

Missouri River Bank Stabilization and Navigation Fish and Wildlife Mitigation Program



Confluence Point Mitigation Site

Draft

Project Implementation Report

January 2009



**US Army Corps
of Engineers**®
Kansas City District

Prepared by:



**US Army Corps
of Engineers**®
St Louis District

Missouri River Bank Stabilization and Navigation Fish and Wildlife Mitigation Program

U.S. Army Corps of Engineers

**Kansas City District
601 East 12th St.
Kansas City, MO 64106**

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DEPARTMENT OF THE ARMY
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
700 FEDERAL BUILDING
KANSAS CITY, MISSOURI 64106-2896

DRAFT Findings of No Significant Impact

Confluence Point Fish and Wildlife Mitigation Project St. Charles County, Missouri

XX January 2009

Summary

The U.S. Army Corps of Engineers, Kansas City District (USACE-NWK), proposes to develop fish and wildlife habitat at the Confluence Point Mitigation Site as part of the Missouri River Recovery Program.

The site is located in St. Charles County, Missouri at the confluence of the Missouri and Mississippi Rivers. It is located between river miles 0 and 2 on the Missouri River and river miles 195 and 199 on the Mississippi River. There is a non-Federal agricultural levee running along the north, east, and southern boundaries of the site. Agricultural lands border the site to the west. The site receives an influx of ground water when river levels are high because of the presence of several exposed sand lenses.

The Full Development alternative would include the use of various activities to develop fish and wildlife habitat on the Confluence Point Site. These methods would include planting trees, prairie vegetation, and wetland vegetation in appropriate locations based on topography, hydrology, soils, and location of utility corridors. More specifically, prairie plantings would be planted in the northern portions of the site while the southern areas would become a mix of areas allowed to self populate with cottonwoods, willows, and other soft mast pioneering species as well as some areas planted with hard mast species at the highest elevations. Small basins would be constructed to capture and hold water as ephemeral wetlands. Larger areas would be constructed to induce more permanent wetland habitat. The basins would be constructed throughout the site and would be constructed to mimic natural land contours.

Monitoring activities would also be conducted and would be used to adaptively manage the site. No recreational features would be constructed by the Corps; however, the site would be open to the public for a variety of uses including bird watching, hiking, and fishing.

Alternatives

A total of three alternatives were evaluated in terms of individual and cumulative effects on the proposed project, which are addressed below:

Alternative 1 - Full Site Development (Recommended Plan): Of the three alternatives considered, this plan is recommended because it provides maximum benefits to fish and wildlife habitat at the site and best meets the project purpose and need for creating fish and wildlife habitat. The Full Development alternative also provides for more enhancement of wetland development, and increases forest diversity. The Full Development alternative would not adversely affect navigation or adjacent landowners.

Alternative 2 - Partial Site Development: Alternative 2 is technically feasible, but would not maximize benefits for fish and wildlife habitat development at the Confluence Point Site as this alternative only emphasizes tree plantings. As such, Alternative 2 was not recommended as the preferred alternative.

Alternative 3 - “No Action” Alternative: The “No Action” Alternative is not recommended because it would have the least benefit for fish and wildlife habitat development at the Confluence Point Site and thus does not meet proposed project goals. It only contains natural regeneration of pioneering tree species and does not include the tree species diversity of Alternatives 1 or 2. This alternative would have no permanent or temporary construction related impacts.

Summary of Environmental Impacts

On this project, minor amounts of soil would be disturbed by construction activities. The adverse effects associated with the project are short-term/minor and related to project construction. Soils disturbed will remain on site to be used as berms to help hold water in small ephemeral wetlands. The benefits of wetland, prairie, and forested habitat development upon project completion, would offset these minor adverse affects.

The proposed fish and wildlife habitat development at the Confluence Point Site would result in environmental benefits, and adverse effects are minor/short-term construction related. The minor adverse impacts associated with this project are well outweighed by the overall long-term environmental benefits.

Mitigation Measures

The recommended plan will result in a minor amount of soil disturbance at Confluence Point. Impacts as a result of project include the temporary loss of vegetation. The overall environmental benefits associated with this project greatly outweigh the minor temporary construction-related impacts of the project. As such, no mitigation measures are proposed.

Public Involvement

Prior to a decision on whether to prepare an Environmental Impact Statement, the USACE circulated a Notice of Availability (Notice) of the Draft Environmental Assessment (EA) and Finding of No Significant Impact (FONSI), dated _____, 2009, with a thirty-day comment period ending on _____, 2009 to the public and resource agencies. The Notice was e-mailed to individuals/agencies/businesses listed on the USACE NWK and St. Louis District Regulatory Branch's General, State of Missouri, St. Charles County and St. Louis County mailing lists. The Public Notice was also available for public/agency review and comment on the NWK-Regulatory Branch's webpage and the Mitigation Program web page (<http://www.nwk.usace.army.mil/projects/mitigation/>).

Conclusion

After evaluating the anticipated environmental, economic, and social effects of the proposed activity, it is my determination that construction of the proposed fish and wildlife habitat at Confluence Point does not constitute a major Federal action that would significantly affect the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

Date: _____

Roger A. Wilson, Jr.

Colonel, Corps of Engineers

District Commander

Chapter 1 Introduction	1
1.1.1 Project Authority.....	2
1.1.2 Project Description and Location.....	3
1.1.3 Previous Related Reports.....	6
1.1.4 Project Goals and Objectives.....	7
1.1.5 Scope of Study.....	8
1.2 PURPOSE OF AND NEED FOR ACTION.....	9
1.3 SITE SELECTION.....	10
1.4 AGENCY COORDINATION.....	11
Chapter 2 Alternatives.....	13
2.1 INTRODUCTION.....	13
2.2 ALTERNATIVES.....	16
2.2.1 Full Development Alternative.....	16
2.2.2 Partial Development Alternative.....	21
2.2.3 No Development Alternative.....	21
2.3 EVALUATION OF ALTERNATIVES.....	21
2.4 DESCRIPTION OF RECOMMENDED ALTERNATIVE.....	26
2.4.1 Actions Already Performed or Scheduled to be Performed Prior to Project Implementation by MDNR.....	26
2.4.2 Summary of Long-term Management Plan Items Not Covered in Section 2.2.1	29
Chapter 3 Affected Environment.....	31
3.1 INTRODUCTION.....	31
3.2 HISTORY OF THE PROJECT AREA.....	31
3.3 GEOLOGICAL RESOURCES.....	34
3.3.1 Topography.....	34
3.3.2 Geology.....	36

3.3.3	Soils	36
3.4	PRIME AND UNIQUE FARMLAND	36
3.5	BIOLOGICAL RESOURCES.....	37
3.5.1	Aquatic Resources.....	37
3.5.2	Terrestrial Resources	38
3.5.3	Wetland Resources	38
3.5.4	Wildlife	39
3.5.5	Threatened and Endangered Species.....	40
3.6	LAND COVER	43
3.7	CULTURAL RESOURCES.....	45
3.7.1	Accreted Lands.....	45
3.7.2	Historic Properties and Archaeological Sites	45
3.7.3	Steamboat Wrecks.....	46
3.8	WATER QUALITY.....	48
3.9	AIR QUALITY	49
3.10	NOISE	49
3.11	SOCIOECONOMIC RESOURCES.....	49
3.11.1	Population and Income	49
3.11.2	Recreation and Aesthetics.....	50
3.11.3	Navigation	51
Chapter 4	Environmental Consequences	52
4.1	INTRODUCTION	52
4.2	GEOLOGICAL RESOURCES.....	53
4.2.1	Topography.....	53
4.2.2	Geology	54
4.2.3	Soils	54
4.3	PRIME AND UNIQUE FARMLAND	55
4.4	BIOLOGICAL RESOURCES.....	55
4.4.1	Aquatic Resources.....	56

4.4.2	Terrestrial and Wetland Resources.....	56
4.4.3	Wildlife	60
4.4.4	Threatened and Endangered Species	62
4.5	LAND COVER	63
4.6	CULTURAL RESOURCES.....	64
4.6.1	Historic Properties and Archaeological Sites.....	64
4.6.2	Steamboat Wrecks	65
4.6.3	Accreted Lands	65
4.7	WATER QUALITY.....	66
4.8	AIR QUALITY	66
4.9	NOISE	67
4.10	SOCIOECONOMIC RESOURCES.....	68
4.10.1	Population and Income	68
4.10.2	Recreation and Aesthetics.....	68
4.10.3	Navigation	69
4.11	CUMULATIVE EFFECTS.....	69
4.12	IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES	72
4.13	FUTURE WITHOUT-PROJECT CONDITION.....	72
4.14	ENVIRONMENTAL COMPLIANCE	72
4.14.1	Environmental Policy	72
4.14.2	Water Resources	73
4.14.3	Biological Resources	75
4.14.4	Cultural Resources	76
4.14.5	Land Use (Prime Farmlands)	76
4.14.6	Air Quality.....	77
Chapter 5	Other Considerations.....	78
5.1	INTRODUCTION	78
5.2	MONITORING AND EVALUATION PLAN	78
5.3	OPERATIONS AND MAINTENANCE (O&M) PLAN	81

5.4 REAL ESTATE CONSIDERATIONS 82

5.5 IMPLEMENTATION RESPONSIBILITIES 83

5.6 COST ESTIMATE..... 83

5.7 SCHEDULE..... 85

5.8 CONCLUSIONS AND RECOMMENDATIONS 85

REFERENCES87

LIST OF PREPARERS

- Appendix A – Public and Agency Coordination**
- Appendix B – Technical Documents**
- Appendix C – Cultural Resources Report**
- Appendix D – Baseline Habitat Assessment**
- Appendix E – Biological Assessment**
- Appendix F – Environmental Permits and Clearances**
- Appendix G – 404(b)(1) Evaluation**

List of Figures

Figure 1-1: Confluence Point Project Location..... 4

Figure 2-1: Current Conditions at Confluence Point Site 15

Figure 2-2: Proposed Habitat Development for Confluence Point Site. 28

Figure 3-1: Confluence Point in 1880..... 32

Figure 3-2: Confluence Point at Present 33

Figure 3-3: Confluence Point Topography and Areas of High Flow Accumulation 35

Figure 3-4: Existing Land Cover at Confluence Point. 44

Figure 3-5: Non-accreted Lands on Confluence Point. 47

Figure 4-1: Proposed Habitat Development..... 58

Figure 4- 2: Public Lands in Vicinity of Confluence Point..... 71

List of Tables

Table 1-1: Confluence Point Site Habitat Goals..... 8

Table 2-1: Comparison of Environmental Consequences of Alternatives Evaluated..... 23

Table 3-1: Existing Resources 38

Table 3-2: Federal List of Species With Potential to Occur at Confluence Point 40

Table 3-3: Missouri Department of Conservation Record of Federal Listed or State
Endangered Species Within One Mile of the Project Site. 40

Table 4-1: Project Outputs 59

Table 4-2: Compliance of Preferred Alternative with Environmental Protection 74

Table 5-1: Cost Estimate for the Confluence Point Site..... 84

Table 5-2: Confluence Point Site Project Schedule 85

Chapter 1

Introduction

1.1 INTRODUCTION

The U.S. Army Corps of Engineers (Corps) - Kansas City District (NWK) proposes to develop fish and wildlife habitat on approximately 1,118 acres of land at the confluence of the Missouri & Mississippi River in St. Charles County, Missouri. The project name is the Confluence Point Missouri River Fish and Wildlife Mitigation Project (Confluence Point). The project involves the restoration and long term management of fish and wildlife habitat on two contiguous tracts of land. Approximately 532 acres of land in the north section was originally acquired by the Confluence Gateway group who leased it to the Missouri Department of Natural Resources (MDNR). These acres were purchased by the Corps from the Confluence Greenway in 2007 and remains in Corps ownership. The remaining, approximately 586 acres, is owned by the MDNR. The project would be completed under the authority of the Corps' Missouri River Fish and Wildlife Mitigation Program (Mitigation Program). The Mitigation Program was authorized by the Water Resources Development Act of 1986 and 1999 (WRDA86 and WRDA99) to develop and restore fish and wildlife habitat along the lower Missouri River from Sioux City, Iowa, to the mouth near St. Louis, Missouri. This was to mitigate for the loss of habitat due to construction, operation, and maintenance of the Missouri River Bank Stabilization and Navigation Project (BSNP). The Reaffirmation Report (Corps 1990) established that NWK would have responsibility for projects in Missouri and Kansas and the Omaha District (NWO) would have responsibility for projects in Iowa and Nebraska. The Corps typically partners with the U.S. Fish and Wildlife Service or a state natural resource management agency, who assumes management duties after projects are completed. MDNR is the onsite management agency working in partnership with the Corps to develop and implement the environmental restoration plan for this project. The Confluence Point project originated as a Section 206 environmental restoration project out of the St. Louis District

(MVS). It was converted to a Missouri River Mitigation Project in 2007. Because of its history with the project and proximity to the City of St. Louis, NWK enlisted MVS to complete the planning effort on the project. NWK is providing oversight on the planning effort and with MDNR will have responsibility for implementation of the restoration plan and long-term operation and maintenance of the project. While MDNR will operate recreational facilities at the site, these efforts are not part of or funded by the Mitigation Program. Collectively, the 1,118 acres are managed by MDNR as their Edward (Ted) and Pat Jones – Confluence Point State Park.

This Project Implementation Report (PIR) includes an Environmental Assessment (EA) consistent with the National Environmental Policy Act (NEPA). It provides an analysis of alternatives and a detailed description of the recommended plan for habitat development at Confluence Point. This PIR also contains an evaluation of environmental impacts related to the development of aquatic and terrestrial habitat consistent with the requirements of pertinent federal regulations including NEPA, the Endangered Species Act (ESA), the National Historic Preservation Act (NHPA), and Section 404 of the Clean Water Act (CWA).

1.1.1 PROJECT AUTHORITY

Confluence Point is proposed to be restored as part of the Mitigation Program. The Mitigation Program was initially authorized in Section 601(a) of WRDA86 [Public Law (PL) 99-662]. The authorization included the acquisition and development of 29,900 acres of land, and habitat development on an additional 18,200 acres of existing public land in the states of Iowa, Kansas, Missouri, and Nebraska. The total amount of land authorized for mitigation by WRDA86 was 48,100 acres.

Section 334(a) of WRDA99 (PL 106-53) modified the Mitigation Program by increasing the amount of acreage to be acquired and/or mitigated by 118,650 acres. Therefore, the total amount of land authorized for mitigation is currently 166,750 acres.

The Corps prepared a *Feasibility Report and Environmental Impact Statement* in 1981 on the original Mitigation Program of 48,100 acres. After Congress modified the Mitigation Program in WRDA99, the Corps initiated a *Supplemental Environmental Impact Statement* (SEIS) in September 2001 for the additional 118,650 acres. The SEIS was completed in early 2003 and the *Record of Decision* (ROD) was signed in June 2003.

1.1.2 PROJECT DESCRIPTION AND LOCATION

The proposed project would develop fish and wildlife habitat at Confluence Point. According to MDNR's 2004 Revegetation Plan, the restoration vision for Confluence Point is a natural floodplain. This vision emphasizes native vegetation and the natural wetlands suitable for the site's current soil, topography, and hydrology. It reflects the examples offered by Missouri Natural Areas and other old-growth natural ecosystems along the Missouri and Mississippi Rivers, yet recognizes the dynamic nature of floodplain ecosystems and the modern alterations of the rivers and their floodplains.

Confluence Point spans the distance between the main channels of the Missouri and Mississippi Rivers at their junction. Its terrain is characterized by a ridge and swale topography that shows the pattern of flooding and drainage that generally flows from west to east. Total relief is approximately twelve feet with elevations ranging from 408 to 421 feet above sea level. A natural levee has developed along the Missouri River, and two other isolated terraces or high spots are situated internally. Soils at Confluence Point all formed from recent alluvial deposits. They are low in elevation and are frequently flooded with ground water that fluctuates with river levels. The ground water enters the site through areas previously deeply excavated (>5 feet) areas to obtain material to perform repairs on the levee surrounding the site. These excavations exposed an area of sand that allows the ground water to move into the site easily.

Contrasting the undulating topography in the southern part of the park, a relatively large and level "plain" at the 416-417 foot elevation covers the northwest park quadrant. Flood stage at Confluence Point is 417 feet, 4 feet below the highest park elevation of 421 feet. Several low swales traverse the property, and include the internal local drainage that flows east from the adjacent properties. Because the Missouri River is higher than the Mississippi, water generally moves from west to east, through the low swales and out to the Mississippi River at three gated pipes. One large, semi-permanent pool exists at the junction of this drainage way with the outlet to the Mississippi River. Four scour holes exist alongside the Mississippi River, where levee breaks and deep scouring occurred during past floods.

An agricultural levee surrounds the property alongside both rivers, and except for three gated pipes, high ground water levels or when the levee is overtopped by flooding, there is no direct connectivity between the park and Mississippi or Missouri Rivers. The top of this levee is at 426

feet. The banks of the rivers themselves are very steep and covered in many places by rip-rap. Channel control structures border the property, with mudflats exposed behind them at low river stages. Compared to upstream lands, this park has a low elevation relative to the normal level of the Missouri River. (MDNR 2004)

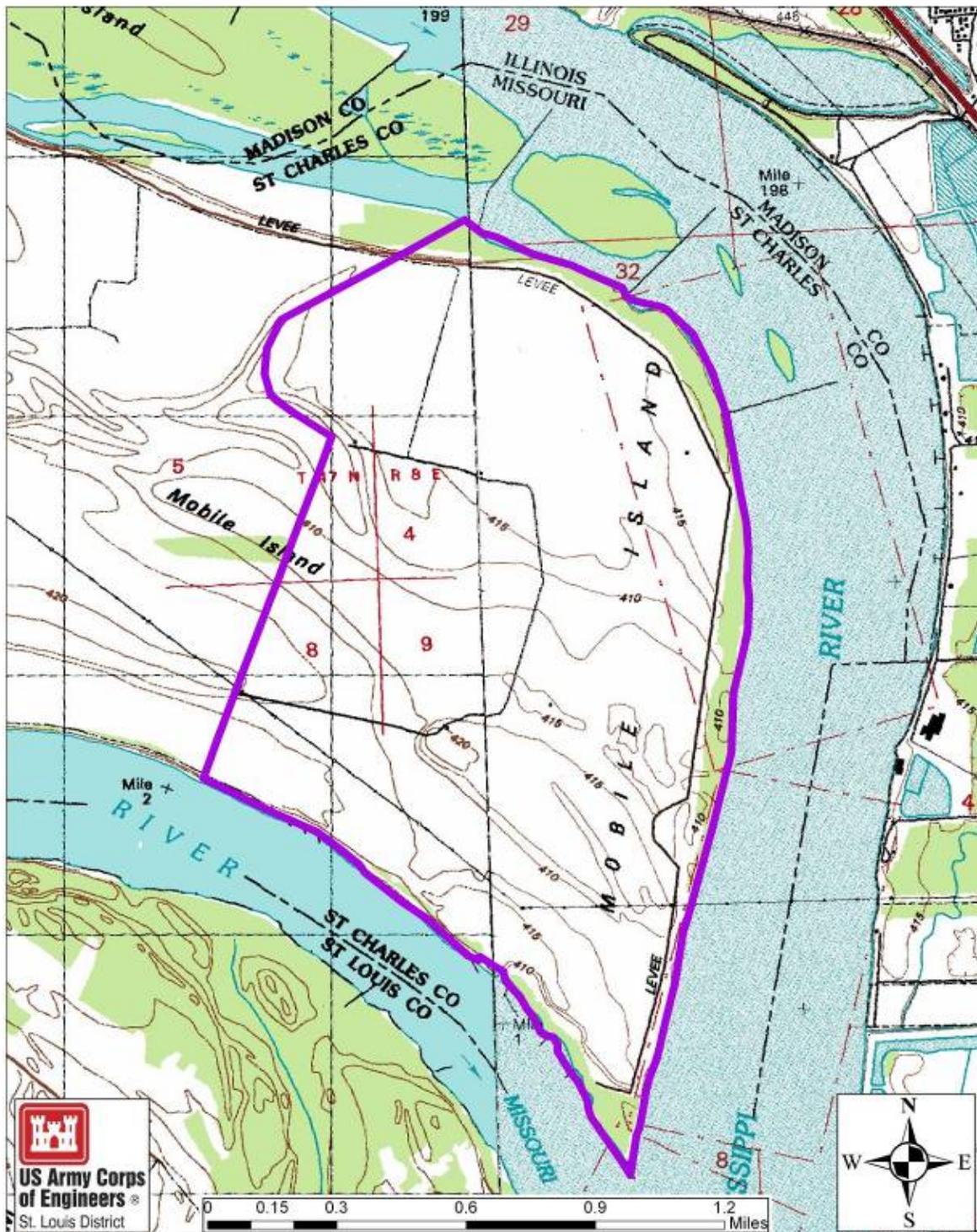


Figure 1-1: Confluence Point Project Location

1.1.3 PREVIOUS RELATED REPORTS

The following previous reports are related to this PIR:

- Corps, Missouri River Division, 1981. *Missouri River Fish and Wildlife Mitigation Iowa, Nebraska, Kansas, and Missouri Final Feasibility Report and Final Environmental Impact Statement.*
- Corps, Kansas City District, 1990. *Missouri River Bank Stabilization and Navigation Fish and Wildlife Mitigation Project, Reaffirmation Report.*
- Corps, Missouri River Division, 1990. *Missouri River Bank Stabilization and Navigation, Fish and Wildlife Mitigation Project, Real Estate Design Memorandum #1.*
- Corps, Missouri River Division, 1992. *Missouri River Fish and Wildlife Mitigation Project, Project Management Plan.*
- Corps, Kansas City District, 1997. *Missouri River Bank Stabilization and Navigation, Fish and Wildlife Mitigation Project, Real Estate Letter Design Memorandum, Hemmes Bend/Corning Site, Holt County, Missouri.*
- Corps, Kansas City District, 2000. *Lower Hamburg Bend Mitigation Site, Definite Project Report.*
- Corps, Omaha District, 2003. *Kansas and Nishnabotna Bends, Environmental Assessment.*
- Corps, Kansas City and Omaha Districts, 2003. *Missouri River Fish and Wildlife Mitigation Project, Final Supplemental Environmental Impact Statement and Record of Decision.*
- Corps, Kansas City and Omaha Districts, 2005. *Missouri River Fish and Wildlife Mitigation Program, Draft Program Management Plan.*
- Corps, Kansas City District, 2005. *Corning Fish and Wildlife Mitigation Site: Site Mitigation Plan (Appendix A).*

- Missouri Department of Natural Resources, 2004. *Edward “Ted” and Pat Jones Confluence Point State Park. Revegetation and Restoration Plan.*
- U.S. Fish and Wildlife Service (USFWS), 1980. *Missouri River Stabilization and Navigation Project, Sioux City, Iowa to Mouth Detailed Fish and Wildlife Coordination Act Report.*

1.1.4 PROJECT GOALS AND OBJECTIVES

The overall objective for Confluence Point as a component of the Mitigation Program is to develop fish and wildlife habitat. Beginning shortly after authorization by WRDA86, the Agency Coordination Team (ACT, discussed in more detail in Section 1.4) has been involved in Mitigation Program guidance and has helped establish overall objectives to:

- Maximize habitat and species diversity;
- Reconnect the river to the floodplain; and
- Develop each site to optimize habitat conditions for that individual site.

In addition to ACT objectives, MDNR lists six restoration objectives in the Revegetation and Restoration Plan for the Confluence Point. The first objective addresses fulfilling Section 404 permit requirements, which cannot be addressed by this authority. The remaining five are as follows:

Restoration Objectives

- 1) Facilitate revegetation of the natural communities
- 2) Provide for semi-permanent pools
- 3) Provide for fish access between the river and the park
- 4) Manage the federally listed endangered species, and other rare or conservative species
- 5) Establish biological inventory and monitoring

Table 1-1 summarizes the acres of general habitat types that currently exist at Confluence Point, the proposed future acres of habitat that would result from

implementation of the preferred alternative, and project outputs (net habitat changes). Project outputs identified in Table 1-1 differ from preliminary outputs identified in the SMP (Appendix A).

Table 1-1: Confluence Point Habitat Goals

General Habitat Type	Existing Acres	Proposed Acres	Output ¹
Wet Prairie/Grassland	41.3	276.5	235.2
Boltonia Restoration	18.2	28.5	10.3
Sandbar/Mudflat	0	38.4	38.4
Scrub/Shrub	0	167.5	167.5
Wet Bottomland Forest (Low)	306.6 ²	126.2	-180.4 ¹
Wet Bottomland Forest (High)	58.0 ³	100.7	42.7
Wet-Mesic Forest	0	60.0	60.0
Deep Meander	0	1.3	1.3
Deep Pool	0	53.0	53.0
Shallow Meander	0	8.2	8.2
Shallow Pool	0	50.7	50.7
Shallow Scour	0	3.6	3.6
Spoil Banks	0	12.5	12.5
Mounds	0	8.9	8.9
Crops/Agriculture	511.9	0	-511.9 ¹
Existing 404 Wetland	11.2	11.2	0
Existing Bottomland Forest	88.5	88.5	0
Existing Scrub/Shrub	36.5	36.5	0
Levee	38.9	38.9	0
Existing Blew Hole	7.5	7.5	0
TOTAL	1118.6	1118.6	0

¹Negative outputs are the result of existing habitat types transitioning into other habitat types or being converted to wetlands through proposed activities.

²Acres consists of naturally established early successional forest. Approximately 3 years ago this area was farmed.

³Acres consists of early successional forest planted by MODNR since farming ceased.

1.1.5 SCOPE OF STUDY

The scope of this study is confined to the project area shown in Figure 1-1. Alternatives considered in this study were limited to those techniques that would restore or preserve terrestrial and/or aquatic habitat on the 1118.6 acres currently managed by MDNR as Confluence Point State Park. An amendment to this PIR would be needed if significant changes to the preferred alternative are proposed in the future. All permanent project

features would be constructed on government-owned lands and would not adversely affect adjacent landowners. The Corps would consider future land acquisition in the Confluence area if notified of a willing seller; however, no willing sellers are available at this time.

1.2 PURPOSE OF AND NEED FOR ACTION

The purpose of the Mitigation Program, and site-specific projects, is to mitigate the loss of fish and wildlife habitat due to the BSNP. The Rivers and Harbors Act of 1912, 1925, 1927, and 1945 authorized the BSNP. The existing BSNP extends 735 miles from Sioux City, Iowa to the mouth near St. Louis, Missouri and maintains a nine-foot deep by 300-foot wide channel. The BSNP consists mainly of revetments along the outsides of bends and transverse dikes along the insides of bends to force the river into a single active channel that is self-maintaining.

The need for the Mitigation Program and site-specific projects rests in the loss of a unique floodplain ecosystem. This included diverse fish and wildlife habitat and the changing public values that have placed significant importance on reestablishing these important ecological resources. The historic variety and quality of aquatic habitats have been eliminated or altered by construction of the navigation channel. Dikes and revetments have greatly reduced the meandering of the river. Flooding has resulted in accretion of lands, which has allowed expansion of agricultural practices into the historic floodplain. The Corps estimated that by 2003, approximately 522,000 acres of fish and wildlife habitat in the natural channel and meander belt of the Missouri River would have been lost as a result of the construction, operation, and maintenance of the BSNP (Corps 1981).

Habitat loss and resultant adverse impacts to fish and wildlife resources need to be mitigated as authorized by the U.S. Congress through WRDA86 and WRDA99. Acquisition and development of lands along the Missouri River need to occur to mitigate the resources lost to channelization and bank stabilization. The Mitigation Program was established to accomplish these needs. Development of this site for fish and wildlife

habitat would contribute to achieving the goals and purpose of the Mitigation Program to mitigate for the loss of habitat that resulted from the BSNP.

As an additional benefit arising from the project's unique location at the confluence of these two rivers, the same benefits that can be expected in working towards the Mitigation Program's goals would be seen on the Mississippi River.

1.3 SITE SELECTION

The Reaffirmation Report (Corps 1990) established general criteria for the selection of sites for land acquisition as part of the Mitigation Program. These criteria included the following:

- The land in private ownership could be acquired from willing sellers.
- The size of the area was greater than 100 acres.
- The area would not adversely affect navigation, carrying capacity of existing levees, or flood-carrying capacity of the existing floodway.
- The area was a large contiguous tract suitable for terrestrial woodland, grassland, and wetland development, with a remnant chute and backwater that could be restored.
- Emphasis will be given to acquiring the remaining larger contiguous tracts of bottomland timber, areas of wetland or former wetland that can be restored, areas that can be developed to provide terrestrial forest and grassland habitat, and areas where chutes or backwaters can be restored.
- Acquisition of agricultural land should be limited except where the area has high potential for development or where a willing seller is available.
- Consideration will be given to the establishment or preservation of native floodplain prairie habitats.
- The area was part of the meander belt of the Missouri River.
- Public access to areas will not be a determining factor in acquisition.

- Sites chosen for establishment of wetlands will include enough adjacent land so that excessive sedimentation can be prevented and appropriate terrestrial non-forested habitat can be provided.
- Sites chosen for acquisition or development will be based on state and federal agency input and support.
- Projected operation and maintenance costs will be considered in the selection of acquisition and development sites.

Confluence Point was selected as a potential mitigation site based on review of historic and current aerial photography and on-site evaluations. Confluence Point met the above stated criteria. In addition, the site was determined to have several attributes that made it favorable as a mitigation site. These include its unique geographical and ecological location at the confluence with the Mississippi River and its potential to develop valuable wetland areas. The property was made available by partnership with MDNR and by purchase of land from the Confluence Greenway. MDNR is currently and will remain in charge of the daily maintenance and oversight activities at the project site. In addition, MDNR will be responsible for monitoring restoration progress and developing adaptive management strategies that promote natural vegetation development and limit invasive species propagation.

1.4 AGENCY COORDINATION

The Mitigation Program ACT meets quarterly. Representatives from the USFWS, U.S. Environmental Protection Agency (EPA), NRCS, Iowa Department of Natural Resources (IDNR), Kansas Department of Wildlife and Parks (KDWP), MDC, and the Nebraska Game and Parks Commission (NGPC) along with the Kansas City and Omaha Districts of the Corps comprise the ACT. The initial responsibility of the ACT was to develop selection criteria for screening and prioritizing general areas to identify willing sellers for potential mitigation sites. The ACT also meets to discuss future activities, priorities, funding, and other issues related to implementing, managing, and monitoring the Mitigation Program.

Confluence Point was originally a St. Louis District Section 206 project, which is why the St. Louis District continues to be involved. In addition, the site lies just a few miles north of the City of St. Louis. The Kansas City District is actively involved in assisting St. Louis with funding, document review, and programmatic activities. The MNDR representatives are actively working with the St. Louis and Kansas City Districts to develop the Confluence Point as a mitigation area.

Coordination among the Kansas City District, Omaha District, St. Louis District, and MDNR has been occurring throughout the planning process for development of Confluence Point. Agency coordination letters were sent to the appropriate federal and state resource agencies requesting information and their comment regarding the Proposed Action. The agencies provided information on federally listed and candidate threatened and endangered species, state species of special concern, and natural communities (Appendix A).

Chapter 2

Alternatives

2.1 INTRODUCTION

This chapter presents the alternatives considered for the development of fish and wildlife habitat at Confluence Point. Three alternatives were considered. They are the Full Development, Partial Development, and No Development alternatives. These alternatives were evaluated against their ability to fulfill the site objectives as previously defined in Section 1.1.4. This chapter includes a description of each alternative, an evaluation of the alternatives, and a detailed description of the recommended alternative.

Missouri Department of Natural Resources has developed a detailed preliminary plan for restoring Confluence Point. The alternatives presented in this PIR are based upon the aspects of the MDNR plan that fall within the parameters established by the Missouri River Mitigation effort. The stated goal of the MDNR plan is:

“To restore the natural communities and native vegetation of a frequently flooded low riverfront ecosystem. This will be a predominantly forested landscape that follows the hill and swale topography on the site, with seasonally flooded sloughs and marshes in the low swales and scour channels. It will include wet prairie, bordered by groves of pin oaks. These vegetation types will be restored or facilitated according to the different wetland zones and soil types at the park.”

MDNR identified five wetland zones that exist or could exist within the property:

Zone I wetlands are open water that is continuously flooded; a hydrology that currently only applies to the scour holes along the Mississippi side of the property.

Zone II wetlands are intermittently exposed (flooded essentially every year for most of the growing season).

Zone III wetlands have a hydrology described as semi-permanently flooded (51-100 % of years, with the total duration of flood events typically more than 25% of the growing season). Soils are dominated by dense clays, and a lack of oxygen prevails for much of the year.

Zone IV wetlands are seasonally flooded (51-100% of years, for 12.5-25% of the growing season). At Confluence Point they occupy the elevations between 413' and 417', and include soil types Blake, Lakeport, some Wabash, Leta, Parkville, and most areas of Haynie.

Zone V wetlands are described as temporarily flooded (11-50% of years, for 2-12.5% of the growing season). Their soils are dominated by silt loams, silty clay loams and very fine sandy loams that are only briefly flooded and therefore much better suited for root respiration. These are the Blake, Haynie, and Parkville soils of the long natural levees that parallel the Missouri River. In the case of Confluence Point where no native vegetation remains, these wetland zones can be used to predict the natural communities for which the flood patterns are best suited, and tie these to specific park elevations.

Some aspects of the current site management and habitat development activities are considered to be included in all three alternatives. These activities would likely be modified during development of Confluence Point. The MDNR has already removed a considerable amount of land from agricultural production. Trees have been planted along a portion of the natural river berm and decurrent false aster (*Boltonia decurrens*) seeds have been dispersed in suitable areas. Currently, agricultural leasing takes place on 581 acres recently purchased by the Corps. An existing agreement is in place with the farmer and is not set to expire until the end of 2008.

During preliminary site investigations it was discovered that numerous pipelines traverse the project area. These pipeline corridors presented substantial challenges to the initial restoration plan due to constraints on types of vegetation and earth-moving activities. The planting scheme and location and designs of basins were modified to work with the existing infrastructure.

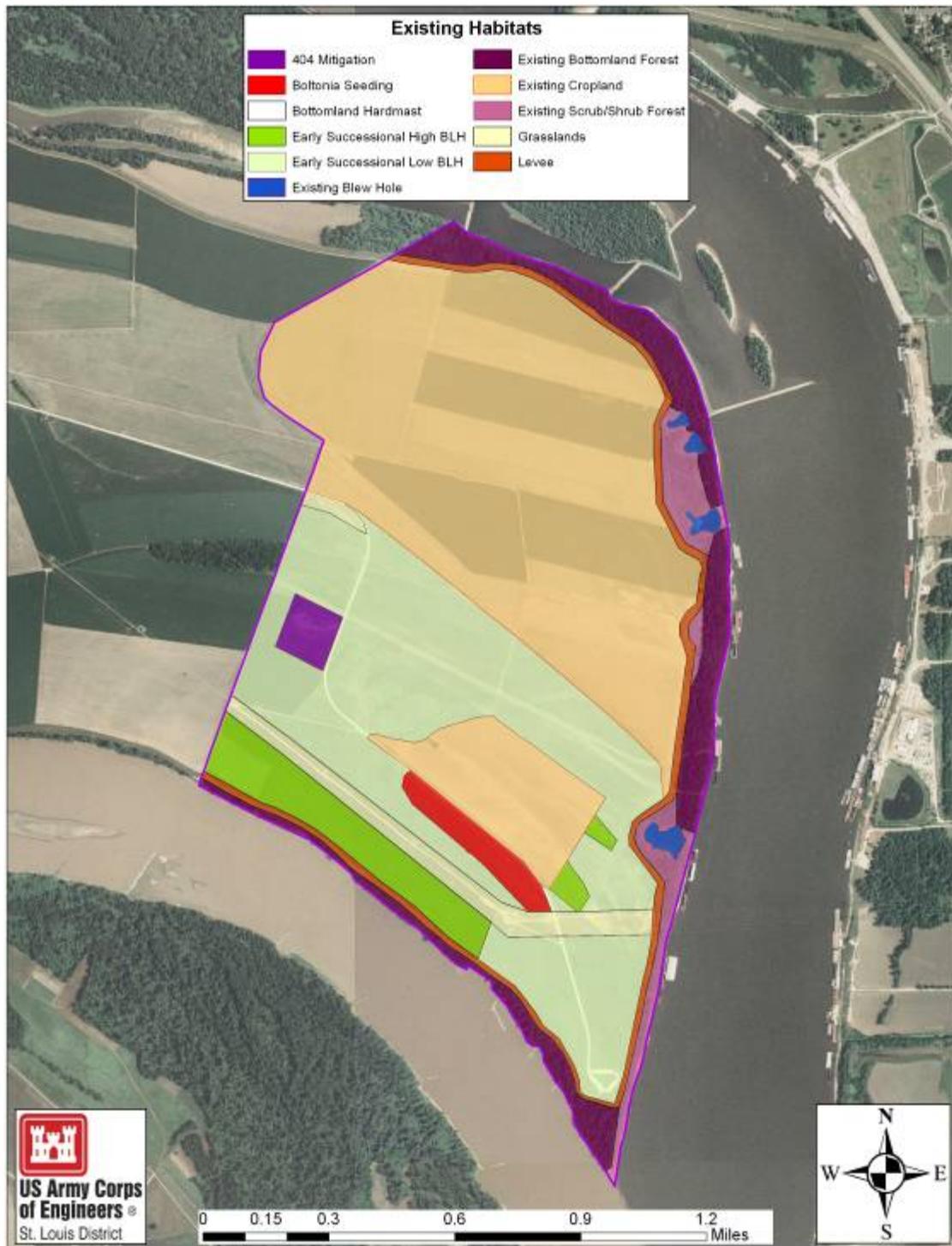


Figure 2-1: Current Conditions at Confluence Point

2.2 ALTERNATIVES

2.2.1 FULL DEVELOPMENT ALTERNATIVE

The Full Development Alternative would include the use of a combination of methods to develop fish and wildlife habitat at Confluence Point. These methods would include planting trees, prairie plants, and wetland vegetation in appropriate locations based on topography, hydrology, soils, and location of utility corridors. Small basins would be constructed to capture and hold water as ephemeral wetlands. Larger areas would be constructed to induce more permanent wetland habitat. These would be developed in a manner that would resemble a naturally contoured system. Two of the larger basins will contain small water control structures that will allow water to be drained if needed.

Revegetation efforts for the Full Development Alternative would include the following:

Wet-mesic bottomland forest: Establish a forest that includes a mix of pin oak, swamp white oak, green ash, American elm, sycamore, slippery elm, hackberry, persimmon, and sugarberry. This would be above 418 feet in areas of Blake, Haynie, and Parkville silt loam. Limit plantings of this species combination to the Zone V wetlands, which are inundated less than 10% of the growing season. Maximum area of wet-mesic bottomland forest that includes these hardwood species would be approximately 60 acres.

Native Virginia wild rye would be sown immediately after construction as a cover crop. Wheat and seed oats could also be included with the Virginia rye as a cover crop, which would provide additional pioneer species suppression if the rye fails to quickly establish. It is likely that no tree plantings would occur until at least one year after construction. During the first year, hydrologic patterns would be observed in order to match species to appropriate locations. Trees would be planted at a rate 100 trees per acre and 10 acres per year as part of an educational program for urban youth. Species success would be monitored by MDNR and adaptive management strategies would be utilized to adjust

species selection to meet observed survival rates. Unplanted areas would be mowed to maintain them for future planting.

High wet bottomland forest: Establish a forest that includes a mix of pecan, green ash, persimmon, American elm, sycamore, and slippery elm, with pockets of pin oak and swamp white oak. As with the wet-mesic forest plantings, native Virginia wild rye would be sown immediately after construction as a cover crop. After one year of observing hydrology, all 101 acres of high wet bottomland forest would be planted. Trees would be planted on 20x20 foot spacing and located in accordance to flood tolerance.

Rather than attempting to control encroachment by cottonwood and willow by mowing, colonizing species would be allowed to persist. During the establishment of the planted trees, these colonizers would serve as a buffer against herbivory by deer and rabbits and also as a shelter against wind and sun. Once the planted species are around 5-10 years old, the cottonwoods and willows would be cut or girdled to allow the planted trees to release into the canopy. Girdling the cottonwoods would also create valuable snag habitat.

Low wet bottomland forest: Promote establishment of a riverfront forest and natural regeneration of cottonwood, willow, sycamore, and silver maple on the more frequently flooded areas. The ground would be lightly disked prior to seed rain to capture the natural seed fall. Approximately 126 acres of low wet bottomland forest is expected, although the extent would be variable according to river stages and flood events.

Timber stand improvement techniques would be used to manage reforestation. After 3-5 years of establishment, naturally-recruited trees would be selected in a pattern that more or less replicates a 20x20 planting spacing. Selection would be done by annual clearing of the competing trees around the selected trees, in about a 10 foot diameter. The objective would be three-fold: one, to replicate a more natural forest community; two, to increase the speed at which that community approaches maturity; and three, to open up the understory to allow colonization by understory species, increasing diversity.

Prairie: Establish prairie on the high plain in the northern portion of the park. If hydrology is suitable, these prairies are to be dominated by wet prairie species such as Virginia

wild rye, big bluestem, cordgrass, Indian grass, eastern gamma grass, switchgrass, and white-scale sedge. Forbs such as decurrent false aster, swamp milkweed, sawtooth sunflower, prairie blazing star, compass plant, ironweed, butterfly weed, wild white indigo, leadplant, and rattlesnake master would be planted where appropriate. Other wet mesic species may be included on high spots within the prairie above 418 feet. MDNR would manage the prairie areas through seasonal burning. Prairie may also be established along utility corridors and berms that must be kept free of trees.

Prairie establishment would occur in multiple phases over several years. In year one a cover crop will be sown immediately after construction and hydrology would be observed. In year two species such Indian grass, big bluestem, eastern gamma grass, and Virginia wild rye would be sown across the appropriate higher areas. Vegetation such as the Decurrent false aster and prairie cord grass would be sown in wetter areas. Once the prairie is able to carry a fire, probably around year three, switchgrass would be introduced. Also in year three, prairie cordgrass and whitescale sedge plugs would be planted. MDNR would actively monitor the prairie during the first five years using standard sampling techniques for measuring richness and diversity. This would likely be linear transects with a 1 meter quadrat. After year five, MDNR would begin selectively planting forb species according to the results of monitoring efforts.

Ephemeral wetlands: The restoration target at the lowest elevations of Zone II wetlands below 413' is ephemeral wetland with a shrub-scrub margin. These would hold water through the spring and early summer, but slowly recede to expose muddy margins. Several large basins would be excavated adjacent to existing drainages. These basin would be constructed so that wetland vegetation develops naturally over the lowest elevation Wabash and Albaton soils, which normally hold water for 25 to 40 percent of each growing season and experience over thirty days of continuous inundation nearly every other year (at 410 feet). Wetland vegetation would be allowed to colonize naturally. The smaller and shallower basins would likely dry quickly and would support wet prairie vegetation. In the larger and deeper basins, buttonbush and swamp rose mallow would eventually ring the areas and a hedge of cottonwood, willow, and river birch could be expected at the high margins of this community. Small water control

structures would be placed in the larger basins to allow them to be drained if needed. This would be done to help control invasives such as reed canary grass.

Sandbars/Mudflats: Natural topography exists on the site that could be prone to long-term inundation. It is hoped that these areas would recede slowly and continuously expose muddy shorelines. In some case the natural topography would be enhanced to maximize this type of habitat. These shorelines would be colonized by seasonal emergent vegetation.

Adaptive Management Strategy:

A properly developed adaptive management strategy could be essential to the successful reestablishment of desirable natural vegetation at Confluence Point. As site managers, MDNR would be responsible for developing an effective strategy. MDNR would be responsible for closely monitoring the success and failure of efforts on the site. MDNR would be required to prepare an annual report that includes these results. Adaptive management would be particularly important in the early stages of restoration. Adaptive management would be used to meet the initial goals for the site not to change goals for the site. This topic is discussed in more detail in Chapter 5

Other Vegetation Management:

- Plant a 100' wide strip of wild rye around the perimeter of the property, and maintain by mowing until other forest or prairie plantings take place. This is to serve as a weed buffer against private agricultural land on the west boundary, and allow access and borrow areas for levee repair elsewhere.
- Control Johnson grass by mowing and herbicide application throughout the revegetation process.
- Control Phragmites by mowing and herbicide application throughout the revegetation process.
- Japanese hops would be aggressively controlled through spraying and mowing. If not controlled, this species can spread very rapidly. It is know to occur very near to the site and could be especially problematic in early stages.

- Unless specifically referenced, any plant species that is not native to the area and normal for the natural community would not be used in any of the restoration work. Preference would be given to obtaining native plant materials grown from locally obtained stock.

Excavation and earth-moving efforts for the Full Development Alternative would include the following:

Meanders: Shallow and deep meanders and would be excavated on soils capable of supporting perched water. Both types would be ephemeral, with the deep meanders holding water slightly longer than the shallow. Excavations would be designed to replicate the appearance of natural meanders. These areas would be located primarily in the northern prairie restoration area and would capture and hold precipitation, upland runoff, and occasionally river floodwater.

Shallow Scours: several minor excavations coupled with low berms would enhance the hydrology of swales that naturally occur on Confluence Point. The berms would only be of sufficient height to induce surface water retention on a seasonal basis.

Semi-permanent Pools: It is likely that natural floodwater would fill these basins during spring and early summer when river levels are high. When the floodwaters recede, the basins would continue to hold water. As summer progresses, the water in the basin should slowly recede and continually provide freshly exposed shoreline.

Any areas selected for excavation in an attempt to create ephemeral wetlands would not be hydraulically connected to drainage ditches or areas where the surface soil is composed of sandy materials.

Water Control Structures: Three small stop log structures would be installed at the lowest point of the three largest pools. These structures would be used solely to drain the pools if necessary. They are not intended to be used to manage water levels year round. Drainage of these pools may be required if an invasive such as reed canary grass became established. Drying out this species is the most effective method of controlling it.

2.2.2 PARTIAL DEVELOPMENT ALTERNATIVE

The Partial Development Alternative would employ the revegetation portion of the Full Development Alternative. None of the excavations would be performed.

2.2.3 NO DEVELOPMENT ALTERNATIVE

The No Development Alternative represents the alternative of no action by the Corps. No additional activities to develop fish and wildlife habitat would be undertaken as part of the No Development Alternative. Vegetation would be allowed to establish from colonizing species and would undergo natural succession.

2.3 EVALUATION OF ALTERNATIVES

All three alternatives would fulfill the overall program goal of providing habitat; however each would provide a different level of success.

The Full Development Alternative would best fulfill the project goals as described in Section 1.1.4. It represents optimal habitat development best suited to the conditions and constraints of Confluence Point. The Full Development Alternative would maximize potential terrestrial benefits by restoring native ecosystems. Overall, it would create a diversity of aquatic, wetland, and terrestrial habitat that would provide life-cycle benefits to birds, mammals, amphibians, reptiles, and insects. The aquatic habitat created by the shallow basins under the Full Development Alternative could potentially be very beneficial to migratory species, specifically wading birds and shorebirds, because of the site's location along the junction of two major river corridors.

The Partial Development Alternative would support most of the terrestrial functions expected under the Full Development Alternative. However, habitat would not be as diverse due to the absence of aquatic fringe, which is required to support some plant species. The Partial Development Alternative would not establish diverse aquatic habitat and many species would not be able to use the area as frequently. Most of the aquatic and wetland benefits provided by the Full Development Alternative would not occur under the Partial Development Alternative.

The No Development Alternative would not achieve the stated goals of creating a more diverse riverine habitat or developing diverse terrestrial habitat (e.g. bottomland forest, wetlands, or prairies) except for the habitat that would develop over a long period of time in response to natural succession. The No Development Alternative would not provide any additional aquatic habitat beyond what currently exists at the site or what would develop naturally.

The Full Development Alternative was selected as the recommended alternative for implementation at Confluence Point. This alternative was recommended because it best fulfills all of the Mitigation Program and site-specific goals for Confluence Point and would maximize beneficial environmental impacts while resulting in no significant adverse impacts to the environment. In all likelihood, unknown and unpredictable factors related to sub-surface hydrology and long-term weather patterns will factor into the final composition and arrangement of the site. All reasonable effort would be made to properly maximize the available habitat. A detailed description of the recommended alternative follows in Section 2.4.

Table 2-1 provides a comparison of environmental consequences for the three alternatives evaluated as part of this PIR.

Table 2-1: Comparison of Environmental Consequences of Alternatives Evaluated

Environmental and Socioeconomic Resources	Preferred Alternative (Full Development)	Partial Development Alternative	No Development Alternative
Geological Resources			
Topography	Insignificant adverse impacts and long-term beneficial impacts through enhancement of surface topography and creation of wetlands, shallow water, and deep water habitat.	Insignificant temporary adverse impacts through tree plantings	No impacts
Geology	No impacts	No impacts	No impacts
Soils	Short-term insignificant adverse impacts resulting from the relocation of soils by earthmoving equipment.	Short-term insignificant adverse impacts resulting from the soil disturbance during tree plantings	No impacts
Prime and Unique Farmland	No adverse impacts farmland would be converted to a non-agricultural use. However it could be easily re-claimed, if needed.	No adverse impacts farmland would be converted to a non-agricultural use. However it could be easily re-claimed, if needed.	No adverse impacts farmland would be converted to a non-agricultural use. However it could be easily re-claimed, if needed.
Biological Resources			
Aquatic Resources	Long-term beneficial impacts resulting from the creation of shallow water and deep water habitat.	No impacts	No impacts
Terrestrial/Wetland Resources	Short-term insignificant impacts resulting from disturbance during construction. Long-term beneficial impacts resulting from the increase in diverse terrestrial and high quality wetland habitat.	Short-term insignificant impacts resulting from disturbance during construction. Long-term beneficial impacts resulting diverse terrestrial habitat.	Long-term beneficial impacts resulting from natural succession of terrestrial habitat.

Environmental and Socioeconomic Resources	Preferred Alternative (Full Development)	Partial Development Alternative	No Development Alternative
Wildlife	Short-term insignificant impacts resulting from disturbance during construction. Long-term beneficial impacts through the creation of diverse terrestrial and high quality wetland habitat..	Short-term insignificant impacts resulting from disturbance during construction. Long-term beneficial impacts resulting from the development of diverse terrestrial habitat.	Long-term beneficial impacts resulting from the development of wildlife habitat through natural succession.
Threatened and Endangered Species	Short-term insignificant adverse impacts resulting from disturbance to species during construction. Long-term beneficial impacts resulting from the creation of valued habitats (aquatic and terrestrial).	Short-term insignificant adverse impacts resulting from disturbance to species during construction. Long-term beneficial impacts resulting from the creation of terrestrial habitat and natural succession terrestrial habitat.	Long-term beneficial impacts resulting from the increase of valued terrestrial habitats through natural succession.
Land Cover	Long-term beneficial impacts resulting from the creation of valued habitats (aquatic and terrestrial).	Long-term beneficial impacts resulting from the restoration of terrestrial habitat and planting of desirable species.	Long-term beneficial impacts resulting from the increase of valued terrestrial habitats through natural succession.
Cultural Resources			
Terrestrial Historic Properties and Archaeological Sites	No impact to potentially significant historic properties. No archaeological site impacts on accreted lands. Low potential for impacts to potentially significant archaeological remains on older historical landforms.	No impact	No impact
Steamboat Wrecks	Minimal potential for adverse impacts resulting from habitat development.	No impact	No impact

Environmental and Socioeconomic Resources	Preferred Alternative (Full Development)	Partial Development Alternative	No Development Alternative
Water Quality	Short-term insignificant adverse impacts resulting from potential sediment disturbance. Long-term beneficial impacts resulting from wetland development.	Short-term insignificant adverse resulting from potential sediment disturbance. Long-term beneficial impacts from reduction in agricultural runoff	Long-term beneficial impacts from reduction in agricultural runoff
Air Quality	Short-term insignificant adverse impacts resulting from increased emissions and fugitive dust during construction. Long-term beneficial impacts resulting from decreased agricultural practices on-site.	Short-term insignificant adverse impacts resulting from increased emissions and fugitive dust during tree planting. Long-term beneficial impacts resulting from decreased agricultural practices on-site.	Long-term beneficial impacts resulting from decreased agricultural practices on-site.
Noise	Short-term insignificant adverse impacts resulting from increased noise during construction. Long-term beneficial impacts resulting from decreased agricultural practices on-site.	Short-term insignificant adverse impacts resulting from increased noise during planting. Long-term beneficial impacts resulting from decreased agricultural practices on-site.	Long-term beneficial impacts resulting from decreased agricultural practices on-site.
Socioeconomic Resources			
Population and Income	Insignificant beneficial impacts to local economy during and after construction through increased local tourist spending.	Insignificant beneficial impacts to local economy during and after construction through increased local tourist spending.	Insignificant beneficial impacts to local economy during and after construction through increased local tourist spending.
Agricultural Income	Insignificant adverse impacts to local agricultural income resulting from the cessation of farming on approximately 440 acres.	Insignificant adverse impacts to local agricultural income resulting from the cessation of farming on approximately 440 acres.	Insignificant adverse impacts to local agricultural income resulting from the cessation of farming on approximately 440 acres.

Environmental and Socioeconomic Resources	Preferred Alternative (Full Development)	Partial Development Alternative	No Development Alternative
Recreation and Aesthetics	<p>Short-term insignificant adverse impacts resulting from decreased accessibility of the site during construction. Long-term beneficial impacts resulting from increased recreational activities, habitat, and greater diversity of features.</p>	<p>Short-term insignificant adverse impacts resulting from the inaccessibility of the site during construction. Long-term beneficial impacts resulting from increased recreational activities, habitat, and greater diversity of features.</p>	<p>Long-term beneficial impacts resulting from increased recreational activities, habitat, and greater diversity of features.</p>
Navigation	No impact	No impact	No impact

2.4 DESCRIPTION OF RECOMMENDED ALTERNATIVE

The Full Development Alternative is the recommended alternative for implementation at Confluence Point. Figure 2-2 displays the desired habitat layout for the site. In addition to the plan discussed in Section 2.2.1, the following items would take place. Some items have already been undertaken by MDNR.

2.4.1 ACTIONS ALREADY PERFORMED OR SCHEDULED TO BE PERFORMED PRIOR TO PROJECT IMPLEMENTATION BY MDNR

- Bottomland hardwoods planted on 35.5 acres of DNR land. These may need to be re-planted due to losses from drought and flooding.
- Cottonwoods released for natural regeneration on 287.4 acres of MDNR land. Some of this area would be converted into different types of forest.
- The decurrent false aster planted at two locations totaling 29.2 acres of MDNR land. One 13.9-acre portion of this is being mowed and actively managed to maintain a healthy population.
- Ten-acre wetland mitigation completed to fulfill 404 permit requirements. The permit applicant was the Missouri Department of Natural Resources - Division of State Parks and the permit number was P-2361 (MVS-2002-6250).

- Wet prairie plant seeds and plugs planted on 1.7 acres of DNR land as part of the environmental education programs.
- One seasonal waterbody created and planted with plugs and seeds of prairie plants.
- Prairie cordgrass and tree seedlings planted in parking lot area.
- Johnson grass and musk thistle control performed annually.
- Agriculture maintained on 113.1 acres of DNR land, completing agreements with original landowners and holding in reserve for bottomland hardwood planting via environmental education programs.
- Seven sets of 3 per location manual piezometers placed in 2006.

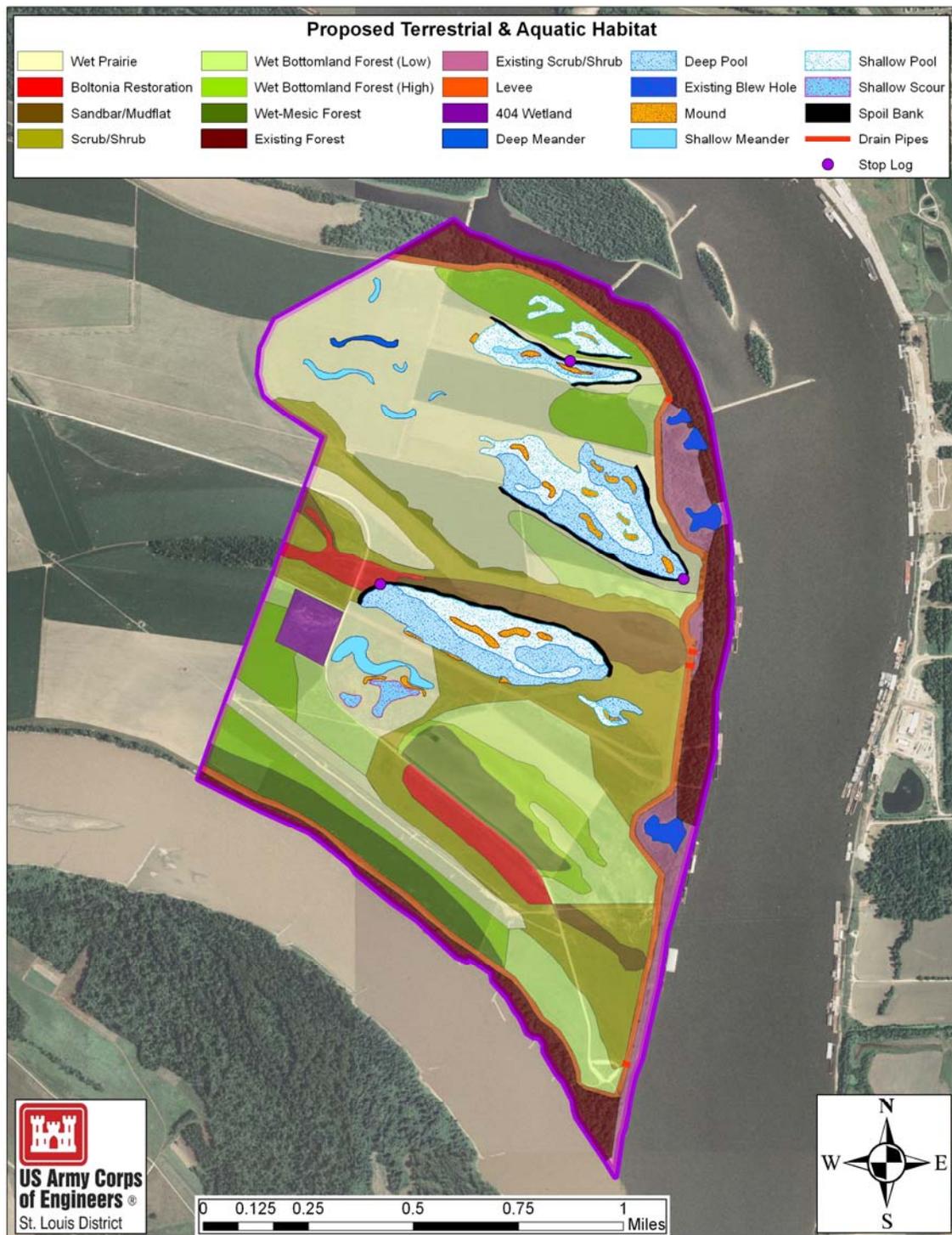


Figure 2-2: Proposed Habitat Development for Confluence Point.

2.4.2 SUMMARY OF LONG-TERM MANAGEMENT PLAN ITEMS NOT COVERED IN SECTION 2.2.1

- Urban Outreach Program: The bottomland hardwood and wet prairie planting areas are being used to provide an urban outreach and environmental education program for students in the St. Louis area. From three to six events are held per year. Urban school children spend a day at Confluence Point learning and exploring. This culminates in the planting of trees or prairie plants as part of the restoration effort. Plans are to let students plant approximately ten acres of bottomland hardwoods per year on the 60 acres designated for wet-mesic bottomland forest. The same amount would be planted on the high wet bottomland forest. The northern prairie area would also be diversified through planting of plugs. Eventually, the seasonal water bodies would also be included in the outreach program.
- Utility and Pipeline Corridor Management: These corridors would need to be kept tree free. Prairie grasses would be planted on these corridors and maintained with prescribed burning or mowing. Much of the northern section of the property would be managed as prairie to prevent creating a fragmented landscape.
- Levee Repair: Because it is only constructed to a 10-year event elevation, the Kuhs Levee is frequently overtopped and often requires repair. General Permit-41 authorizes the repair of damaged levees. The Borrow Material Statement of Purpose acknowledges that excavation of fill material from existing wetland areas would result in short-term construction related adverse impacts. However, this excavation can remove accumulated silt and create diversity, provided that a bottomland hardwood forest is not being cleared. There may also be areas riverward of the levee where excavation for fill material could be used to create additional wetlands or shallow water habitat.
- Floodplain Connectivity: An issue that is not addressed in currently by this PIR is river and floodplain connectivity. The Corps anticipates coordinating with the Kuh's Levee District to investigate the feasibility of a controlled overtopping point that would minimize flood damage and related rehabilitation damage to the levee and adjacent environmental restoration project as well provide ecological benefits to the site. As

these plans are preliminary no estimated cost or location has been identified. Project costs would be borne by the Corps as part of the environmental restoration project. Any adverse environmental effects would be expected to be minimal, short-term, construction related, confined to the levee itself, borrow area and the area immediately landward of the overtopping point. Long-term benefits would be expected to include reduced future rehabilitation costs for the levee and environmental restoration project, increased reliability of the flood damage reduction project, avoidance of damages/disturbance to the environmental restoration project from direct flooding or construction work related to flood damage repair, increased spawning and foraging areas for riverine fishes, disturbance that helps limit invasives and exotics while helping promote growth of native species such as the endangered decurrent false aster, and nutrient recharge. This feature could be implemented with any of the previously described alternatives. Construction of the overtopping point would require a future amendment to this PIR.

- Features Implemented by Others: The Corps would not fund or construct recreation features, but they would be willing to consider working with any agency or organization interested in developing recreational or public use facilities. These facilities would at the expense of the other entity and would be open to the public for a variety of uses such as bird watching, hiking, and fishing. The Corps would repair/replace any existing recreation features or access in-kind if any were damaged or destroyed during construction of project habitat feature.

Chapter 3

Affected Environment

3.1 INTRODUCTION

This chapter presents the affected environment for Confluence Point. The affected environment is used to formulate a baseline to evaluate impacts potentially caused by the proposed action. The existing conditions described in this chapter are based on the current state of the site. Various sources of information were used to determine the affected environment including field investigations, geographic information systems data, literature searches, review of maps, aerial photography, and previous reports.

3.2 HISTORY OF THE PROJECT AREA

Prior to construction of the BSNP, the lower Missouri River was uncontrolled and meandered across a wide floodplain creating a highly dynamic environment through the physical processes of erosion, deposition, and accretion. The historical lower Missouri River consisted of numerous islands, channels, sandbars, and slack water. At the time of the Lewis and Clark Expedition, the confluence was 2 miles upstream from its current position. Prior to the BSNP, the southern portion of the project area was in the Missouri River channel. After the BSNP, the confluence area was stabilized and the project area took its current shape. The land that now composes the southern portion of Confluence Point was accreted from recent alluvial sediment. Confluence Point was covered with trees and was not cleared for farming until the 1950s. Figure 3.1 shows what the confluence looked like in 1880.

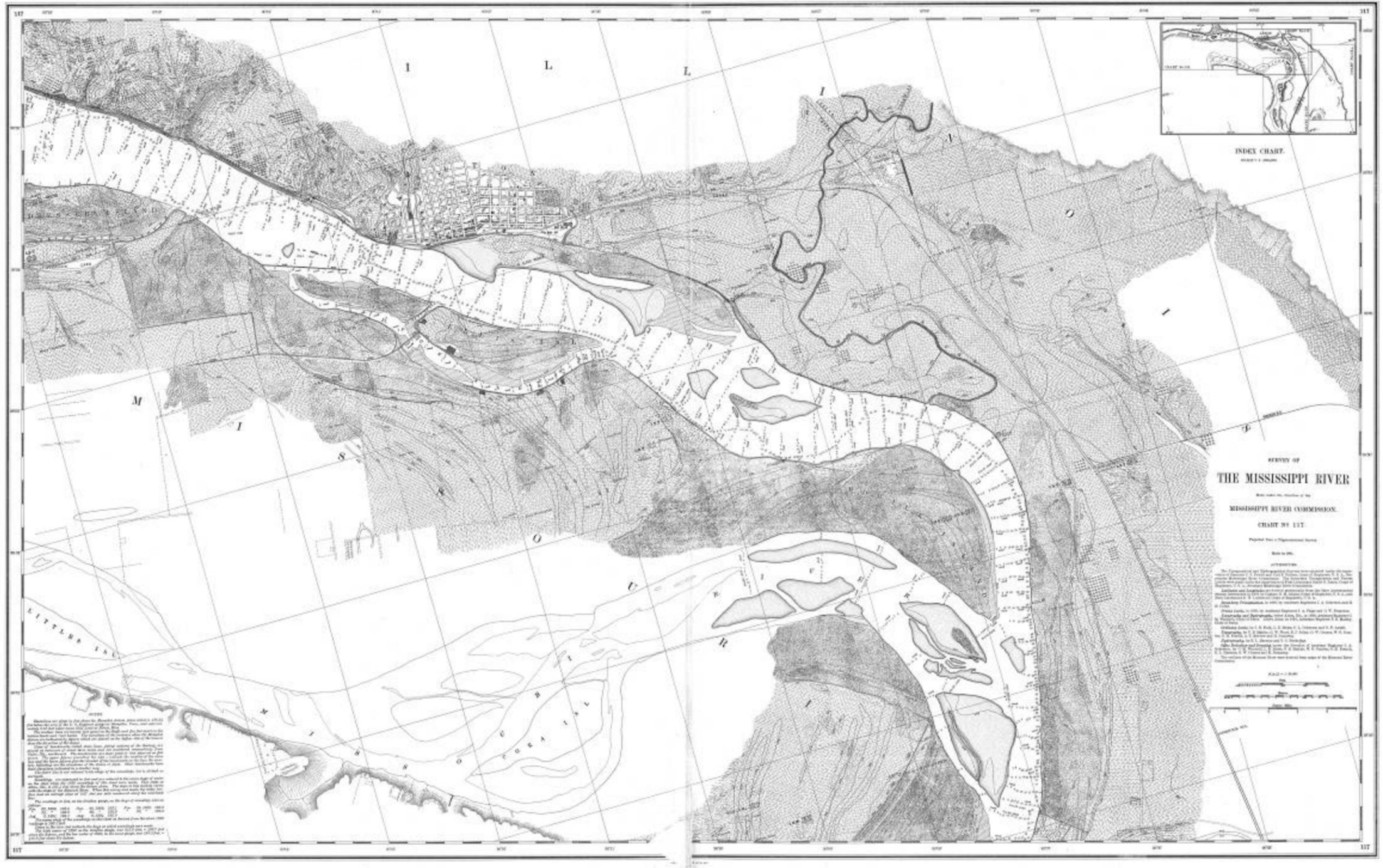


Figure 3-1: Confluence Point in 1880



Figure 3-2: Confluence Point at Present

The Kuhs levee was built in the 1960s and is maintained as a ten-year flood protection levee as a participant in the PL 84-99 program. The levee surrounds the property alongside both rivers, and except for three gated pipes or when the levee is overtopped by flooding, there is no direct connectivity between the park and Mississippi or Missouri Rivers. It is approximately 7 miles long and protects about 1,980 acres. The top of this levee is at 426 feet mean sea level. The banks of the rivers themselves are very steep and covered in many places by rip-rap. Channel control structures border the property, with mudflats exposed behind them at low river stages. Compared to upstream lands, this park has a low elevation relative to the normal level of the Missouri River.

3.3 GEOLOGICAL RESOURCES

The geological resources include the physical surface and subsurface features of Confluence Point such as topography, geology, and soils.

3.3.1 TOPOGRAPHY

Confluence Point spans the distance between the Missouri and Mississippi Rivers at their junction. Its terrain is complex and is characterized by a hill and swale topography that shows a pattern of flooding and drainage that generally flows from west to east. Total relief is approximately twelve feet with elevations ranging from 408 to 421 feet above sea level. A natural levee has developed along the Missouri River. Two other isolated terraces or high spots, which are remnant islands from prior to the BSNP, are situated internally. Several low swales traverse the property and include local drainage that flows east from the adjacent properties. Four scour holes exist alongside the Mississippi River, where levee breaks occurred during past floods. An agricultural levee surrounds the property along both rivers, and except for three drainage tubes or when the levee is overtopped by flooding, there is no connectivity between the park and Mississippi or Missouri Rivers. Contrasted to the undulating topography in the southern part of the park, a relatively large and level “plain” at the 416-417 foot elevation covers the northwest park quadrant.

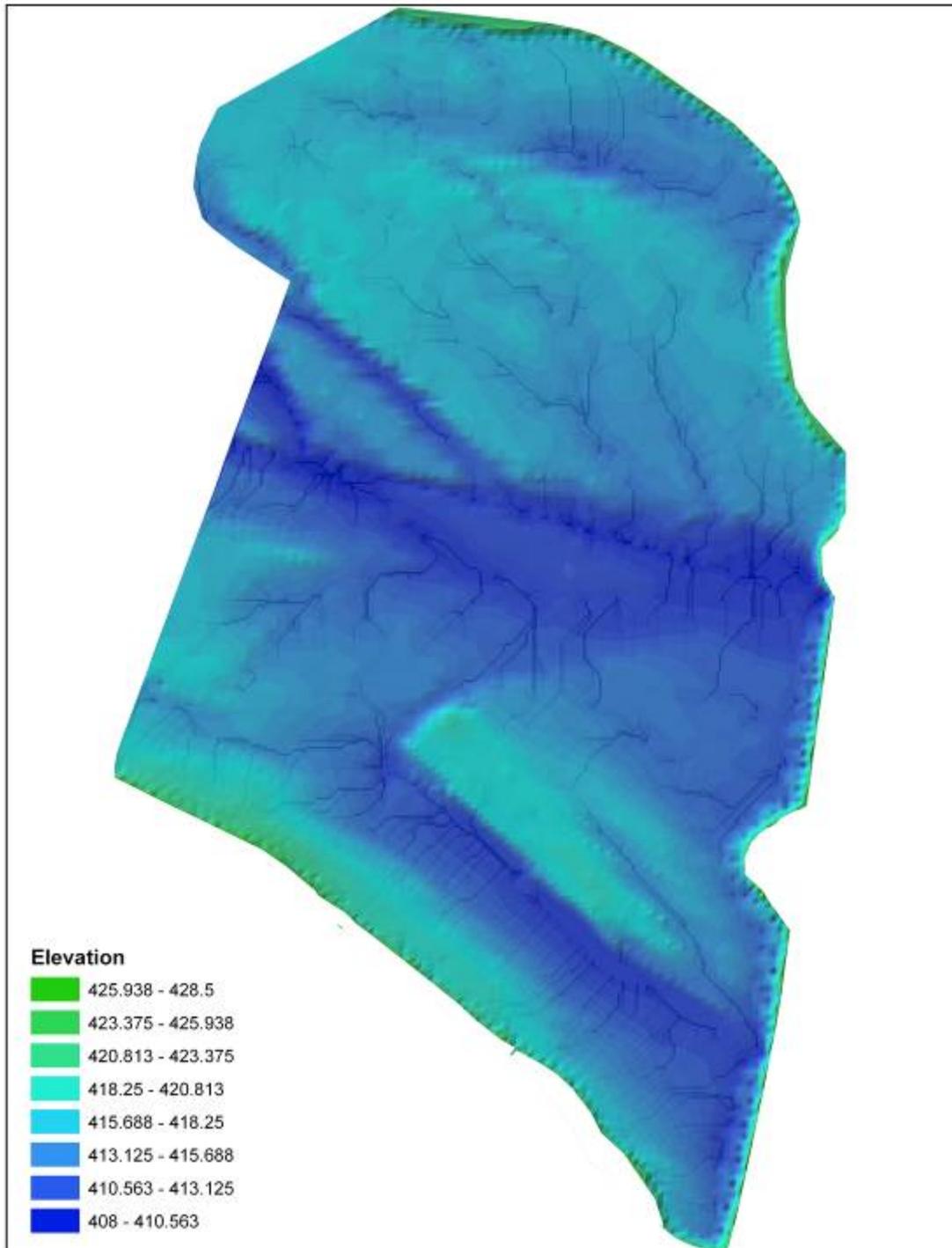


Figure 3-3: Confluence Point Topography and Areas of High Flow Accumulation

3.3.2 GEOLOGY

Confluence Point lies within the Dissected Till Plains (Missouri River Alluvial Plains subsection) of the Central Lowlands physiographic province [U.S. Geological Survey (USGS) 2003].

3.3.3 SOILS

Soils at Confluence Point all formed from recent alluvial deposits. They are low in elevation, frequently flooded with a water table that fluctuates with the elevation of the river. Drainage is somewhat poor on the soils of the natural levee and mid-elevation soils, and poor and very poor in the deep and clay soils of the low swales. Seven soil series occur at the confluence. The Wabash and Albaton series have high clay content in the upper 60 inches or more of the soil profile and occur at the lowest elevations. Leta and Lakeport soils have high clay content from 20 to 60 inches thick, with loamy soil material below these depths. They occur on the mid-elevation sites. The Parkville and Haynie soils are dominated by silty and loamy textures throughout and are on the highest areas. Blake soils have variable textures and occur on natural levees.

3.4 PRIME AND UNIQUE FARMLAND

Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, oilseed crops, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion [7 U.S.C. 4201 (c)(1)(A)]. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding (USDA 1993). The Farmland Protection Policy Act (PL 97-98; 7 U.S.C. 4201 et seq.) was passed by Congress with the stated purpose of minimizing the unnecessary and irreversible conversion of farmland to nonagricultural uses by federal programs.

A letter, fact sheet, and AD-1006 form were sent to the NRCS to allow them to assess potential impacts to prime farmland. The NRCS Area Resource Soil Scientist responded that "No farmland would be converted to a use requiring an AD-1006, Farmland

Conversion Impact Rating. The 511.9 acres of cropland would revert back to vegetation similar to the natural state originally, and could be returned to agriculture at some future date." A copy of this letter is in Appendix A

3.5 BIOLOGICAL RESOURCES

Biological resources include the plants and animals and the habitats in which they occur. The resources discussed in this section include plants and animals in both aquatic and terrestrial ecosystems.

3.5.1 AQUATIC RESOURCES

Aquatic resources include aquatic habitat, fisheries, and other aquatic biota of Confluence Point. Aquatic habitat on Confluence Point includes the Missouri River, the Mississippi River, and four scour/blow holes outside of the Kuhs levee. Table 3.1 displays the break down of existing aquatic resources within the project boundary. The Missouri River borders the site on the south while the Mississippi River borders the site along the east and north.

Fish spawning areas are located along the shoreline, in backwaters, and behind channel control structures. Suitable nursery areas in the Missouri River are limited due to high velocity, turbulent flows, and silt and sand loads (Corps 1994). Construction of dikes and revetments have narrowed and deepened the channel into a fixed location, which has greatly eliminated shallow water habitat and increased water depth and current velocity (National Research Council 2002). In the channelized reaches of the river, fish are associated with revetments and dikes (Corps 2001).

Principal fish species in the lower Missouri River include emerald shiner, river carpsucker, gizzard shad, red shiner, shorthead redhorse, common carp, blue sucker, and goldeye. Pallid sturgeon and shovelnose sturgeon are also found in the lower Missouri River (Corps 2001). Recently introduced invasive silver carp and bighead carp now compose much of the biomass in slackwater areas.

Sport fish include catfish, crappie, sauger, white bass, largemouth bass, bluegill, walleye, and paddlefish (Corps 1995). Species important to the commercial fishery on

the lower Missouri River include buffalo, carp, carpsucker, and freshwater drum (Corps 1995).

The two most common plankton in the lower Missouri River were *Fragilaria* and *Pediastrum*, comprising 23 and 26 percent of the total plankton. Nematodes made up about 16 percent of total plankton. Common zooplankton included rotifers and nauplii (Berner 1951). Within the Missouri River, the areas most productive of a true benthos were near the steep banks which averaged 2.17 pounds per acre. Areas downstream of pile dikes supported about 1.27 pounds per acre (Berner 1951). The most common organisms in the benthos included Diptera larvae and Chironomidae larvae (Berner 1951).

While the previous paragraphs specifically discuss the aquatic resources of the Missouri River, one would expect to find similar, if not identical species in the portions of the Mississippi River near Confluence Point.

3.5.2 TERRESTRIAL RESOURCES

The majority of Confluence Point consists of agriculture and early successional forest. Table 3.1 displays the break down of existing terrestrial resources. Approximately 512 acres of the site remains in cropland. Current management practices include mowing of the decurrent false aster areas to promote regeneration.

3.5.3 WETLAND RESOURCES

Much of the Confluence Park project area has hydrology conducive to support wetland conditions. However, much of the site remains in agriculture where soils are highly disturbed and vegetation is absent. It is difficult to determine how much potential wetland area exists within the agricultural areas. Within the area owned by MDNR, approximately 125 acres have begun to support some hydrophytic vegetation.

Table 3-1: Existing Resources

General Habitat Type	Existing Acres
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General Habitat Type	Existing Acres
Wet Prairie/Grassland	41.3
Decurrent False Aster Restoration	18.2
Wet Bottomland Forest (Low)	306.6
Wet Bottomland Forest (High)	58.0
Crops/Agriculture	511.9
Existing 404 Wetland	11.2
Existing Bottomland Forest	88.5
Existing Scrub/Shrub	36.5
Levee	38.9
Existing Blew Hole	7.5
TOTAL	1118.6

3.5.4 WILDLIFE

Confluence Point provides habitat for numerous wildlife species. Common mammalian species likely to occur in remnant bottomland forest and agricultural fields within the site include cottontail rabbit, coyote, and whitetail deer.

Common furbearers that could occur along the river banks within the site include; mink, muskrat, beaver, river otter, and raccoon. Other furbearers expected to occur within the site include; opossum, striped skunk, and long-tailed weasel.

Upland game birds expected to occur within the site include bobwhite quail and wild turkey. Songbirds likely to occur within the site include mourning dove, American robin, eastern kingbird, American goldfinch, red-winged blackbird, eastern bluebird, northern cardinal, northern oriole, and brown thrasher among others.

The Mississippi River and Missouri Rivers are the most important travel ways along the Mississippi and Central Flyways for many migratory waterfowl species including wood

duck, blue-winged teal, green-winged teal, mallard, gadwall, northern pintail, lesser scaup, canvasback, Canada goose, and white pelican among others.

3.5.5 THREATENED AND ENDANGERED SPECIES

USFWS and MDC were contacted to request information regarding the federal and state lists of threatened, endangered, candidate species, or species of special concern that have potential to occur at Confluence Point. In addition to the threatened and endangered species listed by MDC, a list of “Rare and Uncommon” species was also provided. Comment letters from MDC and USFWS are included in Appendix A. Table 3.2 includes the listed species identified by USFWS. Table 3.3 includes the listed species identified by MDC.

Table 3-2: Federal List of Species with Potential to Occur at Confluence Point.

Common Name	Scientific Name	Status
Indiana Bat	<i>Myotis sodalis</i>	Federally Threatened
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	Federally Endangered

Table 3-3: Missouri Department of Conservation Record of Federal Listed or State Endangered Species Within One Mile of the Project Site.

Common Name	Scientific Name	State Status	Federal Status
Decurrent False Aster	<i>Boltonia decurrens</i>	Endangered	Threatened
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	Endangered	Endangered
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Endangered	

The following information was provided by the USFWS for the pallid sturgeon. The pallid sturgeon is a large, wide-ranging benthic fish found throughout the Mississippi River and its major tributaries. The pallid sturgeon is adapted to large, free-flowing, turbid rivers

with a diverse assemblage of physical characteristics that are in a constant state of change. Pallid sturgeon are known to travel large distances during spawning migrations. Habitat loss through river channelization and dams are two of the major factors responsible for the species decline. The project area includes important habitats for this species, including migration pathways, staging areas, and habitat for early life stages. Early developmental stages of pallid sturgeon spawned upstream potentially drift with the current through the project area. The confluence of the Missouri and Mississippi Rivers has been identified as a priority recovery area because of the high occurrence of pallid sturgeon in the area. It is believed that the sturgeon aggregate in the area prior to spawning.

The following information was provided by the USFWS for the Indiana bat. The Indiana bat spends the winter hibernating in caves in the Ozarks. During April and May, females migrate north and establish small maternity colonies in suitable sites within wooded riparian areas, floodplain forests, or upland forests. Maternity roost sites tend to be in dead or dying trees greater than 9 inches in diameter at breast height and with loose exfoliating bark. Trees most likely to have loose or exfoliating bark are dead oaks, hickories, elms, green and white ash, silver maple, and eastern cottonwood, or living shagbark hickory. Preferred roost sites are located in forest openings, at the forest edge, or where tree canopy is sparse, and within 1 km of water. Indiana bats forage in and around the tree canopy of floodplain, riparian, and upland forest.

In addition to the two species provided by the USFWS, decurrent false aster was listed by MDC and is known to exist on the site. Historically known from almost contiguous populations along a 400 km stretch within the Illinois and Mississippi River floodplain, this species is now reduced to about 20 discrete populations of highly variable size. Habitat destruction and modification are believed to be the reasons for the decline. The species is dependent on periodic disturbance from major floods; however, the flood regime has been altered by dams and levees and much former habitat has been modified into agricultural land. An increase in the amount of silt deposited on the floodplains has had a particularly detrimental effect. In spite of its rarity and geographic restriction, in good years large populations of this species may reach 10,000 individual

plants. Certain suitable areas of Confluence Point would be managed specifically for decurrent false aster.

Although the bald eagle is no longer a federal listed species, the USFWS did provide the following guidance. The riparian forests along the Missouri River provide nesting habitat for the bald eagle which has officially been removed from the List of Endangered and Threatened Species as of August 8, 2007. Breeding bald eagles occupy "territories" that they will typically defend against intrusion by other eagles, and that they likely return to each year. A territory may include one or more alternate nests that are built and maintained by the eagles, but which may not be used for nesting in a given year. Nest sites typically include at least one perch with a clear view of the water or area where the eagles usually forage. Shoreline trees or snags located near large water bodies provide the visibility and accessibility needed to locate aquatic prey.

There is one bald eagle nest very near the confluence, and several additional nests within a couple of miles of the project area. Bald eagles are vulnerable to disturbance during courtship, nest building, egg laying, incubation, and brooding. Disturbance during this critical period may lead to nest abandonment, cracked or chilled eggs, and exposure of small young to the elements. Human activity near a nest late in the nesting cycle may also cause flightless birds to jump from the nest tree, thus reducing their chance of survival. Major threats to this species include habitat alteration, human disturbance, and environmental contaminants.

Although the bald eagle has been removed from the threatened and endangered species list, it continues to be protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). The Service developed the National bald eagle Management (NBEM) Guidelines to provide landowners, land managers, and others with information and recommendations regarding how to minimize potential project impacts to bald eagles, particularly where such impacts may constitute "disturbance," which is prohibited by the BGEPA. Those guidelines recommend maintaining: (1) a specified distance between the activity and the nest (buffer area); (2) natural areas (preferably forested) between the activity and nest trees (landscape buffers); and (3) avoiding certain activities during the breeding season. The buffer areas

serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers would be large enough to protect existing nest trees and provide for alternative or replacement nest trees.

3.6 LAND COVER

Land cover at Confluence Point was primarily cropland at the time of purchase by the MDNR. In 2002 approximately 145,081 acres of land cover in St. Charles County was cropland [USDA-National Agricultural Statistics Survey (NASS) 2002]; whereas in 1997 approximately 158,375 acres of land cover in St. Charles County was cropland [USDA-National Agricultural Statistics Survey (NASS) 2002]. This represents a reduction of 13,294 acres of cropland in St. Charles County over a five year period. A majority of the land use adjacent to and around Confluence Point is agricultural land and cropland. Existing land cover at Confluence Point is summarized in Table 3-2 and shown in Figure 3-3.

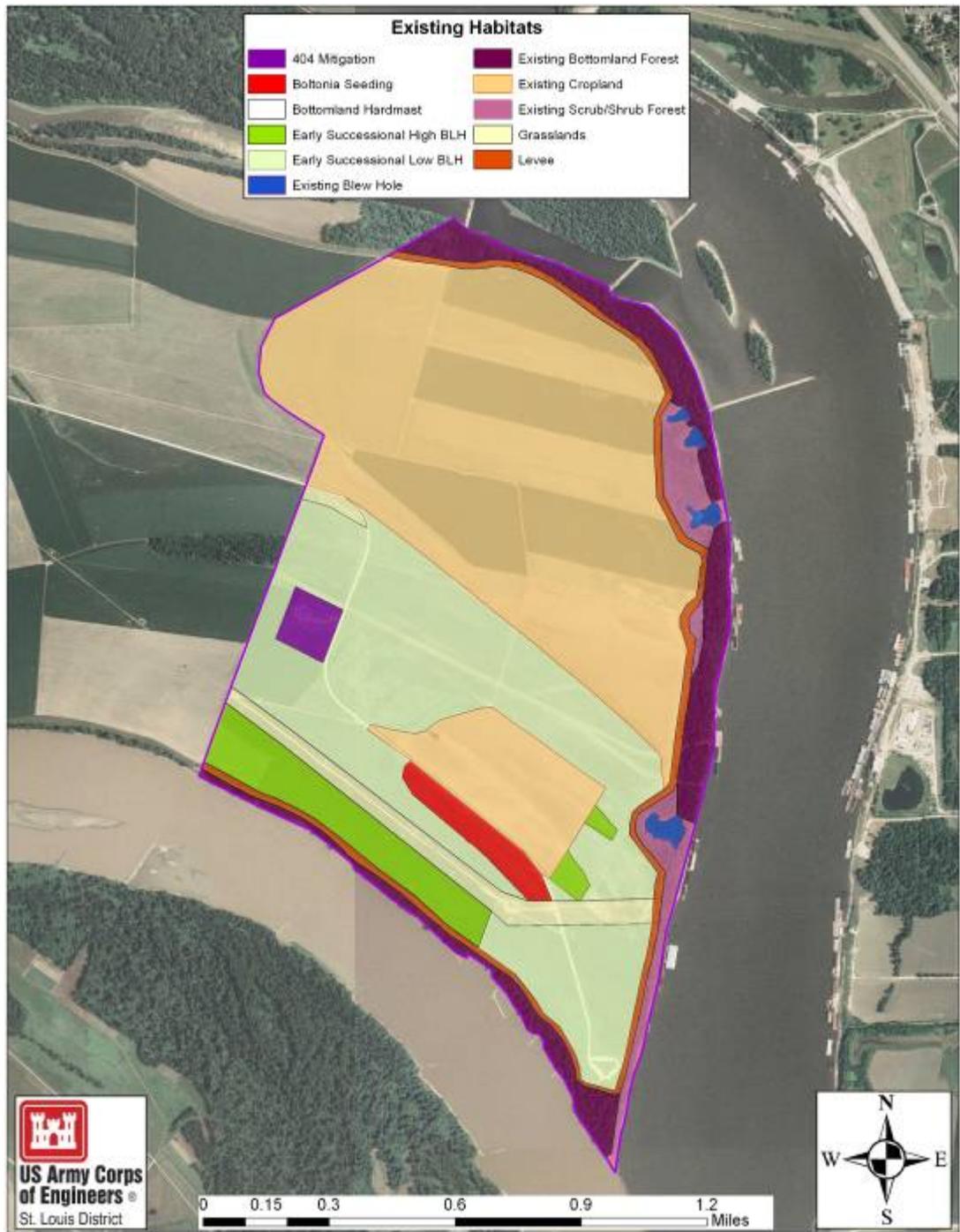


Figure 3- 4: Existing Land Cover at Confluence Point.

3.7 CULTURAL RESOURCES

Cultural resources include sites, structures, buildings, objects, landscapes, districts, and events, etc. that would have archaeological, historical, cultural, Native American, or scientific value to a culture or community. A records search was conducted for Confluence Point. The results of the records search are included in Appendix C.

3.7.1 ACCRETED LANDS

A review of the shapefiles showing the Missouri River channel in 1803, 1879, 1890, and 2000 was performed in order to assess the area of accretion occurring in the limits of Confluence Point. The 1803 shapefile came from the State of Missouri and was derived from the 1803-1804 Lewis and Clark maps as well as 1815 Government Land Office maps. NWK provided the 1879 river channel shapefile. The 1890 and 2000 river channel shapefiles were created by the USGS Long Term Resource Monitoring Program. The shapefiles were overlaid on to the modern USGS 7.5' quadrangles to show areas in which erosion and accretion has occurred due to natural or man-induced meandering by the Missouri River.

Between 1803 and 2000 a large amount of erosion and accretion of land occurred along Confluence Point. Approximately 83.1 percent (929.7 acres) of Confluence Point has been accreted since 1803 whereas the remaining 16.9 percent (188.7 acres) of Confluence Point is non-accreted land (Figure 3-2) prior to 1803. The results of previous geomorphological investigations and observations within the proposed project area indicate that the depth of recently deposited alluvial sediment ranges between 2 and 10 meters in depth across this entire area.

3.7.2 HISTORIC PROPERTIES AND ARCHAEOLOGICAL SITES

There are no properties in the immediate vicinity of Confluence Point listed or eligible for listing on the National Register of Historic Places (NRHP). The Archeological Survey of Missouri (ASM), Missouri State Historic Preservation Office (SHPO) was consulted for the presence of previously recorded sites. The search revealed that no archaeological sites are presently recorded within the proposed project area.

3.7.3 STEAMBOAT WRECKS

A review of records indicated that three nineteenth century steamboats (Bedford, Edna, and the St. Mary) reportedly sank within the vicinity of the project area. In 2007, the St. Louis District conducted geo-magnetic investigations in an attempt to confirm the potential presence of these buried shipwrecks. This effort revealed the potential presence of one of these wrecks, the Bedford (sunk in 1840). Remote sensing indicated that the remains of this steamboat are deeply buried approximately 40 feet below the present day ground surface. The location of this potential wreckage is situated approximately 38 feet below the maximum depth of any proposed ground disturbance associated with the proposed habitat restoration ground disturbance activities. In fact, virtually the entire ground surface of the proposed project area consists of recently deposited river sediment. As a result, the likelihood of impacting any potentially significant archaeological remains during earthmoving associated with this project is low.

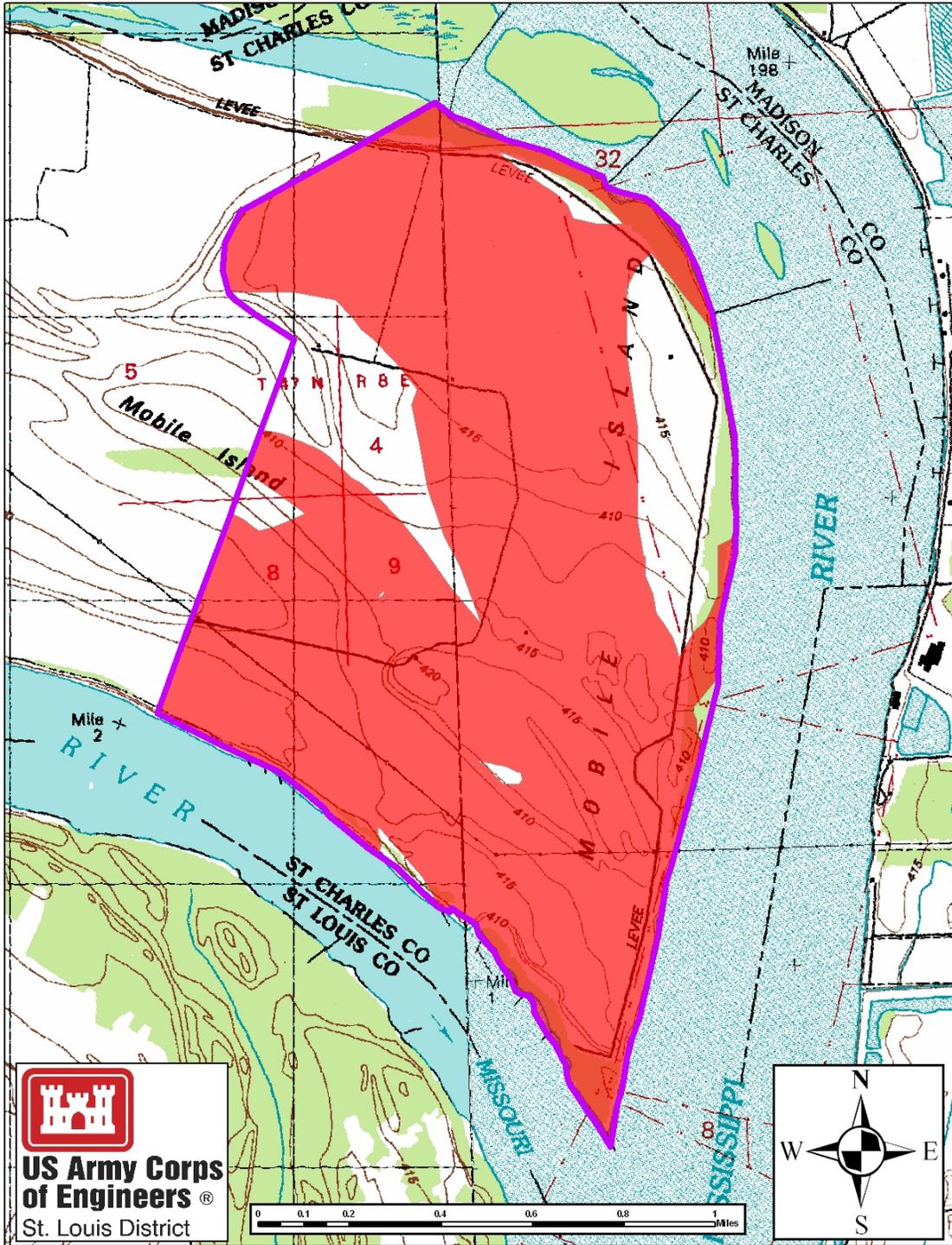


Figure 3-5: Accreted Lands (in red) on Confluence Point.

3.8 WATER QUALITY

The most recent water quality data available was collected by the United States Geological Survey (USGS) for the Water Data for the Nation Program. It was collected between October 2004 and May 2007 twenty three times. The point of data collection nearest to Confluence Point was just downstream of St. Charles, Missouri (approximate RM 24.5), which is located approximately 22 miles upstream from the western boundary of Confluence Point. In addition, the Corps has four samples from immediately south of the site from 2005 and 2007. While these four sites are technically in the Missouri River, it can be assumed that samples from the Mississippi River would give similar results.

The USGS samples were taken in all seasons and the Corps samples were from spring and summer. Results for temperature, pH and dissolved oxygen are as follows:

- Water temperature from USGS samples ranged between 10.0 degrees Celsius (°C) and 32.0 °C. The range for Corps samples was 6.5°C and 28.8°C.
- The USGS pH samples ranged between 7.3 and 8.5. The pH range for Corps samples was 7.8 to 8.5.
- Dissolved oxygen from USGS samples ranged from 5.2 milligrams per liter (mg/l) to 14.6 mg/l. Corps sample ranges were between 3.6 mg/l and 13 mg/l.

These results were fairly consistent with those from other collection points along the Missouri River; these parameters have an effect on the fisheries in the Missouri River. High temperatures decrease the amount of dissolved oxygen. The temperature for the Missouri River in Missouri must not be above 32.2 °C and the dissolved oxygen concentration must not be below 5.0 mg/l based on federally approved water quality standards (Corps 1994). It should be noted that one of the Corps samples dissolved oxygen was below 5.0 mg/l. The Corps sample was taken on March 4 2005. A variety of reasons could exist for this low number and it is hard to interpret because of the low number samples taken.

3.9 AIR QUALITY

Air quality in a given location is described by the concentrations of various pollutants in the atmosphere. The quality of the air is measured against National Ambient Air Quality Standards (NAAQS) set by the EPA. Confluence Point lies within the St. Louis Metropolitan Region. Of the six criteria pollutants addressed in the National Ambient Air Quality Standards, the St. Louis Metropolitan Region is currently in attainment for sulfur dioxide, carbon monoxide, lead, and nitrogen dioxide, but not for particulate matter or ozone. The St. Louis area is currently designated by the U.S. Environmental Protection Agency (USEPA) as not meeting the fine particle standard (PM-2.5). The St. Louis area is also designated by the USEPA as not meeting the eight-hour ozone standard, and levels of this pollutant are classified as moderate.

3.10 NOISE

Sounds that disrupt normal activities or otherwise diminish the quality of the environment are designated as noise. Noise can be stationary or transient and intermittent or continuous. Confluence Point is located in a rural setting. Typical sources of noise in the area include farm equipment and agricultural activities on adjacent lands. The site is near the City of St. Louis and is exposed to low flying commercial jet traffic.

3.11 SOCIOECONOMIC RESOURCES

Socioeconomic resources are the part of the human environment that includes the economic, demographic, and social characteristics of individuals and communities.

3.11.1 POPULATION AND INCOME

Confluence Point is located in St. Charles County, Missouri. The 2000 estimated population for St. Charles County was 283,883. St. Charles County experienced a population increase of 33.3 percent from 1990 to 2000 (U.S. Census Bureau 2007).

In 2005, per capita personal income in St. Charles County was \$33,530. This ranked 5th in the State of Missouri and was 107 percent of the state average (\$31,231) and 97 percent of the national average (\$34,471). In 1990 the per capita personal income for St. Charles County was \$18,480 and ranked 5th in the state. The 1969-2005 average

annual growth rate of per capita personal income was 10.2 percent in the county. The average annual growth rate for the state was 6.9 percent and for the nation was 7.4 percent [Bureau of Economic Analysis (BEA) 2007].

The closest community to Confluence Point is the town of West Alton, Missouri located approximately eight miles to the west. The 2000 estimated population of West Alton, Missouri was 573 (U.S. Census Bureau 2007)

Minorities comprised 5.3 percent of the population of St. Charles County in 2000 and 15.7 percent of the population of Missouri in 2000 (U.S. Census Bureau 2007). Persons 65 years old and over comprised 8.8 percent of the St. Charles County population compared to 13.5 percent of the State of Missouri population (U.S. Census Bureau 2007).

The total of harvested cropland in St. Charles County is 125,355 acres [USDA-National Agricultural Statistics Survey (NASS) 2002]. The amount of Confluence Point land currently being farmed by a neighboring landowner under a preexisting agreement is 440 acres. There are a total of 737 farms in the county with an average net income of \$16,885 [USDA-National Agricultural Statistics Survey (NASS) 2002].

3.11.2 RECREATION AND AESTHETICS

Confluence Point is managed by MDNR as a state park. MDNR allows approved recreational activities for the public at the site including bird watching, hiking, and nature study. The area is a natural stopover for birds migrating along the river corridors. The site is of national significance because it allows direct access to the confluence of two of the countries largest and historically significant rivers. It is located near the historical departure point for Lewis and Clark. The visual aesthetics of Confluence Point are typical of many rural areas along the Missouri and Mississippi Rivers. Agricultural lands, riparian woodlands, wetlands, and grasslands are typical of the area and surrounding landscape. The Missouri River and Mississippi River and their confluence are important aesthetic resources to the region and Nation.

3.11.3 NAVIGATION

Missouri River flows are managed in part, for commercial navigation on the Missouri River. Navigation on the Missouri River is limited to the normal ice-free season, with a full-length flow support season of 8 months (Corps 2001). At Sioux City, the full-length support season extends from March 23 to November 22 and at St. Louis the full-length support season extends from April 1 to December 1 (Corps 2001). In 1994, approximately 50 percent of the commercial tonnage moved on the Missouri River was in the Omaha to Kansas City reach. This reach was also the origin or destination for about 40 percent of Missouri River commercial tonnage (Corps 2001).

Mississippi River flows are managed in part, for commercial navigation as well. The Upper Mississippi River has a length of 663 miles extending from north of Minneapolis, MN, to the confluence with the Missouri River north of St. Louis, MO, providing reliable navigation with a series of 29 locks and maintained at a usable channel depth of 9 feet (Corps 2004). The Middle Mississippi River extends approximately 195 miles, from the mouth of the Missouri River to the mouth of the Ohio River (Corps 2004). The Middle Mississippi River is also maintained to a usable depth of 9 feet (Corps 2004). There are two lock and dam sites on this portion of the Mississippi River. In 2002 44.9 million tons of farm products, 53 percent of total tonnage, were transported on the upper Mississippi River (Corps 2004). Navigation near Confluence Point can occur year round as long as the river remains ice free.

3.12 Hazardous, Toxic, and Radioactive Wastes

An Environmental Site Assessment was performed in conformance with the scope and limitations of ASTM Practice E 1527-05 for Confluence Point. This assessment has revealed no evidence of recognized environmental conditions in connection with the project. If any recognized environmental conditions are identified during the construction of the project features, the work should cease and the Environmental Quality office of the St. Louis District must be notified immediately to reassess the project area.

Chapter 4

Environmental Consequences

4.1 INTRODUCTION

An environmental consequence consists of a detectable change in a resource from baseline conditions. This change is caused by the proposed action. For the purposes of this assessment, these detectable changes are referred to as impacts. The discussion of impacts concentrates on aspects of the environment that could potentially be affected by the proposed action.

4.1.1 DEFINING IMPACTS

Analysis of impacts associated with each course of action can be subdivided into direct, indirect, and cumulative impacts. Impacts can be beneficial or detrimental. The types of impacts are distinguished from one another by spatial and temporal association with the project. A direct impact is caused by the proposed action and occurs at the same time and place. An indirect impact is caused by the proposed action and occurs later in time or is farther removed in distance, but is still reasonably foreseeable. Impacts can be short-term or long-term.

According to Section 1508.7 of the CEQ Regulations for implementing NEPA, a cumulative impact is an impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

4.1.2 DEFINING SIGNIFICANCE

According to Section 1508.27 of the CEQ Regulations for Implementing NEPA, “significance” requires considerations of both context and intensity. Significance of an action must be analyzed in several contexts such as society as a whole, the affected region, the affected interests, and the locality. Intensity refers to the severity of impact. The CEQ Regulations should be referenced for detailed discussions and examples of significance.

4.1.3 FOCUS OF THE ANALYSIS

The analysis focuses on identifying types of impacts and estimating their potential significance in various environmental and socioeconomic resource areas. The environmental impacts of the implementation and site selection process for the Mitigation Program were previously evaluated and documented in the *Feasibility Report and Environmental Impact Statement* (Corps 1981) and the *Supplemental Environmental Impact Statement* (Corps 2003). This PIR evaluates the potential impacts anticipated from the construction and operation of the three alternatives specific to Confluence Point. The environmental effects presented in this chapter would be the same for all alternatives unless noted otherwise.

4.2 GEOLOGICAL RESOURCES

Geological resources are limited, non-renewable resources whose characteristics can easily be degraded by physical disturbances. An adverse impact to geological resources would be significant if it depletes a regional or local resource, affects the rate of erosion, changes the characteristics of the soil, or becomes a less natural condition.

4.2.1 TOPOGRAPHY

The Full Development Alternative would have minor affects on topography due to construction of shallow basins. Basins would enhance the topography and help to re-create some of the diversity that occurred prior to agriculture. These would be developed in low lying areas. Restoring more variable water levels to the area would result in improved surface hydrology which would be beneficial to wildlife. The Full Development Alternative would not have any significant adverse impacts to topography and would support the goal of the Mitigation Program to restore Confluence Point to a condition similar to that of the Missouri River floodplain prior to its channelization.

The Partial Development Alternative would have no beneficial or negative impacts on topography.

The No Development Alternative would have no beneficial or negative impacts on topography.

4.2.2 GEOLOGY

The Full Development Alternative The Full Development Alternative would include excavation to create shallow water habitat. All activities would only affect alluvial deposits and not underlying bedrock or exposed bedrock outcroppings at the margins of the floodplain. The Full Development Alternative would not have any significant adverse impacts to geology.

The Partial Development Alternative would have no beneficial or negative impacts on geology.

The No Development Alternative would have no beneficial or negative impacts on geology.

4.2.3 SOILS

The Full Development Alternative would create wetland habitat by excavation of basins, which would affect soil conditions at that specific location. This would be an unavoidable impact. Soil obtained from excavation would be used to create low berms. It is not expected that excavation would be greater than 18 inches. The newly contoured basins would provide beneficial habitat and satisfy the goals of the Mitigation Program. The beneficial impacts would outweigh the adverse impacts such as compaction.

Control measures would be implemented to ensure that undesirable pollutants from construction activities would not be discharged in stormwater runoff. Disturbed areas would be seeded and stabilized after construction with appropriate mixtures of native seed.

The Partial Development Alternative would have minimal effects on soils from the heavy machinery used in plantings.

The No Development Alternative is not anticipated to cause any adverse effects on soils.

4.3 PRIME AND UNIQUE FARMLAND

The Full Development Alternative would convert soils designated as prime farmland from agricultural use to fish and wildlife habitat use. However, none of the activities proposed under the Full Development Alternative would render prime farmlands non-farmable. Therefore, there would be no direct or indirect impacts to prime farmland. .

The Partial Development Alternative would have essentially the same impacts as the Full Development Alternative

The No Development Alternative would have essentially the same impacts as the Full Development Alternative

4.4 BIOLOGICAL RESOURCES

Biological resources include aquatic resources, terrestrial resources, wetlands, wildlife, and threatened and endangered species. Aquatic resources include the rivers and the water bodies within Confluence Point's boundaries. Terrestrial resources include vegetation communities and ecosystems characteristic of mesic and xeric hydrologic conditions. Wetlands consist of the marginal areas between terrestrial and aquatic areas. Portions of Confluence Point could be categorized as wetland. Wildlife includes the fish, invertebrates, amphibians, reptiles, mammals, birds, and other organisms that occupy the aquatic, terrestrial, and wetland habitats.

An adverse impact would be significant if the viability of a biological resource of the area was jeopardized, with little likelihood of reestablishment to its original state. The significance of the impact would also be dependent upon the importance of the resource and its relative abundance in the vicinity of the site. An impact would also be considered significant if it would result in the taking⁷ of a listed threatened or endangered species.

⁷ The term, "take," means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

4.4.1 AQUATIC RESOURCES

The Full Development Alternative would create shallow water habitat that is currently not present, which would benefit aquatic resources in the project area. It is expected that the Full Development Alternative would allow the creation of approximately 117 acres through excavation of shallow pools and swales. These excavations would be created on soils capable of holding water for longer durations. The intent is to create and restore aquatic habitat historically associated with the Missouri River. These excavations would not be directly connected to the rivers and there are no anticipated benefits to riverine fish. Hydrology would be supplied by runoff and by groundwater seepage. These areas would be used extensively by animals such as frogs, snakes, turtles, waterfowl, shorebirds, wading birds, and small mammals.

Most of the existing fisheries resources associated with Confluence Point exist outside the levee in several scour holes and in the rivers. No adverse effects to aquatic resources are expected from any of the activities. All excess excavated materials would be stockpiled for repair of future levee breaches. No materials would be disposed of in either river.

The Partial Development Alternative would have some beneficial impact during times of high water and inundation. The timing and degree of these impacts would be sporadic and unpredictable.

The No Development Alternative would have some beneficial impact during times of high water and inundation. The timing and degree of these impacts would be sporadic and unpredictable.

4.4.2 TERRESTRIAL AND WETLAND RESOURCES

The Full Development Alternative would improve and expand natural terrestrial habitat as well as wetland resources throughout Confluence Point. Most non-aquatic habitat in the site would likely function as both wetland and terrestrial habitat depending upon the season or year. Because the site is located between the Missouri and Mississippi Rivers, purely terrestrial habitat was not historically abundant before the BNSP and modern flood control practices. Most of the current terrestrial habitat is maintained by levees and drainage systems and is utilized for agricultural production. These types of

lands within Confluence Point would be restored to fish and wildlife habitat and would be planted with appropriate vegetation. Table 4.1 summarizes proposed changes in habitat acres on Confluence Point and the proposed habitat development is illustrated in Figure 4.1. For reference, Figure 3.3 displays the current land use at Confluence Point.

Under the Full Development Alternative, minimal amounts of terrestrial and wetland habitat may be temporarily disturbed due to construction activities associated with the excavation of shallow basins. Excavations at the site would result in a conversion of infrequently flooded wetlands to regularly flooded shallow basins. Conversion to wetland or aquatic habitat would be beneficial and would result in a more natural ecosystem. The long-term beneficial impacts would greatly outweigh the short-term adverse impact. None of the adverse impacts would be considered significant.

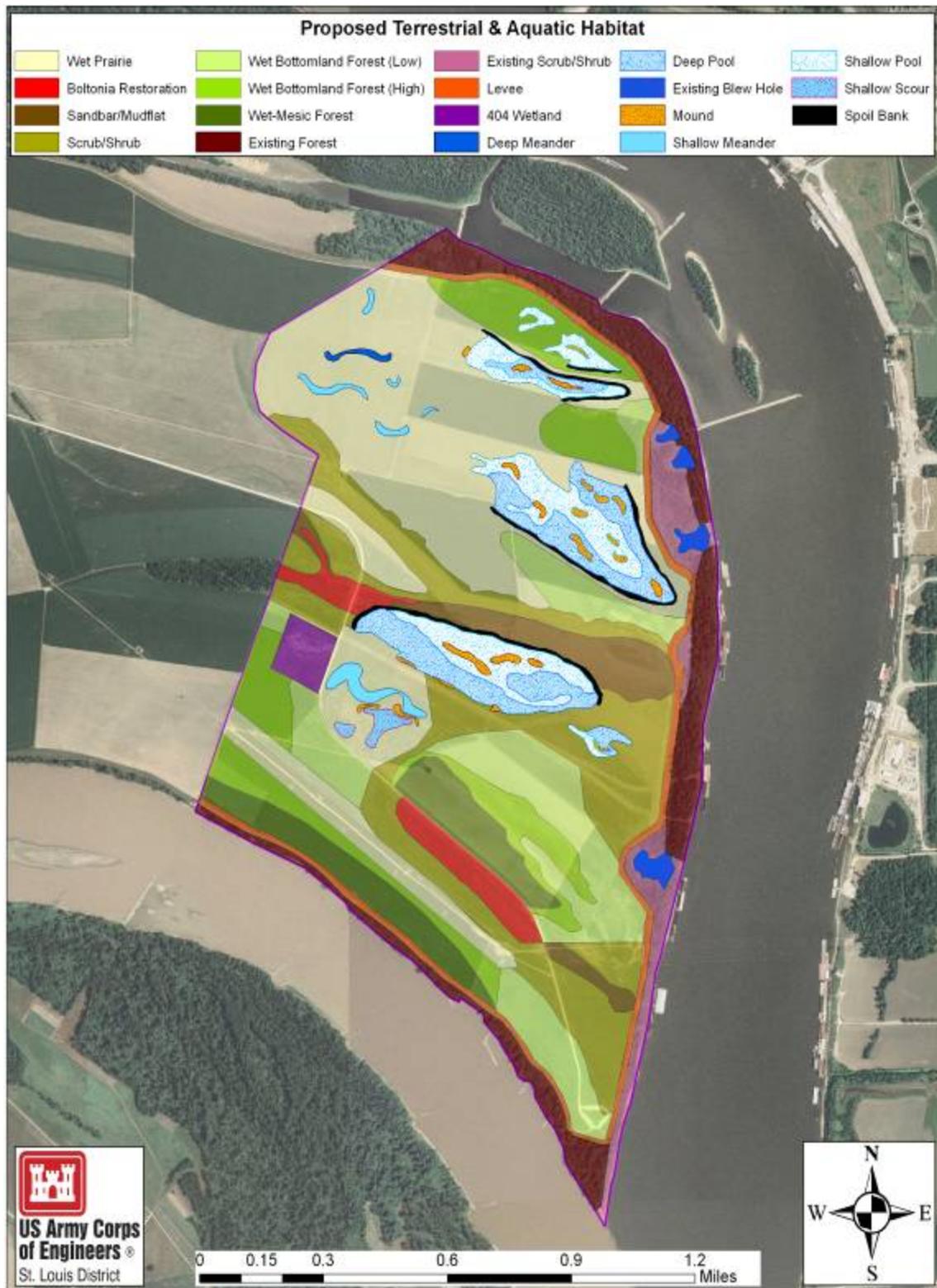


Figure 4-1: Proposed Habitat Development

Table 4-1: Project Outputs

General Habitat Type	Existing Acres	Proposed Acres	Output ¹
Wet Prairie/Grassland	41.3	276.5	235.2
Boltonia Restoration	18.2	28.5	10.3
Sandbar/Mudflat	0	38.4	38.4
Scrub/Shrub	0	167.5	167.5
Wet Bottomland Forest (Low)	306.6 ²	126.2	-180.4 ¹
Wet Bottomland Forest (High)	58.0 ³	100.7	42.7
Wet-Mesic Forest	0	60.0	60.0
Deep Meander	0	1.3	1.3
Deep Pool	0	53.0	53.0
Shallow Meander	0	8.2	8.2
Shallow Pool	0	50.7	50.7
Shallow Scour	0	3.6	3.6
Spoil Banks	0	12.5	12.5
Mounds	0	8.9	8.9
Crops/Agriculture	511.9	0	-511.9 ¹
Existing 404 Wetland	11.2	11.2	0
Existing Bottomland Forest	88.5	88.5	0
Existing Scrub/Shrub	36.5	36.5	0
Levee	38.9	38.9	0
Existing Blew Hole	7.5	7.5	0
TOTAL⁶	1118.6	1118.6	0

¹Negative outputs are the result of existing habitat types transitioning into other habitat types or being converted to wetlands through proposed activities.

²Acres consists of naturally established early successional forest. Approximately 3 years ago this area was farmed.

³Acres consists of early successional forest planted by MODNR since farming ceased.

The Partial Development Alternative would improve terrestrial and wetland habitat to a lesser degree than that described for the Full Development Alternative. Native vegetation would be reestablished in appropriate location; however there would be none of the long-term beneficial or short-term adverse impacts associated with excavation of basins.

The No Development Alternative would improve terrestrial habitat by removing it from agricultural production. However, no planting would occur and the resulting vegetation would be lower quality than that created by the other two alternatives. There would be none of the long-term beneficial or short-term adverse impacts associated with excavation of shallow basins.

4.4.3 WILDLIFE

The Full Development Alternative would benefit wildlife by increasing the amount of habitat and improving the quality of existing habitat. This alternative maximizes ecosystem diversity on the site and would have the greatest benefit to a broad spectrum of wildlife. Bottomland forests would provide trees for roosting, nests, and dens. Mast-producing trees associated with bottomland forests, such as pin oak and pecan would provide a food source for wildlife. Many common bird and mammalian species would thrive in this diverse bottomland system.

Confluence Point is situated in a critical migratory path for shorebirds, waterfowl, songbirds, wading birds, and raptors. It is already experiencing heavy avian usage on areas that flood naturally from high river water. The proposed hydrologic enhancements would likely make the area even more attractive. The nearby USACE Riverlands Migratory Bird Sanctuary is already a haven for migrating birds and it is expected that Confluence Point would experience similar usage. Since the site is uniquely located directly adjacent to both rivers, it is highly likely that Confluence Point would support large numbers of migratory birds and could serve multiple species as a short-term or long-term stop over location.

Reptiles and amphibians would also greatly benefit from the shallow basins. This fish-free environment would be excellent for frogs and other amphibians that require water for their reproductive cycle. Likewise, an increase in shallow water habitat would have a positive effect on terrestrial wildlife. The anticipated increase in prey within the shallow water habitat would provide a food source. Muskrat and mink prefer marshes and quiet, shallow, weedy waters to the Missouri River's deep, swift channel that is typically devoid of vegetation. Quiet backwater areas are desirable feeding areas for raccoon, opossum, and skunks and bottomland forests would provide cover and den sites. Wild turkey numbers are expected to increase as forests mature and provide areas for roosting and cover.

The conversion of cropland acres to upland grasslands and wet prairies would benefit many species of open nesting birds. The cessation of agriculture practices and consequential development of early successional habitat would benefit many species whose populations may be in decline. For example, the yellow warbler and the

prothonotary warbler are expected to respond positively as trees go through succession and become mature forests.

Minor short-term impacts to wildlife could occur during construction. However, most excavation would occur in areas currently farmed so the potential for displacement is very low. If displacement did occur, there would be equivalent habitat nearby. The animals would return to improved habitat after construction is completed. Attempts would be made to avoid direct impacts to species with limited mobility. However, the potential exists for accidental impacts to these creatures. Dust and noise associated with earth-moving equipment could adversely affect wildlife on a short-term basis. The long-term impact of project implementation would be a substantial increase in beneficial habitat as well as the creation of greater ecosystem diversity. The positive benefits to wildlife associated with the Full Development Alternative greatly outweigh any minor adverse impacts that could occur during construction.

The Partial Development Alternative would create bottomland forests and grassland habitat similar to that described for the Full Development Alternative. Many of the beneficial impacts would be the same. The Partial Development Alternative would not maximize ecological diversity on the site. The shallow basins would not be created and the benefits to wildlife would not be realized.

Because no construction would occur, the adverse impacts to wildlife under this alternative would be minimal. The positive benefits associated with the Partial Development Alternative would not be as great as those experienced with the Full Development Alternative because there would be no development of aquatic habitat.

The No Development Alternative would not maximize potential beneficial impacts to wildlife. The site would likely grow into a moderate quality bottomland forest with very few, if any, hard mast species. The plant species diversity expected under the Full and Partial Development Alternative would not be realized and consequently the wildlife using the site would not be as diverse. None of the wildlife benefits associated with the shallow basins would be realized. Because no construction would occur, the short-term adverse impacts to wildlife under this alternative would be minimal.

4.4.4 THREATENED AND ENDANGERED SPECIES

The proposed project is located in a geographic area with potential habitat and potential presence of the endangered Indiana bat and endangered pallid sturgeon. In addition, the endangered decurrent false aster is known to occur on the site. Several state listed species, including bald eagle, have been recorded within one mile of the project area. An analysis of the impacts to the federally listed species is presented in the Biological Assessment found in Appendix E. The goal of the Mitigation Program, of which Confluence Point is a component, is to restore fish and wildlife habitat along the lower Missouri River. In addition, all project features are designed to enhance, create, or restore wetlands, terrestrial, and aquatic habitat at Confluence Point. Because of Confluence Point's unique location these benefits would be seen along the Mississippi River as well.

The Full Development Alternative would not adversely affect Indiana bat. No trees greater than 9 inches dbh would be cut or removed during the development process. It is likely that excavation would occur in the fall when conditions are driest, which would mean that Indiana bats would likely have migrated to their winter hibernaculum before construction begins. In the long run, it is possible that the project would benefit Indiana bats by providing forested riparian foraging habitat. In addition, the basins could provide additional foraging opportunities within the boundaries of the park. All snags that naturally occur would be left in place to potentially provide roost habitat.

The Full Development Alternative would not adversely affect the pallid sturgeon. Although it borders both the Missouri and the Mississippi Rivers, no construction would occur riverside of the Kuhs Levee. The Kuhs levee would remain intact and continue to limit the entrance of surface water into the site. Pallid sturgeon habitat would not be positively or negatively impacted by project implementation.

The Full Development Alternative would not adversely affect decurrent false aster. A notable population of the species currently exists on the site. Future management plans include specific measures to expand the suitable habit for decurrent false aster. The proposed Full Development Alternative would likely beneficially affect the species.

The bald eagle is no longer listed as a federal threatened or endangered species. It remains an endangered species on the Missouri State list. The proposed project would

result in long-term beneficial effects to the bald eagle from the restoration of bottomland forest that would provide additional roosting and nesting habitat for the eagle. The bald eagle would benefit indirectly from construction of the proposed project because the increased shallow water habitat would provide another potential forage base for use while wintering along the Missouri and Mississippi Rivers. A field survey would be conducted prior to construction activities to identify existing bald eagle roost/perch/nest sites. The full development alternative would follow all guidelines established in the BGEPA and MBTA. Construction would likely occur in the dry fall season, which would avoid nesting and the peak of the winter migration.

It is unlikely that the project would have any adverse effects to any “Species of Concern” on Missouri State list. The project is designed to benefit wildlife, including endangered species wherever possible.

The Partial Development Alternative would have similar impacts to endangered species as described for the Full Development Alternative. Overall benefits would be less since the basins would not be created.

The No Development Alternative would have similar impacts to endangered species as described for the Full Development Alternative. Overall benefits would be less since the basins would not be created and hard mast tree species would not be planted.

4.5 LAND COVER

The Full Development Alternative would not have significant adverse impacts to land cover. The existing cropland within the site would be converted to fish and wildlife habitat. This would not be considered a significant impact due to the amount of agricultural land in the vicinity of the project area or regionally. Habitat restoration components of the Full Development Alternative are expected to provide valuable functions present prior to the BSNP. Beneficial effects to the terrestrial land cover are expected over both the short and long-term from implementation of the Full Development Alternative due to the creation of wildlife habitat.

The Partial Development Alternative would not have significant adverse impacts to land cover. Habitat benefits would be less due to the absence of excavated basins in this alternative.

The No Development Alternative would not have significant adverse impacts to land cover. Habitat benefits would be less due to the absence of excavated basins and selective species planting in this alternative.

4.6 CULTURAL RESOURCES

Cultural resources are limited, non-renewable resources whose integrity could be easily diminished by physical disturbances. However, it appears that the proposed project has a low probability of adversely impacting potentially significant archaeological remains within the project Area of Potential Effect (APE). The ground surface across virtually the entire proposed project area consists of recently deposited sediment.

4.6.1 HISTORIC PROPERTIES AND ARCHAEOLOGICAL SITES

No historic properties listed on the NRHP or other recorded archaeological sites are recorded in the project APE. Approximately 83.1 percent (929.7 acres) of Confluence Point has accreted since 1803 either by natural or man-induced (i.e. dike field land accretion) sediment deposition. There is little likelihood of adversely affecting unanticipated cultural resources on accreted land is minimal.

The Full Development Alternative is unlikely to have adverse impacts to historic or archaeological resources because the project is primarily situated on recently accreted lands. A Phase 1 archaeological survey would be conducted prior to implementation of this alternative. If unanticipated cultural resource sites are encountered during construction or future operation and maintenance, these activities would be halted and the Corps' cultural resource personnel would be notified immediately along with the SHPO [36 C.F.R. § 800.11(b)2], and federally recognized Native American Tribes. The provisions of 36 C.F.R. § 800.6 would be implemented. No unavoidable adverse impacts are anticipated to potentially significant cultural resources at this time.

The Partial Development Alternative is unlikely to have adverse impacts to historic or archaeological resources because the project is primarily situated on recently accreted lands. In addition, earth moving activities will not take place under this alternative.

The No Development Alternative is unlikely to have adverse impacts to historic or archaeological resources because the project is primarily situated on recently accreted lands. In addition, earth moving activities will not take place under this alternative.

4.6.2 STEAMBOAT WRECKS

Results of record searches for cultural resources in the area and a review of literature regarding steamboat wrecks suggested that the remains of three nineteenth century steamboat wrecks may be present within the proposed project area. Archival and on site remote sensing efforts identified the potential remains of one of these shipwrecks (the Bedford- sunk in 1840). The St. Louis District sponsored investigations revealed that the potential remains of the Bedford are deeply buried approximately 40 feet below the surface.

The Full Development Alternative is unlikely to have adverse impacts to the steamboat wreck because it is 38 feet deeper than the maximum depth of any proposed earthmoving activity associated with the proposed project.

The Partial Development Alternative is unlikely to have adverse impacts to the steamboat wreck because earth moving activities will not take place under this alternative.

The No Development Alternative is unlikely to have adverse impacts to the steamboat wreck because earth moving activities will not take place under this alternative.

4.6.3 ACCRETED LANDS

Approximately 16.9 percent (188.7 acres) of has not been accreted since the early 19th Century as shown in Figure 3-2. Approximately 83.1 percent (929.7 acres) of Confluence Point are accreted lands caused either by natural or man-induced (i.e. dike field land accretion) sediment deposition. There is little likelihood of adversely affecting unanticipated cultural resources on previously accreted or disturbed areas (e.g. bank revetments and levees) located on non-accreted lands.

The Full Development Alternative Earth disturbing activities associated with building berms in the area of Confluence Point would include earth moving activity in non-accreted soils. In the future (despite the fact that these areas are also capped by approximately 2 meters of recently deposited river sediment) should the Corps pursue and design these elements of the Full Development Alternative, a Phase I Archeological Survey would be conducted prior to design and construction.

The Partial Development Alternative is unlikely to have adverse impacts because earth moving activities will not take place under this alternative.

The No Development Alternative is unlikely to have adverse impacts because earth moving activities will not take place under this alternative.

4.7 WATER QUALITY

The Full Development Alternative would not have a significant adverse impact on water quality of the Missouri River or Mississippi River. Significant impacts would be those that could affect water quality in a manner that exceed federal or state standards, including degrading an existing use. Minor disturbances would result from the creation of shallow scours and meanders as well as the planting of vegetation. Sediment would be used to create berms neighboring these excavations. Any impact would be short-term and insignificant. Methods to reduce discharges of pollutants in storm water runoff would be implemented. Construction of the Confluence Point mitigation features would require issuance of General Permit MO-G699 from the MDNR. The permit and associated storm water pollution prevention plan would address control issues for pollutants during and after construction. These construction activities would also comply with any conditions recommended by the Corps and MDNR in issuing respectively the Section 404 authorization and 401. The Full Development Alternative would have a long term positive impact and enhance water quality.

The Partial Development Alternative would not have any adverse impact on water quality at Confluence Point. Some soil disturbances may occur during the planting of vegetation at the site. Any impacts would be short-term and insignificant. A long term positive impact on water quality in both the Missouri and Mississippi Rivers would occur as the result of the Partial Development Alternative.

The No Development Alternative would consist of natural vegetation recruitment. There would be no adverse impact to water quality and long term increase in water quality would be expected.

4.8 AIR QUALITY

The Full Development Alternative would not result in significant adverse impacts to air quality at the site. Minor direct impacts to air quality could occur from construction

activities such as excavation, grading, and construction-related traffic. Increases in fugitive dust and increases in exhaust emissions from construction activities would be unavoidable; however, these impacts would be temporary and emission levels would be relatively low. These pollutants would be expected to disperse quickly and impacts would be minimal. When necessary, construction access roads would be watered down to minimize the escape of fugitive dust during high wind speeds and periods of high construction-vehicle activity. An air quality impact would be considered significant if it results in a violation of NAAQS.

The Partial Development Alternative would not result in significant adverse air quality impacts. Activity would be limited to vegetation planting and impacts would be minimal.

The No Development Alternative would not result in significant adverse air quality impacts.

4.9 NOISE

Noise impacts are related to the magnitude of the noise levels generated by construction activities and the proximity of sensitive noise receptors. A sensitive noise receptor is commonly defined as the occupants of a facility or location where a state of quietness is a basis for use. These locations include residences, churches, and wilderness areas. The human response to noise is generally subjective (e.g., annoyance). Some species of protected wildlife are also considered to be sensitive noise receptors, for instance, the bald eagle. Noise impacts to wildlife vary depending on a species hearing ability, time of year, and physical condition. Species behavior, mating, and feeding activities can be adversely affected due to increases in noise levels.

The Full Development Alternative would result in temporary increases in ambient noise levels at Confluence Point due to construction activities. These impacts would be minor and short-term. As previously discussed, most construction activities would occur in the driest part of the year, which is typically in the fall. Endangered species and other sensitive species would not typically be present during this time period. The project would likely be completed before eagle nesting began. All human noise receptors are several miles from the proposed construction location and would not be impacted by the project. No adverse impacts to human sensitive receptors are anticipated because no receptors are within close proximity of the site.

The Partial Development Alternative would not have any substantial noise effects.

The No Development Alternative would not have any substantial noise effects.

4.10 SOCIOECONOMIC RESOURCES

Impacts to socioeconomic resources would be associated with construction activities and the operation of Confluence Point as a State Park. Impacts would be significant if the proposed project would noticeably affect the local economy, labor market, or land use. The impacts to socioeconomic resources would be essentially the same for each of the three alternatives. Therefore they are discussed together in this section.

4.10.1 POPULATION AND INCOME

Impacts from construction and implementation of the Confluence Point project are not expected to have any impact on population and income of the local area. Population trends and composition in the local area are not anticipated to change. An influx of construction dollars may provide for temporary increases to the local economy. Any possible increases to the local economy, though beneficial, would likely be insignificant. Long-term revenue in the surrounding communities could increase from additional recreational opportunities. Due to the minimal amount of land removed from crop production, any impacts to the local agricultural economy would be insignificant.

4.10.2 RECREATION AND AESTHETICS

No long-term adverse impacts to recreation facilities or opportunities at Confluence Point are expected. Temporary impacts to recreation opportunities could occur during construction if Confluence Point would be closed to the public for safety reasons. This could be considered a short-term inconvenience to some public users. Once complete, the public would be able to enjoy MDNR approved recreational activities such as nature study, wildlife viewing, photography, and hiking. It is expected that the sight could become very popular with bird watchers because of the multitude of species that would potentially be attracted to this habitat. These recreational activities are expected to increase once the project is complete and long-term beneficial impacts are expected.

Short-term adverse visual impacts would occur during construction of the recommended alternative. No permanent adverse impacts to aesthetics and the surrounding landscape

are expected. Over the long-term, the visual aesthetic values of the area should improve as a result of the increased natural habitat and greater diversity of features on the site. Businesses in surrounding communities could expect a slight increase in revenue over the long-term from increased recreational use in the area.

4.10.3 NAVIGATION

No adverse impacts to navigation on the Missouri or Mississippi Rivers are expected from construction and operation of Confluence Point for any of the alternatives. The U.S. Congress requires the Corps to maintain a 9 feet deep by 300 feet wide navigation channel in both rivers that would not be adversely affected by the alternatives.

4.11 CUMULATIVE EFFECTS

Cumulative effects were previously addressed in the SEIS for the Mitigation Program completed in 2003. However, there are other cumulative effects not addressed in the SEIS that would result from the construction and operation of Confluence Point. These include the following:

Regional beneficial increases in the land acreage base for fish and wildlife habitat would occur due to this and other public lands (mitigation sites, conservation areas (CA), state parks, wildlife management areas (WMA), and state recreation areas (SRA) located in St. Charles and St. Louis Counties, Missouri and also in neighboring counties in Illinois. These sites include, but are not limited to Columbia Bottoms Conservation Area, Upper Mississippi Conservation Area, Pelican Island Conservation Area, Marais Temps Clair Conservation Area, Riverlands Ecological Demonstration Area, Pere Marquette State Park (IL), Chouteau Island State Park (IL), and Horseshoe Lake State Park (IL).

There would be local cumulative beneficial effects to fish and wildlife populations, such as the prothonotary warbler, which needs areas of bottomland forest near rivers and wetlands for breeding and migratory resting areas (Ehrlich et al. 1988). As bottomland forest continues to develop and mature on Confluence Point, these larger tracts would compliment existing timber on Maple Island and could attract larger numbers neotropical migrant birds. There could also be an increase in the use of this resource by native bats for roosting and maternal colonies in the project vicinity. Grassland and

open field birds such as the dickcissel, eastern and western meadowlarks, and grasshopper sparrows should also benefit from native prairie grass restoration.

- Regional increases in fish and wildlife populations resulting from site specific habitat development activities on the land base. Increases in regional habitat quantity should positively correlate to increased fish and wildlife resources in terms of species and abundance.
- Overall beneficial increases in aquatic shallow water habitat and terrestrial bottomland forest habitat that support the bald eagle and the federally listed decurrent false aster and Indiana bat. State listed species could potentially benefit as well.
- Regional beneficial improvements in water quality from the creation of wetland habitats on Confluence Point and reduction in agricultural chemical use.
- Regional increases in public land availability for recreational opportunities.
- Long-term and cumulative impacts to wildlife resources are expected to be beneficial because of an increase in valued habitat types and the relative abundance of these habitats.
- Cumulative water quality impacts for all alternatives are expected to be a long-term benefit because previously farmed lands converted to fish and wildlife habitat would no longer be exposed to the chemical applications for agricultural crop production.
- Cumulative air quality impacts for all alternatives are expected to be a long-term benefit because suspended particulate matter from annual farming practices would be reduced.
- Cumulative noise impacts for all alternatives are expected to be a long-term benefit because noise generated from annual farming practices would be reduced.
- No cumulative adverse impacts to cultural resources are anticipated since there is little likelihood of affecting cultural resources through the implementation of the Mitigation Program at Confluence Point.

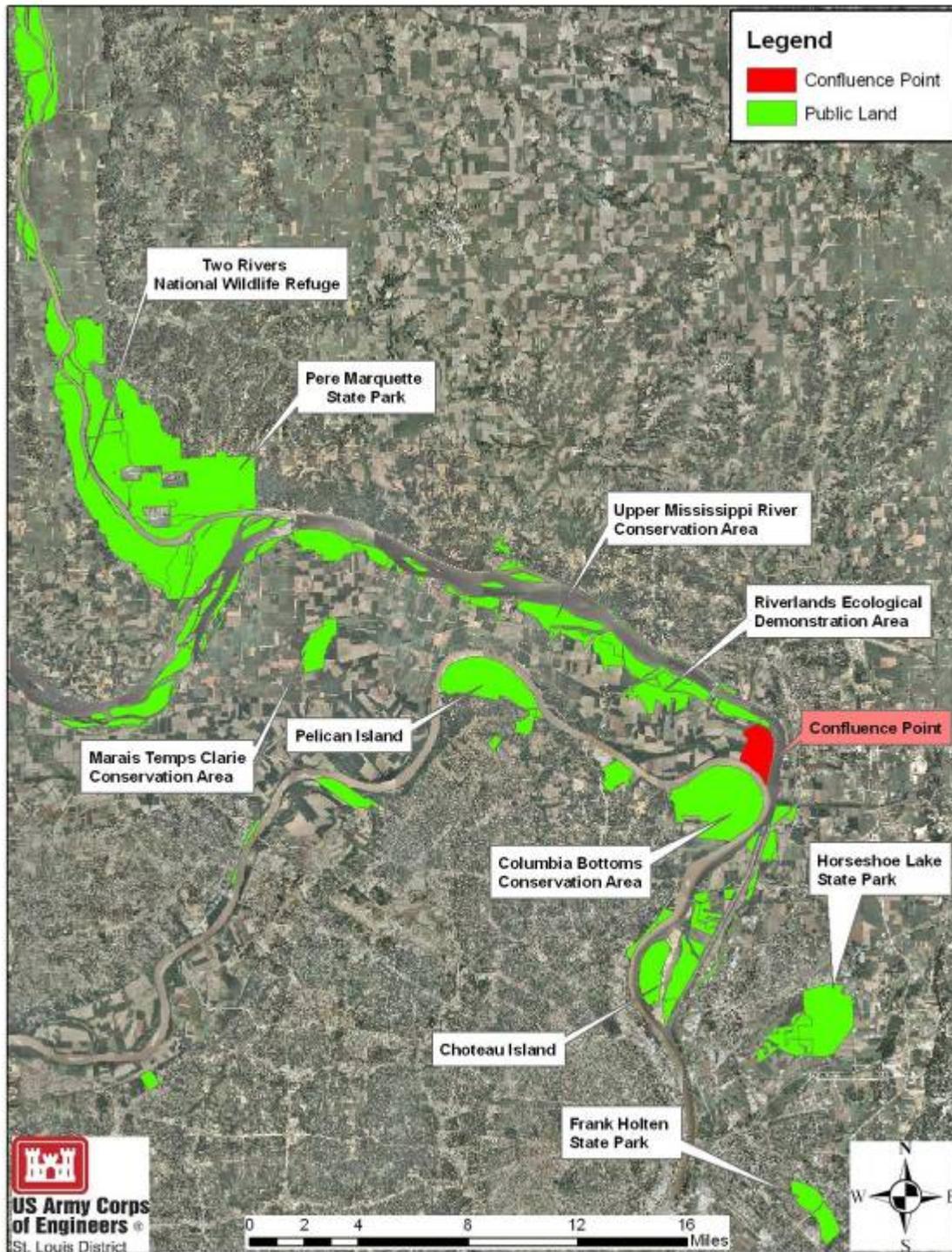


Figure 4- 2: Public Lands in the vicinity of Confluence Point.

4.12 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The proposed action would require the expenditure of human and fiscal resources and the potential modification of natural resources. Construction would require the relocation of materials. Considerable amounts of fossil fuels and labor would be expended. However, these items are not in short supply and their use would not have an adverse effect upon their continued availability. Construction would require a large, one-time investment of federal funds that are not retrievable.

No irreversible or irretrievable commitment has occurred which would have the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative. No commitment of resources has occurred that would prejudice the selection of any alternative before making a final decision on this project.

4.13 FUTURE WITHOUT-PROJECT CONDITION

Without construction and operation of Confluence Point, the site would continue to provide limited terrestrial, aquatic, and wetland habitat. MDNR would continue to manage the mitigation site as a State Park primarily for terrestrial species, although natural development of terrestrial habitat would be a slow process. The establishment and success of wetlands would be reliant on natural processes and success would be unlikely. Invasive species would likely impair the sites ability to develop into a quality area. By taking no action, the mitigation of the aquatic and wetland habitats lost over the years due to the BSNP would occur to a much lesser degree.

4.14 ENVIRONMENTAL COMPLIANCE

This section summarizes the statutory and regulatory environmental compliance requirements and discusses the major federal and state permits and clearances that would be required for the approval and implementation process for Confluence Point. The applicability and status of these environmental requirements is presented in Table 4-2 and a discussion of the most important requirements follows.

4.14.1 ENVIRONMENTAL POLICY

The Corps has prepared this PIR for the proposed Confluence Point project. This PIR has documented the planning for Confluence Point and has provided the information

necessary to ensure compliance with respect to all applicable environmental considerations.

Federal agencies use NEPA [42 USC 4321 et seq.] to evaluate the environmental impacts of a proposed project. Through the NEPA process, public officials and citizens are to be given an opportunity to be involved in the environmental review and receive information about environmental impacts before any decisions are made on the federal action regarding the proposed project. This PIR is intended to serve as the documentation necessary to incorporate the NEPA process into the Mitigation Program planning and implementation. All NEPA requirements have been met for the Confluence Point PIR. No significant impacts are anticipated and a FONSI will be included with the Final Draft of this document to ensure full NEPA compliance.

4.14.2 WATER RESOURCES

Federal limits on the amounts of specific pollutants that can be discharged to surface waters in order to restore and maintain the chemical, physical, and biological integrity of the water are governed by CWA [33 USC 1251 et seq., as amended], National Pollutant Discharge Elimination System (NPDES).

Discharge of stormwater resulting from construction activities that would disturb more than one acre of surface area requires an NPDES permit under Section 402 of the CWA. The MDNR authorizes NPDES permits in the State of Missouri. The Corps has obtained a general operating permit (MO-G699000) for work pertaining to the Mitigation Program.

Table 4-2: Compliance of Preferred Alternative with Environmental Protection Statutes and Other Environmental Requirements

Federal Environmental Requirements	Applicability	Status a, b, c, d
Archeological Resources Protection Act, 16 U.S.C. 470, et. seq.	Applicable	Full Compliance ^b
Clean Air Act, as amended, 42 U.S.C. 7401-7671g, et. seq.	Applicable	Full Compliance ^a
Clean Water Act (Federal Water Pollution Control Act),	Applicable	Partial Compliance
Coastal Zone Management Act, 16 U.S.C. 1451, et. seq.	Not Applicable ^d	Not Applicable
Endangered Species Act, 16 U.S.C. 1531, et. seq.	Applicable	Full Compliance
Estuary Protection Act, 16 U.S.C. 1221, et. seq.	Not Applicable	Not Applicable
Federal Water Project Recreation Act, 16 U.S.C. 4601-12, et. seq.	Applicable	Full Compliance
Fish and Wildlife Coordination Act, 16 U.S.C. 661, et. seq.	Applicable	Full Compliance
Land and Water Conservation Fund Act, 16 U.S.C. 4601-4, et. seq.	Not Applicable	Not Applicable
Marine Protection Research and Sanctuary Act, 33 U.S.C. 1401, et. seq.	Not Applicable	Not Applicable
National Environmental Policy Act, 42 U.S.C. 4321, et. seq.	Applicable	Full Compliance
National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470a, et. seq.	Applicable	Full Compliance
Rivers and Harbors Act, 33 U.S.C. 403, et. seq.	Applicable	Full Compliance
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et. seq.	Not Applicable	Not Applicable
Wild and Scenic River Act, 16 U.S.C. 1271, et. seq.	Not Applicable	Not Applicable
Farmland Protection Policy Act, 7 U.S.C. 4201, et. seq.	Applicable	Full Compliance
Protection & Enhancement of the Cultural Environment (Executive Order 11593)	Applicable	Full Compliance
Floodplain Management (Executive Order 11988)	Applicable	Full Compliance
Protection of Wetlands (Executive Order 11990)	Applicable	Full Compliance
Environmental Justice (Executive Order 12898)	Applicable	Full Compliance

NOTES:

- a. Full Compliance. Having met all requirements of the statute for the current stage of planning (either pre-authorization or post-authorization)
- b. Partial compliance. Not having met some of the requirements in the current stage of planning.
- c. Noncompliance. Violation of a requirement of the statute.
- d. Not applicable. No requirements for the statute required; compliance for the current stage of planning.

MDNR Form E is still required to be submitted for each individual project under the Mitigation Program. A stormwater permit under Missouri's general permit for land disturbance would be submitted for Confluence Point at a later time prior to construction activities.

Regulatory requirements for a permit system governing the placement of dredged or fill material into waters of the United States are also mandated by CWA under Section 404. The Corps authorizes this permit. The Section 404(b)(1) Evaluation (40 CFR 23) is in the process of being prepared and will be included in Appendix G.

Section 401 of the CWA requires state agencies to certify that a project requiring a federal permit to discharge complies with specific provision of the CWA. A copy of the 401 water quality certification will be included in Appendix F after it is received.

4.14.3 BIOLOGICAL RESOURCES

Federal agencies are required to determine the effects of their actions on federally listed endangered or threatened species and their critical habitats under ESA [16 USC 1531 et seq.]. Steps must be taken by the federal agency to conserve and protect these species and their habitat, and to avoid or mitigate any potentially adverse impacts resulting from the implementation of the proposed project.

The *Fish and Wildlife Coordination Act* (16 U.S.C. 661, et seq.) provides the basic authority for USFWS involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. It requires that fish and wildlife resources receive equal consideration to other project features. It also requires that federal agencies that construct, license, or permit water resource development projects must first consult with USFWS (and the National Marine Fisheries Service in some instances) and state fish and wildlife agency regarding the impacts on fish and wildlife resources and measures to mitigate these impacts. Full consideration is to be given to USFWS recommendations.

The preparation of a biological assessment (BA) is required under ESA to evaluate if a major construction activity is likely to adversely affect a listed species or its habitat. A BA was prepared for the project and can be found in Appendix E. The BA was used to determine if formal consultation between the federal agency and the USFWS would be

required. It was determined by the USFWS (Appendix A and E) that formal consultation is not required for the project as adverse impacts to listed species or their habitats are not anticipated and the USFWS has concurred with the BA's findings.

4.14.4 CULTURAL RESOURCES

Section 106 of NHPA of 1966 (amended June 17, 1999) requires federal agencies to take into account the effects of their undertakings on historic properties. By definition, historic properties are properties eligible for or listed on the NRHP. Federal undertakings refer to any federal involvement including funding, permitting, licensing, or approval. Federal agencies are required to define and document the APE for undertakings. The APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist.

The Advisory Council on Historic Preservation (ACHP) issues regulations that implement Section 106 of NHPA at 36 CFR Part 800, Protection of the Historic Properties. Section 106 sets up the review process whereby a federal agency consults with the SHPO, Native American tribes, and other interested parties including the public to identify, evaluate, assess effects, and mitigate adverse impacts on any historic properties affected by their undertaking. The PIR was provided to the Missouri State Historic Preservation Officer and appropriate federally recognized Native American Tribes for comment in accordance with Section 106 of the NHPA during the public comment period. Comments received from the SHPO and tribes are included in Appendix A and C. The SHPO concurred with the PIR findings under the provision that the Corps perform an archaeological assessment prior to construction of project features on areas of non-accreted land affected by construction excavation activities. Native American tribal responses indicated that they have no further interest in the project unless archaeological materials or human remains are discovered during construction of project features.

4.14.5 LAND USE (PRIME FARMLANDS)

The *Farmland Protection Act* [7 CFR 658] minimizes the extent to which federal actions contribute to the unnecessary conversion of prime farmlands to nonagricultural use. The

NRCS takes steps to ensure that prime farmlands lost to development are documented and provided to congress in a yearly report. After coordination with the NRCS (Appendix A) it was determined that there would be no loss of prime farmland as a result of habitat development at Confluence Point.

4.14.6 AIR QUALITY

The federal policy to protect and enhance the quality of the air to protect human health and the environment is established under the *Clean Air Act* [42 USC 7401 et seq., as amended]. Impacts to air quality are considered to be insignificant. Therefore, no additional actions would be required for full compliance.

Chapter 5

Other Considerations

5.1 INTRODUCTION

The recommended Full Development Alternative for Confluence Point includes various activities, previously described, to develop fish and wildlife habitat. Management of the site currently includes reestablishment of native prairie grasses and forbs, selective tree plantings, establishment of cover crops, and noxious weed control. This section describes the monitoring and evaluation plan, operations and maintenance plan, real estate considerations, implementation responsibilities and views, cost estimate, schedule, conclusions, and recommendations for Confluence Point's recommended alternative.

5.2 MONITORING AND EVALUATION PLAN

The purpose of the site Monitoring and Evaluation Plan (M&E) plan is to establish goals to guide the pre- and post-construction collection of physical and biological information. This information could be used to evaluate changes or improvements to Confluence Point. It would also serve as a tool to measure the success of the proposed project in helping to achieve the goals of the overall Mitigation Program. Information obtained could be used to compare Confluence Point to the success of other mitigation sites.

The M&E Committee appointed by the ACT was established to develop an M&E plan for the Mitigation Program. This committee included representatives from the Corps, USFWS, IDNR, KDWP, MDC, and NGPC. A draft of the M&E Plan has been completed. The goal of the M&E plan is to understand the physical and biological responses to Mitigation Program actions within an adaptive management context. The objectives of the M&E plan include the following:

- Track location, type, and physical characteristics of each mitigation site
- Quantify habitat use and population responses of key species
- Recommend program adaptations based on new information
- Gain understanding of the physical and biological responses through time
- Formalize information transfer among all to communicate lessons learned and increase the effectiveness of project actions.

Because of the Mitigation Program's significant financial investment, it is important to learn how constructed mitigation sites are performing and apply adaptive management. This information can be used on existing and future sites to maximize habitat potential. It will help determine the level of success and provide a basis for future adaptive management. By monitoring the mitigation sites and collecting basic habitat data, the ACT can determine whether the mitigation sites are performing as expected. Utilizing information obtained through the monitoring of sites will enable decision makers to recommend improvements to existing sites and make more informed decisions about planning and design of future sites. The M&E committee has agreed to a three-tiered M&E program. Tier 1 will gather data on the physical aspects of the mitigation sites, Tier 2 will document the project's biologic response, and Tier 3 activities will include focused research to test a specific hypothesis.

Tier 1 data is limited to physical data on mitigation sites. The physical data will include habitat delineations, cross sections, hydrographs, etc. Habitats will be classified using the National Wetland Inventory (NWI) and the National Land Cover Data (NLCD) classification system. Aquatic and wetland habitats will be classified using the NWI and all upland habitats will be classified using the NLCD system. The existing baseline habitat conditions will be documented for each mitigation site to establish the baseline habitats that existed prior to acquisition by the Mitigation Program. This data will be established and maintained by the Corps as a Geographic Information Systems (GIS) land cover data layer. Tier 1 efforts will be performed by the Corps or its contractors. In general, the baseline condition of new sites will be documented during site-specific design activities and NEPA compliance.

Tier 2 activities will utilize standardized protocol, as approved by the M&E committee, to monitor the biologic response at select mitigation sites. The committee has established native riverine fish species as being the highest priority for monitoring followed by birds, reptiles, and amphibians. This monitoring may also track changes in both quality and quantity of a species' preferred habitat. Tier 2 activities may characterize the habitat in greater detail using the NWI and NLCD systems, as appropriate. This additional data on habitat will be added to the GIS land cover data layer maintained by the Corps. These monitoring activities will be completed by the mitigation site's land managing agency and funded through the site's annual management plan. MDNR is the land managing agency for Confluence Point. Each land managing agency will decide how to conduct these activities (i.e. in-house labor, contract, academic institution, etc.). Monitoring results will be reported in annual progress reports and final reports. Tier 2 monitoring data will also be summarized and presented in the Annual Implementation Report. The M&E committee will meet annually to review all on-going monitoring activities and decide on future activities based on available appropriations.

Specific research activities will be Tier 3 activities and will test a specific hypothesis relevant to the Mitigation Program. These activities may include more rigorous research techniques and sampling protocol. As with Tier 2 monitoring, these research projects will be completed by the mitigation site's land managing agency and funded through the site's annual management plan. For Tier 3 research, the land managing agency will also decide how to conduct these activities (i.e. as in-house labor, contract, academic institution, etc.). Research results will be reported in annual progress reports and final reports. The M&E committee will meet annually to review all on-going monitoring activities and decide on future activities based on available appropriations. Tier 3 research will receive lower priority for funding than Tier 1 or Tier 2 monitoring activities.

Monitoring efforts may reveal the need for adaptive management at Confluence Point. As an example, adaptive management efforts might become necessary on the site if drought conditions persist or flooding results in damage to project features or vegetative plantings. Additionally, the biotic response of the habitat development measures, results of the M&E plan, changing site conditions and opportunities to focus on achieving the maximum restoration benefits possible at each site may also require changes to the site

through adaptive management. In many cases, adaptive management strategies will be used to guide the next phase of the restoration effort. If any re-work is needed to restore the area, it would be paid for with Construction General funds. If the re-work was considered a major change to the recommended alternative identified in this PIR, an amended PIR would be prepared.

The M&E committee established two subcommittees to develop the program's mitigation efforts. These protocols are "living" documents that may be modified to better facilitate future monitoring activities, as needed (i.e. improved sampling methods, additional informational needs, etc.). A team of biologists, representative of the four state fish and game agencies and federal agencies affiliated with various Missouri River projects, including pallid sturgeon projects, provided the framework for these plans and protocols. These biologists provided knowledge and experience regarding the fish and bird communities of the Missouri River ecosystem, including the pallid sturgeon. The fish monitoring protocol includes standard operating procedures for fishery sampling gears, sampling segments, sampling strategies, sampling experimental design, and collection of micro-habitat characteristic data.

Standardized protocols for monitoring of fish and avian response are included as an appendix to the M&E Plan that has been prepared by the M&E Committee. The M&E Plan also includes guidance on schedule, funding, quality control, acquisition strategy, and communications regarding M&E activities for the Mitigation Program. The M&E Plan and appendices will be made available on the Mitigation Program website (<http://www.nwk.usace.army.mil/projects/mitigation/>).

5.3 OPERATIONS AND MAINTENANCE (O&M) PLAN

A long term O & M Plan will be developed by NWK after following finalization of habitat improvements. It is anticipated that MDNR will conduct certain aspects of O&M as part of its normal management activities at Confluence Point. These final arrangements would be outlined in the O&M Manual. The plan will be found in Appendix B when it is completed.

MDNR will submit an Annual Management Plan to the Corps for approval. The Kansas City District would negotiate the costs of implementing the Annual Management Plan

with MDNR prior to each federal fiscal year. Individual management and maintenance features required at Confluence Point would be described in the plan. The Corps would be responsible for all costs required to implement the approved Annual Management Plan by MDNR. The MDNR would be reimbursed for all costs in accordance with the Cooperative Agreement.

5.4 REAL ESTATE CONSIDERATIONS

The northern 531 acres of Confluence Point is currently owned by the Corps of Engineers (U.S. of America) and licensed to the Missouri Department of Natural Resources for management purposes. MDNR are owners of the southern parcel that makes up the entire Confluence Point. The lands were purchased from willing sellers during a period from 2000 to 2007. The MDNR will continue to manage the site under a Site Management Plan and A Sole Source Agreement upon completion of the project. The above plans detail relationship, arrangements, and general procedures that the Corps and MDNR would follow in operating, maintaining, repairing, and rehabilitating the project features.

Responsibility for maintaining the levee would remain with the Kuhs Levee district. The existing easement states that the landowner would be responsible for paying rehabilitation costs. MDNR would participate as a member of the district. NWK cannot legally participate as a member of the district because paying for any rehabilitation would be construed as paying taxes or fees. An agreement between the levee district and NWK is currently being discussed to solve this issue.

The project area is crisscrossed by a number of utility line easements that run with the acquisition of the lands as well as a levee unit. These easements directly affect the location of the mitigation project pools and the project as a whole. Close coordination with the utility companies and the levee district has already been established and will continue as required to avoid damage to the utility lines, levee unit, and violation of the real estate rights established through the easements.

If a willing seller comes forward, additional lands may be acquired at Confluence Point. At this time there is no interest from the current adjacent owners. These additional lands are not required for the current project development.

5.5 IMPLEMENTATION RESPONSIBILITIES

The St. Louis District is responsible for study management and coordination with USFWS, MDNR, and other affected/interested agencies. The St. Louis District will prepare and submit the subject PIR and complete all environmental review and coordination requirements. The St. Louis District will prepare any engineering design plans that may be required, finalize plans and specifications, advertise and award a construction contract, and perform construction contract supervision and administration.

It will be the responsibility of the Kansas City District to develop an O&M manual, ensure O&M is carried out in accordance with the O&M manual, and develop and implement the real estate agreement and O&M agreement. The ACT meets quarterly to discuss the status of the Mitigation Program. As part of the meetings, an O&M update is given at which time the ACT ensures that site O&M is appropriate and reasonable. In the event of flood damages to the project features, the Kansas City District will evaluate and complete the work necessary to re-establish the mitigation project features.

The MDNR is responsible for management of the project features at Confluence Point. In addition, they will assist the Kansas City District in preparation and implementation of a monitoring and evaluation plan. Each year they will prepare a plan and budget for the next year's activities and submit it to the Kansas City District. They will be responsible for carrying out the later phases of the initial restoration plan outlined in this PIR, such as the year 3 planting of prairie forb species. MDNR will be responsible for developing and implementing adaptive management strategies and for any other activities outlined as MDNR responsibility in any O&M agreements.

5.6 COST ESTIMATE

The total estimated cost of Confluence Point includes: planning and design, construction, O&M during construction, and S&A totaling \$1,250,000 (Table 5-1). This total cost would be adjusted based on whether additional lands are acquired as part of the site.

Confluence Point would be federally funded in its entirety. If federal funds are not available to accomplish general operations, management and maintenance at the site,

such work could be deferred or not accomplished. Additionally, the dynamics of the Missouri River adjacent to the site could deem a deferment or “no action” decision about operations, management and maintenance at the site. If Confluence Point would remain 1,118.6 acres in size, annual O&M costs are estimated at \$40,000 (Corps 2005). The cost estimate would be updated throughout the life of the project as project features are further defined.

All planting will be done by MDNR through their Annual Management Plan Contract, funded through the Missouri Recovery Program Appropriation during construction. The MDNR contract is currently funded at \$161,000 for FY 2009, and the site is anticipated to remain in construction in FY 2010. After construction of the site is completed, and vegetation is established, the site will be considered operational, and the annual management plan contract with MDNR will be funded through the operation and maintenance appropriation.

Table 5-1: Cost Estimate for Confluence Point.

Activity	Cost
Planning & Design	300,000
Construction	750,000
O&M During Construction	150,000
S&A	50,000
Total	\$1,250,000

Source: Corps, Confluence Point Mitigation Plan, June 2005

5.7 SCHEDULE

Table 5-2: Confluence Point Project Schedule

Milestone	Scheduled	Actual
Real Estate DM Submitted		4/2000
Real Estate DM Approved		4/2000
Current Real Estate Acquisition Initiated		2000
Current Real Estate Acquisition Completed		2002
Future Acquisitions	Not Scheduled	
Cooperative Agreement Signed		4/2003
Habitat Restoration Plan (Fact Sheet) Approved		6/2005
PIR Started		7/2005
PIR Approved	9/2006	
Plans & Specifications Started	12/2008	
Plans & Specification Reviewed	3/2009	
Plans & Specification Approved	4/2009	
Construction Contract Advertised	4/2009	
Construction Contract Awarded	5/2009	
Construction Contract Completed	11/2009	

5.8 CONCLUSIONS AND RECOMMENDATIONS

The habitat development at Confluence Point has been identified as a priority project for inclusion into the Missouri River Fish and Wildlife Mitigation Program. The MDNR and ACT concur. The value of the area as fish and wildlife habitat prior to acquisition was minimal due to the majority of the area being in agricultural use. Development at Confluence Point would restore shallow water habitat, wetlands, prairie, and bottomland

forest. These activities would greatly enhance the site's value as fish and wildlife habitat.

It is recommended that the Full Development Alternative be constructed as described in this PIR and operated by MDNR in accordance with their Cooperative Agreement with the Corps. The Full Development Alternative would result in the greatest beneficial impacts to fish and wildlife habitat and would not significantly adversely affect the human environment.

REFERENCES

- Berner, L. M. 1951. *Limnology of the lower Missouri River*. Ecology 32: 1-12.
- Bureau of Economic Analysis (BEA). 2008. *BEA State Factheets., Missouri 2000*.
- Missouri Department of Natural Resources. 2004. *Edward "Ted" and Pat Jones Confluence Point State Park Revegetation and Restoration Plan*
- National Research Council (NRC). 2002. *The Missouri River ecosystem: exploring the prospects of recovery*. National Academy Press, Washington, D.C.
- U.S. Army Corps of Engineers (Corps). 2003. *Missouri River Fish and Wildlife Mitigation Project, Final Supplemental Environmental Impact Statement*. Kansas City and Omaha Districts.
- U.S. Army Corps of Engineers (Corps). 2001. *Main Report Revised Draft Environmental Impact Statement. Volume 1: Missouri River Master Water Control Manual Review and Update Study*. Northwestern Division, Omaha, Nebraska
- U.S. Army Corps of Engineers (Corps). 1995. *Floodplain Management Assessment of the Upper Mississippi River, Lower Missouri River, and major tributaries. Appendix C: Environmental Resource Inventory*. St. Paul District, St. Paul, Minnesota.
- U.S. Army Corps of Engineers (Corps). 1994. *Missouri River Master Water Control Manual Review and Update, Volume 3A: Low Flow Studies, Gavins Point Dam to St. Louis, Missouri*. Missouri River Division.
- U.S. Army Corps of Engineers (Corps). 1990. *Missouri River Bank Stabilization and Navigation Fish and Wildlife Mitigation Project Reaffirmation Report*. Missouri River Division, Omaha, Nebraska.
- U.S. Army Corps of Engineers (Corps). 1981. *Missouri River Fish and Wildlife Mitigation Iowa, Nebraska, Kansas, and Missouri Final Feasibility Report and Final Environmental Impact Statement*. Missouri River Division, Omaha District, Omaha, Nebraska.

U.S. Census Bureau. 2007. *U.S. Census Bureau: State and County Quick Facts, St. Charles County, Missouri.*

U.S. Department of Agriculture (USDA). 1993. *SSM, Handbook No. 18.*

U.S. Department of Agriculture (USDA). NAAS (National Agricultural Statistics Service). 2002. *County Summary Highlights:2002.*

U.S. Geological Survey (USGS). 2003. *Physiographic Regions.*
<http://tapestry.usgs.gov/boundaries/boundaries.html> Last modified April 17, 2003.

List of Preparers

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