

CHAPTER 2

ALTERNATIVES

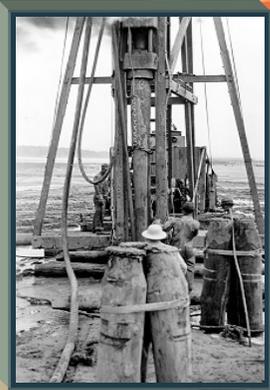
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MISSOURI RIVER FISH AND WILDLIFE MITIGATION PROJECT

FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

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



CHAPTER 2

ALTERNATIVES

2.1 INTRODUCTION

This chapter describes the alternatives considered for evaluation in this SEIS and presents reasons each alternative was eliminated from detailed evaluation, or included for detailed evaluation in this SEIS. The development of these alternatives included consideration of those alternatives presented in the Feasibility Report and FEIS (Corps, 1981), alternatives derived from public comment, and input from the Mitigation Project coordination team.

Alternatives that were eliminated in the original Feasibility Report and FEIS were also not considered further in this SEIS. Four alternatives, in addition to a No Action alternative, were evaluated in the Feasibility Report and FEIS (1981). These four alternatives were the USFWS Plan (Corps' interpretation of USFWS recommendations from 1980 FWCA Report), Alternate Plan – Level A, Alternate Plan – Level B, and

Alternate Plan – Level C. The USFWS Plan called for the restoration or preservation of 40,414 acres of aquatic habitat and 149,899 acres of terrestrial habitat. The Alternate Plan – Level A included the acquisition and development of timber-brush habitat on 20,000 acres and development of 6,600 acres of public land, development of 4,800 acres of aquatic habitat on public and non-public land and acquisition of 18,000 acres of terrestrial land adjoining aquatic habitat. The Alternate Plan – Level B was the selected plan and was described in Section 1.5.1, WRDA86 Original Mitigation Project. The Alternate Plan – Level C included the restoration of aquatic habitat on 1,000 acres and preservation on 600 acres, in addition to the development of habitat on 16,900 acres of existing public lands. The rationale for eliminating these three alternatives and selecting Alternate Plan – Level B was included in the original Feasibility Report and FEIS; the document is incorporated by reference per 40 CFR

Table 2.1-1 Summary of Alternatives Considered			
Alternative Identified		Description	Shallow Water Habitat (acres)
A.	118,650 acres including 7,000 to 20,000 acres of Shallow Water Habitat (Preferred Action)	Authorized by WRDA99; total acreage of authorization for habitat development including 7,000 - 20,000 acres of shallow water habitat	7,000 - 20,000
B.	118,650 acres with no habitat development	Total acreage authorized by WRDA99, however, there would be no habitat development or construction activities.	0
C.	No Action	No federal action to acquire or develop mitigation sites under WRDA99	0
D.	20,000 acres Shallow Water Habitat	Acquire and develop up to 20,000 acres of shallow water habitat; no other habitat development	20,000
E.	50,000 acres	Acquire and develop up to 50,000 acres of habitat	unspecified
F.	50,000 acres including 7,000 to 20,000 acres Shallow Water Habitat	Acquire and develop up to 50,000 acres of habitat including 7,000 to 20,000 acres of shallow water habitat	7,000 - 20,000
G.	473,900 acres (Full Mitigation)	Acquire and develop additional 473,900 acres; including original 48,100 acres representing full mitigation of BSNP effects	unspecified

1502.21. Seven alternatives are described and evaluated in this chapter and are summarized in Table 2.1-1, Summary of Alternatives Considered.

2.2 DESCRIPTION OF ALTERNATIVES

2.2.1 ALTERNATIVE A (PREFERRED ACTION: 118,650 ACRES INCLUDING 7,000 TO 20,000 ACRES OF SHALLOW WATER HABITAT)

The Preferred Action would increase mitigation efforts by 118,650 acres to a total of 166,750 acres as authorized by WRDA99. The additional 118,650 acres

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

Project authorized by WRDA86, and therefore the acquisition and development of mitigation sites would be similar to that described in Section 1.5.1, WRDA86 Original Mitigation Project. Implementation of the Preferred Action would be a long-term process and is anticipated to be in excess of 30 years.

The 118,650 acres for the modified Mitigation Project would be obtained through acquisition of private land in fee title from willing sellers, and development of public land through donated easements. Depending on future Corps policy, lands may also be acquired by purchasing permanent easements from willing sellers. Mitigation sites would vary in the types of habitats restored or preserved depending on site characteristics. In general, restored habitat types would include wetlands, bottomland forest, native prairie, chutes and side channels, backwater areas, and slack water habitats. Existing mitigation sites developed by the original Mitigation Project have ranged in size from approximately 420 acres to over 5,000 acres. All existing mitigation sites are located along the Lower Missouri River. Under Alternative A, future mitigation sites would continue to be located along the Lower Missouri River; however, the Corps would retain the

potential to acquire lands for mitigation sites at suitable locations along the tributaries of the Lower Missouri River.

Criteria for selection of sites state that the sites to be acquired must have a minimum size of 100 acres. Exceptions would include unique or critical habitat or populations, small tracts suitable as additions to existing state or Federal lands, or small acreages needed for aquatic restoration. The Corps is also pursuing methods of streamlining its land acquisition process, including the consideration of ideas such as a “right of first refusal” that was suggested during the public scoping process.

An annual PILT would continue to be paid to local governments. Although no funds would be spent on recreation related features/facilities, all sites would be open to public access. Some sites may only be accessible by boat. The resource agencies of the four states and the USFWS have expressed interest in administering the areas to be acquired after development. Where this would be the case, the Corps may turn over management responsibility of mitigation lands to the appropriate state agency or USFWS. The Corps would fund operations and maintenance costs for the

life of the Mitigation Project, subject to availability of funds. For these sites, management decisions regarding authorized public uses would be proposed by the relevant state natural resource agency or USFWS and approved by the Corps. However, as a Federal project, the Corps may desire to retain complete management responsibilities of some select mitigation sites. Public uses could potentially include hunting, fishing, bird watching, education, hiking, the use of all-terrain vehicles, or other activities. A portion of some of the sites may be planted as crops for wildlife food plots.

As part of the modified Mitigation Project, the Corps would continue to use an adaptive management approach to identify, develop, construct, and operate mitigation sites. The concept of adaptive management promotes flexible management policies that incorporate new information as it becomes available (NRC, 2002). The NRC stated that, "*adaptive management is an approach to natural resources management that promotes carefully-designed management actions, assessment of these actions' impacts, and subsequent policy adjustments.*" A necessary component of successful adaptive management is a monitoring

program. The NRC has recommended an adaptive management strategy for management of the Missouri River ecosystem and to complement restoration projects along the Missouri River. Alternative A would include biological and physical monitoring programs at representative mitigation sites to determine site effectiveness. Monitoring programs would depend on the types of habitats restored or preserved and the information pertinent to adaptive management of the mitigation sites. Site management agencies would use information from monitoring programs along with continued input from the coordination team, as well as other site-specific interests, to make informed decisions on the management of mitigation sites to maximize the benefits to fish and wildlife and the floodplain ecosystem.

Alternative A would mitigate an additional 23 percent of the estimated fish and wildlife habitat that will be lost by 2003. Added to the acreage of the WRDA86 authorization, the total acreage of fish and wildlife habitat that would be mitigated along the Lower Missouri River would represent 32 percent of the estimated fish and wildlife habitat lost by 2003 as a result of the BSNP. The acres of habitat mitigated, including shallow

water habitat, under this alternative would depend on the amount of Congressional funding allocated to the modified Mitigation Project. A goal of approximately 20-30 acres per mile of shallow water habitat along the Lower Missouri River has been established. This is consistent with the USFWS goal specified in the BiOp that was considered necessary to avoid jeopardizing the pallid sturgeon (USFWS, 2000). The BiOp also specified that shallow water habitat created to benefit the pallid sturgeon should be less than five feet deep and have a flow of less than 2 feet per second (fps). These criteria would be used as an initial goal, subject to change through adaptive management, for shallow water habitat restored under the modified Mitigation Project. Alternative A would provide significant benefits to the Missouri River floodplain ecosystem and also includes measures that would benefit the other threatened and endangered species of the Lower Missouri River.

The Corps considers Alternative A necessary to achieve a significant level of recovery of the Missouri River floodplain ecosystem. The coordination team expects the modified Mitigation Project will provide significant benefits to the fish and wildlife resources of the Missouri River, including

the Federally listed pallid sturgeon. The Mitigation Project is the most comprehensive tool within the Corps' authorities to address habitat mitigation along the Lower Missouri River. Therefore, the Corps considers Alternative A to be a reasonable alternative, its Preferred Alternative, and will evaluate this alternative in detail in this SEIS.

2.2.2 ALTERNATIVE B (NO DEVELOPMENT ALTERNATIVE: 118,650 ACRES WITH NO HABITAT DEVELOPMENT)

Alternative B would increase mitigation efforts by an additional 118,650 acres to a total of 166,750 acres as authorized by WRDA99. The additional 118,650 acres would be obtained through acquisition of private land in fee title from willing sellers or, depending on future Corps policy, obtaining permanent easements in lieu of fee title from private landowners. Under this alternative, there would be no habitat development following land acquisition. Therefore, activities described in Section 2.2.1, Alternative A, such as the construction of chutes, wetland cells, installation of pumps and other water delivery systems, tree planting, and levee setbacks would not occur as part of this alternative. As with Alternative A, implementation would be a long-term

process and is anticipated to be in excess of 30 years. Future mitigation sites would continue to be located along the Lower Missouri River; however, the Corps would retain the potential to acquire lands for mitigation sites at suitable locations along the tributaries of the Lower Missouri River. An annual PILT would continue to be paid to local governments. Although no funds would be spent on development of habitat or recreation related features/facilities, all sites would be open to public access. Some sites may only be accessible by boat. The resource agencies of the four states and the USFWS have expressed interest in administering the areas to be acquired. Where this is the case, the Corps would likely turn over management responsibility of mitigation lands to the appropriate state agency or USFWS. Although no habitat development would occur, operation and maintenance activities (e.g. noxious weed control) would still be necessary at the mitigation sites. The Corps would fund operations and maintenance costs for the life of the Mitigation Project, subject to the availability of funds. Management decisions regarding authorized public uses of the mitigation sites would be proposed by the relevant state fish and wildlife agency or USFWS and approved by the Corps. A monitoring program, similar to that

described for Alternative A, would also be included in this alternative.

No specific acreage of shallow water habitat would be included in the 118,650 acres under this alternative. Because of the extensive bank stabilization of the Lower Missouri River, shallow water habitat restoration typically requires development or construction activities because the old chutes and side channels were cut off from the main channel during construction of the BSNP and have filled in with an extensive amount of sediment. Therefore, it is reasonable to assume that the only shallow water habitat that would be created under Alternative B would be that which may occur naturally. Such an event may result from a flood event, for example the reopening of the chute at Lisbon Bottoms, Missouri, after the 1993 and 1995 floods breached the levee at that location. However, these events are infrequent and it is not known how many acres of shallow water habitat, if any, would ultimately be restored as part of Alternative B.

Alternative B would mitigate an additional 23 percent of the fish and wildlife habitat that will be lost by 2003. Added to the acreage of the WRDA86 authorization, the total acreage of fish and wildlife habitat that

would be mitigated along the Lower Missouri River would represent 32 percent of the estimated fish and wildlife habitat lost by 2003 as a result of the BSNP. In terms of acres, this would be the same level of mitigation as that included in Alternative A. As with Alternative A, the acres of habitat mitigated would depend on the amount of Congressional funding allocated to the modified Mitigation Project. As described previously, the USFWS has recommended the development of approximately 20,000 acres of shallow water habitat to reach a goal of approximately 20-30 acres per river mile, in order to avoid jeopardizing the endangered pallid sturgeon. Alternative B would not likely provide any significant benefits to achieving this goal for the pallid sturgeon because no planned development of shallow water habitat would occur.

Although Alternative B would achieve a significant level of mitigation of the Missouri River floodplain ecosystem, certain benefits to fish and wildlife that would result from habitat development and construction activities would not be realized. Therefore, Alternative B is a reasonable alternative and as such will be evaluated in detail in the SEIS.

2.2.3 ALTERNATIVE C (NO ACTION)

The No Action alternative would not involve any Federal action authorized by WRDA99. Under the No Action alternative, the additional 118,650 acres proposed for acquisition and development for aquatic and terrestrial habitat mitigation along the 735 miles of the BSNP would not be acquired or developed. The only fish and wildlife habitat mitigation site development on the Lower Missouri River would be the 48,100 acres that was previously authorized by WRDA86 and evaluated in the original Feasibility Study and FEIS. This acreage represents approximately three percent of the aquatic acres and seven percent of the terrestrial acres lost due to the BSNP. Some benefits to fish and wildlife resources would occur due to other programs such as the Corps' dike notching program, Section 1135 and 206 projects, NRCS conservation programs, and state funded programs. However, no additional mitigation would occur to restore the fish and wildlife habitat lost as a result of construction of the BSNP. The No Action alternative will be evaluated in detail in this SEIS.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER STUDY

The alternatives presented in this section were considered by the Corps as potential plans to implement the fish and wildlife habitat mitigation authorized by Congress in WRDA99 and to implement the recommendations of the BiOp for aquatic habitat. The following sections describe each alternative and why it was not considered a reasonable alternative and subsequently eliminated from further study. In general, alternatives were eliminated from further consideration if they were considered not technically reliable; not justifiable by tangible and/or intangible benefits; were not socially and/or environmentally acceptable; or would not fulfill the project purpose as described in Chapter 1.

2.3.1 ALTERNATIVE D (20,000 ACRES OF SHALLOW WATER HABITAT)

In November 2000, the USFWS issued a final BiOp that concluded that the Corps' operation of the Missouri River Mainstem Reservoir System, the BSNP, and the Kansas River projects jeopardize the continued existence of the pallid sturgeon. The USFWS identified aquatic habitat development as a critical element of the

reasonable and prudent alternative contained in the BiOp. Specifically, to achieve a shallow water habitat goal of 20-30 acres per mile over the length of the 735-mile Missouri River BSNP, the USFWS estimated that approximately 20,000 additional shallow water acres would be required to avoid jeopardizing the pallid sturgeon. Alternative D, as defined herein, would develop approximately 20,000 acres of shallow water habitat between Sioux City and the mouth of the Missouri River.

The pallid sturgeon has been documented to use sand habitat and historically occupied turbid rivers (USFWS, 1993). However, little is known regarding the life history, reproduction, or spawning activities of pallid sturgeon (Corps, 1999; USFWS, 1993). Inferences about reproduction and spawning activities have been made from information available on the closely related shovelnose sturgeon (USFWS, 1993). The creation of shallow water habitat is anticipated to provide benefits to the pallid sturgeon along with other native species and to avoid jeopardy (USFWS, 2000). The acquisition and development of 20,000 acres of shallow water habitat, in addition to the original WRDA86 acreage, would mitigate approximately 23 percent of the lost aquatic habitat and seven percent of

the lost terrestrial habitat estimated by the Corps (1981) to occur by 2003. However, the NRC states that although the ESA has had positive effects for many species, one of its weaknesses is that it focuses on single species (NRC, 2002).

Consequently, the NRC supported ecosystem-level restoration and protection of the Missouri River floodplain, as opposed to protecting the habitat of an individual species (NRC, 2002). The Corps concurs with this approach for the Lower Missouri River. Therefore, the NRC concluded that restoring habitat solely for the pallid sturgeon is not likely to provide a sufficient basis for marked Missouri River ecosystem improvements (NRC, 2002). In addition, the purpose of the WRDA86 and WRDA99 authorizations were to mitigate for all fish and wildlife habitat. Therefore, restricting land acquisition and development to shallow water habitat for the specific benefit of the pallid sturgeon would not fulfill the purpose of the Mitigation Project as authorized under WRDA86 or WRDA99. Consequently, Alternative D is not a reasonable alternative and has been eliminated from further study.

2.3.2 ALTERNATIVE E (50,000 ACRES)

Alternative E contemplated acquisition and development of 50,000 acres of aquatic and terrestrial habitat along the Lower Missouri River for fish and wildlife habitat mitigation. This alternative is the same as Alternative A, except the acreage for acquisition and development is smaller and the amount of shallow water habitat is not specified. A few individuals commented at the public scoping meetings that the modified Mitigation Project is too large at 118,650 acres. Therefore a reduced size alternative has been considered.

Alternative E would mitigate an additional 9.6 percent of the fish and wildlife habitat that was lost due to the BSNP. Added to the acreage authorized under WRDA86, the total amount of acreage mitigated would be 98,100 acres, which would represent approximately 19 percent of the fish and wildlife habitat lost due to the BSNP as estimated by the Corps (1981) to occur by 2003. The Corps does not consider this level of mitigation sufficient to mitigate fish and wildlife habitat lost as a result of BSNP and to provide benefits to the Lower Missouri River ecosystem; therefore, it does not meet the project purpose. Consequently, Alternative E is not a

reasonable alternative and has been eliminated from further study.

2.3.3 ALTERNATIVE F (50,000 ACRES INCLUDING 7,000 TO 20,000 ACRES OF SHALLOW WATER HABITAT)

Alternative F would acquire and develop 50,000 acres of fish and wildlife habitat along the Lower Missouri River, including 7,000 to 20,000 acres of shallow water habitat. This alternative is the same as Alternative A, except the acreage for acquisition and development is smaller. The difference between this alternative and Alternative E is that the latter did not specifically designate an acreage amount for shallow water habitat development. A few individuals commented at the public scoping meetings that the modified Mitigation Project is too large at 118,650 acres. Therefore a reduced size alternative that would still provide benefit to the pallid sturgeon has been considered.

Alternative F would mitigate an additional 9.6 percent of the fish and wildlife habitat that was lost due to the BSNP. Added to the acreage authorized under WRDA86, the total amount of acreage mitigated would be 98,100 acres that would represent approximately 19 percent of the fish and wildlife habitat lost due to the BSNP as

estimated by the Corps (1981). However, this alternative would include acquisition and development of shallow water habitat for the benefit of the pallid sturgeon and numerous other species that rely on that habitat. Representatives of the coordination team supported an ecosystem based Mitigation Project that would mitigate a significant level of habitat. Even though there would be benefits to the pallid sturgeon, this level of fish and wildlife habitat restoration is not considered sufficient to adequately mitigate fish and wildlife species and the Lower Missouri River floodplain ecosystem. Therefore, Alternative F does not meet the project purpose, is not a reasonable alternative, and has been eliminated from further study.

2.3.4 ALTERNATIVE G (FULL MITIGATION OF 473,900 ACRES)

The Corps' Feasibility Report and FEIS for the original Mitigation Project estimated that 522,000 acres of fish and wildlife habitat along the Missouri River will have been lost by 2003 as a result of BSNP (Table 1.2-1). Approximately 100,200 acres of aquatic habitat were lost in the natural channel, 67,800 acres of terrestrial habitat in the natural channel, and 354,000 acres of terrestrial habitat in the meander belt. The original Mitigation Project is providing

48,100 acres of habitat restoration. This leaves 473,900 acres of unmitigated habitat loss from the BSNP. Alternative G would include the acquisition and development of 473,900 acres of aquatic and terrestrial fish and wildlife habitat in the study area. This acreage plus the 48,100 acres of the original Mitigation Project would accomplish full mitigation of BSNP impacts.

This alternative is outside the authority of the Corps to implement because it is more than the authorized Mitigation Project. However, NEPA requires the consideration of alternatives outside the authority of the agency. Therefore, it is considered here. Alternative G would result in substantial benefits to fish and wildlife and the Missouri River ecosystem, however, it is unlikely that this level of mitigation could be implemented using a willing seller policy. Also, it is unlikely that this level of mitigation could be accomplished and still maintain the required navigation channel. Further, this alternative would result in substantial effects on agricultural production and local governments. While this alternative would achieve a high level of ecosystem restoration, it is likely to be economically and socially unlikely or objectionable. The Corps does not consider Alternative G to be

a reasonable alternative and it was eliminated from further study.

2.4 COMPARISON OF ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

This section presents a comparison of the environmental consequences associated with the three alternatives that were carried forward for detailed analysis in Chapters 3 and 4 of this SEIS and are summarized in Table 2.4-1. The three alternatives included Alternative A (Preferred Action), and Alternative B (No Development), and Alternative C (No Action). Alternative A would include the acquisition and development of 118,650 acres of fish and wildlife habitat including 7,000 to 20,000 acres of shallow water habitat along the Lower Missouri River between Sioux City and St. Louis. Alternative B would also include the acquisition of 118,650 acres along the Lower Missouri River for fish and wildlife habitat; however, no habitat development or construction activities would be performed. Alternative C, the No Action alternative, would not acquire any additional acreage for fish and wildlife habitat mitigation along the Lower Missouri River except for that which was previously authorized under WRDA86 and the subject of the original Feasibility Report and FEIS

Table 2.4-1 Comparison of Environmental Consequences of Alternatives Evaluated			
Environmental and Socioeconomic Resources	Potential Effect Alternative A – Preferred Action (118,650 acres including 7,000 – 20,000 acres of shallow water habitat)	Potential Effect Alternative B – No Development (118,650 acres with no habitat development)	Potential Effect Alternative C – No Action
Water Resources			
Missouri River Hydrology	Less than significant impact to hydrology and hydraulics. Potential benefits to river hydrology from restoring natural riverine functions.	No impact to hydrology or hydraulics.	No impact. No further benefits to Missouri River hydrology would occur.
Groundwater Hydrology	Less than significant impact. Potential for localized increase of water table.	No impact.	No impact.
Water Quality	Less than significant short-term impact due to increased sediment. Some long-term improvements to water quality would occur due to the construction of wetlands.	No short-term impacts to water quality. Long-term benefit to water quality from reduced agricultural runoff.	No impact. No further benefits to water quality would occur.
Flood Control	Increased floodplain storage capacity would be a beneficial impact by reducing downstream flood potential.	No impact. Existing flood potential would remain.	No impact. Existing flood potential would remain.
Biological Resources			
Wetlands	Less than significant short-term impact from construction. Significant net increase in wetlands within the Lower Missouri River floodplain.	Long-term beneficial impacts from reestablishment of farmed wetlands and other opportunistic wetlands.	Significant adverse impact. No additional wetlands would be constructed, restored, or preserved.
Vegetation	Less than significant short-term impact from construction. Significant increase in native vegetation	Significant long-term beneficial impacts from an increase in native vegetation.	Significant adverse impact.
Wildlife	Less than significant short-term impact from construction. Significant beneficial increase in wildlife habitat.	Significant long-term beneficial impact from increase in wildlife habitat.	Significant adverse impact.
Fisheries	Less than significant short-term impact from construction. Significant beneficial increase in shallow water habitat.	Significant adverse impact due to no new aquatic habitat and continued degraded state of Missouri River fishery.	Significant adverse impact.
Threatened and Endangered Species	No short-term impact. Increase in potential threatened and endangered species habitat. Increase in shallow water habitat for the pallid sturgeon as recommended by the BiOp.	Significant adverse impact. Pallid sturgeon would remain in jeopardy based on USFWS BiOp. Beneficial impacts but less than under the Preferred Action. This alternative would provide floodplain habitat for T&E species.	Significant adverse impact. Pallid sturgeon would remain in jeopardy based on USFWS BiOp.

Table 2.4-1 (continued) Comparison of Environmental Consequences of Alternatives Evaluated			
Environmental and Socioeconomic Resources	Potential Effect Alternative A – Preferred Action (118,650 acres including 7,000 – 20,000 acres of shallow water habitat)	Potential Effect Alternative B – No Development (118,650 acres with no habitat development)	Potential Effect Alternative C – No Action
Land Use and Ownership			
Land Use	Less than significant adverse impact. Would result in the conversion of less than one percent of the agricultural land within the ROI to fish and wildlife habitat.	Less than significant adverse impact similar to the Preferred Action. Potential for conversion of more agricultural land than under the Preferred Action because all acquisition would be from private landowners.	No impact.
Land Ownership	Less than significant adverse impact. Would result in less than one percent of privately owned land converted to governmental ownership.	Less than significant adverse impact. Potential for conversion of more privately owned land to public ownership than under the Preferred Action because all acquisition would be from private landowners. No public land would be acquired for mitigation sites under the No Development alternative.	No impact.
Prime Farmland	Less than significant adverse impact. Would result in the conversion of less than 5.7 percent of the prime farmland in the floodplain to fish and wildlife habitat.	Less than significant adverse impact. Potential for conversion of more prime farmland than under the Preferred Action because land acquisition is only from private landowners.	No impact.
Access and Recreation	Significant beneficial increase in access and recreational opportunity due to the acquisition and development of mitigation sites.	Significant beneficial impact. Same as for Preferred Action.	Significant adverse impact.
Socioeconomic Resources			
Agriculture	Less than significant impact. Loss of cropland in ROI counties could range from 0.5 percent to 2 percent. Loss of retail sales from farm purchases in ROI counties could range from 0.04 percent to 1.66 percent.	Less than significant adverse impact. Potential for conversion of more privately owned agricultural land to public ownership than under the Preferred Action because land acquisition would only be from private landowners. No public land will be acquired for mitigation sites under the No Development alternative.	No impact.
Taxes	Less than significant adverse impact. Potential loss of county tax revenue of less than 1.8 percent.	Less than significant adverse impact. Potential for greater loss of tax base from the conversion of more privately owned land to public ownership than under the Preferred Action. Under the No Development alternative, land acquisition would only be from private landowners.	No impact.
Levee and Drainage Districts	Impacts would depend on site. Less than significant to potential significant adverse impacts on remaining levee district landowners, depending on amount of land acquired in levee district.	Impacts would depend on site. Less than significant to potential significant adverse impacts on remaining levee district landowners, depending on amount of land acquired in levee district.	No impact.

Table 2.4-1 (continued)			
Comparison of Environmental Consequences of Alternatives Evaluated.			
Environmental and Socioeconomic Resources	Potential Effect Alternative A – Preferred Action (118,650 acres including 7,000 – 20,000 acres of shallow water habitat)	Potential Effect Alternative B – No Development (118,650 acres with no habitat development)	Potential Effect Alternative C – No Action
Environmental Justice	No impact to minority population of Thurston County, Nebraska.	Same as Preferred Action.	No impact.
Local Economics	Local economic benefits from project-induced spending during construction, monitoring, and operation and maintenance of the mitigation sites.	Local economic benefits for the No Development alternative would be less than for the Preferred Action. The No Development alternative would not include between \$500 and \$900 million for engineering and construction of mitigation sites. Annual O&M cost and monitoring/ evaluation expenditures would also be less under this alternative.	No impact.
Recreation Economics	Local economic benefits from project-induced spending from recreation users.	Same as the Preferred Action.	No impact.
Project Cost	Total project cost in the range of \$740,000,000 to \$1.3 billion plus an estimated \$3 to \$5 million in annual operations and maintenance costs.	Total project cost in the range of \$240,000,000 to \$430,000,000. Annual operations and maintenance costs would be less than the Preferred Action but are currently undetermined.	No cost.
Other Resources			
Native American Resources	Less than significant adverse impacts. Potential beneficial impacts to fish and wildlife resources and opportunities for recreational and traditional activities.	Same as the Preferred Action.	No impact.
Navigation	No impact; Corps is required to maintain navigation channel.	No impact.	No impact.
Cultural Resources	Beneficial impact. Land acquisition would provide Federal protection for cultural resources located on the acquired site.	Same as the Preferred Action.	No impact. Cultural resources within the floodplain would not receive any additional protection.
Air Quality	Less than significant short-term impact during construction. Beneficial long-term impact.	No short-term impacts to air quality. Beneficial long-term impact.	No impact.
Noise	Less than significant short-term impact during construction. Beneficial long-term impact.	No short-term impact to noise. Beneficial long-term impact.	No impact.
Solid Waste	No impact.	No impact.	No impact.
Hazardous Waste	No impact.	No impact.	No impact.

or that acquired through other Federal or state programs. It should be noted that the environmental consequences described herein refer to the potential impacts resulting from the acquisition and/or development of 118,650 acres for fish and wildlife habitat restoration of the modified Mitigation Project authorized by WRDA99. Analyses for each alternative considered a defined Region of Influence (ROI) as the floodplain of the Lower Missouri River, or for some resources the 46 counties contiguous to the Lower Missouri River in Nebraska, Iowa, Kansas, and Missouri. The ROI is discussed further in Section 3.1, Project Area and Regional Setting. The potential impacts associated with the 48,100 acres of fish and wildlife habitat mitigation authorized under WRDA86 were addressed in the original Feasibility Report and FEIS for the Mitigation Project (Corps, 1981). However, the cumulative effects of both projects are considered in Section 4.11, Cumulative Effects.

No significant impacts to water resources are anticipated as a result of the Preferred Action. The acquisition and development of 118,650 acres for fish and wildlife habitat would provide benefits to the hydrology of the Missouri River and its tributaries by restoring a portion of the natural hydrologic

connectivity between the river and its floodplain and by restoring a level of natural riverine function. The construction and development of mitigation sites under the Preferred Action could potentially result in a local increase of the water table on lands adjacent to mitigation sites; however, these impacts are considered to be less than significant. The Preferred Action would provide benefits to water quality in the area as land is removed from agricultural use and would also increase the flood storage capacity in the ROI. Measures to minimize adverse effects are not required, however, may be considered to minimize the potential for impacts on adjacent property. The No Development alternative would not have any short-term impacts to water resources within the ROI. There would be a long-term beneficial impact to water quality in the ROI as a result of the No Development alternative. No impacts to water resources in the ROI would result from the No Action alternative.

The Preferred Action would provide significant benefits to biological resources in the ROI through restoration of habitat of the Lower Missouri River ecosystem. The construction or restoration of wetlands as part of the Preferred Action would result in a significant net increase in the acres of

wetlands within the study area. Other project features, such as the planting of native trees and grasses to develop terrestrial habitat, would significantly increase the amount of native vegetation within the floodplain. The Preferred Action would result in a significant increase of wildlife habitat, and the development of 7,000 to 20,000 acres of shallow water habitat through the restoration or construction of side channels and backwater areas and through dike modifications would be a significant beneficial impact to fisheries and the endangered pallid sturgeon. The development of an additional 20,000 acres of shallow water habitat for the pallid sturgeon was recommended by the USFWS in its BiOp for recovery of the species. The Preferred Action would also result in an increase in available habitat for other threatened and endangered species.

The No Development alternative would provide some benefits to wetlands within the ROI. There would be an increase in opportunistic wetlands. There would also be beneficial impacts to vegetation and wildlife within the ROI. Because there would be no construction of chutes and shallow water habitat under this alternative, it would have a significant adverse impact

on fisheries, as well as the endangered pallid sturgeon. Some threatened and endangered species would benefit from additional floodplain habitat.

The No Action alternative would not provide any additional benefits to biological resources within the ROI, as no further land would be acquired for fish and wildlife habitat mitigation except through other Federal or state programs. The No Action alternative would result in a significant adverse impact to biological resources due to the continued degraded state of the Missouri River ecosystem.

The Preferred Action would result in the conversion of less than 1 percent of the agricultural land within the ROI to fish and wildlife habitat. Estimated loss of agricultural land in each county would range from 0.5 percent to 2 percent and conversion of private land to government owned would be less than 1 percent of the ROI. Loss of retail sales from farm purchases in each county would range from 0.04 percent to 1.65 percent. The potential loss of county tax revenue as a result of the Preferred Action would be less than 1.8 percent. These land use, land ownership, and economic impacts are considered to be less than significant. Depending on the

specific location and levee district involved, there could be a significant adverse impact to the tax revenue of the levee district, and the resulting tax burden of landowners remaining in a levee district. Measures to minimize these adverse effects would be necessary. There would be economic benefits in the ROI relative to the increase in recreational use on mitigation sites. Impacts from the No Development alternative would be similar to that of the Preferred Action. No land use, ownership, or socioeconomic impacts would result from the No Action alternative.

Native American resources are not anticipated to be significantly impacted by the Preferred Action, No Development alternative, or by the No Action alternative. However, Native American resources could experience some beneficial impacts from increased fish, wildlife, and vegetation resources under the Preferred Action and No Development alternatives.

The Preferred Action would not impact the operation or maintenance of the authorized navigation channel from Sioux City to St. Louis and, therefore, the Preferred Action would have no impact on navigation. Because no chute construction or other habitat development would occur under the

No Development alternative, it would have no impacts to navigation. The No Action alternative would also not impact navigation.

Implementation of the Preferred Action would result in an increase in cultural resources brought under the protection of the Federal government. No adverse impacts to cultural resources are anticipated as part of the Preferred Action. Under the No Development alternative, cultural resources would also experience beneficial impacts due to increased Federal protection. The No Action alternative would not impact cultural resources, however there would also be no increase in the amount of cultural resources brought under the protection of the Federal government.

The Preferred Action is anticipated to result in less than significant short-term air quality and noise impacts from construction activities. The Preferred Action would result in beneficial long-term impacts to air quality and noise in the ROI. The No Development alternative would have no short-term air quality or noise impacts; however, it would have long-term beneficial impacts similar to the Preferred Action. The No Action alternative would have no impact on air quality of noise.

Acquisition of land for the Preferred Action would not directly affect solid waste facilities and would not include the purchase of contaminated properties, such as hazardous waste facilities and CERCLA sites, therefore, no impacts to solid and hazardous waste is anticipated. The No Development alternative is also not anticipated to impact solid or hazardous waste within the ROI. The No Action alternative would have no impact on solid and hazardous waste.