland habitats that support native species of vegetation for fish and wildlife within the floodplain. The Project will preserve and restore riverine habitats including diversity within the main river channel, side channels and chutes, backwater areas, sandbars, and islands. The Project will also preserve and restore wetland habitats such as scour holes and emergent, scrub-shrub, and forested wetlands. And, the Project will preserve and restore terrestrial floodplain habitats such as grasslands, scrub-shrub, forested, and mixed open lands. In summary, the habitat development goals implemented to date can be stated as follows:

- Create native and diverse habitats
- Preserve and improve riverine habitats and processes
- Preserve and restore wetland habitats
- Preserve and restore upland terrestrial habitats
- Create opportunities to reconnect the floodplain to the river
- Create areas that will require mostly passive management

To date, the Project has not focused on one species type. Rather, habitat diversity placing appropriate mixes of each habitat type on individual sites is a Project goal. Additionally, a mix of fully mature, early successional, and newly planted vegetation has been encouraged.

Because of the flood prone nature of these lands, extensive capital improvements have been avoided. Modest developments that feature low or moderate management have been encouraged. The infrastructure constructed has been limited to that needed to support habitat development, encourage fish and wildlife use, and ensure long term habitat success. This has included berms, water control structures, pumps, and other features that require only low management levels.

Where possible, damaged levees have not been rebuilt. Several existing interior levees have been altered or removed so flood waters can regain access to the flood plain and exert some of their historic influence in creating and shaping riverine resource communities. Dike structures in the river channel have been altered so that river flows create shallow areas along the bank line. Terrestrial areas have been reshaped to diversify the landscape. Native vegetation has been planted in areas that will support them.

The Project has strived for passive, self-sustaining mitigation sites. Reforestation activities have assumed the passive character of natural succession. Grasslands will be encouraged to regenerate with only minor land management such as burning. The natural force of the river has been used

as much as possible to reshape areas in the dike fields and carve out side channels and chutes. Assured water for managed wetland areas has been limited to the growing season and migratory periods as much as possible. Early successional vegetation as well as areas for open land has been incorporated on suitable sites.

### **Habitat Development Status**

Habitat development or preservation to date has been undertaken at 28 sites to date. As shown in Table 1, the Corps of Engineers has expended 37% of the funds received for the Project, or \$36,775,000, on habitat development activities. The development has been accomplished primarily through three types of construction. Several developments have been completed by Corps of Engineers in-house work forces. Many native plantings, small water control projects, and minor construction has been completed by partner land management agencies such as Missouri Department of Conservation or US Fish and Wildlife Service. And larger developments have been completed through construction contracts.

Development of riverine aquatic habitat has been accomplished at numerous mitigation sites. This effort has emphasized development of side channels and chutes and completing within-river improvements. This was accomplished primarily by dike notching, river structure modifications, bank sloughing, excavation, and dredging. Through 30 Sep 04, river structure modifications have been made at 17 mitigation sites, and side channels have been preserved, re-opened, or work has been started, at 16 mitigation sites.

Through 30 Sep 04, wetland habitats have been created or work has been started, at 14 mitigation sites. Development of this terrestrial aquatic habitat has been accomplished by construction of low dikes, berms, wells, pumps, water delivery systems, and drainage control structures.

Through 30 Sep 04, native forest and prairie grassland habitats have been planted at 13 mitigation sites. Development of upland terrestrial habitat such as bottomland forest and prairie grassland habitats has been a key to the restoration of the ecosystem of the Missouri River. Upland habitat supports food plot establishment, nesting cover, insect production, and a whole array of necessary biological functions to keep the ecosystem alive and functioning. Development of upland habitat has been dependent upon the type of existing land use and management objectives. The terrestrial habitat development to date has included vegetative plantings, water control, and land grading.

As of 30 Sep 04, reconnecting floodplain habitats to the river have been completed, or work started, at 13 mitigation sites. Several mitigation sites had levees that were close to the river channel. In some cases, the levee was moved landward from the Missouri River. At some locations, such as Overton North, an existing levee was breached in several places to allow high flows to inundate terrestrial habitats and provide valuable organic matter to the river's water. At many locations, side channels have been developed to encourage high flows to spread out across the floodplain.

Table 8 displays the different types of development activities that have been undertaken at the 36 different mitigation sites established to date. These developments have been coordinated with the Agency Coordination Team to assure appropriate mitigation efforts have been implemented.

**TABLE 8**

**HABITAT DEVELOPMENT ACTIVITIES BY SITE  
(AS OF 30 SEP 04)**

Site Name	River Structure Mod	Side Channel/ Backwater	Floodplain Reconnection	Water Control	Plantings	Other	Undeveloped
Winnebago Bend, IA	X	X	X	X			
Blackbird Bend, IA							X
Tieville-Decatur Bends, IA/NE		X	X	X			
Louisville Bend, IA		X	X	X			
California Bend, IA	X	X	X				
Tobacco Island, NE	X	X	X		X		
Noodleman Island, IA							X
Auldon Bar, IA							X
St. Mary's Island, IA							X
Copeland Bend, IA				X			
Hamburg Bend, NE	X	X	X	X			
Lower Hamburg Bend, IA/MO	X	X	X	X	X		
Kansas Bend, NE		X	X				
Nishnabotna, NE/MO				X	X		
Langdon Bend, NE	X	X	X				
Deroin Bend, MO		X	X	X	X		

**TABLE 8, Continued**

<b>Site Name</b>	<b>River Structure Mod</b>	<b>Side Channel/ Backwater</b>	<b>Floodplain Reconnection</b>	<b>Water Control</b>	<b>Plantings</b>	<b>Other</b>	<b>Undeveloped</b>
Corning, MO				X	X		
Thurnau, MO				X	X		
Rush Bottom Bend, MO					X		
Wolf Creek Bend, MO							X
Monkey Mountain, MO	X				X		
Worthwine Island, MO	X	X	X				
Benedictine Bottoms, KS	X			X	X		
Weston Bend, MO	X						
Grand Pass, MO	X	X					
Franklin Island, MO	X						
Diana Bend, MO	X						
Overton Bottoms – North, MO	X	X	X		X		
Overton Bottoms – South, MO	X			X	X		
Rocheport Cave, MO						X	
Eagle Bluffs, MO		X	X	X			
Plowboy Bend, MO	X						
Marion Bottoms, MO	X						
Tate Island, MO		X					
Berger Bend, MO					X		
Columbia Bottom, MO		X	X	X	X		
<b>Number of Sites</b>	<b>17</b>	<b>16</b>	<b>13</b>	<b>14</b>	<b>13</b>	<b>1</b>	<b>5</b>

## Existing Habitat Assessment

There have been 41,744 acres of land acquired at 36 different mitigation sites to date. As discussed above, the Project has completed many habitat developments that have lead to changes in the land covers and land use of the associated lands. During FY04, the Corps of Engineers began an effort to assess the existing habitats to establish a baseline condition from which long-range habitat changes can be measured. The information is being captured in a GIS database.

The habitat assessment is utilizing standardized, national classification systems to define the different habitat types that exist on the Project lands. Aquatic and wetland habitats are classified using the National Wetland Inventory (NWI) and the upland habitats are classified using the National Land Cover Data (NLCD) classification system. The combined classification system is explained in Table 9 below.

**TABLE 9**

**PROJECT HABITAT CLASSIFICIATION SYSTEM**

<b>Habitat Type</b>	<b>Description</b>
Aquatic	In Channel
Aquatic	Side Channel
Aquatic	Backwater
Aquatic	Scour/Blew Holes
Aquatic	Tributary streams
Wetland	Emergent Wetlands
Wetland	Scrub-shrub Wetlands
Wetland	Forested Wetlands
Upland	Barren
Upland	Grassland
Upland	Shrubland

**TABLE 9, Continued**

<b>Habitat Type</b>	<b>Description</b>
Upland	Forest
Upland	Cropland and Levees
Upland	Orchards and Vineyards
Upland	Developed

The assessment of the existing wetland and upland habitats has been completed for five mitigation sites. The amounts of the different habitats on the Columbia Bottom, Berger Bend, Tate Island, Grand Pass, and Benedictine Bottoms mitigation sites are displayed in Table 10. The remaining sites will be completed during FY05. Additionally, an effort to quantify the amount of riverine habitat along each mitigation site within the Missouri River main channel has not been attempted yet. This effort will also begin in FY05. Updated amounts of habitats for all mitigation sites will be listed in future Annual Implementation Reports. The annual update of habitat changes will be able to be seen by comparing the annual reports.

Location maps for all of the mitigation sites can be found in Appendix 1. Additionally, detailed descriptions of each mitigation site with photos and maps, etc. have been placed in Information Papers for each site. The information papers are included in Appendix 2 to this report.

**TABLE 10**

**ACREAGE AMOUNT OF HABITATS  
DISTRIBUTION BY SITE  
(AS OF 30 SEP 04)**

<b>Habitat</b>	<b>Benedictine Bottoms, KS</b>	<b>Grand Pass, MO</b>	<b>Tate Island, MO</b>	<b>Berger Bend, MO</b>	<b>Columbia Bottom, MO</b>	<b>TOTAL</b>
In Channel	(1)	(1)	(1)	(1)	(1)	(1)
Side Channel	0	4	81	0	105	190
Backwater	0	0	0	0	0	0
Scour/Blew Holes	2	0	0	8	3	13
Tributary streams	7	0	0	0	0	7
Emergent Wetlands	521	1	0	42	333	897
Scrub-shrub Wetlands	0	0	16	60	41	117
Forested Wetlands	0	30	238	40	731	1,039
Barren	0	0	0	0	31	31
Grassland	698	0	0	60	154	912
Shrubland	762	0	0	50	0	812
Forest	35	0	9	32	0	67
Cropland and Levees	93	0	0	152	2,769	3,014
Orchards and Vineyards	0	0	0	0	0	0
Developed	1	0	0	0	47	48
<b>TOTAL (2)</b>	<b>2,119</b>	<b>35</b>	<b>344</b>	<b>444</b>	<b>4,214</b>	<b>7,156</b>

(1) The amount of riverine habitat within the main river channel has yet to be estimated.

(2) The total acreage of habitats may not equal the amount of real estate acquired for the different areas. The real estate acquired is based upon legal description at the time the land was acquired. The habitat assessment acres may include portions of the river, etc. that would not match the real estate acquired.

## **OPERATION AND MAINTENANCE (FY04 and Prior)**

There are two types of Operation and Maintenance (O&M) activities for the Project. The first is "O&M During Construction (O&MDC)". O&MDC begins immediately after sites are acquired. O&MDC activities include basic land management, vegetative plantings, weed control, etc. These activities are typically performed while additional studies, designs, and/or construction are being completed. Sometimes O&MDC may extend several years while additional funds are appropriated to purchase adjacent lands or develop habitats. There are currently fifteen sites in O&M During Construction status.

Funding for sites that require O&MDC are provided from Construction, General (CG) type funds. CG funds are accounted for against Project funding. The work is usually performed by Corps of Engineers in-house work crews or by the land management agency that has entered into a Cooperative Agreement with the Corps to manage the site for fish and wildlife purposes. Any revenues that are raised from leasing the site will offset the O&MDC costs. If funds are needed by an agency other than the Corps of Engineers for O&MDC, the funds are requested and approved from the Corps on an annual basis via an Annual Management Plan process. Requests are usually made in the summer for work planned for the following fiscal year (Oct through Sep). As shown in Table 1, the Corps of Engineers has expended 2% of the funds received for the Project, or \$1,852,000, on O&MDC activities.

The second type of O&M is long term Operation and Maintenance that is on going for the life of the Project. Sites are considered to be in an O&M phase once constructed features have been completed and are accepted as complete by all parties. Sites can also be considered in an O&M phase when areas have been planted and are in a healthy growing condition. The constructed features and habitat areas must be operated and maintained to assure that maximum habitat value is achieved. Therefore, O&M funds are provided for this purpose. O&M type funds are not a part of CG funding and do not count against the Project costs. There are currently 16 sites utilizing long-term O&M funds.

On a typical site, long-term O&M requirements are estimated initially during the design phase. An O&M manual is then developed during the construction phase with the party responsible for administering the O&M at the particular site. An O&M manual will define the entity that will do the maintenance, the degree of Corps responsibility, schedule and procedure requirements, etc. After construction of features or habitats at a site, a cooperative agreement will be executed between the Corps and the party responsible for administering the O&M. The cooperative agreement will document the long-term O&M responsibilities. Similar to O&M During Construction funds, if funds are needed by an agency other than the Corps of Engineers for long term O&M, the funds are requested and approved from the Corps on an annual basis via an Annual Management Plan process.

To date, the Corps has funded 100 percent of the O&M of the mitigation features and habitat lands developed under this Project, whether the sites are in O&M During Construction or long term O&M status. For mitigation that has occurred on properties not owned by the Corps, O&M

will only be conducted on those portions of the property in which mitigation occurred and only for those features that were constructed by the Project. In most instances, the funds are forwarded to the land managing agency for the work to be accomplished by their work force.

As of 30 Sep 04, there were 36 mitigation sites that have been established. Of the total number of sites, 10 have not had any O&M performed on them to date. There are 14 sites that are undergoing short-term land management and habitat development using O&M During Construction funds. Also, there are 16 sites which have had habitat developed or preserved and are now considered to be in a long term O&M phase. A summary of the O&M Activities that has taken place to date at all mitigation sites is described in Table 11, below.

**TABLE 11**  
**OPERATION AND MAINTENANCE ACTIVITIES BY SITE**  
**(AS OF 30 SEP 04)**

Site	Fund Type	Description of O&M	Responsible Party
Winnebago Bend, IA	O&M	Maintain all structures, pumps, fences, signs and roadways. Provide land management, habitat preservation and law enforcement.	IDNR
Blackbird Bend, IA	--	None (to be started in FY06)	COE
Tieville-Decatur Bends, IA - NE	--	Maintain all structures, pumps, fences, signs and roadways. Provide land management, habitat preservation and law enforcement.	COE
Louisville Bend, IA	O&M	Maintain all structures, pumps, fences, signs and roadways. Provide land management, habitat preservation and law enforcement.	IDNR
California Bend, IA	O&M	Maintain all structures, fences, signs and roadways. Provide land management, habitat preservation and law enforcement.	IDNR
Tobacco Island, NE	O&M	Basic land management, inspection of chute development.	NGPC
Noodleman Island, IA	CG	Provide land management, habitat preservation, and law enforcement.	IDNR
St. Mary's Island, IA	--	None (to be started in FY08)	COE

**TABLE 11, Continued**

<b>Site</b>	<b>Fund Type</b>	<b>Description of O&amp;M</b>	<b>Responsible Party</b>
Auldon Bar, IA	CG	Provide land management, habitat preservation, and law enforcement.	IDNR
Copeland Bend, IA	CG	Provide land management, habitat preservation, and law enforcement.	IDNR
Hamburg Bend, NE	O&M	Maintain structures, fences, signs and roadways. Provide land management, habitat preservation and law enforcement.	NGPC
Lower Hamburg, IA/MO	CG	Land management, tree and grass planting, existing habitat preservation, water control, weed control, controlled burning, food plots.	MDC
Kansas Bend, NE	--	None (to be started in FY06).	COE
Nishnabotna, NE/MO	CG	Land management, existing habitat preservation, vegetative plantings, water control, weed control, food plots	MDC
Langdon Bend, NE	O&M	Maintain all structures, pumps, fences, signs and roadways. Provide land management, habitat preservation, and law enforcement.	NGPC
Deroin Bend, MO	CG/ O&M	Tree plantings, access road improvement, controlled burning, weed control	MDC
Corning, MO	CG	Basic land management, weed control, vegetative plantings.	MDC
Thurnau, MO	CG	Land management, weed control, vegetative plantings, water control, food plots.	MDC
Rush Bottom Bend, MO	CG	Land management, weed control, vegetative plantings, food plots.	MDC
Monkey Mountain, MO	--	None (to be started in FY05).	COE
Wolf Creek Bend, MO	--	None (to be started in FY05).	MDC

**TABLE 11, Continued**

Site	Fund Type	Description of O&M	Responsible Party
Worthwine Island, MO	--	None (to be started FY06)	MDC
Benedictine Bottoms, KS	O&M	Wetland management, infiltration control, tree planting, weed control, pumping, controlled burning.	KDWP
Weston Bend, MO	--	None (to be started in FY05)	COE
Grand Pass, MO	O&M	River structure maintenance and surveillance	COE
Franklin Island, MO	--	None (to be started in FY05)	COE
Diana Bend, MO	--	None (to be started in FY05)	COE
Overton Bottoms North, MO	CG/ O&M	Native grass and tree plantings, weed control, surveillance of constructed chute, signage.	USFWS
Rocheport Cave, MO	CG/ O&M	Debris removal, access road maintenance	MDC
Overton Bottoms South, MO	CG/ O&M	Basic land management, wetland habitat development, weed control, food plots.	MDC
Eagle Bluffs, MO	O&M	Management of wetland pool elevations, water control structures, weed control, mowing, food plots.	MDC
Plowboy Bend, MO	O&M	River structure maintenance and surveillance	COE
Marion Bottoms, MO	O&M	River structure maintenance and surveillance	COE
Tate Island, MO	O&M	Habitat preservation, signage	MDC
Berger Bend, MO	CG	Habitat preservation, weed control, vegetative plantings, and food plots.	COE
Columbia Bottom, MO	CG	Land management, weed control, vegetative plantings, water control, food plots.	MDC

CG = O&M During construction paid for with "Construction, General" funding, O&M = Long term O&M paid for out of COE O&M funding (not a project cost), COE = Corps of Engineers, MDC = Missouri Department of Conservation, KDWP = Kansas Department of Wildlife and Parks, IDNR = Iowa Department of Natural Resources, NGPC = Nebraska Game and Parks Commission, USFWS = U.S. Fish and Wildlife Service.

## **MONITORING AND EVALUATION (FY04 and Prior)**

Because many of the mitigation features of the Project will be constructed as opposed to created naturally over time, it is important to complete monitoring and evaluation (M&E). By monitoring the mitigation sites and collecting basic habitat data, the Corps and the Agency Coordination Team can determine whether the mitigation sites are performing as expected.

However, the Project is a construction effort intended to purchase lands and convert them into fish and wildlife habitats. The Project is not intended to complete studies or research programs. Therefore, funding for M&E has been limited prior to FY03. In the future, the Cost Report to Congress allowed for 6% of the total amount appropriated to be utilized for monitoring efforts.

As of 30 Sep 04, only minimal M&E activities have been completed. As shown in Table 1, the Corps of Engineers has expended approx. 1% of the funds received for the Project, or \$705,000, on monitoring activities. This includes periodic inspections of completed habitats. Some site specific data has been collected such as a three-year fisheries study performed under contract with the State of Nebraska, limited funding of efforts at Benedictine Bottoms through the Benedictine University, pallid sturgeon micro model studies with the St. Louis District, USFWS studies on songbirds and turtles at the Overton North site, physical monitoring of the Overton North chute, aerial photography, and benthic fish population assessments within the Missouri River.

Beginning in FY03, the Corps began working with the Agency Coordination Team to develop an M&E Plan to guide the expenditures of Project funds on monitoring activities. A draft plan was completed in FY04. The plan outlines that during the planning and design phase, specific goals and objectives will be determined for each site and monitoring criteria for meeting these objectives will be established. After construction, monitoring will be conducted on the various aspects of each site in order to assess the degree of success of the habitat development. In accordance with the plan, land managers will perform the M&E. Monitoring results will be collected at some sites on an annual basis and at others at a less frequent interval, depending on the objectives of the specific site. Project performance will be reported in future Annual Implementation Reports.

Establishing baseline habitat conditions will be the early focus of the monitoring program. The habitat classification system and habitat assessment effort described earlier in this report are being completed using Monitoring funds. The physical monitoring of the changes in habitats will be tracked in a GIS database that will be shared with managing agencies. The start of this effort is displayed in Tables 9 and 10, above.

## PLANNED MITIGATION EFFORTS FOR FY05

### FUNDING (FY05)

As of the writing of this Annual Implementation Report, a final FY05 budget for the Project has not been approved. The Federal government started FY05 operating under a continuing resolution authority while Congress completed FY05 appropriations. Therefore, the information in this section of the report is assumed. Actual FY05 funding amounts will be reflected in the next Annual Implementation Report and tracked during FY05 at the quarterly Agency Coordination Team meetings for the Project.

The President's Budget for FY05 included a proposal by the Corps of Engineers to change the Project authorization for the FY05 funding period. The Corps' proposal would extend the area in which efforts could be completed to include the area upstream of Sioux City, IA to Fort Peck, MT. The Corps' proposal would also focus most of the funds on endangered species, meeting the requirements of the 2003 Biological Opinion, and the preferred alternative for the Missouri River Master Manual. This is a great departure to the currently authorized Project. The President's Budget included \$69,000,000 for the new authorization in FY05. The Corps developed the \$69M amount based upon \$23.5M for the efforts underway following the existing authorization, plus \$45.5M for additional efforts that are currently out of scope but needed to meet ESA, Bi-Op, and/or Master Manual requirements.

The House of Representatives have completed their review of the President's proposed budget and authorization change proposal. An amount of \$18,000,000 was recommended in the House Report to be expended on mitigation that is currently within project authorization. This is the same amount of funding that was appropriated for the Project in FY04. The proposal to change the authorization was not approved in the House Report.

As of the writing of this report, the FY05 appropriation is currently under review by the Senate Appropriation Committee. It is anticipated that the Senate will not complete their report until after 1 Jan 05. Also, if the Senate approves the Corps proposal to utilize FY05 funds for out of scope items, the House of Representatives will need to reevaluate and approve the change in a Conference Committee prior to a final FY05 appropriation bill being passed.

Therefore, the FY05 budget is very uncertain. Based upon the above, the Corps has assembled a preliminary budget for FY05. This is displayed in Table 12. The budget assumes an amount of \$23,500,000 will be appropriated for the existing authorized purposes. No attempt is made herein to estimate what will be completed with any additional funds that may be appropriated and authorized to expend on currently out of scope activities.

**TABLE 12**

**ESTIMATED FUNDING FOR FY05**

<b>Task</b>	<b>CENWK (1,000)</b>	<b>CENWO (1,000)</b>	<b>TOTAL (1,000)</b>	<b>% of Appropriated Amount (1,000)</b>
Land Acquisition	\$2,705	\$3,800	\$6,505	28
Planning, Engineering, and Design	1,050	370	1,420	6
Habitat Development (Construction)	8,570	4,890	13,460	57
Construction Management	300	300	600	3
O&M During Construction	200	140	340	1
Monitoring and Evaluation	675	500	1,175	5
<b>TOTAL</b>	<b>\$13,500</b>	<b>\$10,000</b>	<b>\$23,500</b>	<b>100</b>

It must be noted that the Congress has not fully funded the Corps budgets in the past. An amount of “savings and slippage” has had to be applied to Corps projects in order to account for the amount of funds actually given by Congress. For instance, the past two years Congress has only given the Corps approximately 80% of the amount of funds it “appropriates”. Therefore, a savings and slippage amount of approximately 20% has been applied to all appropriations. The information in Table 12 does not include any estimated reduction for “savings and slippage”. Actual FY05 funding amounts will be reflected in the next Annual Implementation Report and tracked throughout FY05 at the quarterly Agency Coordination Team meetings for the Project.

**REAL ESTATE (FY05)**

As of September 30, 2004, there remains a total of 124,911 acres of lands authorized for acquisition. These acres are authorized in all four states. Therefore, if funds are appropriated for the Project and the authorization does not change for FY05, the Corps estimates spending 28% of the amount of funds appropriated on Real Estate activities. The goal for FY05 is to acquire 4,000 new acres for the Project.

During FY05, the Corps will undertake several efforts to purchase additional land from private willing sellers. Willing seller efforts will continue in all four States. Current ownership

information will be updated and many landowners will be contacted to inquire if they are willing to sell their property. An amount of \$6,005,000 is estimated to be available in FY05 for real estate activities (pending final appropriation and savings and slippage).

In Iowa, letters were sent to nearly all private landowners owning land along the river during FY03. Follow-up with these owners will continue during FY05. In addition to the willing seller effort, the Corps will be focused on acquiring lands in several specific areas in FY05. Additional non-public lands are being sought at Copeland Bend to compliment the lands that are already owned there. The Corps will be working with NRCS and IDNR at this location. Additional efforts will be undertaken to obtain additional lands at St. Mary's Island, Auldon Bar, Noddleman Island, Soldier Bend and Blackbird Bend.

In Nebraska, letters were sent to nearly all private landowners owning land along the river during FY03. Follow-up with these owners will continue during FY05. In addition to the willing seller effort, the Corps will be attempting additional site-specific acquisitions at Langdon Bend, Kansas Bend, and Tobacco Island. The Corps will also finalize real estate agreements with the Omaha Tribe at Hole in the Rock and the Winnebago Tribe at Glovers Point to complete mitigation on their lands during FY05.

In Kansas, the Corps will continue to pursue willing sellers. The Corps and the Kansas Department of Wildlife and Parks are continuing an effort to identify several areas where there is good restoration potential. The restoration potential for Kansas' lands along the Missouri River will be placed into a GIS database in FY05. The Corps has sent willing seller questionnaires to several owners and follow up on this will continue in FY05. Additional opportunities to expand the area at Benedictine Bottoms will be pursued. New acquisitions will be pursued in Doniphan County during FY05. The Corps will also meet regularly with KDWP and the NRCS to keep informed on progress of acquisition efforts.

In Missouri, the Corps will continue to work with Missouri Department of Conservation and the US Fish and Wildlife Service to coordinate willing seller efforts. A GIS database has been developed that identifies the restoration potential of all lands along the river within Missouri. This effort will be extended to include the areas in Kansas during FY05. The Corps will continue to utilize the help of a contractor to identify landowners in the areas that show the most potential for restoration. Focused efforts will be placed on acquiring lands at Aspinwald Bend and Brownville Bend. Additional acquisitions adjacent to the existing sites at Berger Bend, Wolf Creek Bend, Monkey Mountain, Corning, Nishnabotna, and Thurnau sites will be pursued. Additionally, the Corps will continue working with US Bureau of Prisons to obtain the Federal prison farmland on the Missouri side of the river opposite Leavenworth, KS. The Corps will also be seeking to obtain more easements on existing public property at the Marion Bottoms, Eagle Bluffs, Diana Bend, Franklin Island, and Thurnau Conservation Areas.

During FY05, the Corps will also focus on obtaining strips of land along the bank of the Missouri River. This would be for the specific purpose of completing structural modifications to the existing bank protection and navigation dikes. The changes will encourage the river to widen

and create more shallow water habitat in the dike fields. In FY03, the Corps obtained approval to utilize “sloughing” easements. This type of real estate interest allows the Corps to erode portions of the bank while the current landowner maintains ownership. During FY05, the areas immediately adjacent to the river that are needed to improve riverine diversity will be sought in either fee title or sloughing easement from both private and public owners.

## **HABITAT DEVELOPMENT (FY05)**

In FY05, an amount of \$15,480,000 is estimated to be available for habitat development (pending final appropriation and savings and slippage). This includes \$2,020,000 for engineering and management activities and \$13,460,000 for construction. The following is a summary of habitat development activities to be completed by site during FY05.

**Hole in the Rock, NE** - Plans and specifications for installation of several backwater areas at this mitigation site were completed in FY04. In FY05, a construction contract will be advertised and awarded to complete habitat development at this site.

**Glovers Point, NE** - Plans and specifications for installation of a side channel and backwater area at this mitigation site were completed in FY04. In FY05, a construction contract will be advertised and awarded to complete the habitat development at this site.

**Tobacco Island, NE** – The Corps will continue fencing the boundary at this site during FY05.

**Copeland Bend, IA** – The Corps and IDNR will continue to work at creation of opportunistic wetlands at this site. This effort was started in FY03 and will continue through FY05.

**Lower Hamburg Bend, IA/MO** – The Corps will complete an Operation and Maintenance Manual for this site during FY05.

**Kansas Bend, NE** – A construction contract was awarded in FY04 to construct two side channels at this site. The construction will continue through FY05.

**Nishnabotna, NE/MO** – The Corps will be completing an environmental assessment of this site in FY05. The Corps will utilize the preferred alternative from this document to do a detailed design of levee breaching, and water control structures at this site. Additionally, MDC will continue to plant native grasses and trees through the Annual Management Plan process.

**Langdon Bend, NE** – In FY05, the Corps will complete an improved access road and parking area to this site.

**Deroin Bend, MO** – In FY05, the Corps will be working with MDC on modifying the channels connecting the new side channel to the existing scour holes on this site. The work will allow MDC to control flow into and out of the existing location of an old scour hole.

**Corning, MO** – The Corps will be working with MDC and NRCS to continue to plant native vegetation and develop opportunistic wetlands in FY05 at this site.

**Thurnau, MO** – The Corps will be completing an environmental assessment of this site in FY05. The Corps will utilize the preferred alternative from this document to do a detailed design of levee breaching, and water control structures at this site. Additionally, MDC will continue to plant native grasses and trees on the lands already owned at this area.

**Rush Bottom Bend, MO** – Although acquisitions are not complete, the Corps will be completing an environmental assessment of this site in FY05. The Corps will utilize the preferred alternative from this document to do a detailed design of levee breaching, and water control structures at this site. Additionally, MDC will continue to plant native grasses and trees on the lands already owned at this area.

**Worthwine Island, MO** – A construction contract for development of a side channel at this site was awarded in FY04. This habitat development will continue through FY05.

**Diana Bend, MO** – The Corps anticipates obtaining a no cost easement from MDC at this site. The Corps will complete Habitat Restoration Plans and initiate environmental assessment on installation of a fish friendly backwater control structure at this site.

**Overton Bottoms South, MO** – The levee set back will be made operational and turned over to the Overton-Woolridge levee district for O&M beginning in FY05. The Corps will breach the levee at several locations utilizing in-house Corps construction crews. The Corps will complete an Operation and Maintenance Manual for this site during FY05.

**Eagle Bluffs, MO** – The Corps anticipates obtaining a no cost easement for some additional 200 acres from MDC at this site. The Corps will complete Habitat Restoration Plans and initiate environmental assessment for this site during FY05.

**Marion Bottom, MO** – The Corps anticipates obtaining a no cost easement from MDC at this site. The Corps will complete Habitat Restoration Plans and initiate environmental assessment for this site during FY05. The Corps will also work with MDC on development of detailed design of a side channel at this site.

**Berger Bend, MO** – CG Funding in FY05 will be used to continue habitat improvements at this site. Approximately 100 acres of hardwood trees will be planted in the Spring 05. Goal is to turn the property over to MDC by Dec 05. Corps will also be working with NRCS on potential licensing of lands around the existing 60 acres of WRP at this location.

**Columbia Bottom, MO** – A construction contract for installation of a river pump structure was awarded in FY04. This habitat development will continue through FY05. Additionally, funds will be made available to MDC to pay for planting of approximately 1,300 acres of native trees and grasses during FY05 through the Annual Management Plan process.

## **OPERATION AND MAINTENANCE (FY05)**

In FY05, an amount of \$340,000 of Construction, General (CG) funds is estimated to be available for O&M During Construction (pending final appropriation and savings and slippage). The following is a summary of how the CG funds will be spent in FY05.

At sites that have not been placed in a long-term O&M status, O&M During Construction funds will be provided for basic land management, habitat preservation, tree plantings, weed control, and signage. Pending available funds, O&M During Construction will occur at the following mitigation sites in FY05: Noddleman Island, IA; Auldon Bar, IA; Copeland Bend, IA; Lower Hamburg, IA/MO; Nishnabotna, MO; Deroin Bend, MO; Corning, MO; Thurnau, MO; Rush Bottom Bend, MO; Overton Bottoms North, MO; Rocheport Cave, MO; Overton Bottoms South, MO; Berger Bend, MO, and Columbia Bottom, MO. Also, O&M During Construction is anticipated to begin during FY05 at the Wolf Creek Bend, MO and Monkey Mountain, MO sites.

For those sites that have at least partially been placed in an "Operations" status, long-term O&M funds (not counting against the Project cost) will be used to maintain completed features. The types of work included are maintaining constructed structures, pumps, fences, signs and roadways. Also covered are land management activities such as habitat preservation, wetland and infiltration control, and weed control. Pending available funds, long-term O&M will continue during FY05 at the following mitigation sites: Winnebago Bend, IA; Louisville Bend, IA; California Bend, IA; Tobacco Island, NE; Hamburg Bend, NE; Langdon Bend, NE; Deroin Bend, MO; Benedictine Bottoms, KS; Grand Pass, MO; Overton Bottoms North, MO; Rocheport Cave, MO; Overton Bottoms South, MO; Eagle Bluffs, MO; Plowboy Bend, MO; Marion Bottoms, MO; and Tate Island, MO. Also, long term O&M is anticipated to begin at Weston Bend, MO; Franklin Island, MO; and Diana Bend, MO.

## **MONITORING AND EVALUATION (FY05)**

In FY05, an amount of \$1,175,000 of Construction, General (CG) funds is estimated to be available for Monitoring and Evaluation (pending final appropriation and savings and slippage). This amount is 6% of the estimated \$18M annual appropriation for FY05. In FY05, M&E funds will be spent on periodic and/or annual inspections at the mitigation sites that have been placed in an Operation phase. Some site-specific data will be collected to support baseline conditions for shallow water habitat. An effort will be undertaken to initiate fish sampling at selected mitigation sites in Iowa, Nebraska, and Missouri where constructed side channels have been completed. USFWS studies on songbirds, turtles, and native fish will again be funded at the Overton North site. The Corps will complete assessment of existing habitats at the mitigation sites obtained to date. This information will be placed in a report. The Corps will update this report in the future so that changes to the habitats can be monitored over time. Additionally, the Agency Coordination Team will approve the final M&E Plan for the Project during FY05.

**FUTURE MITIGATION EFFORTS,  
FY06 TO COMPLETION**

**FUNDING (FY06 to completion)**

In accordance with the requirements of WRDA99, the Corps of Engineers worked with the Agency Coordination Team to develop a Cost Report to Congress. The Cost Report estimated the amount of funds needed to complete mitigation of the additional 118,650 acres authorized by WRDA99. The cost to complete the Project was estimated to be \$740 million (includes 7,000 acres of shallow water habitat) to \$1.33 billion dollars (includes 20,000 acres of shallow water habitat). These costs were at October 2001 price levels.

It is important to note that all future funding for the mitigation efforts is subject to annual appropriation. Also, due to increasing pressures to focus mitigation efforts on maximizing riverine diversity, the Corps has created budgets based upon constructing the higher goal of 20,000 additional acres of shallow water habitat. Therefore, when seeking annual appropriations in FY06 through completion, the Corps will request funding to meet the higher, \$1.33 billion, total cost. The cost information from the Report to Congress is displayed in Table 13 below.

**TABLE 13**

**ESTIMATED COSTS FROM REPORT TO CONGRESS**

Task	CENWK (1,000,000)	CENWO (1,000,000)	TOTAL (1,000,000)	% of Total Cost
Land Acquisition	\$230	\$120	\$350	26
Planning, Engineering, and Design	110	70	180	14
Habitat Development (Construction)	350	270	620	46
Construction Management	30	20	50	4
O&M During Construction	30	20	50	4
Monitoring and Evaluation	50	30	80	6
<b>TOTAL</b>	<b>\$800</b>	<b>\$530</b>	<b>\$1,330</b>	<b>100</b>

The life of the Project is currently anticipated to last until the year 2042. After inflation is applied, the cost to implement the Project with 20,000 additional shallow water habitat acres is estimated to be \$3.1 billion. The Corps has input this funding stream into the budgetary data for the Project. The budgetary data for the next 5 years and the remainder to completion is displayed in Table 14, below.

**TABLE 14**  
**CURRENT BUDGET FY06 TO COMPLETION**

<b>District</b>	<b>FY06 (1,000)</b>	<b>FY07 (1,000)</b>	<b>FY08 (1,000)</b>	<b>FY09 (1,000)</b>	<b>FY10 (1,000)</b>	<b>FY11 – FY42 (1,000)</b>
Omaha	10,000	15,000	17,000	16,000	23,000	1,026,423
Kansas City	15,000	17,500	22,000	22,000	32,000	1,717,141
<b>TOTAL</b>	<b>25,000</b>	<b>32,500</b>	<b>39,000</b>	<b>38,000</b>	<b>55,000</b>	<b>2,743,564</b>

The budget data in table 14 is subject to change. For instance, while the Corps may request at least \$25,000,000 in funding in FY06, Congress may only appropriate a portion of that. Therefore, this table will be updated annually and changes will be reflected in future Annual Implementation reports.

Also, please note that the figures above do not include any additional costs attributed to the current Corps proposal to change the authorization through the FY05 appropriation bill. For instance, during FY05 an additional \$45.5M is proposed to cover ESA, Bi-Op compliance, and Master Manual requirements that are currently out of scope of the existing authorization. This amount is not included in the long range cost estimate shown in Table 14 for the Project. If the FY05 funding/authorization proposal is approved, then the budgetary information above will need to be adjusted to reflect the increase in funding and total costs.

**REAL ESTATE (FY06 to completion)**

In June 2003, the SEIS process was completed. With the NEPA documentation complete, the Corps is now able to acquire the additional acres authorized by WRDA99. There are 124,911 acres remaining to be acquired for the Project. If the acquisition program is successful in meeting the FY05 goal of 4,000 acres, then there will be approximately 120,911 acres remaining to be acquired from FY06 to completion.

There are currently 36 mitigation sites established which amount to 41,744 acres in lands. This is an average of 1,162 acres per site. Using this average, the Corps will need to establish approx. 104 new sites from FY06 to completion.

Authority to purchase additional lands is available in all four states. It is anticipated that the concerted effort to inform the public of the Project and the update of the willing seller surveys will produce additional willing sellers over time. Also, during FY06 to completion, the Corps will continue to work with the Agency Coordination Team to identify existing public lands in which mitigation efforts can be implemented.

As willing sellers, both private and public, come forward, acquisitions of their properties will be of top priority. During the next 5 to 10 years, real estate acquisitions will take priority over all other Project activities. If funds are provided, it is estimated that the acquisition effort will last for at least 20 years before enough willing sellers are found. In order to meet the authorized amount of lands to mitigate, an average of 6,000 acres of land will need to be acquired per year from FY06 to FY25.

#### **HABITAT DEVELOPMENT (FY06 to completion)**

Provided that annual appropriations continue from FY06 to completion of the Project, the Corps anticipates that an additional 104 sites will be established. Since the Project is estimated to last until FY42, habitat must be developed on approximately three mitigation sites per year to complete the mitigation efforts. From FY06 to completion, modification of existing river structures and excavation of side channels and backwater areas will continue to be a priority for habitat development. Additional opportunities for reconnecting the floodplain with the river will be undertaken at all possible locations. Set back and breaching of existing levees will be undertaken. Vegetative plantings and other land management practices to develop native habitats to terrestrial areas will also continue. Also, the Corps will continue to strive for passive, self-sustaining habitat designs for all habitat types.

#### **OPERATION AND MAINTENANCE (FY05 to completion)**

If funds are provided from FY06 to completion of the Project, the Corps of Engineers will be establishing many new mitigation sites. As is current practice, the States will be asked to provide annual management plans in order to receive Federal funds for maintenance of constructed features of the Project. O&M of the mitigation sites will remain 100% Federal funded.

It was estimated in the Cost Report to Congress that the O&M requirements would incrementally increase over time to reach an amount estimated to be \$5 million per year by the time the Project is fully constructed. This amount was estimated based on only passive, self-sustaining habitat areas being constructed by the Project.

## **MONITORING AND EVALUATION (FY05 to completion)**

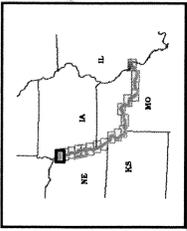
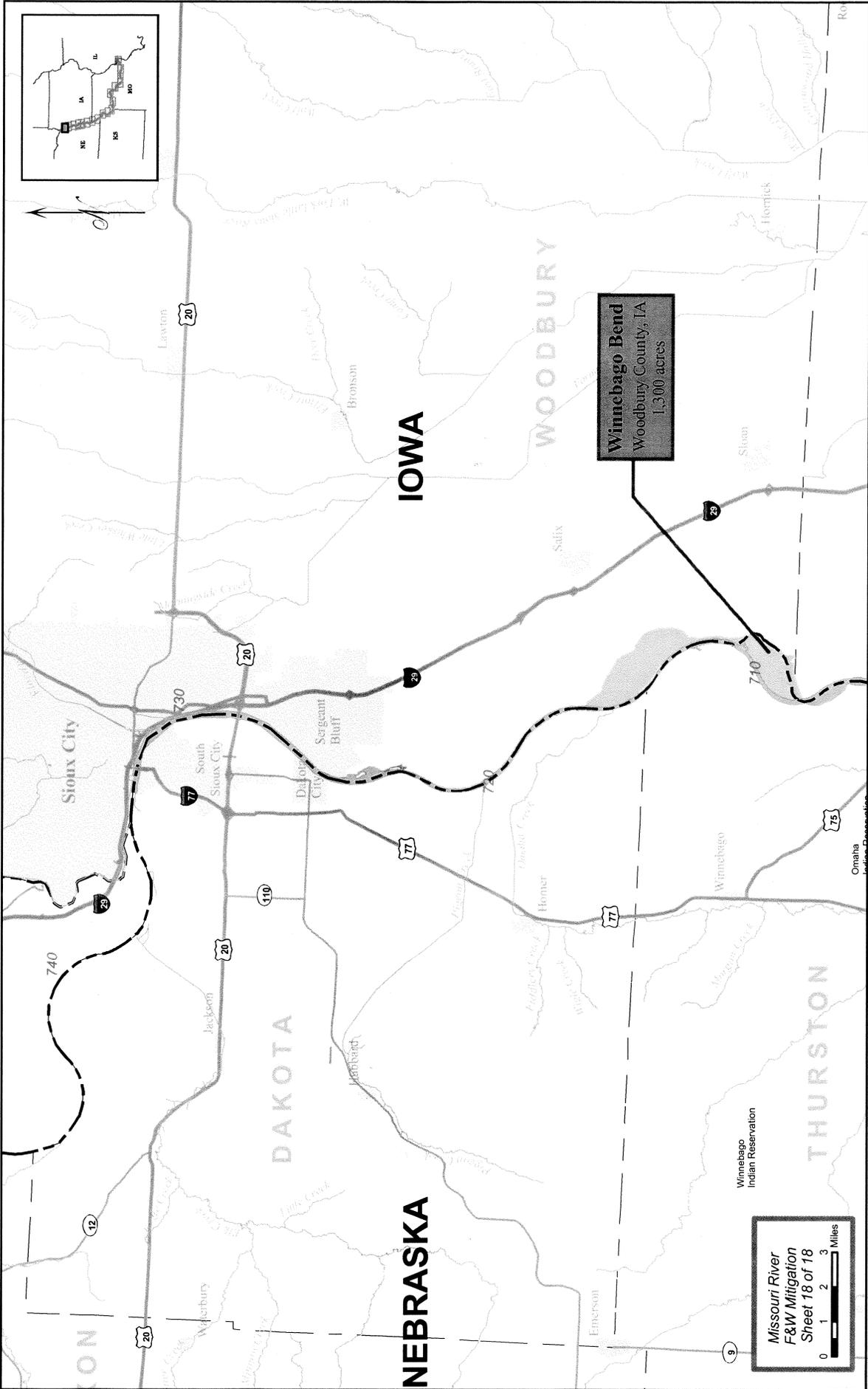
The SEIS calls for a detailed Monitoring and Evaluation (M&E) effort to be funded by the Project. The M&E effort will be used to support adaptive management of established mitigation sites. Participation of the Agency Coordination Team is considered essential to understanding and agreeing upon adaptive management needed to keep established mitigation sites healthy and productive.

If funds are provided in FY06 to completion, M&E efforts will continue to be based on the entire Missouri River floodplain ecosystem. No one species will be concentrated upon. Rather, a holistic approach must be taken to assure that a portion of the form and function of the river is restored. It was estimated in the Cost Report to Congress that an amount of 6% of the total funds appropriated will be needed to fund M&E activities.

During the planning and design phase of new mitigation sites, the Corps will establish habitat baselines for the sites. Some baseline data may be collected on biologic use of the area. Once habitat development takes place on the site, the Corps will work with the land manager for the individual sites to determine appropriate monitoring efforts needed to be taken to see that the mitigation site is performing as designed. On typical sites, monitoring will be limited to measuring the physical changes of the habitats over time. On selected sites, monitoring of biologic response, such as fish or bird usage will be measured. Monitoring results will be collected at some sites on an annual basis and less frequently at others. Results of monitoring efforts will be posted to the Project website and summarized in future Annual Implementation Reports.

**APPENDIX 1  
SITE LOCATION MAPS**





**Winnabago Bend**  
Woodbury County, IA  
1,300 acres

Missouri River  
F&W Mitigation  
Sheet 18 of 18

0 1 2 3 Miles

IOWA

WOODBURY

DAKOTA

NEBRASKA

THURSTON

Sioux City

South Sioux City

Sergeant Bluff

DuBois

Homer

Winnabago

Omaha

Laverton

20

20

29

77

110

77

75

12

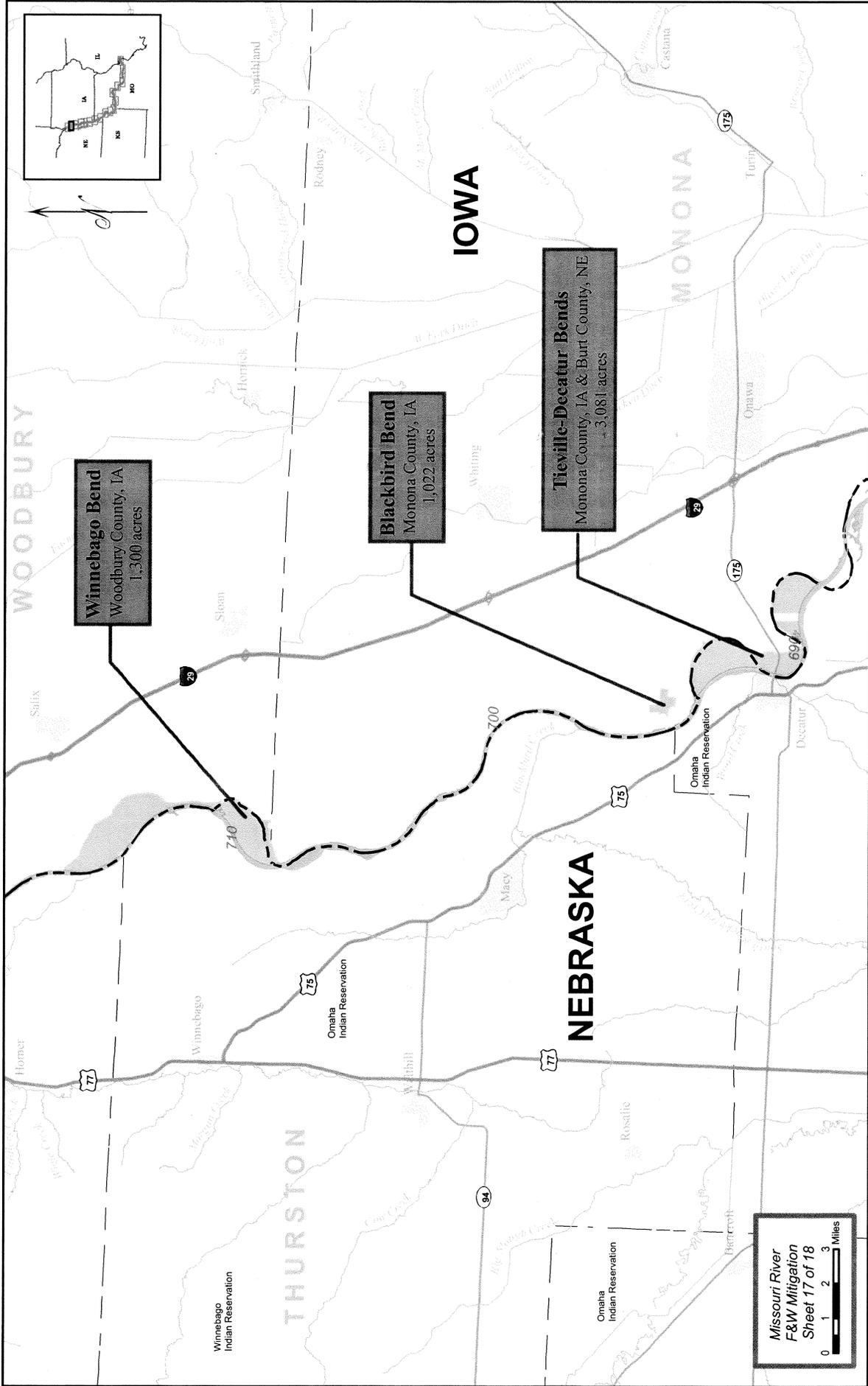
20

9

Sloan

Horstet

Ro



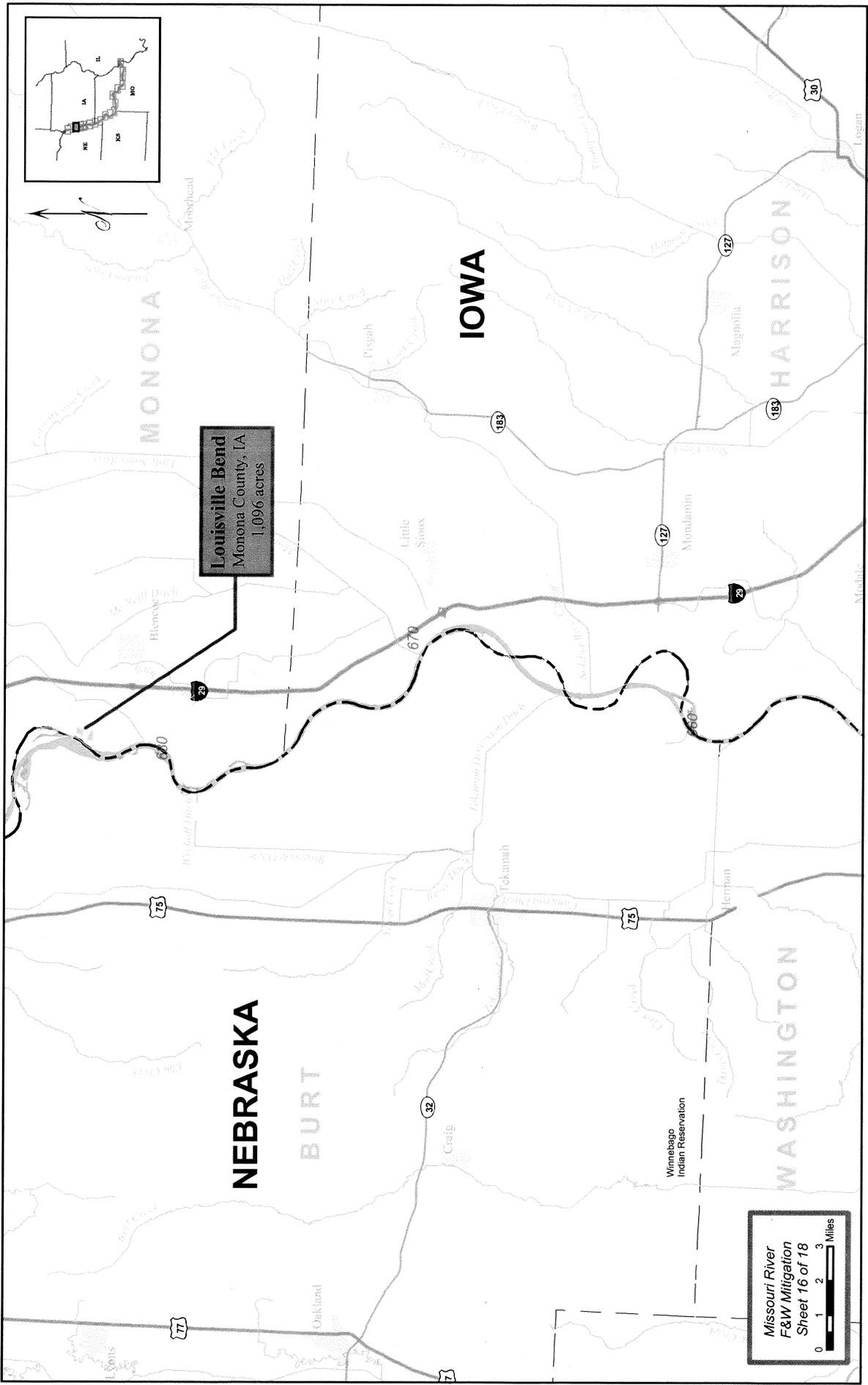
**Winnebago Bend**  
Woodbury County, IA  
1,300 acres

**Blackbird Bend**  
Monona County, IA  
1,022 acres

**Tieville-Decatur Bends**  
Monona County, IA & Burr County, NE  
3,081 acres

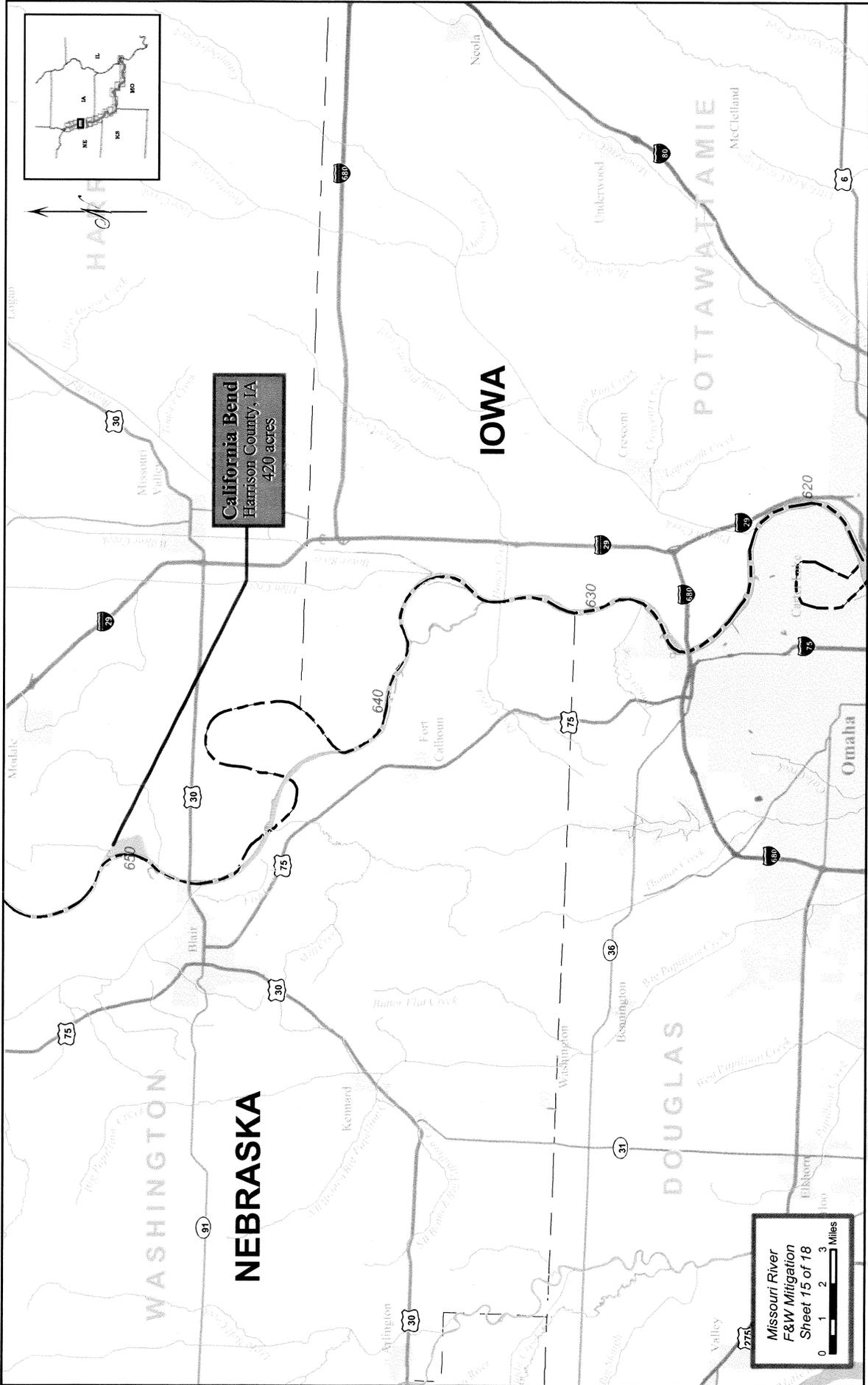
Missouri River  
F&W Mitigation  
Sheet 17 of 18

0 1 2 3 Miles



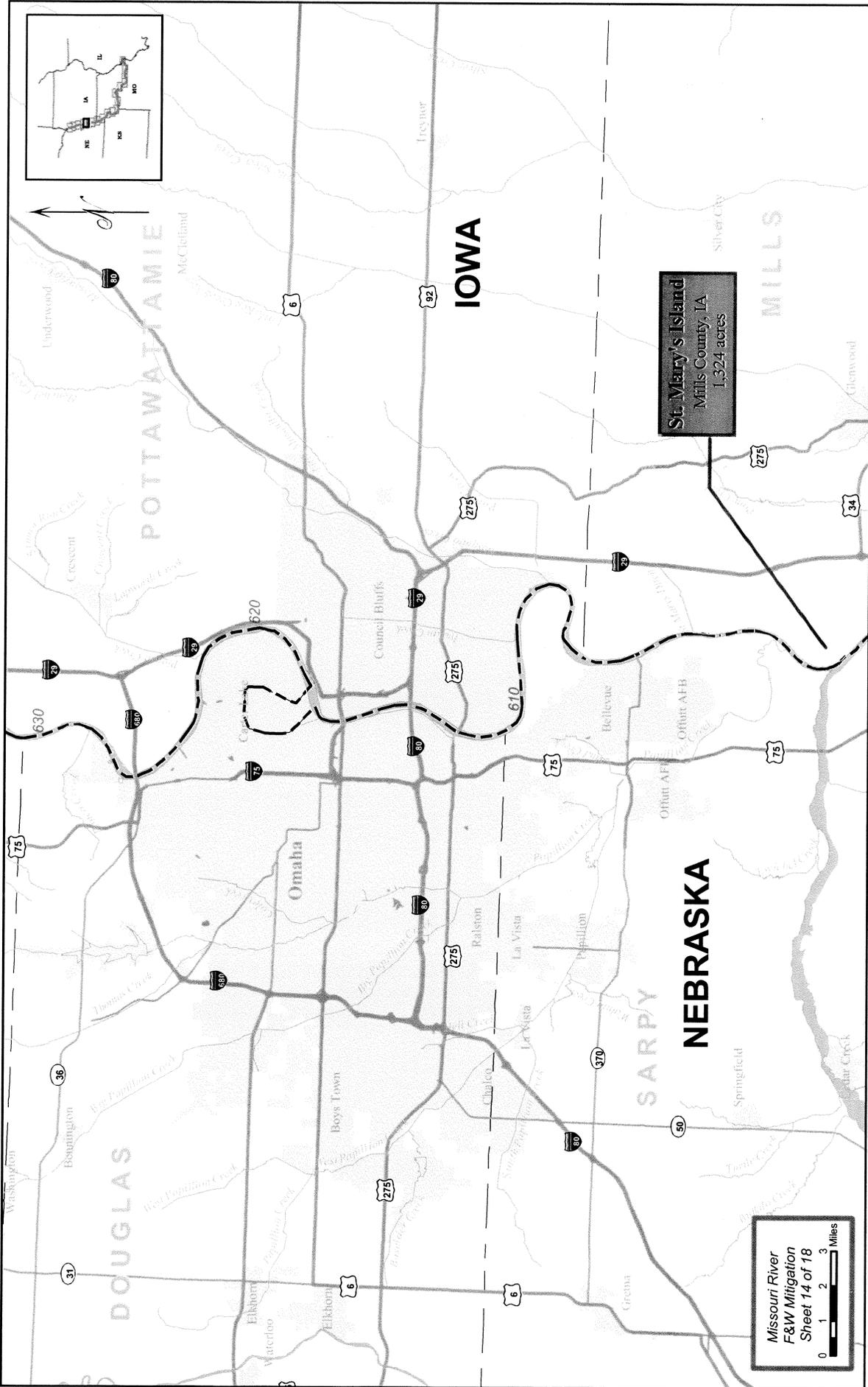
**Louisville Bend**  
Monona County, IA  
1,096 acres

Missouri River  
F&W Mitigation  
Sheet 16 of 18  
0 1 2 3 Miles



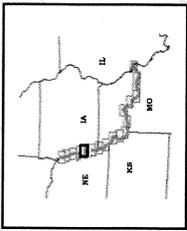
**California Bend**  
Harrison County, IA  
420 acres

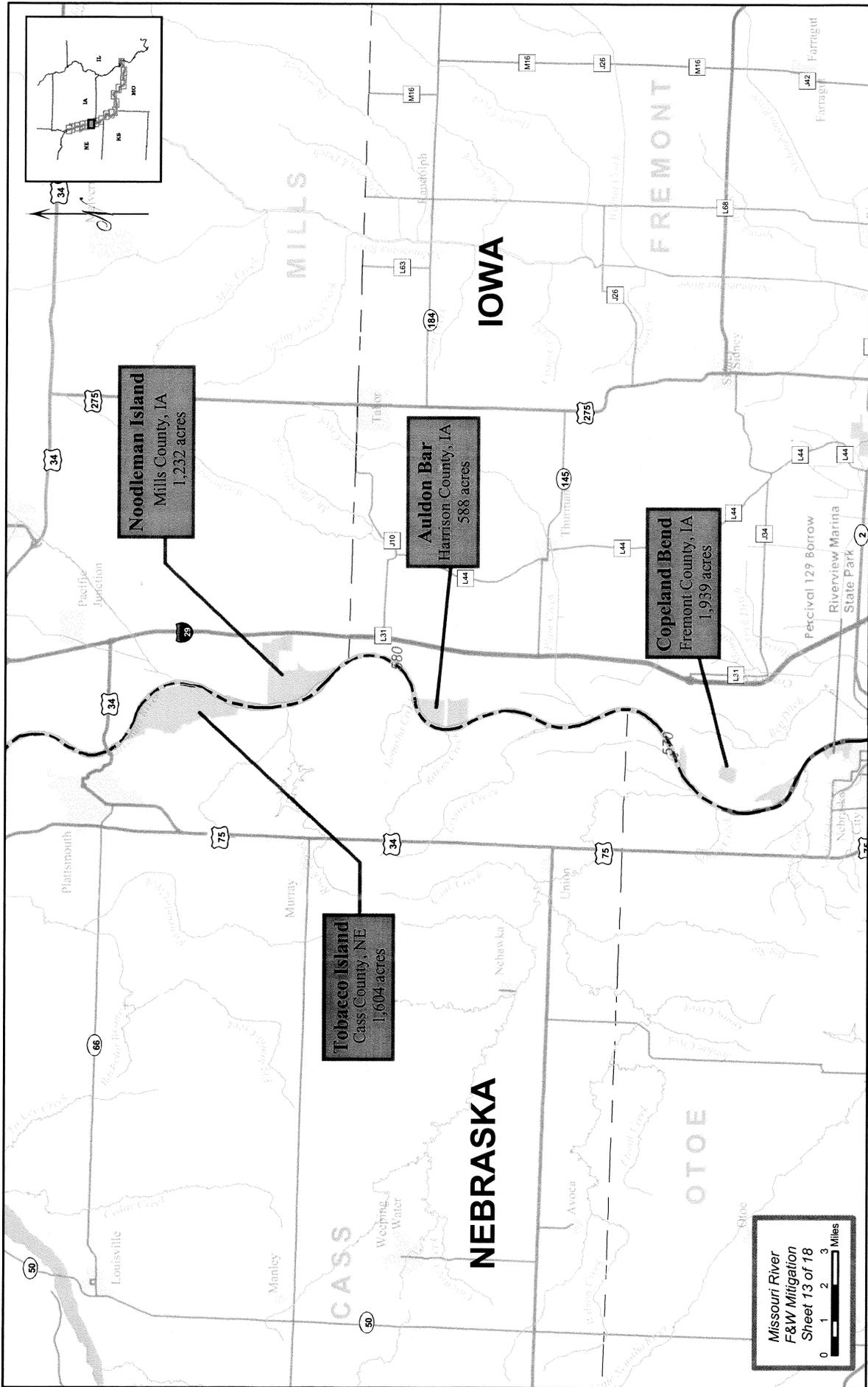
Missouri River  
F&W Mitigation  
Sheet 15 of 18  
0 1 2 3 Miles

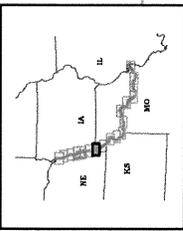
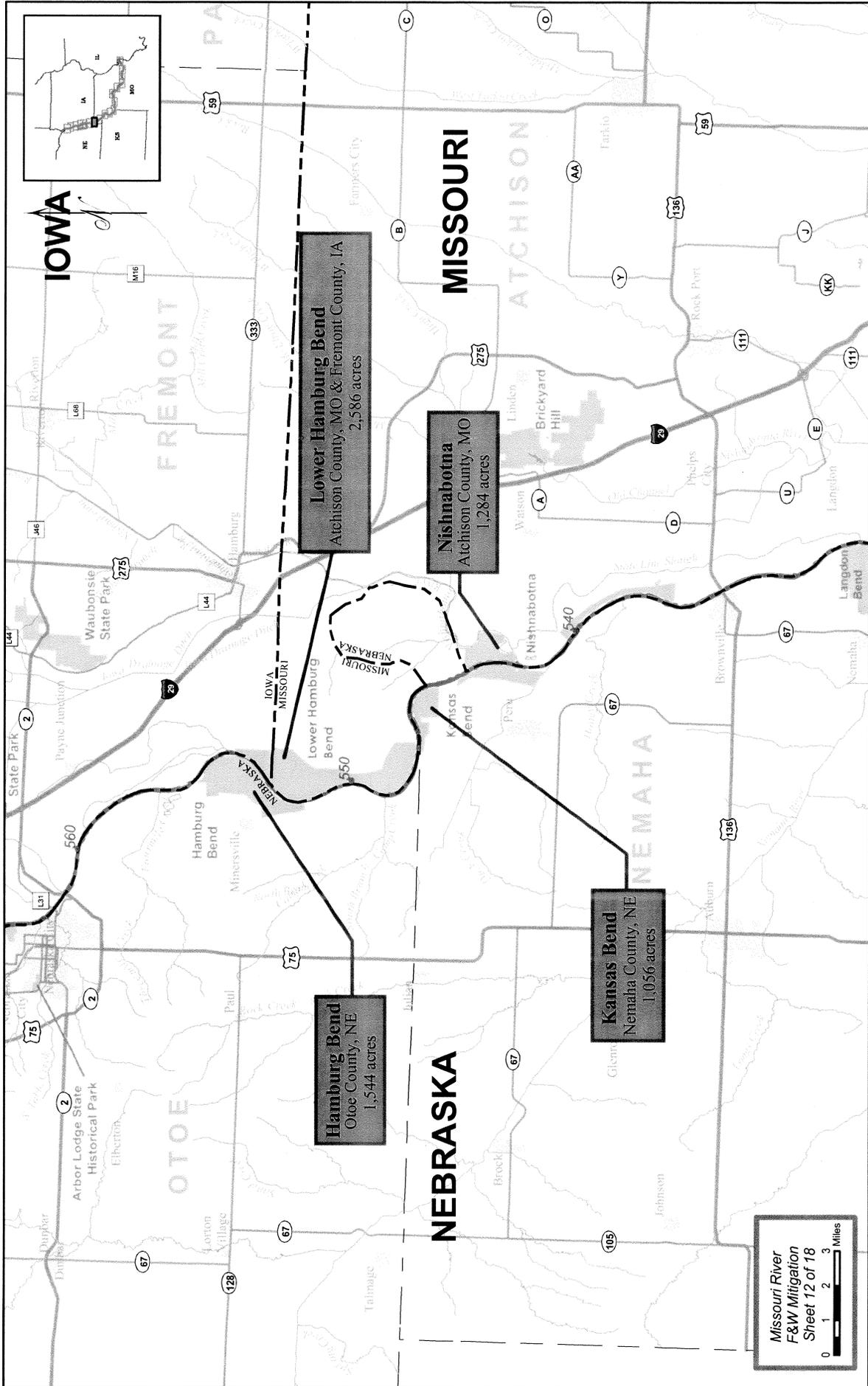


**St. Mary's Island**  
Mills County, IA  
1,324 acres

Missouri River  
F&W Mitigation  
Sheet 14 of 18  
0 1 2 3 Miles







**IOWA**

**MISSOURI**

**NEBRASKA**

**Lower Hamburg Bend**  
Atchison County, MO & Fremont County, IA  
2,586 acres

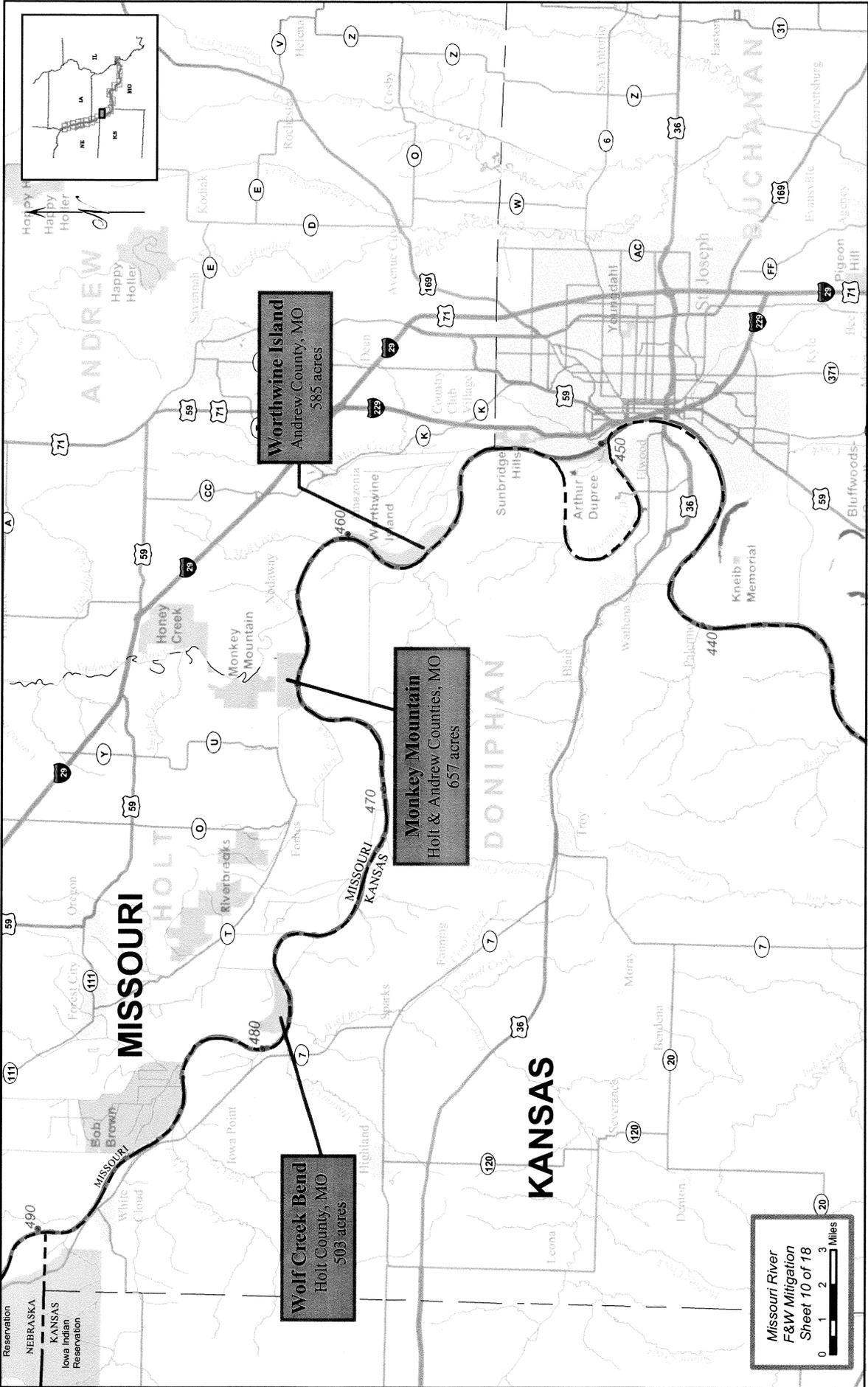
**Nishnabotna**  
Atchison County, MO  
1,284 acres

**Kansas Bend**  
Nemaha County, NE  
1,056 acres

**Hamburg Bend**  
Otoe County, NE  
1,544 acres

Missouri River  
F&W Mitigation  
Sheet 12 of 18





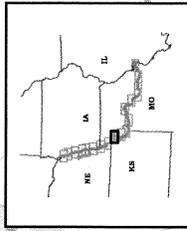
**Worthwine Island**  
 Andrew County, MO  
 585 acres

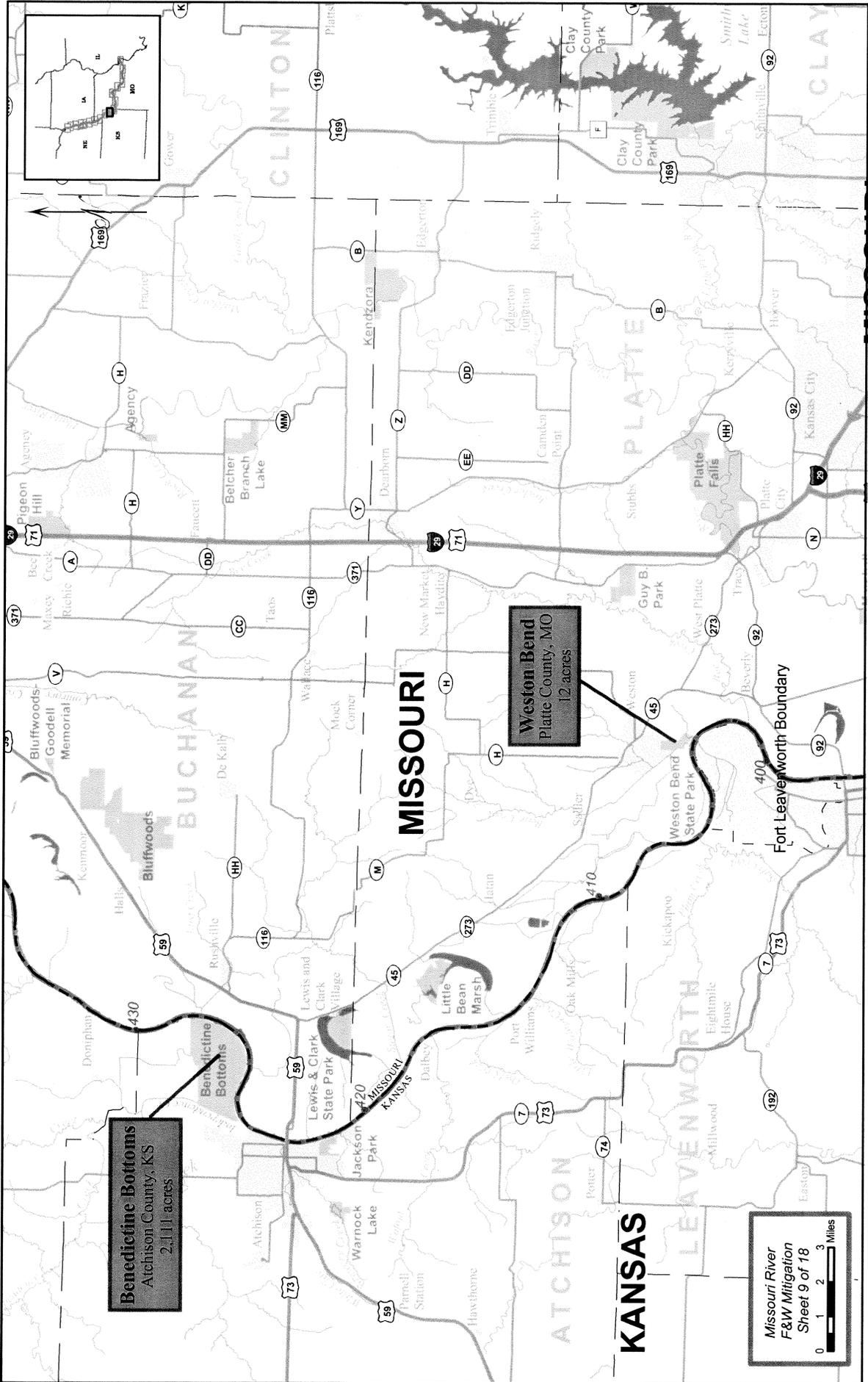
**Monkey Mountain**  
 Holt & Andrew Counties, MO  
 657 acres

**Wolf Creek Bend**  
 Holt County, MO  
 503 acres

Missouri River  
 F&W Mitigation  
 Sheet 10 of 18

Reservation  
 NEBRASKA  
 KANSAS  
 Iowa Indian  
 Reservation

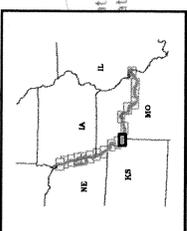
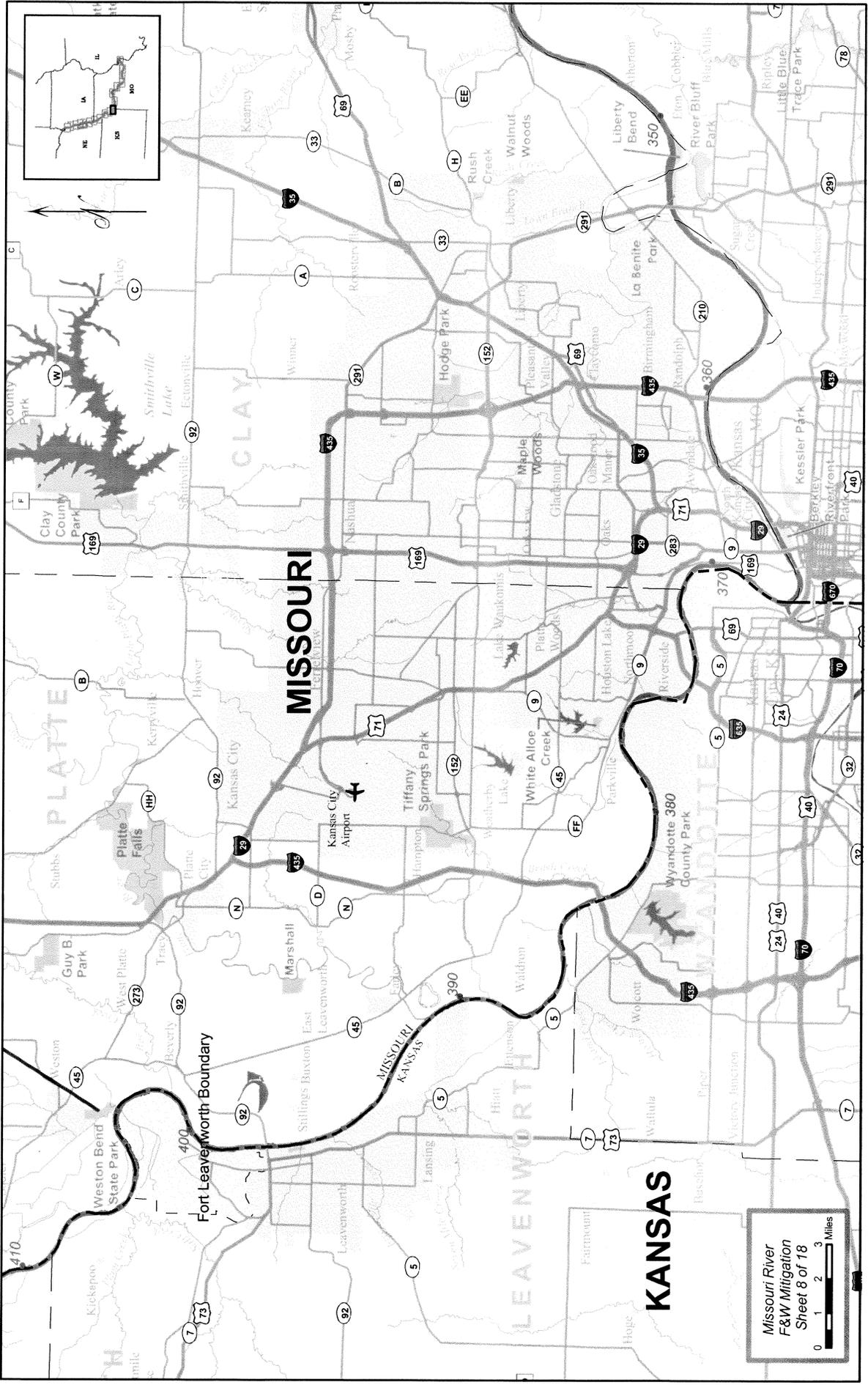




**Benedictine Bottoms**  
Atchison County, KS  
2,111 acres

**Weston Bend**  
Platte County, MO  
12 acres

Missouri River  
F&W Mitigation  
Sheet 9 of 18  
0 1 2 3 Miles



Missouri River  
F&W Mitigation  
Sheet 8 of 18

0 1 2 3 Miles

MISSOURI

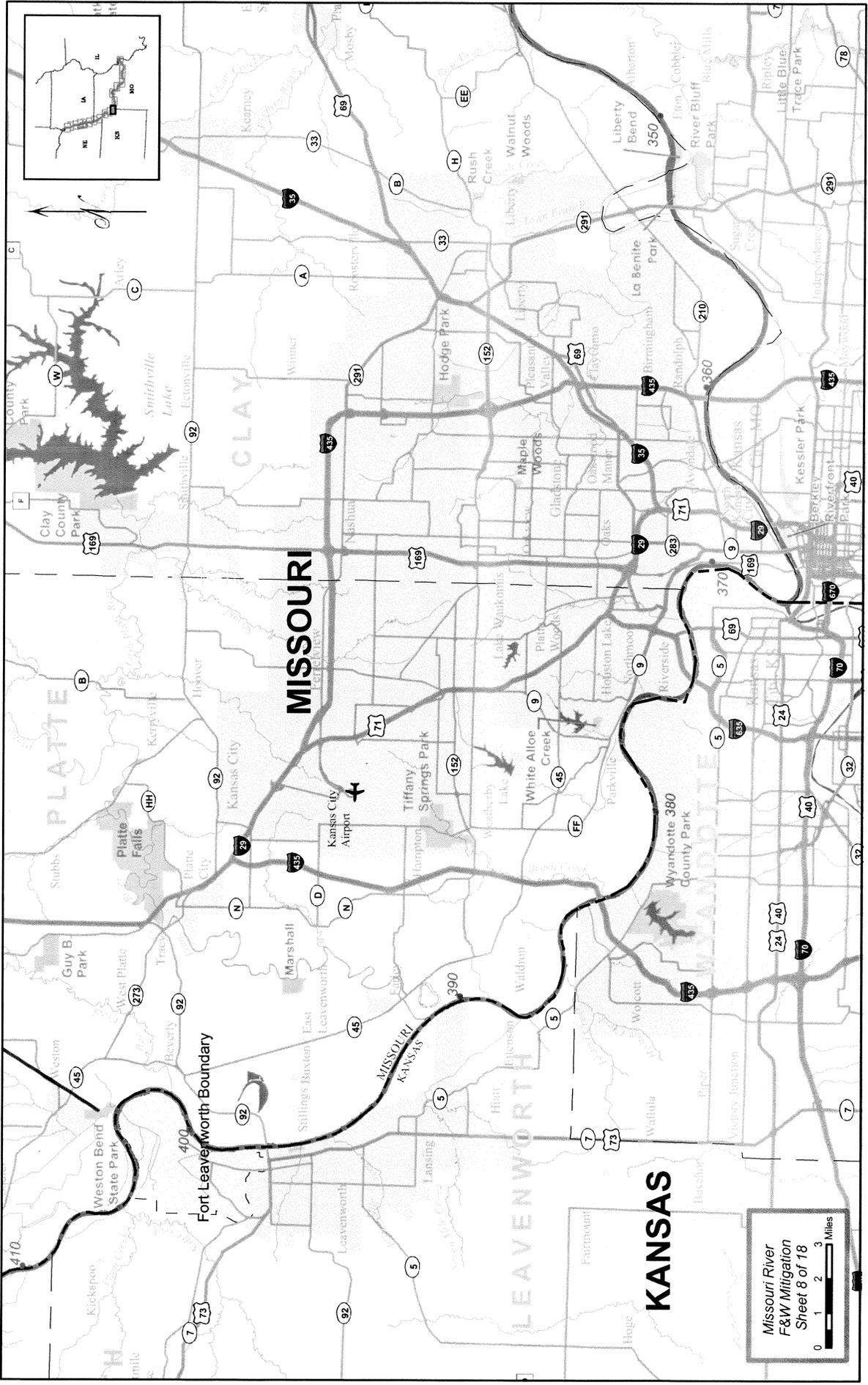
KANSAS

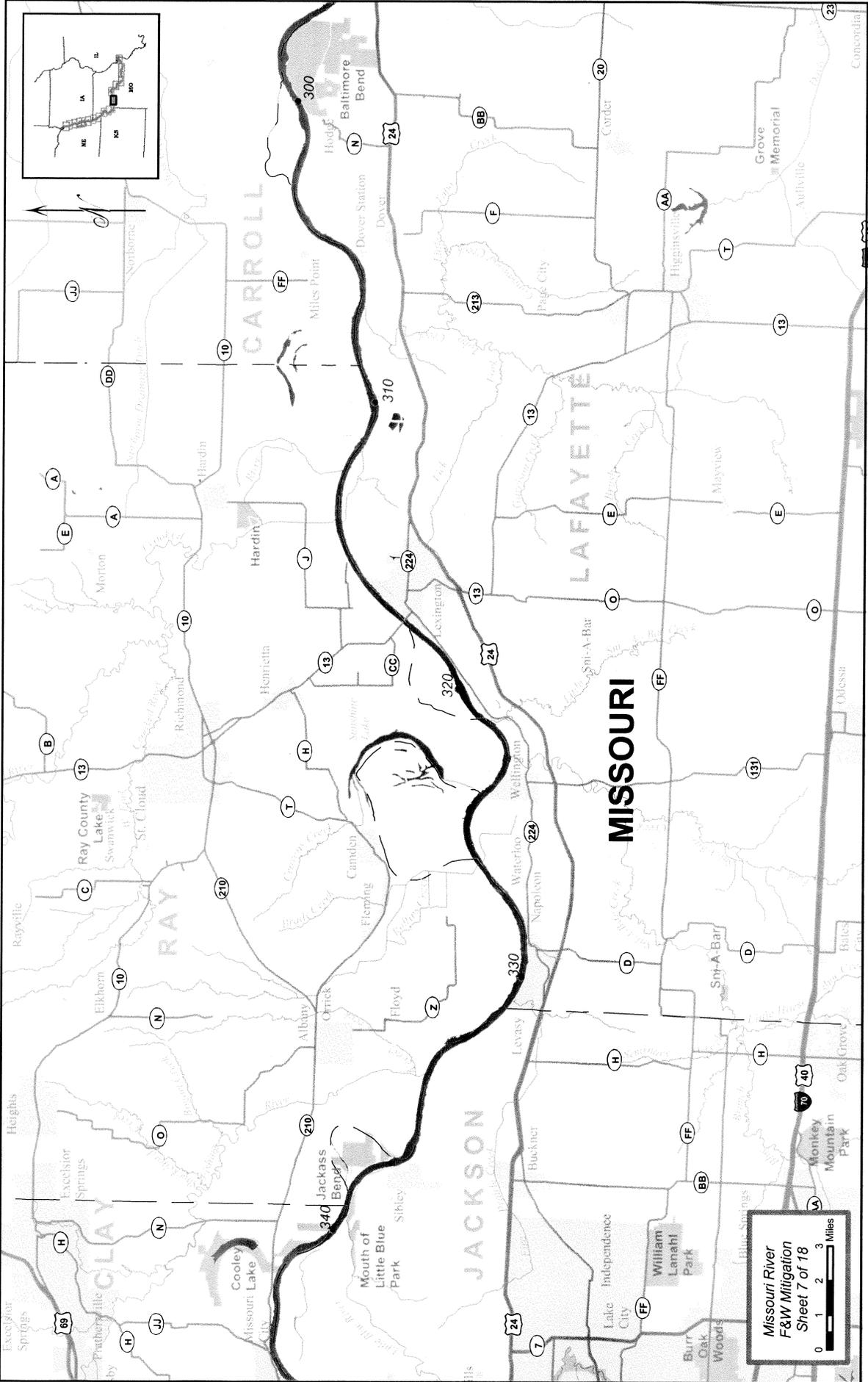
LEAVENWORTH

PLATTE

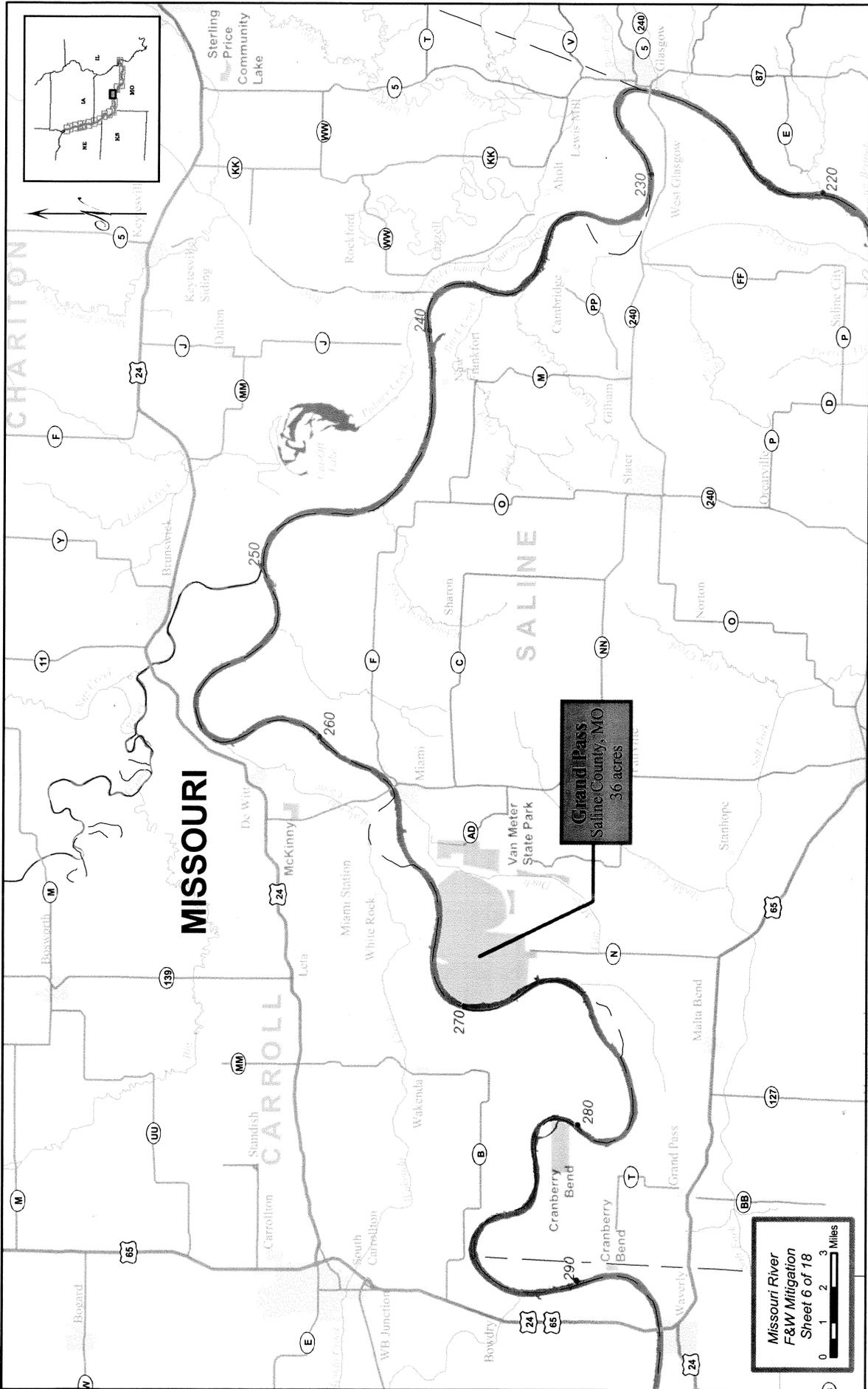
WYANDOTTE

Fort Leavenworth Boundary



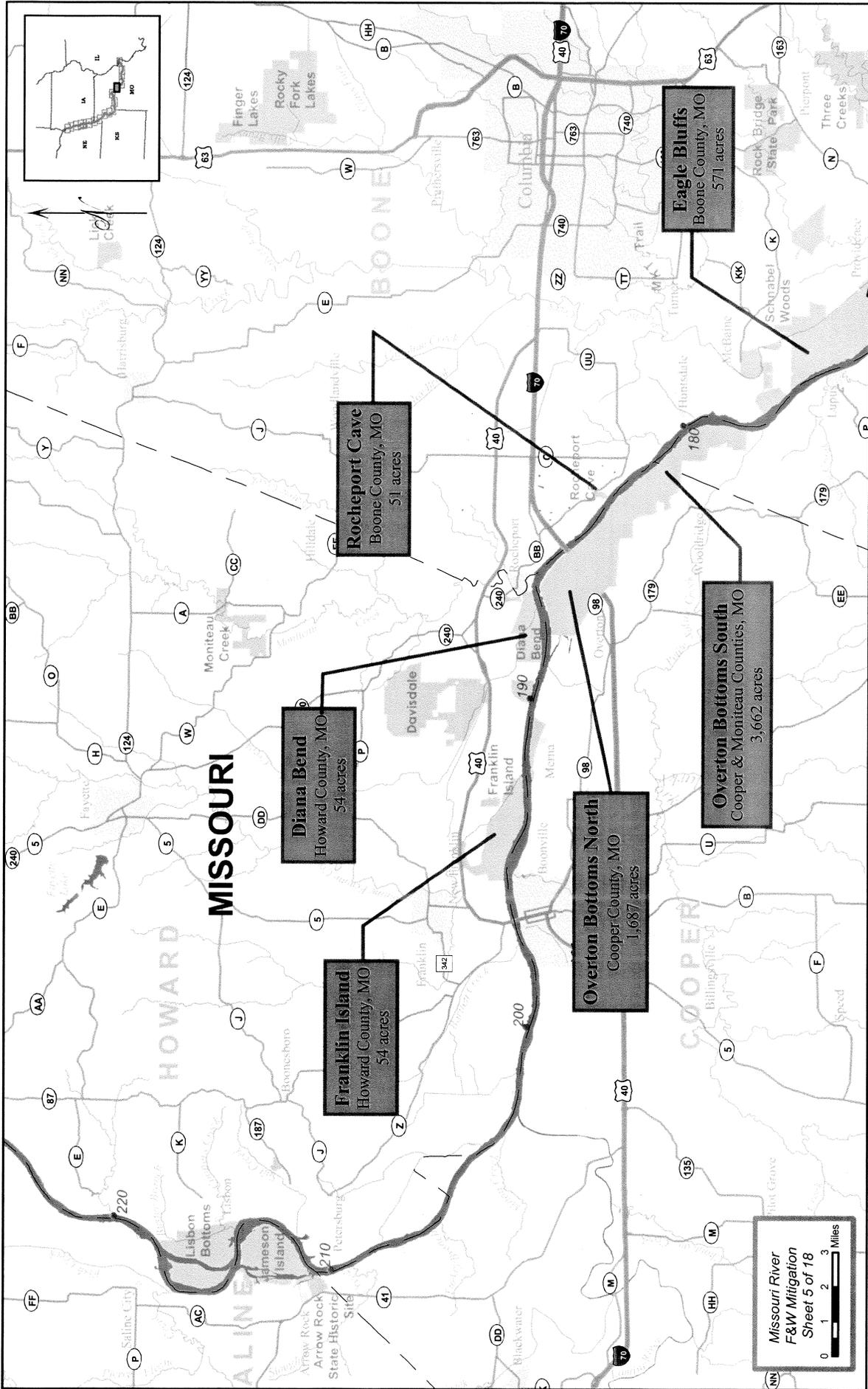


Missouri River  
 F&W Mitigation  
 Sheet 7 of 18  
 0 1 2 3 Miles



**Grand Pass**  
 Saline County, MO  
 36 acres

Missouri River  
 F&W Mitigation  
 Sheet 6 of 18  
 0 1 2 3 Miles



**Franklin Island**  
Howard County, MO  
54 acres

**Diana Bend**  
Howard County, MO  
54 acres

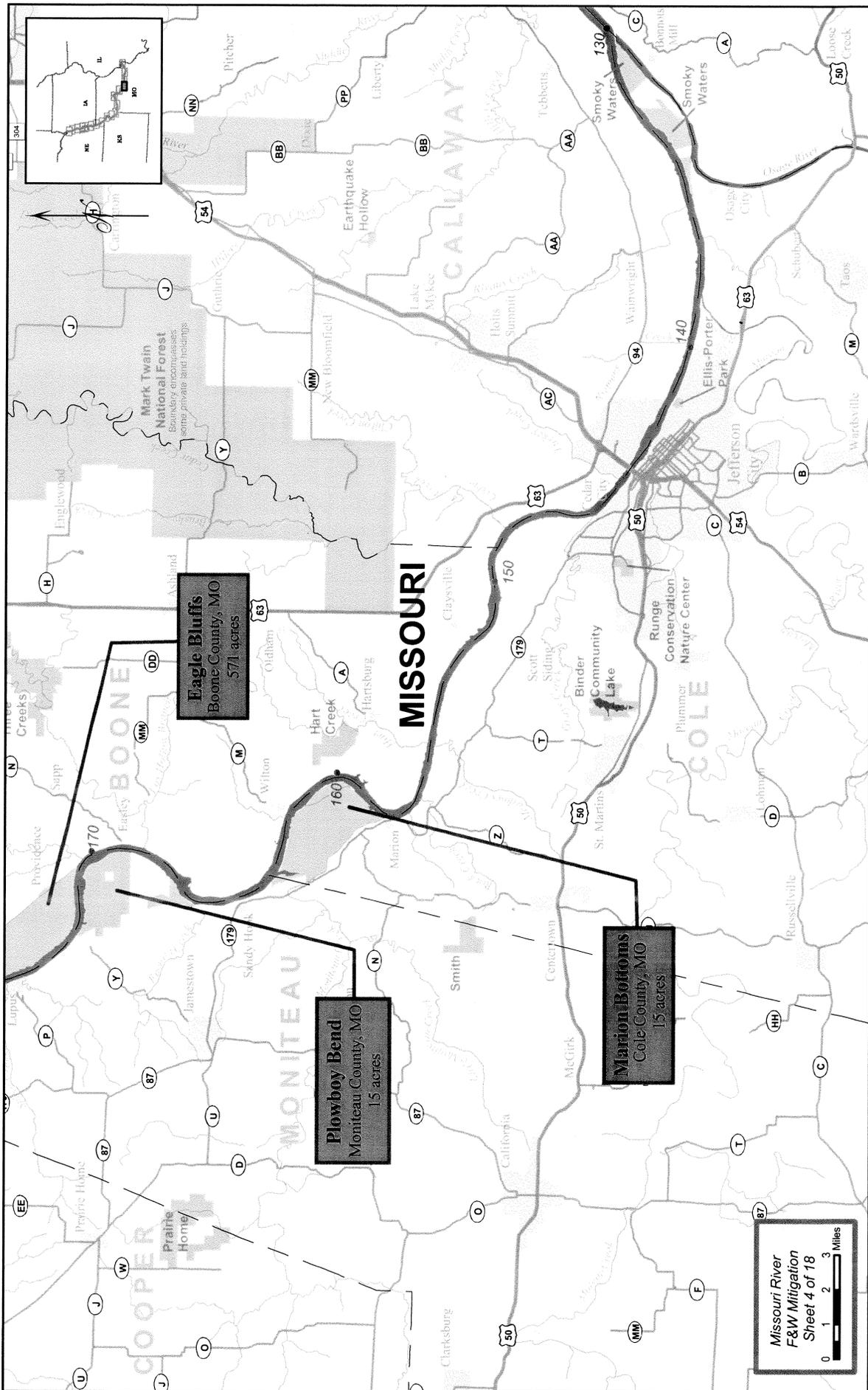
**Rocheport Cave**  
Boone County, MO  
51 acres

**Overton Bottoms North**  
Cooper County, MO  
1,687 acres

**Overton Bottoms South**  
Cooper & Monticello Counties, MO  
3,662 acres

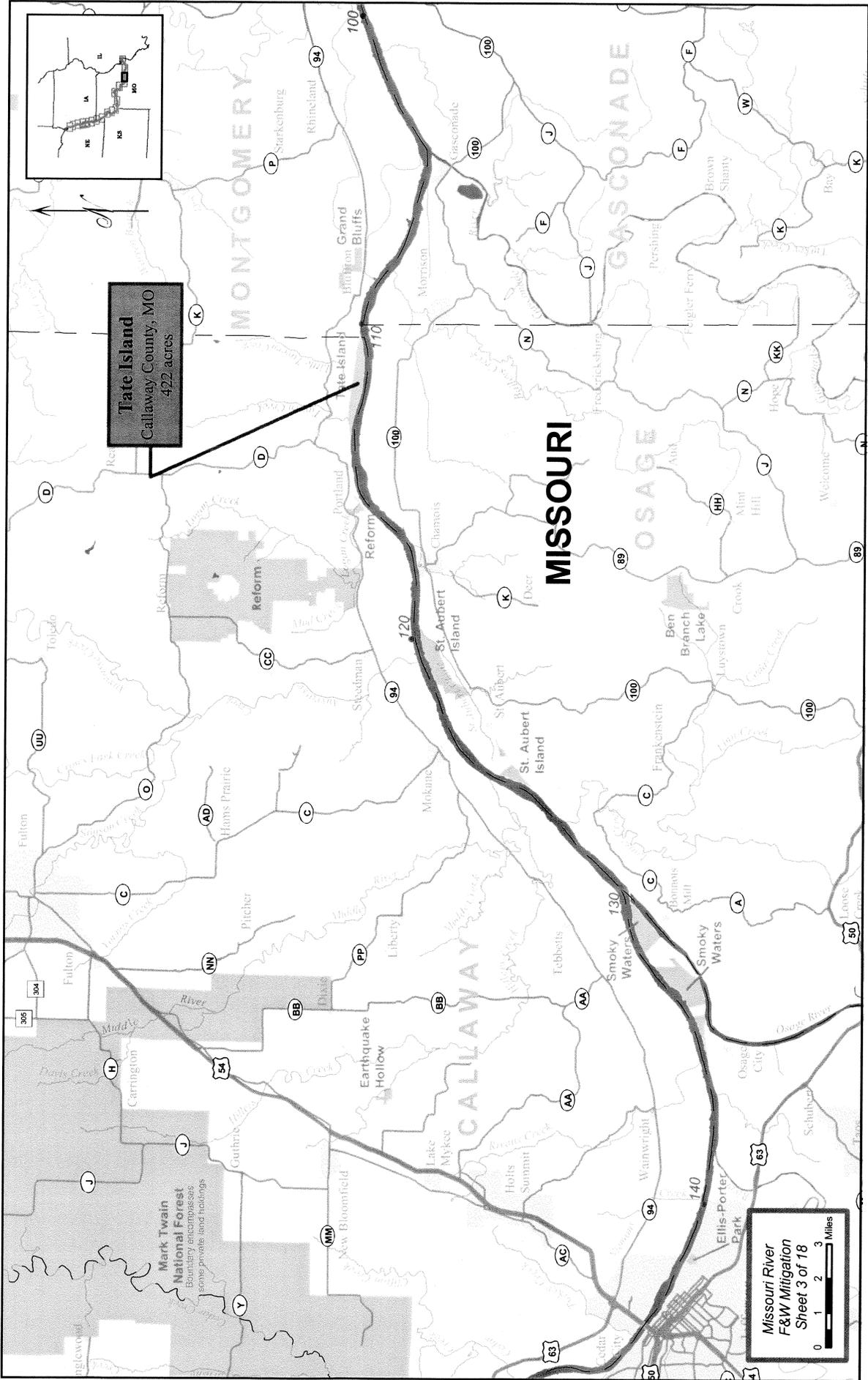
**Eagle Bluffs**  
Boone County, MO  
571 acres

Missouri River  
F&W Mitigation  
Sheet 5 of 18



Missouri River  
F&W Mitigation  
Sheet 4 of 18

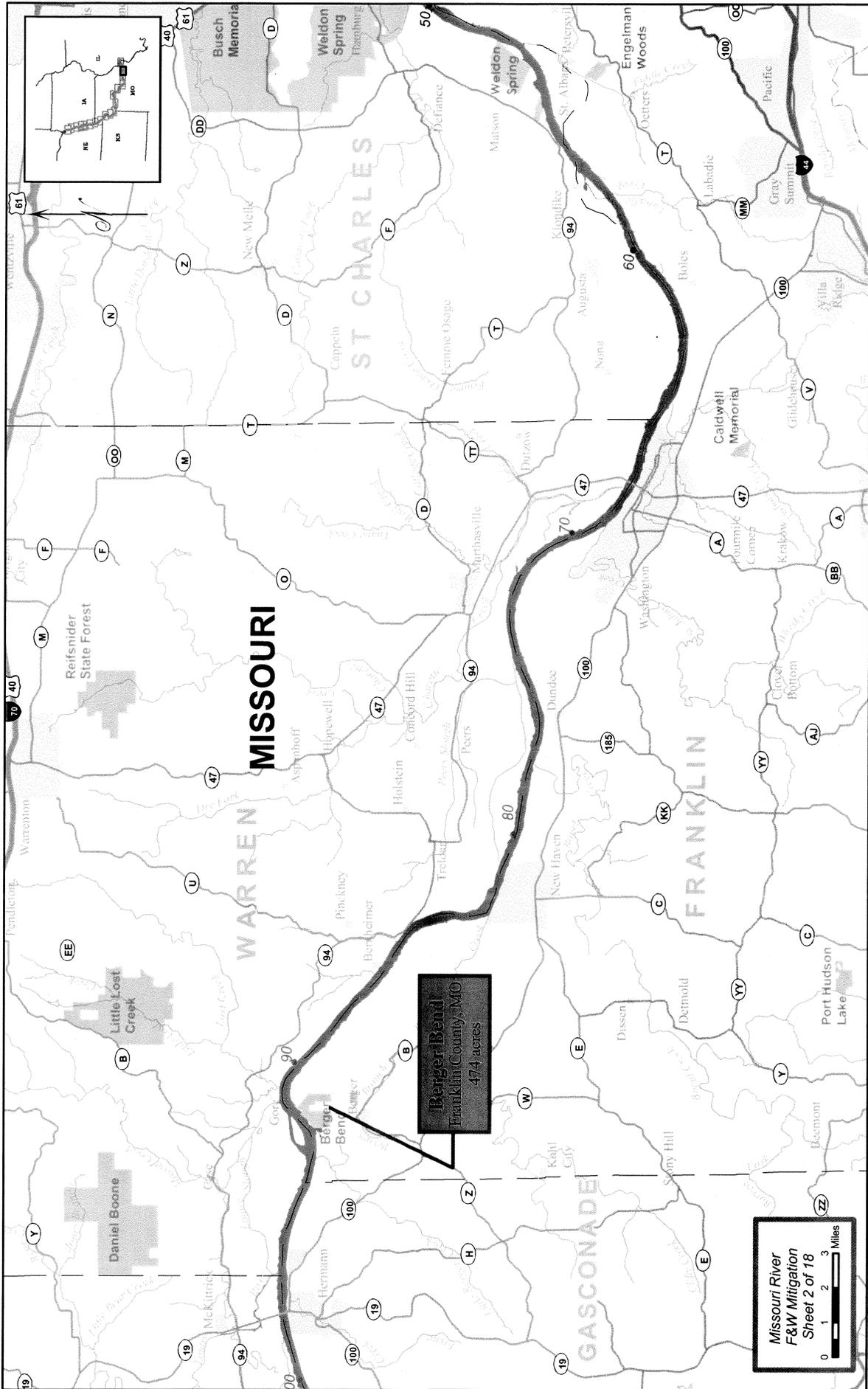
0 1 2 3 Miles



**Tate Island**  
 Callaway County, MO  
 422 acres

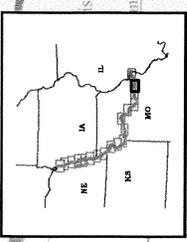
Missouri River  
 F&W Mitigation  
 Sheet 3 of 18

0 1 2 3 Miles



Missouri River  
F&W Mitigation  
Sheet 2 of 18  
0 1 2 3 Miles

Berger Bend  
Franklin County, MO  
474 acres





**APPENDIX 2**  
**DETAILED SITE DESCRIPTIONS/INFORMATION PAPERS**





US Army Corps  
of Engineers®  
Omaha District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Winnebago Bend, IA



*View of the backwater area created in the restored side channel at the Winnebago Bend site*

### Contact

Mike Barnes, Project Manager  
Email: [micheal.j.barnes@usace.army.mil](mailto:micheal.j.barnes@usace.army.mil)  
Phone: 402-221-4605

### Location

8 miles west of Slone in Woodbury County, Iowa

### Description

The Winnebago Bend site is located on 1,300 acres of land owned by the Corps of Engineers. The area is adjacent to the left descending bank of the Missouri River at river miles 713 to 708.

An old side channel that existed at Winnebago Bend was closed in conjunction with the Missouri River Bank Stabilization and Navigation Project. The main project element for the mitigation at this site was reconnecting the side channel to the river. This has created a mitigation site that includes diverse shallow water and terrestrial flood plain habitats.

Habitat development at the site included construction of controlled openings at the inlet and

outlet of the side channel. During periods of high flow, the Missouri River flows naturally through the side channel. During lower river stages, water in the side channel is supplied by a constructed pump system at the inlet. The pump was necessary due to the lower river level in relation to the bank. Water is pumped in as needed and the outflow is regulated to maintain the water surface elevation. Water can also back flood into the area.

### Current Status

Restoration of this area was completed in 2001. The mitigation features have been turned over to the Iowa Department of Natural Resources for its operation and management. The mitigation site is open to the public for a variety of outdoor activities including fishing, bird watching, hiking, and hunting when in season. No motor vehicles are allowed on the site, but public foot access is available.



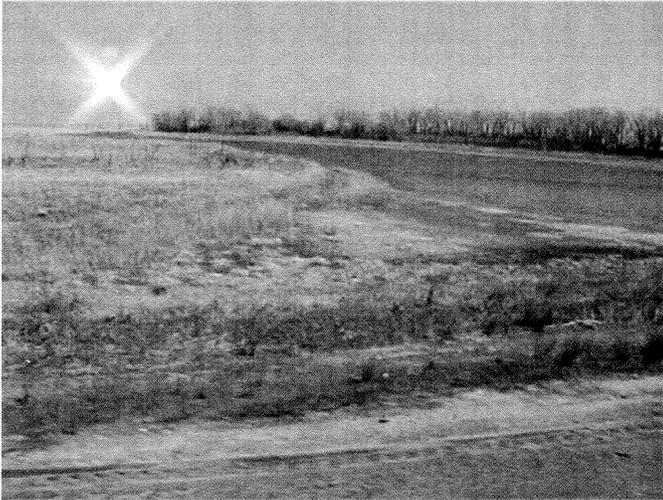
*Aerial view of the restored side channel and terrestrial habitats, Winnebago Bend mitigation site*



US Army Corps  
of Engineers®  
Omaha District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Tieville-Decatur Bends, IA and NE



*View of existing oxbow lake to be expanded at the Tieville-Decatur mitigation site*

the flow through the side channels and allowed the land to accrete in this area. In 2002 to 2003, the Corps of Engineers constructed several backwater areas. Pumps were installed to provide water from the Missouri River to maintain the oxbow lake located on the site.

The Nebraska Game & Parks Department and the Iowa Department of Natural Resources will assume joint operation and management of the constructed features. No motor vehicles are allowed on the site, but public foot access is available. This site is available for a variety of outdoor activities including fishing, bird watching, hiking and hunting when in season.

### Current Status

The Corps is working to acquire additional land adjacent to this site, just to the north on the Blackbird Bend. If these acquisitions are successful, this project could expand into the newly acquired areas.

### Contact

Mike Barnes, Project Manager  
Email: [micheal.j.barnes@usace.army.mil](mailto:micheal.j.barnes@usace.army.mil)  
Phone: 402-221-4605

### Location

8 miles west of Onowa, Iowa. The project is located on the east bank of the river in Monona County, Iowa and Burt County, Nebraska.

### Description

The Tieville-Decatur Bends project has been constructed on two adjacent river bends. The project contains 3,081 acres that have been obtained from willing sellers and public interests. The lands were formerly in agricultural production. The area is adjacent to the left descending bank of the Missouri River at river miles 694 to 686.



*View of recently completed backwater area at the Tieville-Decatur mitigation site*

Historically, these bends contained side channels that spread the river across the flood plain. The side channels were closed in conjunction with the Missouri River Bank Stabilization and Navigation Project (BSNP). Construction of the BSNP cut off



US Army Corps  
of Engineers®  
Omaha District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Louisville Bend, IA



*Backwater area at the Louisville Bend site*

### Contact

Mike Barnes, Project Manager  
Email: [micheal.j.barnes@usace.army.mil](mailto:micheal.j.barnes@usace.army.mil)  
Phone: 402-221-4605

### Location

3 miles west of Blencoe in Monona County, Iowa.

### Description

The Louisville Bend site is located on 1,096 acres of land owned and operated by the Iowa Department of Natural Resources. The area is adjacent to the left descending bank of the Missouri River, at river miles 685 to 683.

The chute at Louisville Bend was closed in conjunction with the Missouri River Bank Stabilization and Navigation Project (BSNP). Construction of the BSNP used dikes and revetments to cut off the side channel across bend in the Missouri River. The main project elements for the mitigation at this site are re-establishing the open water and floodplain habitats at this site.

In order to reconnect the land with the river, controlled openings were constructed at the inlet and outlet of the closed chute. Because the constructed side channel is at a higher elevation than the adjacent river, a pump was also installed at the inlet to pump in water during periods of low river flows. Water in the constructed chute is maintained by the regulating the outlet. An intermediate berm was also installed in 2003 to control water.

### Current Status

This project was completed in 1995. This site now contains 270 acres of open water with scrub-shrub and forested wetland areas. The Iowa Department of Natural Resources is continuing operation and management of the constructed features. No motor vehicles are allowed on the site, but public foot access is available. This site can be used for a variety of outdoor activities including fishing, bird watching, hiking and hunting when in season.



*Aerial view of the backwater areas and vegetation re-establishing at the Louisville Bend site.*



US Army Corps  
of Engineers®  
Omaha District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project California Bend, IA



*Aerial view of the restored side channel and backwater areas, September 2000*

### Contact

Mike Barnes, Project Manager  
Email: [micheal.j.barnes@usace.army.mil](mailto:micheal.j.barnes@usace.army.mil)  
Phone: 402-221-4605

### Location

5 miles southwest of Modale in Harrison County, Iowa.

### Description

The California Bend mitigation site is located on 420 acres owned and managed by the Iowa Department of Natural Resources (IDNR). The area is adjacent to the left descending bank of the Missouri River at river miles 652 to 649.

The side channel at California Bend was closed in conjunction with the Missouri River Bank Stabilization and Navigation Project (BSNP). The mitigation at this site included reopening the mile-long channel to the Missouri River flows. The site now contains flow through riverine side channel

areas during high water and backwater areas during lower river stages.

Restoration of this area was completed in 1999. The flow through side channel was constructed using a 10-foot bottom width pilot channel which has been allowed to erode and expand over time. The side channel is now approximately 50 feet wide and provides excellent shallow water habitat for a variety of fish. This site also contains excellent terrestrial and wetland habitats.

### Current Status

The Corps has turned the management of the site over to IDNR. No motor vehicles are allowed on the site, but public foot access is available. This site can be used for a variety of outdoor activities including fishing, bird watching, hiking and hunting when in season.



*Looking downstream across the riverine side channel and wetland habitats on the left overbank*



US Army Corps  
of Engineers®  
Omaha District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Tobacco Island, NE



*Aerial view of the new side channel at Tobacco Island, September 2002*

### Contact

Mike Barnes, Project Manager  
Email: [micheal.j.barnes@usace.army.mil](mailto:micheal.j.barnes@usace.army.mil)  
Phone: 402-221-4605

### Location

2 miles southeast of Plattsmouth in Cass County, Nebraska.

### Description

The Tobacco Island mitigation site is located on 1,604 acres of former agricultural land purchased by the Corps of Engineers. The area is adjacent to the right descending bank of the Missouri River at river miles 589 to 586.

The side channel at Tobacco Island was closed in conjunction with the Missouri River Bank Stabilization and Navigation Project (BSNP). Construction of the BSNP cut off the side channel

across Tobacco Island. In 2001, the Corps completed re-opening the closed off side channel across this site. The work included construction of a 3-mile long, 10-foot bottom width pilot channel that will be allowed to erode and widen over time. The area also had native vegetative plantings to compliment the new riverine habitat.

The Nebraska Game & Parks Department has assumed operation and management of the constructed features. No motor vehicles are allowed on the site, but public foot access is available. This site can be used for a variety of outdoor activities including fishing, bird watching, hiking and hunting when in season.

### Current Status

Restoration of this area was completed in December 2001. It has been operational since that time and continues to function as planned providing critical shallow water/sandbar complex habitat.



*Looking out at the Missouri River from the Tobacco Island Mitigation site*



US Army Corps  
of Engineers®  
Omaha District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Noddleman Island Bend, IA



*USGS TerraServer 1999 aerial photo of the  
Noddleman Island Bend mitigation site*

No motor vehicles are allowed on the site, but public foot access is available. This site can be used for a variety of outdoor activities including fishing, bird watching, hiking and hunting when in season.

### **Current Status**

The Corps will be negotiating to acquire additional lands at this site in 2005. Also, some depressional wetlands have been proposed. Additional habitat development will take place as more land is acquired and studies have been made as to the best habitat for the site.

### **Contact**

Mike Barnes, Project Manager  
Email: [micheal.j.barnes@usace.army.mil](mailto:micheal.j.barnes@usace.army.mil)  
Phone: 402-221-4605

### **Location**

4 miles southwest of Pacific Junction in Mills  
County, Iowa.

### **Description**

The Noddleman Island Bend site is located on 1,232 acres of former agricultural land purchased by the Corps of Engineers. The area is adjacent to the left descending bank of the Missouri River, at river miles 585 to 582.

The Corps lands have been turned over to the Iowa Department of Natural resources for short-term management while additional acquisitions are made in this area. Additional areas adjacent to the site are needed prior to extended restoration efforts. Since the Corps has obtained only a part of this site, development has been limited.



US Army Corps  
of Engineers®  
Omaha District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Copeland Bend, IA



*1999 USGS TerraServer aerial photo of the lower area acquired at Copeland Bend, IA*

### Contact

Mike Barnes, Project Manager  
Email: [micheal.j.barnes@usace.army.mil](mailto:micheal.j.barnes@usace.army.mil)  
Phone: 402-221-4605

### Location

9 miles northwest of Hamburg, Fremont County, Iowa.

### Description

The Copeland Bend site is located on 1,939 acres of former agricultural land purchased by the Corps of Engineers. There are currently three disconnected areas acquired at this site. The three areas lie adjacent to the left descending bank of the Missouri River at river miles 571 to 565.

The Corps is attempting to purchase additional lands in and around the existing areas. The additional lands are needed to round out the existing mitigation site. Therefore, the mitigation efforts at this site have been limited. The Corps has produced some depressional wetlands on the protected side of the levee. Additional development will take place as more land is acquired and studies have been made as to the best habitat for the site.

The Iowa Department of Natural Resources has assumed operation and management of the site. No motor vehicles are allowed on the site, but public foot access is available. This site can be used for a variety of outdoor activities including fishing, bird watching, hiking and hunting when in season.

### Current Status

The Corps is currently negotiating for additional lands at this site with the hopes of purchasing more areas starting in 2005.



*1999 USGS TerraServer aerial photo of the middle area acquired at Copeland Bend, IA*



US Army Corps  
of Engineers®  
Omaha District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Hamburg Bend, NE



*Looking south across side channel, May 2004*

### Contact

Mike Barnes, Project Manager  
Email: [micheal.j.barnes@usace.army.mil](mailto:micheal.j.barnes@usace.army.mil)  
Phone: 402-221-4605

### Location

8 miles southeast of Nebraska City, Otoe County, Nebraska.

### Description

The Hamburg Bend site is located on 1,544 acres of former agricultural land purchased by the Corps of Engineers. The area is adjacent to the right descending bank of the Missouri River, at river miles 556 and 552.

The side channels at Hamburg Bend were closed in conjunction with the Missouri River Bank Stabilization and Navigation Project (BSNP). The construction allowed land at this bend to accrete. The area became agricultural lands, but was low lying and subject to frequent flooding.

After the Corps purchased the accreted lands for the mitigation project, work began to re-open the side channels. The Corps constructed a flow-through

side channel and several backwater areas. The side channel was constructed using a 10-foot bottom width pilot channel, which has been allowed to erode and expand over time. The backwater areas were dredged to their current configuration.

The channel is connected to the river at both ends. The channel and backwater areas provide critical shallow water habitat for numerous fish species. The increase in the numbers and variety of fish at this location shows that excellent aquatic habitat has been created at this site. In addition, terrestrial species are also increasing in this area.

### Current Status

The Nebraska Game & Parks Department has assumed operation and management of the constructed features. During FY05, NGPC will be adding additional wetlands at this location. No motor vehicles are allowed on the site, but public foot access is available. This site can be used for a variety of outdoor activities including fishing, bird watching, hiking and hunting when in season.



*Aerial view of the inlet to the side channel, May 2004*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Lower Hamburg Bend, MO and IA



*Outlet of the new side channel, September 2004*

### Contact

Jake Owen, Site Project Manager  
Email: [jacob.w.owen@usace.army.mil](mailto:jacob.w.owen@usace.army.mil)  
Phone: 816-240-8131

### Location

6 miles southwest of Hamburg Iowa, in Atchison County, Missouri and Fremont County, Iowa

### Description

The Lower Hamburg Bend mitigation site is approximately 2,586 acres in size. The area is adjacent to the left descending bank of the Missouri River at river miles 554 to 546. Federal Levee Unit No. L-575 is located on the eastern, landward side of the site. Another mitigation site is located just upstream and across the river at Hamburg Bend in Nebraska.

The lands at the Lower Hamburg Bend mitigation site were purchased by the Corps of Engineers from willing sellers from 1995 through 1998. The lands were in cultivation, but contained several meander scars that indicated the former location of side channels across the area. These side channels were closed off entirely by rock dike structures installed

by the Corps to restrict the Missouri River flows to the main channel.

In 2003 through 2004, the Corps modified the existing closure structure at the upper end of this site. A 75-foot wide pilot channel and new control structures were installed. Over time, the Corps will monitor and maintain the flows through the restored side channel to assure that it will erode to a full 200-foot width. In addition to the side channel, native hardwood trees and grasses were planted on the formerly farmed areas.

### Current Status

The side channel work was completed in September 2004. The Corps will manage the flows into to side channel to assure that the navigation channel is not affected. The lands that are within Missouri and Iowa have been turned over to the Missouri Department of Conservation (MDC) and Iowa Department of Natural Resources (IDNR), respectively, so that they may manage the fish and wildlife resources. The mitigation site is now open to the public for a variety of uses including fishing, bird watching, hiking, and hunting.



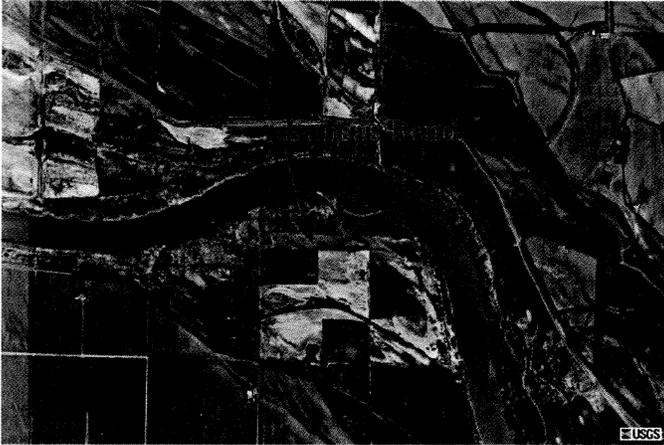
*New side channel at the Lower Hamburg Bend site, September 2004.*



US Army Corps  
of Engineers®  
Omaha District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Kansas Bend



*USGS TerraServer 1999 Aerial view*

### Contact

Mike Barnes, Project Manager  
Email: [micheal.j.barnes@usace.army.mil](mailto:micheal.j.barnes@usace.army.mil)  
Phone: 402-221-4605

### Location

3 miles east of Peru, Nemaha County, Nebraska.

### Description

The Kansas Bend site is located on 1,056 acres of former agricultural land purchased by the Corps of Engineers. This site is separated into two areas by privately own farmland. The area is adjacent to the right descending bank of the Missouri River, at river miles 547 to 544.

Several side channels at Kansas Bend were closed in conjunction with the Missouri River Bank Stabilization and Navigation Project (BSNP). Construction of the BSNP used dikes and revetments to cut off the side channels across the bend in the Missouri River. The main project

element for the mitigation at this site will be reopening two side channels to the river.

Two side channels at this site are being constructed with only a 10-foot bottom width. Through adaptive management and the natural forces of the river, the channels are expected to erode and expand over time to a full 200-foot design width. The upper channel at this site will be 7,200 feet long while the lower channel will be similar, but only 5,580 feet long.

The Nebraska Game & Parks Department will assume operation and management of the constructed features when it is completed. No motor vehicles are allowed on the site, but public foot access is available. This site will be used for a variety of outdoor activities including fishing, bird watching, hiking and hunting when in season.

### Current Status

This site is currently under construction and will be complete in December 2004.



*Construction is underway to build the side channels at the Kansas Bend site, July 2004*

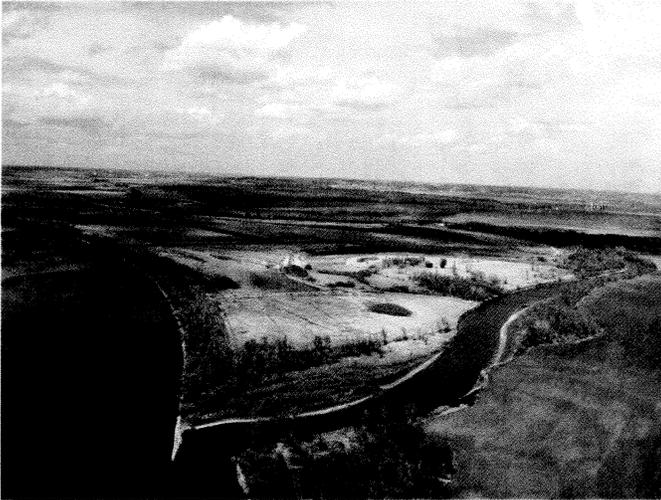


US Army Corps  
of Engineers®

Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Nishnabotna, MO and NE



*Mouth of Nishnabotna River and the mitigation lands on the upper area, May 2004*

### Contact

Dave Hibbs, Project Biologist

Email: [david.r.hibbs@usace.army.mil](mailto:david.r.hibbs@usace.army.mil)

Phone: 816-983-3136

### Location

6 miles northwest of Rock Port, in Atchison County, Missouri and Nemaha County Nebraska.

### Description

The Nishnabotna mitigation site is approximately 1,284 acres in size. The area is adjacent to the left descending bank of the Missouri River at river miles 545 to 537. Federal Levee Unit No. L-550 is located on the eastern, landward side of the site. The site consists of two separate areas with private lands inbetween the upper and lower areas. The Nishnabotna River flows through the upper area. Also, directly across the Missouri River is the Kansas Bend mitigation site.

The lands at the Nishnabotna mitigation site were purchased by the Corps of Engineers from willing sellers in 1998 to 2000. The site has been turned

over to the Missouri Department of Conservation (MDC) for short-term management while additional lands are acquired in the area. Through the annual management plan process, MDC has planted native grasses and trees.

In the future, the Corps plans to modify the existing structures along the bank of the river to improve aquatic diversity in the river. Additionally, the Corps will be breaching an existing levee to allow flows to spread out over the area during high river stages in either the Nishnabotna or Missouri Rivers. The Corps will be installing a “fish friendly” water control structure that will allow flood flows to enter into even more areas of site, create a backwater nursery area, and opportunistic wetland areas.

### Current Status

In Fall 2004, the Corps will be completing the Environmental Assessment for the site. The work in the preferred alternative will be installed over the next few years, pending available funds. The Corps will continue to attempt to purchase lands between the upper and lower areas. Meanwhile, the area is open to the public for a variety of uses including fishing, bird watching, hiking, and hunting.



*Aerial view of lower area, May 2004*



US Army Corps  
of Engineers®  
Omaha District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Langdon Bend



*Aerial view of Langdon Bend Mitigation Site*

### Contact

Mike Barnes, Project Manager  
Email: [micheal.j.barnes@usace.army.mil](mailto:micheal.j.barnes@usace.army.mil)  
Phone: 402-221-4605

### Location

3 miles south of Brownville, Nebraska in Nemaha County.

### Description

The Langdon Bend site is located on 1,312 acres of former agricultural land purchased by the Corps of Engineers. The area is adjacent to the right descending bank of the Missouri River at river miles 532 to 528.

The chute at Langdon Bend was closed in conjunction with the Missouri River Bank Stabilization and Navigation Project (BSNP). Construction of the BSNP cut off the side channel

across Langdon Bend. In 2000, the Corps of Engineers completed construction of a backwater/shallow water area within the historic alignment of the closed off chute. The new backwater area could not be opened to the river at the upstream end of the site due to its proximity to the Cooper Nuclear Power Plant. However, during highest flows on the river, the area will act as a flow through chute.

The Nebraska Game & Parks Department has assumed operation and management of the constructed features. No motor vehicles are allowed on the site, but public foot access is available. This site can be used for a variety of outdoor activities including fishing, bird watching, hiking and hunting when in season.

### Current Status

This project was completed in 2000. It has been operational since that time and continues to function as planned providing shallow water and flood plain terrestrial habitat. A new public access road and parking lot is under construction and should be done by December 2004. We are also looking at adding additional land to this site.



*Outlet of backwater area during winter freeze*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Deroin Bend, MO



*Looking upstream at control structures along the restored side channel at the Deroin Bend mitigation site, April 2002*

### Contact

John Skelton, Operations  
Email: [john.a.skelton@usace.army.mil](mailto:john.a.skelton@usace.army.mil)  
Phone: 816-240-8131

### Location

7 miles northwest of Corning in Atchison and Holt Counties, Missouri.

### Description

The Deroin Bend mitigation site is located on 1,082 acres of land owned and operated by the Missouri Department of Conservation (MDC). The area is adjacent to the left descending bank of the Missouri River at river miles 520 to 516. Federal Levee Unit No. L-536 is located on the eastern, landward side of the site. The site is also adjacent to the Corning mitigation site. Directly across the Missouri River is the Indian Cave Nebraska State Park.

The side channel at Deroin Bend was closed in conjunction with the Missouri River Bank Stabilization and Navigation Project (BSNP). The

mitigation at this site includes restoration of a 3 mile-long channel and creation of additional shallow water habitat in backwater areas.

Construction of the new side channel was completed in December 2001. A flow through side channel and numerous water control structures were constructed using a 70-foot pilot width. The channel will be allowed to erode and expand over time. The channel is now approximately 100 feet across and will provide excellent shallow water habitat for a variety of fish. Numerous native hardwood trees were also planted at the site.

### Current Status

MDC manages the terrestrial habitats at the site, while the Corps of Engineers maintains the side channel to assure its' development and maintain adequate flows in the main river channel. This site can be used for a variety of outdoor activities including fishing, bird watching, hiking and hunting when in season.



*Aerial view of the Deroin Bend site, June 2004*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Corning, MO



*Winter view of Corning lands, November 2004*

The Corps lands have been turned over to the Missouri Department of Conservation (MDC) for short-term management while additional acquisitions are attempted to round out the site. Through the annual management plan process, MDC has planted native grasses and trees. A majority of the area is being leased for agricultural production pending additional acquisitions.

The Natural Resources Conservation Service plans to enhance the wetland areas on the WRP lands. Beginning in 2005, the Corps will complete a habitat restoration plan for the lands currently owned.

### Current Status

The area is open to the public for a variety of uses including bird watching, hiking, and hunting when in season.

### Contact

Dave Hibbs, Project Biologist  
Email: [david.r.hibbs@usace.army.mil](mailto:david.r.hibbs@usace.army.mil)  
Phone: 816-983-3136

### Location

3 miles west of Corning in Holt County, Missouri.

### Description

The Corning mitigation site is currently 1,888 acres in size. The lands are adjacent to the left descending bank of the Missouri River at river miles 516 to 514.

The Corps of Engineers purchased the lands at the Corning mitigation site from willing sellers from 2000 through 2002. The lands include approximately 740 acres of land that is enrolled in the NRCS Wetland Reserve Program. The lands are adjacent to the Deroin Bend mitigation site, but located on the land side of Federal Levee L-519.



*Winter view of Corning lands, November 2004*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Thurnau, MO



*View of Thurnau site as it lies adjacent to the Tarkio River, May 2004*

### Contact

Dave Hibbs, Project Biologist  
Email: [david.r.hibbs@usace.army.mil](mailto:david.r.hibbs@usace.army.mil)  
Phone: 816-983-3136

### Location

3 miles west of Craig in Holt County, Missouri.

### Description

The Thurnau mitigation site is currently 1,372 acres in size. The lands are on the left descending bank of the Missouri River at river miles 512 to 508. The Corps of Engineers purchased the lands at the Thurnau mitigation site from willing sellers in 1999 through 2001.

The Corps lands are adjacent to 400 acres at the Thurnau Conservation Area that is owned and operated by the Missouri Department of Conservation (MDC). The properties are adjacent to the mouth of the Tarkio River. The Corps lands have been turned over to the Missouri Department of Conservation (MDC) for short-term management while additional acquisitions are attempted to round out the site. The Corps also is attempting to obtain permanent easement to the MDC lands.

In cooperation with the Corps, MDC has planted native grasses and trees at the Thurnau mitigation site. A majority of the area is being leased for agricultural production pending additional acquisitions. These areas will be converted to habitats over time.

In the future, the Corps plans to modify the existing structures along the bank of the river to improve aquatic diversity in the river. Additionally, the Corps will be breaching an existing levee to allow flows to spread out over the area during high river stages in either the Tarkio or Missouri Rivers. The Corps will be installing a “fish friendly” water control structure that will allow flood flows to enter into even more areas of site, create a backwater nursery area, and opportunistic wetland areas.

### Current Status

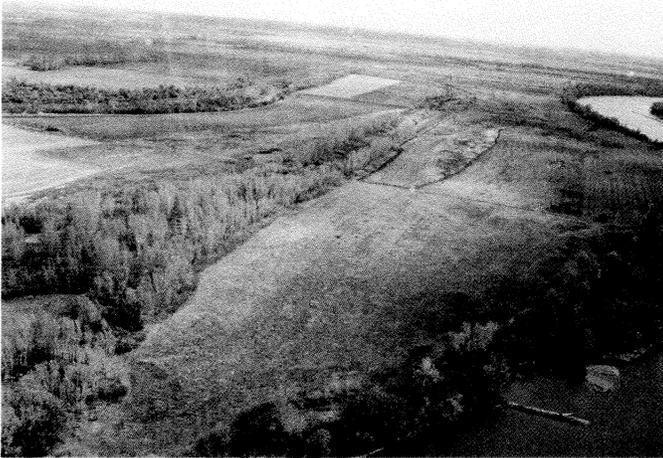
In Fall 2004, the Corps will be completing the Environmental Assessment for the site. The work in the preferred alternative will be installed over the next few years, pending available funds. Meanwhile, the area is open to the public for a variety of uses including bird watching, hiking, and hunting when in season.



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Rush Bottom Bend, MO



*Looking south along the existing slough at the Rush Bottom Bend site, May 2004*

### Contact

Dave Hibbs, Project Biologist  
Email: [david.r.hibbs@usace.army.mil](mailto:david.r.hibbs@usace.army.mil)  
Phone: 816-983-3136

### Location

8 miles west of Mound City in Holt County, Missouri.

### Description

The Rush Bottom Bend mitigation site is currently 811 acres in size. The lands are adjacent to the left descending bank of the Missouri River at river miles 502 to 499. The Corps of Engineers purchased the lands at the mitigation site from willing sellers in 1996 through 1999.

The Rush Bottom Bend lands have been turned over to the Missouri Department of Conservation (MDC) for short-term management while additional acquisitions are attempted to round out the site. Through the annual management plan process, MDC has planted native grasses and trees.

A majority of the area is being leased for agricultural production pending additional acquisitions.

In the future, the Corps plans to modify the existing structures along the bank of the river to improve aquatic diversity in the river. The existing slough is the site of a former side channel that has been closed off from the river. Pending purchase of additional lands, the Corps may attempt to re-open a side channel on the site.

### Current Status

In Fall 2004, the Corps will be completing the Environmental Assessment for the site. The work in the preferred alternative will be installed over the next few years, pending available funds. Meanwhile, the area is open to the public for a variety of uses including bird watching, hiking, and hunting when in season.



*USGS TerraServer 1999 aerial photo of Rush Bottom Bend mitigation site*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Wolf Creek Bend, MO



*Open lands recently purchased at the Wolf Creek Bend site, June 2004*

### Contact

Karl Mueller, Real Estate Leader  
Email: [w.karl.mueller@usace.army.mil](mailto:w.karl.mueller@usace.army.mil)  
Phone: 816-983-3764

### Location

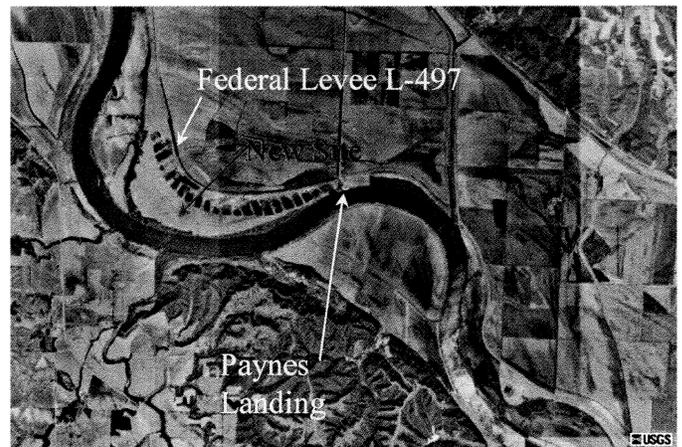
6 miles south of Oregon in Holt County, Missouri.

The Wolf Creek Bend mitigation site is approximately 503 acres in size. The area is adjacent to the left descending bank of the Missouri River at river miles 480 to 477. Federal Levee Unit No. L-497 is located on the north, landward side of the site. At the downstream end, the site joins the existing Payne's landing river access owned by the Missouri Department of Conservation. According to maps, it is also believed that Lewis and Clark camped on the area on July 9, 1804.

The lands at the Wolf Creek Bend mitigation site were purchased by the Corps of Engineers from a private willing seller in 2004. Although outside of the flood protection, the lands have been in cultivation for an extended period. Because the lands were very recently purchased, they will continue to be farmed in the short term while additional acquisition and mitigation plans are made.

### Current Status

In 2005, the Corps hopes to turn over the lands at this site to the Missouri Department of Conservation so that they may perform short term management on the area while environmental assessments and designs on the lands can be completed. The area is not currently opened to the public because the former landowner is allowed to harvest his remaining crops in the field.



*1995 USGS TerraServer aerial view*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Jim and Olivia Hare Wildlife Area, MO



*Riverine habitat created by modifying existing river structures along the banks, September, 2004*

### Contact

David Hibbs, Project Biologist  
Email: [david.r.hibbs@usace.army.mil](mailto:david.r.hibbs@usace.army.mil)  
Phone: 816-983-3136

### Location

Two miles west of Nodaway, Missouri, river miles 466 to 464 at the Dallas Bends of the Missouri River.

### Description

This mitigation site is 657 acres in size. The site was purchased from willing sellers in 2003. The site is in the river bottom adjacent to the Missouri Department of Conservation's (MDC) Monkey Mountain Conservation Area.

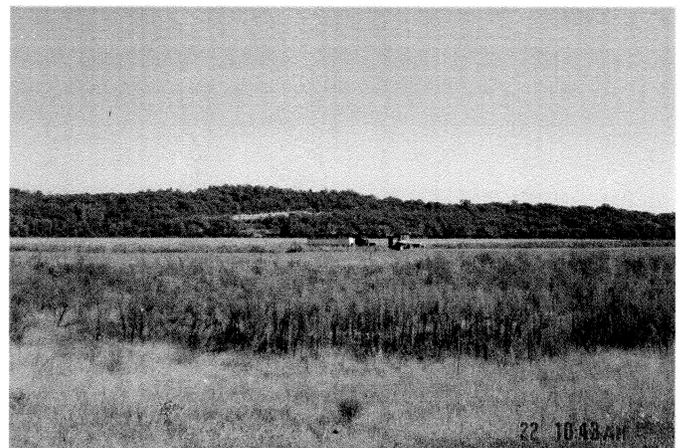
The river bottom at this site has been in agricultural production for many years. Through Cooperative Agreement with MDC, the lands are being slowly converted to grassland and bottom land forest habitats. The site will make a great compliment to the adjacent Monkey Mountain Conservation Area, allowing wildlife to move from the upland woods down across the river bottom to the Missouri River.

In the Spring of 2004, the Corps of Engineers completed several modifications to the existing river structures along the banks of this site. The modifications eroded some of the bank, allowing the river to widen in this area. The resulting shallow, slow moving water provides more diversity within the river for big river native fishes.

The Corps, MDC and US Fish and Wildlife Service will be completing a mitigation plan for the site during 2005. An Environmental Assessment of the site will then be performed followed by additional projects needed to convert the area to fish and wildlife habitats.

### Current Status

Conversion of the lands to native land covers is underway. Access to the site is limited due to adjacent railroad separating the site from the Monkey Mountain CA. MDC will be working with the railroad soon to assure safe access for the general public. Until that time, access to the site is limited to MDC and Corps use.



*View across the newly acquired site to the bluffs of the Monkey Mountain Conservation Area, 2004*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Worthwine Island, MO



*Location of proposed side channel at the Worthwine Island mitigation site*

### Contact

Jake Owen, Site Project Manager  
Email: [Jacob.w.owen@usace.army.mil](mailto:Jacob.w.owen@usace.army.mil)  
Phone: 816-240-8131

### Location

6 miles Northwest of St. Joseph in Andrew County, Missouri, on the left descending bank of the Missouri River, at river miles 460 to 456.

### Description

This mitigation site is located at the Worthwine Island Conservation Area (WICA), 585 acres of existing public land owned and operated by the Missouri Department of Conservation (MDC). The area is adjacent to Federal Levee Unit No. L-476.

A side channel at the Worthwine Island site was closed during construction of the Missouri River Bank Stabilization and Navigation Project. During 2005, the Corps of Engineers will be restoring flow through the side channel. The restoration work will include modification of existing river structures, excavation of a pilot channel, and construction of rock control points. The pilot channel will be 75 feet wide. The project is being designed to allow the river to scour out the historic chute to a full 200-foot width over time, creating approximately 45 acres of high quality riverine habitat.

In addition, approximately 500 acres of bottomland riparian habitat will be created by the project. The spoil material excavated from the pilot channel will be used to create a stability berm on the land side of the adjacent Federal levee.

Upon completion of construction, MDC will resume management of the site. The Corps will monitor the side channel to assure adequate flows remain in the main channel of the Missouri River. The WICA is closed to public use during the construction period that is scheduled to end by Fall of 2005.



*Debris located at the proposed inlet to the restored side channel, August 2004*

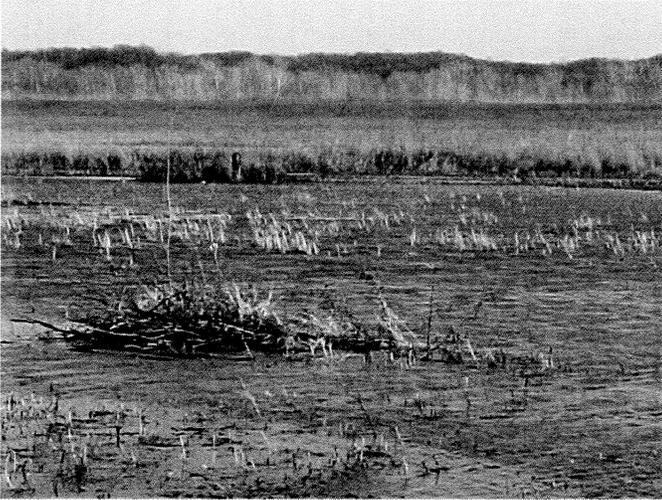


US Army Corps  
of Engineers®

Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Benedictine Bottoms, KS



*Emergent wetland habitat in early winter, 2001*

### Contact

Glenn Covington, Project Biologist  
Email: [William.g.covington@usace.army.mil](mailto:William.g.covington@usace.army.mil)  
Phone: 816-983-3141

### Location

Two miles northwest of Atchison, Kansas, river miles 429 to 424 at the Rushville Bend of the Missouri River.

### Description

This mitigation site is 2,111 acres in size. The site was purchased from willing sellers in 1993 and 1994. Design of the mitigation features at this site were coordinated with the Kansas Department of Wildlife and Parks, the Kansas State Extension and Forestry and the US Fish and Wildlife Service. The project features 550 acres of native upland habitat, 750 acres of native grassland habitat, and 450 acres of wetland habitat.

Construction of the project was completed in 1998. The native upland habitat was created by planting more than 175,000 tree and shrub seedlings. The grasslands were created by planting a mixture of big

bluestem, Indian, eastern gama and switch grasses along with wildflowers and legumes. The wetland prairie habitat will provide valuable nesting and escape cover as well as a source of food.

The wetlands were built using low-profile earthen berms, three wells and distribution piping, and water control structures. The wetland cells are operated as seasonal marshes that contain shallow water for migratory waterfowl.

### Current Status

In 2003, a binder material was mixed and compacted in the wetland areas to aid water retention at the site. In 2002 and 2004, the Corps of Engineers made modifications to the river dike structures along the banks to enhance the riverine diversity in the Missouri River and at the mouth of Independence Creek. The site has been turned over to the KDWP for management. The site is available to the public for a variety of activities including fishing, bird watching, hiking, and hunting (by special permit).



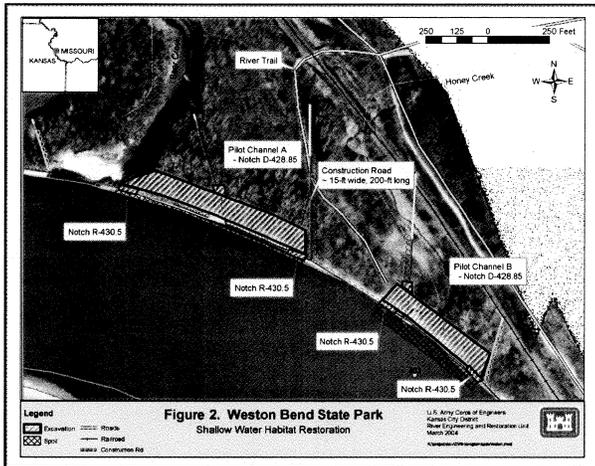
*Wintertime view of wetland prairie habitat, Benedictine Bottoms mitigation site*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Weston Bend, MO



*Diagram of the work completed at the Weston Bend State Park in July, 2004*

The mitigation work at Weston Bend created approximately 5 acres of riverine habitat but will vary over time, hopefully growing to a full 12-acre site. It is located at river mile 403 on the left descending bank of the Missouri River.

### Current Status

The Weston Bend State Park is owned and operated by the Missouri Department of Natural Resources (MDNR). MDNR maintains the park features at the site. The Corps will maintain the river structures at this location to assure adequate flows remain in the main river channel while the riverine habitat forms. Meanwhile, the site is available to the public for a variety of outdoor activities including picnicking, site seeing, bird and wildlife watching.

### Contact

Mike Chapman, Civil Engineer  
Email: michael.d.chapman@usace.army.mil  
Phone: 816-983-3310

### Location

One mile south of Weston, in Platte County, Missouri.

### Description

This mitigation site is located within the Missouri River along the bank of the Weston Bend State Park. Two pilot channels were constructed in the existing river structures in the spring of 2004. These modifications were completed to increase the diversity of the riverine habitat at this location for a wide variety of fish, including the endangered pallid sturgeon. The increase in shoreline will also benefit native shore birds and amphibians.



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Grand Pass, MO



*Looking downstream at the restored chute*

### Contact

Glenn Covington, Project Biologist  
Email: [William.g.covington@usace.army.mil](mailto:William.g.covington@usace.army.mil)  
Phone: 816-983-3141

### Location

7 miles northwest of Marshall in Saline County, Missouri at the Grand Pass Conservation Area (GPCA).

### Description

GPCA is existing public land owned and operated by the Missouri Department of Conservation (MDC). GPCA is approximately 5,100 acres in size. The area is adjacent to the right descending bank of the Missouri River at river miles 273 to 266.

Along the banks of the GPCA, the Corps of Engineers has installed numerous river structures and miles of revetments. This work included a closure structure near river mile 271 that was installed to keep flows out of a small chute that was

located there. In 1991, the Corps of Engineers worked with MDC on re-opening this chute. The closure structure was modified and the filled in chute was excavated and dredged so that the river flow could return to the chute.

In addition to re-opening the chute, the Corps installed brush piles and rock hard points to increase the diversity within the chute. The restored chute is now approximately 50 feet wide and the restoration has returned approximately 35 acres of riverine and forested wetland habitats to the area.

### Current Status

MDC operates and manages the lands at GPCA around the restored chute. The Corps maintains the river structures at this location to assure the side channel continues to provide shallow and slow moving water for native big river fishes. The GPCA is open to the public for a variety of uses including fishing, bird watching, hiking, and hunting.



*View of the excellent shallow water habitat created by restoration of the Grand Pass chute*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Franklin Island, MO



*Shallow water riverine habitat created through dike notching along Franklin Island, June 2004*

### Contact

Mike Chapman, Civil Engineer  
Email: michael.d.chapman@usace.army.mil  
Phone: 816-983-3310

### Location

One mile northeast of Boonville, in Howard County, Missouri.

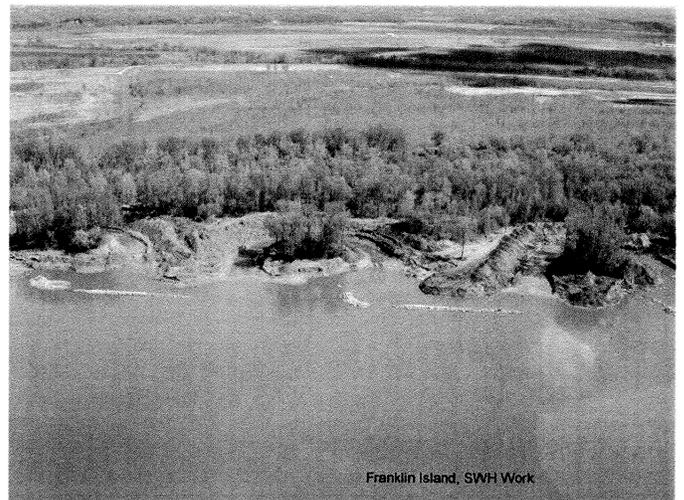
### Description

This mitigation site is located within the Missouri River along the bank of the Franklin Island Conservation Area. Nine bank notches were made in the existing river structures in the Spring of 2004. These modifications were made to increase the diversity of the riverine habitat at this location for a wide variety of fish, including the endangered pallid sturgeon. The increase in shoreline will also benefit a variety of native shore birds and amphibians.

The Franklin Island mitigation site is now approximately 36 acres in size but will vary over time, hopefully growing to a full 54-acre site. It is located at river miles 196 to 193 on the left descending bank of the Missouri River.

### Current Status

The Franklin Island Conservation Area is jointly owned and operated by the Missouri Department of Conservation (MDC) and the Natural Resources Conservation Service. MDC maintains the wetland, forest, and other terrestrial habitats at this site. The Corps will maintain the river structures at this location to assure adequate flows remain in the main river channel while the riverine habitat forms. Meanwhile, the site is available to the public for a variety of outdoor activities including bird and wildlife watching, hunting, photography, and fishing.



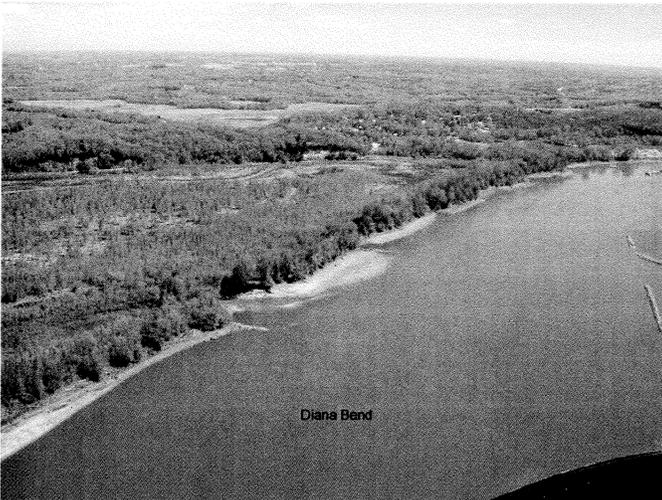
*Shallow water riverine habitat created by Corps of Engineers in-house work crews, June 04*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Diana Bend, MO



*Bankline along the Diana Bend Conservation Area, June 2004*

### Contact

Mike Chapman, Civil Engineer  
Email: michael.d.chapman@usace.army.mil  
Phone: 816-983-3310

### Location

One mile west of Rocheport, in Howard County, Missouri.

### Description

This mitigation site is located within the Missouri River along the bank of the Diana Bend Conservation Area. Two bank notches and a 1000-foot long pilot channel were made in the existing river structures in the Spring of 2004. These modifications were completed to increase the diversity of the riverine habitat at this location for a wide variety of fish, including the endangered pallid sturgeon. The increase in shoreline will also benefit native shore birds and amphibians.

The mitigation work at Diana Bend created approximately 12 acres of riverine habitat but will vary over time, hopefully growing to a full 16-acre site. It is located at river miles 190 to 187 on the left descending bank of the Missouri River.

### Current Status

The Diana Bend Conservation Area is jointly owned and operated by the Missouri Department of Conservation (MDC) and the Natural Resources Conservation Service. MDC maintains the wetland, forest, and other terrestrial habitats at this site. The Corps will maintain the river structures at this location to assure adequate flows remain in the main river channel while the riverine habitat forms. Meanwhile, the site is available to the public for a variety of outdoor activities including bird and wildlife watching, hunting, photography, and fishing.



*Shallow water riverine habitat created by Corps of Engineers in-house work crews, June 04*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Overton Bottoms North, MO



*Outlet of the constructed chute, May 2004.*

### Contact

Bob Dimmit, Site Project Manager  
Email: robert.g.dimmit@usace.army.mil  
Phone: 816-983-3468

### Location

14 miles West of Columbia in Cooper County,  
Missouri.

### Description

The Overton Bottoms North (OBN) mitigation site is located on the right descending bank of the Missouri River at river miles 188 to 185. The site is bounded on the east by Interstate 70. Located directly across the interstate is the Overton South mitigation site, and across the river is the Diana Bend Conservation Area.

The OBN site consists of 1,687 acres of land purchased from private willing sellers by both the Corps of Engineers and US Fish and Wildlife Service (USFWS). With implementation of the mitigation at this site, former agricultural lands have been taken out of production and native grasses and trees have been planted.

In 2001, the Corps constructed a chute at the OBN site. The chute was approximately 40 feet wide and only passed flows during high river stages. In 2003, the Corps widened the chute to 70 feet and deepened the entire length so that the chute now has water all year long. Also at this site, the Corps modified the dike structures in 2003-2004 within the Missouri River to create shallow water habitat opportunities for native big river fishes.

### Current Status

The OBN mitigation site has been turned over to the USFWS to manage as part of the Big Muddy National Wildlife Refuge. The USFWS has implemented low maintenance operation plans for the area and plans to let the land recover to pre-agricultural conditions on its own. The Corps and USFWS will continue monitoring the chute and other habitats at the site to assure their development. OBN is available to the public for a variety of outdoor activities including hiking, fishing, bird watching, and hunting when in season.



*Shallow water riverine habitat within the dike field along the banks of the mitigation site, May 2004.*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Overton Bottoms South, MO



*Example of the some of the bankline changes for increased riverine habitat, May 2004*

### Contact

Bob Dimmit, Site Project Manager  
Email: [robert.g.dimmit@usace.army.mil](mailto:robert.g.dimmit@usace.army.mil)  
Phone: 816-983-3468

### Location

14 miles West of Columbia in Cooper and Moniteau Counties, Missouri.

### Description

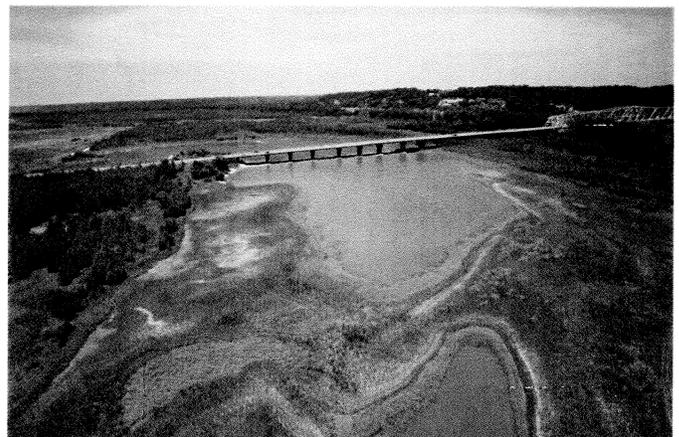
The Overton Bottoms South (OBS) mitigation site is located on the right descending bank of the Missouri River at river miles 185 to 178. Located directly to the north of OBS is the Overton North mitigation site.

The OBN site consists of 3,662 acres of land purchased from private willing sellers by the Corps of Engineers from 1994 through 1997. The lands were primarily used for cultivation, but the site did contain approximately 500 acres of bottomland forest that is being preserved along the river corridor.

In 2002 to 2003, the Corps constructed a set back levee at OBS. The new levee is approximately 1000 feet landward (away from the river's edge) from the existing levee. The existing levee will be breached in 2005, allowing high water to cross out over the increased floodplain at this site. Borrow areas for the new levee were excavated so that opportunistic wetlands will form. Also, extensive river bank modifications have been completed by the Corps at OBS. The riverine diversity will improve shallow water habitats for native big river fishes and shore birds.

### Current Status

The construction of the levee setback and opportunistic wetlands at OBS is complete. The shallow water habitat improvements will continue to erode and form over the next few more years. The area has been turned over to the Missouri Department of Conservation (MDC) for operation and management of the constructed features. The new levee will be turned over to the Overton-Woolridge Levee District in 2005. The area is open to the public for a variety of outdoor activities including bird watching, hiking, fishing, and hunting when in season.



*Scour hole at the OBN site, May 2004.*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Rocheport Cave, MO



*View of the new cave gate at the Rocheport Cave mitigation site.*

### Contact

Jud Kneuvean, Site Project Manager  
Email: [eugene.j.kneuvean@usace.army.mil](mailto:eugene.j.kneuvean@usace.army.mil)  
Phone: 816-983-3281

### Location

20 miles southwest of Columbia in Boone County, Missouri

### Description

This site is located up a side drainage on the left descending bank at Missouri River mile 183. In 1996, the Missouri Department of Conservation (MDC) purchased the opening of this cave and 51 surrounding acres to enhance hibernation, nursery and migratory habitat for the federally endangered Indiana and Grey bats. The endangered Grey bat traditionally used this cave, created by erosive forces of Sinking Creek, as both a wintering hibernation spot and day roost site from which it left to forage over the adjacent Missouri River floodplain.

Recognizing that restricting visitors' access to the cave's interior is paramount to preserving the bats, various proposals to restrict access to the interior of the cave were considered. The most viable option for developing bat use while allowing limited public access to the scenic area was constructing a metal gate across the entrance to the cave.

A joint project was undertaken with MDC, Corps and the American Cave Association to construct the project in the summer of 2002. The cave gate was constructed to allow safe passage of the bats through a 'window' at the top of the gate while restricting any human trespass into the cave's interior.

### Current Status

During the summer of 2004, a large rainfall washed large logs and debris through sinking creek. The debris stacked up against the gate with such force that the gate sustained considerable damage. While the gate in its current condition still functions to prevent human access, repairs are needed. These repairs will be undertaken in 2005. Until the repairs are made, the area will remain closed to the public.



*View of the metal gate being constructed across the entrance to Rocheport Cave.*



US Army Corps  
of Engineers®

Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Eagle Bluffs, MO



*View of the new levee and water control structure on the east wetland cell, May 02*

### Contact

Cindy Moses, Site Project Manager  
Email: [cynthia.j.moses@usace.army.mil](mailto:cynthia.j.moses@usace.army.mil)  
Phone: 816-983-3256

### Location

6 miles southwest of Columbia in Boone County, Missouri at the Eagle Bluffs Conservation Area (EBCA).

### Description

The EBCA is existing public lands owned and operated by the Missouri Department of Conservation (MDC). It is approximately 4,269 acres in size. The area is bounded by the Missouri River to the west and Perche Creek to the East. The EBCA is currently managed for the benefit of a variety of game and non-game species. Habitat components of the EBCA include seasonally flooded wetlands, riparian woodlands, and river-bluff forest.

In 2000, MDC granted the Corps of Engineers a permanent easement to the lower 571 acres at EBCA. This area had been recently purchased by

MDC and was being used for row crop production. The Corps worked with MDC to design and construct two new wetland cells to compliment the other wetlands at the site.

The new wetland pools were constructed in 2001 to 2002. The new wetland pools feature "fish friendly" water control structures. The "fish friendly" structures were specifically constructed to allow fish to enter the wetland areas during high spring flows. While in the wetland cells, the fish can feed and spawn. After nursing new fish within the protected wetlands, the fish can be safely returned to the river. In 2004, the Corps completed modifications to the river structures along the banks at the EBCA to improve riverine diversity.

### Current Status

The new wetland cells have been turned over to MDC for their management. The Corps will maintain the river structures along the banks at this site. EBCA is available to the public for a variety of outdoor activities including bird watching, fishing, hiking, and hunting when in season.



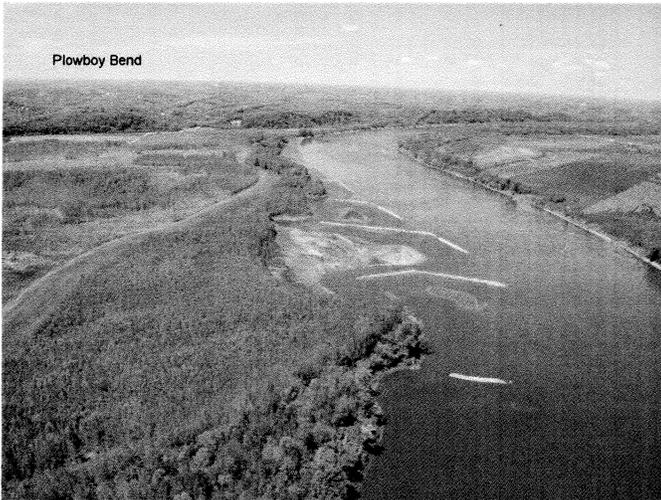
*View of backwater nursery and waterfowl area along Perche Creek, May 02*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Plowboy Bend, MO



*Shallow water habitat created through dike notching along Plowboy Bend, May 2004*

### Contact

Mike Chapman, Civil Engineer  
Email: michael.d.chapman@usace.army.mil  
Phone: 816-983-3310

### Location

Five miles southeast of Lupus, in Cole County, Missouri.

### Description

This mitigation site is located within the Missouri River along the bank of the Plowboy Bend Conservation Area. Several notches and a reverse wing dike were made in the existing river structures in 2001. The river has created deep scour holes and shallow water areas. This site now contains a diverse and dynamic riverine habitat for a wide variety of fish, including the endangered pallid sturgeon.

The new riverine habitats created at this mitigation site are now approximately 30 acres in size but will vary over time, hopefully growing to a full 45-acre site. It is located at river miles 172 to 169 on the right descending bank of the Missouri river.

### Current Status

The Plowboy Bend Conservation Area is jointly owned and operated by the Missouri Department of Conservation (MDC) and the Natural Resources Conservation Service. MDC maintains the wetland, forest, and other terrestrial habitats at this site. The Corps will maintain the river structures at this location to assure adequate flows remain in the main river channel while the riverine habitat forms. Meanwhile, the site is available to the public for a variety of outdoor activities including bird and wildlife watching, hunting, photography, and fishing.



*Wintertime aerial view of eroding bankline, Feb 03*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Marion Bottoms, MO



*USGS TerraServer Aerial View of Marion Bottoms site, 1995*

miles 160 to 159 on the right descending bank of the Missouri river.

### Current Status

The Marion Bottoms Conservation Area is jointly owned and operated by the Missouri Department of Conservation (MDC) and the Natural Resources Conservation Service. MDC maintains the wetland, forest, and other terrestrial habitats at this site. The Corps will maintain the river structures at this location to assure adequate flows remain in the main river channel while the riverine habitat forms. During 2005, the Corps and MDC will evaluate additional mitigation at the Marion Bottoms site including installation of a side channel. Meanwhile, the site is available to the public for a variety of outdoor activities including bird and wildlife watching, hunting, photography, and fishing.

### Contact

Mike Chapman, Civil Engineer  
Email: michael.d.chapman@usace.army.mil  
Phone: 816-983-3310

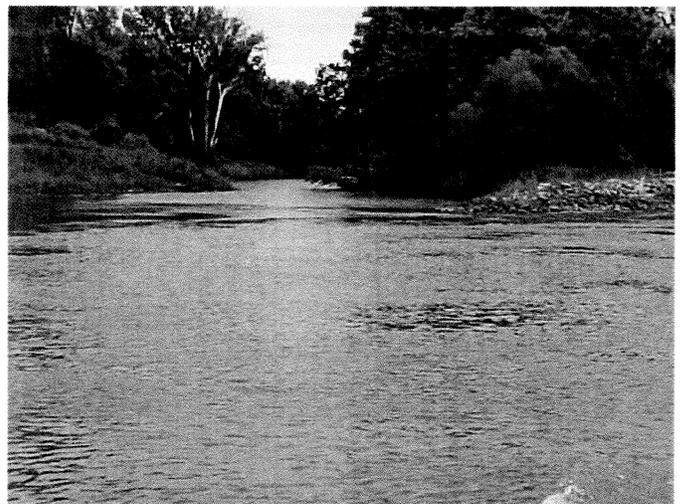
### Location

Twelve miles northwest of Jefferson City, in Cole County, Missouri.

### Description

This mitigation site is located within the Missouri River along the bank of the Marion Bottoms Conservation Area. Several dike notches were made in the existing river structures in 2001 and again in 2004. The river has created deep scour holes and shallow water areas. This site now contains a diverse and dynamic riverine habitat for a wide variety of fish, including the endangered pallid sturgeon.

The riverine habitat at the site is now approximately 36 acres in size but will vary over time, hopefully growing to a full 54-acre site. It is located at river



*Mouth of Moniteau Creek, Marion Bottoms Conservation Area, Sep 04*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Tate Island, MO



*1995 aerial photo of Tate Island mitigation site  
(USGS image from Microsoft TerraServer)*

landside are Tavern and Little Tavern Creeks. This interaction of the side channels with the tributary creeks makes this mitigation site a unique area along the river.

### Current Status

No construction is planned for the site at this time, however opportunities to complete shoreline and/or within river improvements to increase and diversify the riverine habitats at this site may be undertaken in the future. The Corps of Engineers will continue to maintain and operate the river dikes at this location to keep the braided side channels open and active. Land management of the site is being performed by the Missouri Department of Conservation.

### Contact

Glenn Covington, Project Biologist  
Email: [William.g.covington@usace.army.mil](mailto:William.g.covington@usace.army.mil)  
Phone: 816-983-3141

### Location

Two miles east of the city of Portland, in Callaway and Montgomery Counties, Missouri.

### Description

This mitigation site is 423 acres in size. It is located at river miles 113 to 110 on the left descending bank of the Missouri river near the Morrison Bend. The site contains 4 islands separated by a braided side channel.

Tate Island was purchased from a private willing seller in 1998. The site has no existing structures, roads, or buildings. The island has seen little historic use and therefore is relatively undisturbed native habitat. The site contains excellent shallow water, island sandbar complex, and bottomland hardwood areas.

The islands are made up of forested and scrub-shrub wetlands. The dominant tree species is the Cottonwood. Entering the side channel from the



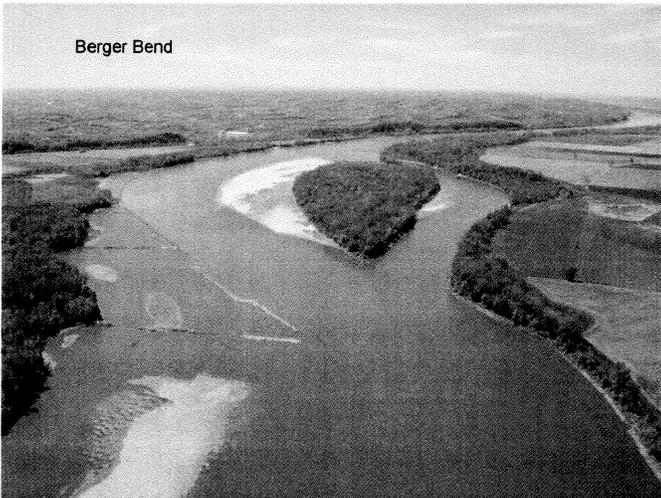
*Aerial view at timbered islands, May 04*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Berger Bend, MO



*At the left of this photo is the bank line of the Berger Bend mitigation site, May 2004*

### Contact

Dave Hibbs, Project Biologist  
Email: [david.r.hibbs@usace.army.mil](mailto:david.r.hibbs@usace.army.mil)  
Phone: 816-983-3136

### Location

6 miles east of Hermann in Franklin County,  
Missouri.

### Description

The Berger Bend mitigation site is approximately 474 acres in size. The area is adjacent to the right descending bank of the Missouri River at river miles 93 to 90.

The lands at the Berger Bend mitigation site were purchased by the Corps of Engineers from willing sellers from 1995 through 1998. The lands were in cultivation, but were heavily damaged by sands carried by the 1993 flood. The lands include approximately 60 acres of land that is enrolled in the NRCS Wetland Reserve Program.

Since the time of purchase, the Corps has been leasing portions of the land for agricultural production. This practice has allowed the area to remain open while additional surrounding areas were acquired. Unfortunately, additional willing sellers have not come forward at this site.

In 2004, the lands began to be fully removed from agricultural production. The formerly cultivated areas will be planted with native trees. The area also has valuable scour hole and forested wetland habitats outside the existing levee that are being maintained by the Corps.

### Current Status

The Berger Bend area will be turned over to the Missouri Department of Conservation once the tree plantings are completed in December 2005 so that they may manage the lands. The mitigation site is now open to the public for a variety of uses including fishing, bird watching, hiking, and hunting.



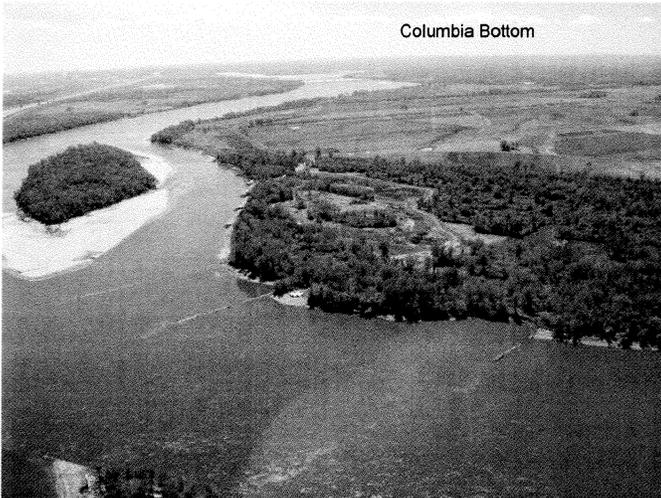
*Winter view of forested area outside existing levee, Dec, 2003*



US Army Corps  
of Engineers®  
Kansas City District

# Information Paper

## Missouri River Fish and Wildlife Mitigation Project Columbia Bottom, MO



*Aerial view of the wooded island and chute, 2004*

### Contact

Don Meier, Site Project Manager  
Email: donald.h.meier@usace.army.mil  
Phone: 816-983-3121

### Location

2.5 miles north of the I-270 Riverview Drive exit, in north St. Louis County, Missouri at the Columbia Bottom Conservation Area (CBCA).

### Description

The CBCA is existing public land owned and operated by the Missouri Department of Conservation (MDC). CBCA is approximately 4,226 acres in size. The site is on the right descending bank of the Missouri River, at the confluence with the Mississippi River.

The land at the Columbia Bottom mitigation site was previously farmed. The area is being improved so that wetlands, native grasses, and bottomland hardwood forest habitats can be restored to the area. Due to the size of the site, the mitigation is taking place in three phases.

Phase I has been completed. Phase I consisted of setback of an existing agricultural levee. The setback moved an existing levee approximately 800 feet from the Mississippi River bank to create additional land on the riverside of the levee. The setback allows floodwaters to spread out onto the floodplain creating excellent feeding areas for fish. The additional land on the riverside of the levee will be planted with bottomland hardwood habitat.

Phase II of the mitigation is currently under construction. This work includes development of approx. 800 acres of wetlands by construction of 15 low dikes, a pump station, and a water delivery system. Once completed, Phase II will allow development of high quality migratory waterfowl habitat. Construction of Phase II is scheduled to be completed by Fall 2005.

Phase III is also underway. This work includes native vegetative plantings which converts existing cultivated areas to forest and grassland habitats. MDC manages the site. The area is available to the public for a variety of outdoor activities including bird watching, hiking and fishing.



*Winter view of existing wetland area, 2002*



**US Army Corps  
of Engineers®**

**US Army Corps of Engineers  
Omaha District  
215 North 17<sup>th</sup> Street  
Omaha, Nebraska 68102  
402-221-4605**

---



**US Army Corps  
of Engineers®**

**US Army Corps of Engineers  
Kansas City District  
601 East 12<sup>th</sup> Street  
Kansas City, Missouri 64106  
816-983-3324, Fax: 816-426-6356**

---