Chapter 2 – Description of Alternatives

This chapter describes the range of options (alternatives) to restore, enhance, and protect existing floodplain hardwood forest, native prairie, wetlands, and riverine areas within the proposed Addition Area of Marais des Cygnes National Wildlife Refuge. How the study area boundary and alternatives were formulated, identification of the preferred alternative, and an explanation of why some alternatives were eliminated from further study are also discussed.

2.1 Formulation of Study Area Boundary and Alternatives

The boundaries of the study area were formulated by the identification of a reach of the Marais des Cygnes River that is believed able to meet the above habitat goals. The study area targets one of the last remaining reaches of the Marais des Cygnes River floodplain that is not greatly impacted by drainage ditches, levees, and loss of native vegetation. Some of the items reviewed were: flooding characteristics, presence of floodplain hardwood and native prairie, restoration potential, presence of cropland, levees, and drainage ditches, habitat requirements of desired wildlife species, location of public roads, and comments received from the public. It is Service policy to acquire the least interest in land necessary to meet refuge goals.

Development of Alternatives was guided by the following goals:

- Protect and increase the diversity and abundance of migratory bird and waterfowl species dependent on floodplain hardwood and tallgrass prairie habitats.
- Conserve, manage, and restore the diversity and viability of native fish, mussels, and other aquatic life unique to a prairie river hydrology and habitat, as well as wildlife and plant populations associated with floodplain hardwood and tallgrass prairie.
- Restore, enhance, and protect water quality and quantity that approaches natural hydrologic functions.
- Work in partnership with others, including private landowners, to restore or enhance floodplain hardwood, tallgrass prairie, and other unique plant communities.
- Protect and restore federally listed and state-listed threatened and endangered species.
- Provide for compatible wildlife-dependent recreational uses by the public, emphasizing increased public understanding of floodplain hardwood forest and tallgrass prairie ecosystems and the mission of the National Wildlife Refuge System.

2.2 Alternatives Considered but Eliminated from Detailed Study

The following alternatives were considered early in the planning process. These alternatives were discussed by the planning team but were not considered to be viable alternatives.

2.2.1 East Highway V Addition

Extend the boundary east of Highway V to include the downstream reach of the River that is transected by the portion of the Bates County Drainage Ditch, which was not dug deep enough to carry River flows except during flood events. This reach includes 3 miles of drainage ditch and 6 miles of River. While this reach of River does have wildlife values, flood events are impacted by the drainage ditch and extensive levees. Much of the floodplain is in cropland and little native vegetation remains. Restoration of this reach of the River would be both controversial and expensive.

2.2.2 Mulberry Creek Addition

Extend the boundary north of Highway 52 along Mulberry Creek. This area contains floodplain hardwood and fescue pasture. It is not impacted by levees or drainage ditches and little cropland is present. While habitat values are significant, the floodplain is very narrow. Flooding from the Marais des Cygnes River rarely backs into this area and Mulberry Creek does not have a large enough watershed to routinely flood, thus wetland values are limited.

2.2.3 East Worland Addition

Extend the boundary south to include a large forested area east and south of Worland. This area is a very rugged terrain created by turn-of-the-century open-pit mining. Most of the area is covered by oak-hickory forest and mine ponds. This type of habitat is often purchased throughout eastern Kansas and western Missouri as wildlife habitat by both private and state interests. However, it does not lend itself well to meeting the above goals. It is also a habitat that is not under great threat.

2.3 Explanation of Alternatives

2.3.1 Alternative A: No Action

Marais des Cygnes NWR operations would continue at the current level, entirely in the State of Kansas. The 7,500 acres of current holdings could be expanded by acquiring additional lands within the original approved acquisition boundary encompassing 9,300 acres. Management efforts would be directed toward achieving existing resource goals in Kansas.

2.3.2 Alternative B: Protect and Restore Habitat in the Marais des Cygnes Floodplain in Missouri Through Land Acquisition

Purchase additional lands, fee title, only in the floodplain, in order to expand the Refuge capability to protect, restore and preserve floodplain habitat associated with the Marais des Cygnes River by extending the Refuge into the Marais des Cygnes/West Osage River Basin of Missouri (Figure 3).

Figure 3: Alternative B, Proposed Addition to Marais des Cygnes NWR

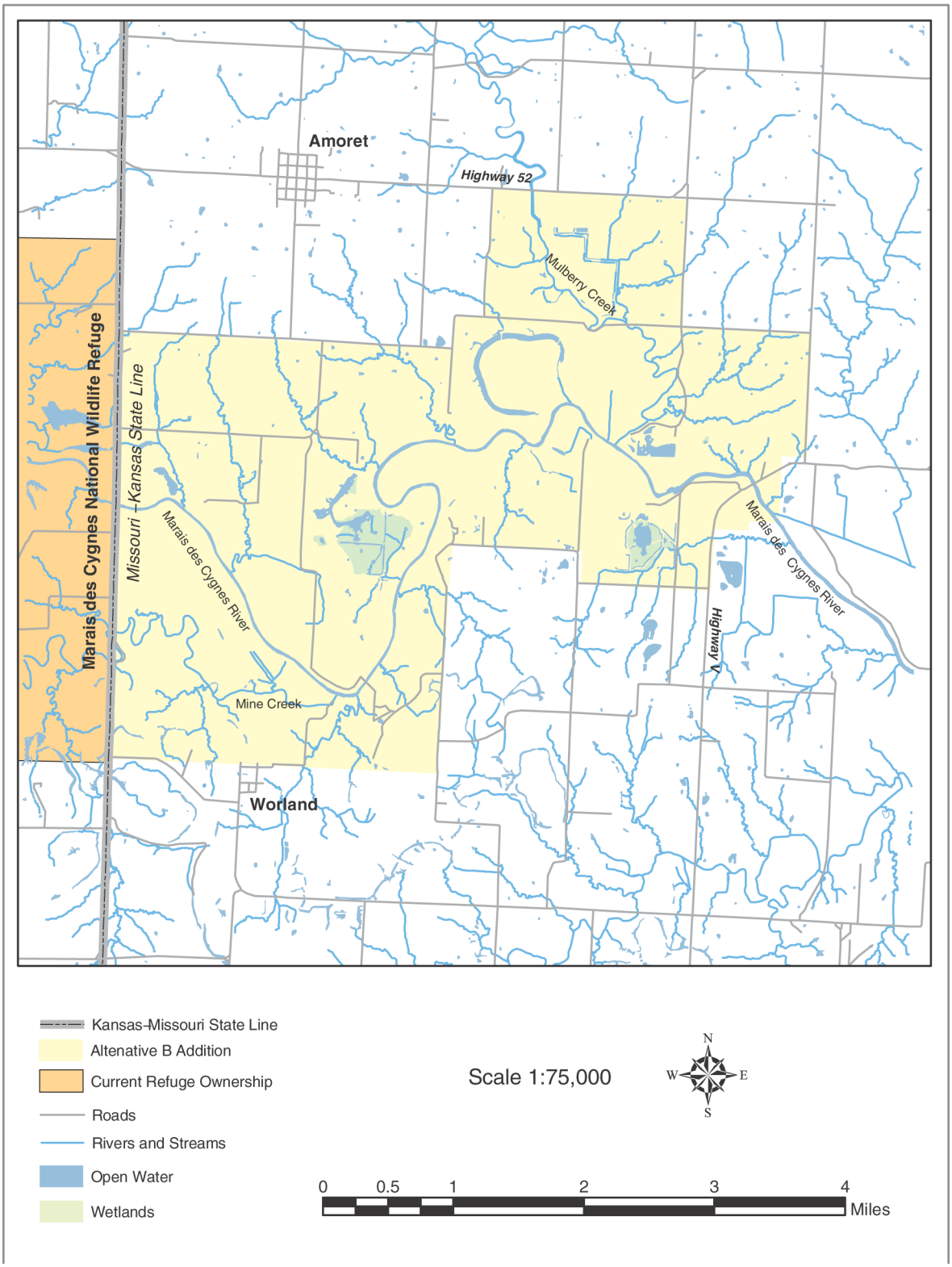
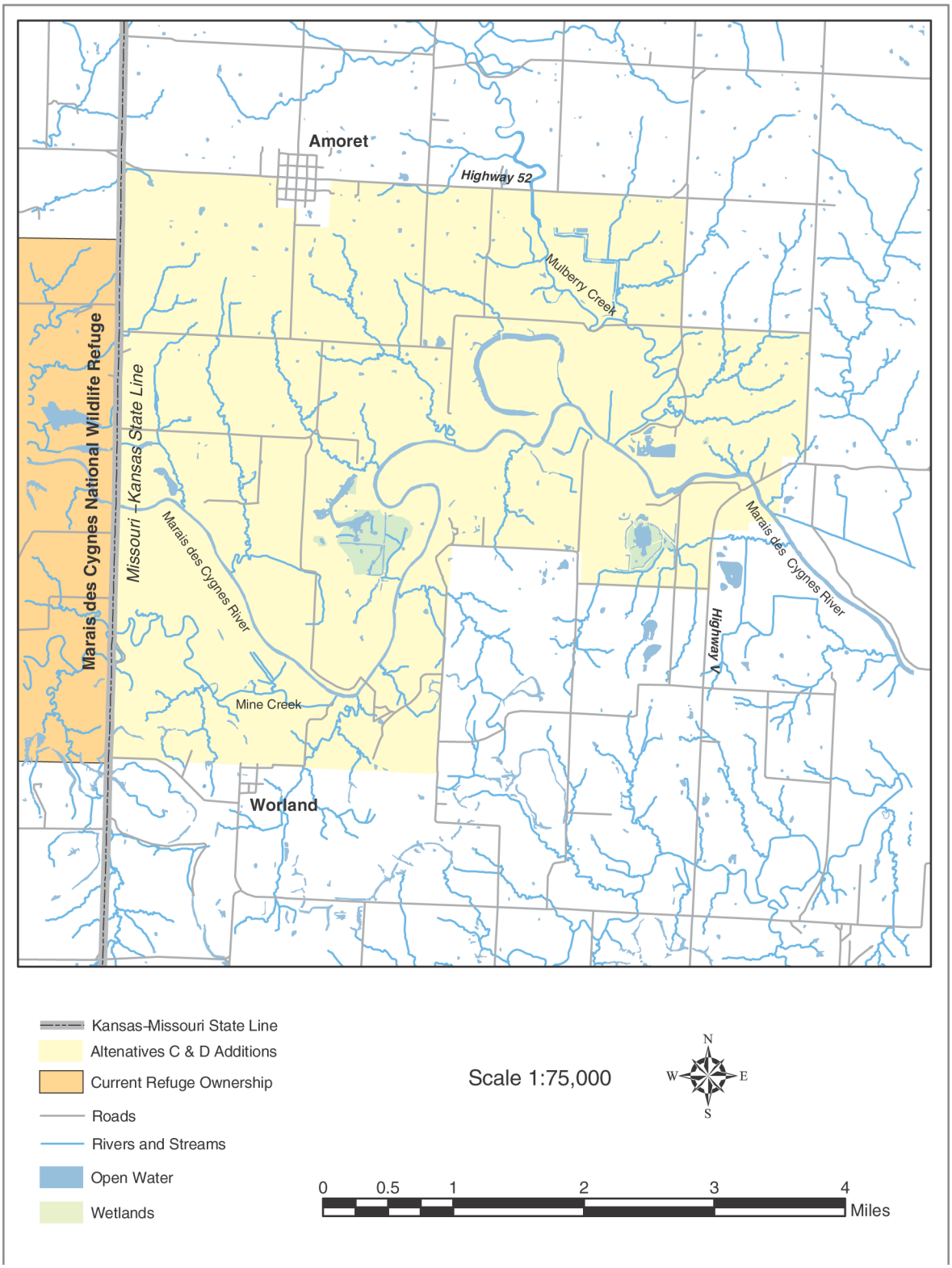


Figure 4: Alternatives C and D, Proposed Addition to Marais des Cygnes NWR



2.3.3 Alternative C: Protect and Restore Floodplain and Adjacent Upland Habitat Along Missouri Reaches of the Marais des Cygnes River by Acquiring Additional Lands (Preferred Alternative)

Purchase additional lands, fee title, in order to expand the Refuge capability to protect, restore and preserve floodplain, wetland, and native prairie habitat on lands adjacent to and nearby the Marais des Cygnes River in Marais des Cygnes/West Osage Basin of Missouri (Figure 4).

The main difference between Alternative C and Alternative B is that Alternative B primarily targets the floodplain with restoration of wetlands and floodplain hardwoods as primary goals while Alternative C includes these goals as well as the protection and restoration of native prairie on the uplands adjacent to the floodplain.

2.3.4 Alternative D: Protect and Restore Additional Floodplain and Adjacent Uplands through Long-term Easements and Private Land Programs

Expand the Refuge's capability to protect and restore floodplain and upland habitat on private lands entirely through easements and agreements with land owners (Figure 4).

Table 1: Summary of Effects of Alternatives A, B, C and D on USFWS Habitat, Wildlife, and Public Use Goals and Their Associated Management Priorities

Land Management Priorities	Alternative A No Action	Alternative B Protect and Restore Floodplain Through Purchase of Land.	Alternative C Protect and Restore Floodplain and Adjacent Uplands Through Land Purchase (Preferred Alternative)	Alternative D Protect and Restore Floodplain and Adjacent Uplands Through Perpetual Easements and Private Land Programs
Goal: Protect and increase the diversity and abundance of migratory bird and waterfowl species dependent on floodplain hardwood and tallgrass prairie habitats. *Goal: Conserve, manage and restore the diversity and viability of native fish, wildlife and plant populations associated with floodplain hardwood and tallgrass prairie.* *Goal: Restore, enhance and protect water quality and quantity that approaches natural hydrologic functions.* *Goal: Work in partnership with others, including private landowners, to restore or enhance floodplain hardwood, tallgrass prairie, and other unique plant communities.*				
Manage bottomland forests to provide mature stands of hardwoods.	On most large stands, mature timber likely to be harvested when large enough to provide lumber or firewood.	Mature timber left to provide habitat for species which require large and standing/ fallen dead trees.	Mature timber left to provide habitat for species which require large and standing/ fallen dead trees. Little forested land would occur on the uplands.	Could have similar effects as Alternative B and C, depending on availability of programs and landowner interest. Easements would need to be periodically checked for compliance, especially when land changes ownership.
Manage grasslands to provide a variety of cover heights.	Other than on CRP, grassland cover likely to be generally short, mostly benefitting bird species which require little cover for nesting and brood rearing.	Grassland cover short to rank with many stands having litter from previous years to provide cover for ground nesting birds. Little grassland cover would be located in the floodplain.	Grassland cover short to rank with many stands having litter from previous years to provide cover for ground nesting birds. Most grassland cover would be located in the uplands.	CRP program may provide rank grass cover. Much landowner involvement and probably monetary incentives would be necessary to convert fescue pastures to native grasses/forbs and create a variety of cover heights and density.

Table 1: Summary of Effects of Alternatives A, B, C and D on USFWS Habitat, Wildlife, and Public Use Goals and Their Associated Management Priorities (Continued)

Land Management Priorities	Alternative A No Action	Alternative B Protect and Restore Floodplain Through Purchase of Land.	Alternative C Protect and Restore Floodplain and Adjacent Uplands Through Land Purchase (Preferred Alternative)	Alternative D Protect and Restore Floodplain and Adjacent Uplands Through Perpetual Easements and Private Land Programs
Manage croplands to benefit wildlife and reduce soil erosion.	Crop fields likely to be disced in the fall. Use of terraces and grass waterways variable depending on landowner interest and budget.	Crop fields not disced until spring to provide food for wildlife. Use of terraces and grass waterways on all fields which require it. Most floodplain cropland planted to trees.	Crop fields left unworked until spring. Use of terraces and grass waterways on all fields which require it. Much cropland in upland planted to native grasses and floodplain to trees.	Much landowner involvement and possibly monetary incentives would be necessary to leave fields unworked through the winter and install soil conservation methods. WRP perpetual easement program available to restore wetlands.
Protect river-floodplain interaction.	Levees could be constructed to prevent the floodplain from flooding.	Levees would not be constructed to prevent the floodplain from flooding. This would help restore and preserve a more natural floodplain hydrology.	Same as Alternative B.	WRP perpetual easement program available to restore wetlands. Program does not allow construction of levees. Landowner interest in program likely limited due to management restrictions. Protection of all of floodplain from levees unlikely.
Protect and restore bottomland hardwood forests.	Floodplain fields would likely remain in crops or hay fields.	Most floodplain crop fields would be planted to pecan, pin oak, shellbark hickory and other hardwoods.	Same as Alternative B.	WRP perpetual easement program available to restore forested wetlands. CRP program may be available to restore forest on some sites. Landowner interest in programs likely limited due to program restrictions.

Table 1: Summary of Effects of Alternatives A, B, C and D on USFWS Habitat, Wildlife, and Public Use Goals and Their Associated Management Priorities (Continued)

Land Management Priorities	Alternative A No Action	Alternative B Protect and Restore Floodplain Through Purchase of Land.	Alternative C Protect and Restore Floodplain and Adjacent Uplands Through Land Purchase (Preferred Alternative)	Alternative D Protect and Restore Floodplain and Adjacent Uplands Through Perpetual Easements and Private Land Programs
Protect and restore floodplain wetlands.	Existing wetlands likely to remain. Most wetlands managed to harvest waterfowl. Little restoration of wetland sites which cannot readily be dewatered to grow waterfowl food in the summer and then pumped in the fall for waterfowl hunting.	All historic wetlands would be restored if possible. Wetlands would vary greatly in size, depth, and seasonal availability of water. Many species would be benefitted including breeding waterfowl, wading birds, shorebirds, frogs, turtles, crayfish, etc. Wetland restoration would help restore the natural floodplain hydrology. Wetlands provide excellent spawning and nursery habitat for young fish.	Same as Alternative B.	WRP perpetual easement program available to restore forested wetlands. Landowner interest in programs likely limited. Most wetlands managed to harvest waterfowl. Little restoration of wetland sites which cannot readily be dewatered to grow waterfowl food in the summer and then pumped in the fall for waterfowl hunting.
Protect and restore native prairie grasslands.	Most native prairie would remain as pasture. Protection of plant diversity variable depending on landowner interest and budget. Little restoration would occur except on CRP sites.	Existing native prairie would be carefully managed to protect diversity. Broadcast spraying of invading noxious weeds would be unlikely. Most upland fields would gradually be planted to a wide variety of native grasses and forbs.	Many opportunities available on uplands. Most crop fields would be planted to native grass and forbs.	CRP program could restore some sites, depending on landowner interest, site eligibility, and availability of program funding. CRP sites restricted to crop fields with no grazing or haying allowed.

Table 1: Summary of Effects of Alternatives A, B, C and D on USFWS Habitat, Wildlife, and Public Use Goals and Their Associated Management Priorities (Continued)

Land Management Priorities	Alternative A No Action	Alternative B Protect and Restore Floodplain Through Purchase of Land.	Alternative C Protect and Restore Floodplain and Adjacent Uplands Through Land Purchase (Preferred Alternative)	Alternative D Protect and Restore Floodplain and Adjacent Uplands Through Perpetual Easements and Private Land Programs
Control invasive animals and plants such as Sericea lespedeza.	Control variable depending on landowner interest and budget.	Control a high priority with annual expenditures of man power and funds.	Similar to Alternative B. Greater efforts required to control noxious weeds as more species of noxious weeds occur on upland grasslands.	Control variable depending on landowner knowledge and availability of time and funding necessary for control methods. Similar goals and cooperation among adjacent landowners needed for effective control.
Goal: Protect and restore federally and state-listed threatened and endangered species.				
Increase the abundance of Federal and State Threatened and Endangered Species and abundance and diversity of migratory birds.	Abundance and diversity would largely remain the same or slowly decrease over time as forest invades upland grassland pastures and bottomland forest is cleared.	Occurrence and abundance of species which require or use large stands of mature timber and forested wetlands would increase. Species include paddlefish, cerulean warbler, red shouldered hawk, bald eagle, piping plover, American bittern, wood duck, and hooded merganser.	Same values as alternative B. In addition, grassland species likely to increase with restoration and management of upland grasslands. Species include Mead's milkweed, barn owl, and northern harrier.	CRP and WRP are the primary programs available. Increases possible depending on landowner knowledge and availability of time and funding necessary to implement land management techniques. Similar goals and cooperation among adjacent landowners needed for species requiring large blocks of habitat.

Table 1: Summary of Effects of Alternatives A, B, C and D on USFWS Habitat, Wildlife, and Public Use Goals and Their Associated Management Priorities (Continued)

Land Management Priorities	Alternative A No Action	Alternative B Protect and Restore Floodplain Through Purchase of Land.	Alternative C Protect and Restore Floodplain and Adjacent Uplands Through Land Purchase (Preferred Alternative)	Alternative D Protect and Restore Floodplain and Adjacent Uplands Through Perpetual Easements and Private Land Programs
Manage floodplain to benefit paddlefish and other fish, protect spawning and mussel beds, and improve river water quality.	Paddlefish spawning and mussel beds could be permanently damaged if levees were constructed near the river. Water quality would largely remain the same or slowly degrade over time.	Spawning for paddlefish, an interjurisdictional fish, and mussel beds would not be threatened by levees. Water quality would increase due to reductions in cropland and increase in forested cover which reduces transport of soil and chemicals. The increase in quality would largely be local.	Similar to Alternative B. More improvement in local water quality as uplands would largely be taken out of crops and put into grass. Pastures grazed less to provide more ground litter which would further reduce erosion.	CRP and WRP are the primary programs available. Increases in water quality possible depending on landowner interest and funding. Similar goals and cooperation among adjacent landowners needed to make a significant difference.
Goal: Provide for compatible wildlife-dependent recreational uses by the public, emphasizing increased public understanding of floodplain hardwood forest and tallgrass prairie ecosystems and the mission of the national wildlife Refuge System.				
Provide quality opportunities for hunting, fishing, wildlife observation, and other wildlife-dependent uses.	Quality outdoor opportunities would be limited to current landowners and their guests.	Quality outdoor opportunities would be available to the public. Possibility of limitations (drawings) for some activities to maintain hunting quality. Periodic flood events would occasionally limit some activities. Provides excellent spawning and nursery habitat for a number of sport fish (walleye, white bass, perhaps paddlefish), benefiting the Truman Lake fishery for sport anglers.	Similar to Alternative B but more opportunities available as uplands do not flood and additional habitats of grassland and ponds are available. Uplands also easier to access.	Quality outdoor opportunities would be limited to current landowners and their guests. Possibility exists for the Service to lease hunting and/ or fishing rights, thus these programs may be possible.

Table 1: Summary of Effects of Alternatives A, B, C and D on USFWS Habitat, Wildlife, and Public Use Goals and Their Associated Management Priorities (Continued)

Land Management Priorities	Alternative A No Action	Alternative B Protect and Restore Floodplain Through Purchase of Land.	Alternative C Protect and Restore Floodplain and Adjacent Uplands Through Land Purchase (Preferred Alternative)	Alternative D Protect and Restore Floodplain and Adjacent Uplands Through Perpetual Easements and Private Land Programs
Provide for environmental education and research and protect and interpret archaeological and historic sites.	Opportunities variable depending on landowner interest. Identification, protection, and interpretation of archaeological and historical sites also variable depending on landowner interest and funding.	Activities encouraged and opportunities generally available. Identification, protection, and interpretation of archaeological and historical sites a priority.	Similar to Alternative B but more opportunities available as uplands do not flood and additional habitats of grassland and ponds are available. Uplands also easier to access and likely to contain most archaeological and historic sites.	Opportunities variable depending on landowner interest. Identification, protection, and interpretation of archaeological and historical sites variable depending on landowner interest and funding.

TRACT #	ACRES	PRIORITY
34a	39.3	Lower
34d	477.9	Medium
34e	39.3	Medium
34f	111.3	Higher
34g	435.1	Lower
34h	52.7	Lower
35	10.8	Lower
37	43.0	Higher
38	88.9	Higher
38a	20.6	Higher
38b	20.0	Higher
40	78.8	Lower
41	25.5	Lower
42	81.1	Lower
42c	38.4	Lower
43	77.4	Lower
44	41.2	Medium
44a	37.0	Higher
46	14.6	Higher
48	116.5	Higher
50	560.8	Lower
50a	135.8	Lower
52	191.3	Higher
52a	103.4	Higher
52b	250.9	Higher
52c	234.3	Higher
53	130.2	Higher
54	97.8	Higher
56	84.1	Higher
57	102.1	Higher
57a	270.3	Higher
59	293.6	Higher
60	188.4	Higher
61	934.6	Higher
62	184.7	Medium
63	20.4	Medium
64	64.8	Higher
64a	14.8	Higher
65	18.5	Higher
66	11.0	Higher
67	46.1	Higher
totals:	11567.1 91	