

Chapter 5—Environmental Consequences



NPS

Unfortunately, purple loose strife is common along the Missouri River.

This chapter summarizes and compares the potential effects of implementing the four management alternatives described in chapter 3 on the physical and biological environment, management of special area designations, public use opportunities, cultural and paleontological resources, and other social and economic factors. The environment that would be affected by the alternatives proposed is described in “Chapter 4—Affected Environment.”

5.1 Analysis Methods

Under each topic (resource), the actions or things that could affect that resource are discussed. Usually, these are the actions stemming from the strategies identified in “Chapter 3—Alternatives.” Often the effect of an action cuts across several resources. For example, the conservation of native upland bluffs is beneficial for wildlife species as well as for the scenic quality of the landscape.

The environmental effects are evaluated at several levels, including whether the effects are negative (or adverse in the case of threatened or endangered species) or beneficial and whether the effects are direct, indirect, or cumulative. The evaluation of

environmental consequences also considers the duration of an effect—that is, whether it is a short- or a long-term effect.

Direct effects are those where the effect on the resource is immediate and a direct result of a specific action or activity. An example of a direct effect might be the trampling of vegetation because of increased public access to an area.

Indirect, or secondary, effects are those that are induced by project-related actions or activities but that occur later in time or are farther removed from the place of action through a series of interconnected effects. Examples of indirect effects include the downstream water quality effects of an upstream surface disturbance, or the consequences of reduced sediment input as a result of bank stabilization.

A cumulative effect is defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR 1508.7). Reasonably foreseeable future actions independent of the LPP for the project are described in chapter 3.

Effects are often described in terms of their context, intensity, and duration:

- *Negligible*—the effect would be at the lower levels of detection (a change of less than 5 percent, compared to existing conditions).
- *Minor*—the effect would be detectable (a change of 5–24 percent).
- *Moderate*—the effect would be readily apparent, and it would have the potential to become major (a change of 25–50 percent).
- *Major*—the effect would be severe or, if beneficial, exceptionally beneficial (a change of more than 50 percent).

The duration of effects are described as occurring over the short or long term. Short-term effects would persist for a period of 1–5 years and would consist primarily of temporary disturbance associated with habitat restoration, prescribed fire, facility construction, and subsequent revegetation efforts. Long-term effects would last more than 5 years after the relevant action. For example, there could be a long-term benefit to wildlife habitat resulting from a short-term management action.

For each resource, the effects common to all alternatives are discussed first. This discussion is followed by a discussion of the effects of each alternative on that resource. For effects that could not be quantified, it was assumed that the level of effects would be associated with the extent of conservation specified—in other words, alternative B, with 40,000 acres of protected lands, would have the least effect, alternative C, with 80,000 acres, would have a greater effect, and alternative D, with 120,000 acres, would have the greatest level of effect.

In compliance with the provisions of the Improvement Act, we have thoroughly assessed the environmental effects using available science, in keeping with NEPA as well as FWS and NPS policies. We used GIS data from several sources—other agencies, organizations, and researchers—which are identified as appropriate. Although GIS is a useful tool for evaluation, it is not the same as conducting formal field surveys, and discrepancies can exist. Wherever possible, the degree of effect was quantified using known numeric information or modeled estimates, or where extensive monitoring or research provided pertinent numeric information. Where sufficient numeric information was not available, qualitative or relative assessments were made using scientific literature or professional field experience.

At the end of each discussion of environmental consequences (sections 5.3–5.9), the anticipated cumulative impacts of each alternative and the reasonably foreseeable actions are disclosed. Reasonably

foreseeable actions are described near the end of “Chapter 3—Alternatives.”

The cumulative effects analysis focuses on four broad categories of reasonably foreseeable actions:

- Federal land management activities
- State wildlife management
- nongovernmental conservation activities
- regional demographic and economic changes

The analysis of environmental consequences is documented in seven sections:

- 5.3 Environmental Consequences for the Physical Environment
- 5.4 Environmental Consequences for Biological Resources
- 5.5 Environmental Consequences for Special Management Areas
- 5.6 Environmental Consequences for Visitor Services
- 5.7 Environmental Consequences for Cultural Resources
- 5.8 Environmental Consequences for Paleontological Resources
- 5.9 Environmental Consequences for the Socioeconomic Environment

In addition, we analyzed the following aspects of implementing the alternatives:

- 5.10 Irreversible and Irrecoverable Resource Commitments
- 5.11 Short-Term Uses of the Environment and Maintenance of Long-Term Productivity
- 5.12 Adherence to Planning Goals
- 5.13 Unavoidable Adverse Effects
- 5.14 Conflicts with Federal, State, Tribal, and Local Agencies

The chapter concludes with a comparison of alternatives.

5.2 Assumptions

Assessments were based on a variety of information including meetings and other communications with natural resource and other professionals, published scientific information, site monitoring, agency reports, and computer modeling, among other sources. The following assumptions have been made in the analysis presented in this chapter:

- Money and staff would be sufficient to carry out any alternative selected. This assumption does not constitute a commitment for funding, and future budgets could affect implementation. Funding will depend on congressional appropriations and thus be subject to annual fluctuations. We assume that acquisitions of the proposed action will grow proportionally to funds received and landowner interest. In addition, acquisitions will occur over an approximate 50-year time frame.
- Monitoring activities would be conducted annually for conservation easements to maintain compliance of the easement conditions, and adjustments or revisions would be made to management as indicated by evaluations (but within the scope of the particular alternative).
- Standard FWS and NPS operating procedures would be followed.

5.3 Environmental Consequences for the Physical Environment

The following sections discuss the effects of implementing the alternatives on the physical environment.

Effects on Climate and Climate Change

Alternative A

Implementation of alternative A, the no-action alternative, would have no discernible change in

effect on climate or climate change compared to the existing condition. Climate and climate change would continue to be affected by stressors already present in the environment, such as existing carbon emissions from motor vehicles, change in land cover types, or changes in temperature and precipitation patterns.

Alternatives B–D

Implementation of the action alternatives may have a beneficial effect on human-induced climate change by increasing native vegetation (for example, cottonwood forest), which has the capability of sequestering more carbon than the amounts of vegetation found under existing conditions.

Wildland fire may be allowed to burn to promote natural ecosystem function. Such fire could consume all protected lands (40,000–120,000 acres) in a given year, but this scenario is not likely because the protected lands are not contiguous and because fire often leads to a mosaic of plant communities on the landscape when some areas severely burned next to areas that do not burn at all. Chapter 4 of the LPP addresses wildland fire management and planning. Although wildland fires may contribute to climate change, the extent of wildland fire on the protected lands would be inconsequential when compared to wildfires that average 4.2 million acres nationwide annually (1960–2011).

Prescribed fire may be used to control invasive species and promote natural ecosystem function. We expect to use this management action only when biologically necessary in any given year. The effect on climate change would be inconsequential. Wildland fire and prescribed fire are expected to have negligible effects on climate change.

Effects on Air Quality

Alternative A

Implementation of the no-action alternative would have no discernible change in effect on air quality compared to the existing condition.

Alternatives B–D

Implementation of any action alternative would have negligible negative effects on air quality, because there would be no substantial changes from the existing condition. Major air pollution sources would not increase because industrial and other developments would not occur on protected lands.

Increasing public access to protected lands could lead to increased traffic and associated vehicular emissions; this could occur on easement land (with owner-allowed public access) and on fee-title land. Increased vehicular emissions are not expected to have a substantial effect on air quality because of mandatory emission controls required by the Clean Air Act. The Clean Air Act mandates controls on air pollution from mobile sources by regulating both the composition of fuels and emission-control components on motor vehicles and non-road engines. Vehicle fuel standards for gasoline and diesel are met by refiners, importers, and other parties in the fuel distribution system. Regulation of vehicles includes vehicle emission limits for hydrocarbons, carbon monoxide, and nitrogen oxides, as well as particulates in the case of diesel vehicles. These limits, which must be met by the vehicle manufacturers, apply to on-road vehicles, off-road vehicles, and non-road sources (for example, marine engines, locomotives, and lawn and garden equipment). Under the 1990 Clean Air Act amendments, vehicle standards are being made more stringent, in stages, through 2005 or later.

Managing protected land may include using prescribed fire to promote natural ecosystem function and invasive species control. Wildland fires may be allowed to burn to promote natural ecosystem function. The LPP addresses wildland fire management and planning. Effects of wildland or prescribed fire on air quality are not possible to quantify because of the extreme variability of onsite conditions, including vegetation, humidity, wind, and anticipated weather. There is potential for increased smoke and particulate matter from wildland or prescribed fires, but this is expected to be a negligible or minor effect compared to the existing condition.

Effects on Visual Resources

Alternative A

Implementation of the no-action alternative would have no discernible change in effect on visual resources compared to the existing condition.

Alternatives B–D

Promoting native grasses, shrubs, and trees and controlling invasive species may improve the visual resources found on the protected lands. Increasing native vegetation, including riparian cottonwood forests, may increase native wildlife populations, in turn improving wildlife viewing and bird sightings and improving visual aesthetics along the river corridor.

Promoting increased access on protected land would require site-by-site analysis to determine suitable locations and practices to protect visual resources. Consulting with agency landscape architects for developing access sites would promote aesthetically pleasing results and would not substantially diminish visual resource quality on protected lands. Providing access to view some of the Scenic ORVs like the meandering rivers, riparian forests, chalkstone bluffs, pastoral grasslands, rolling hills, and the dark night sky in and near the river corridor would enhance visual resources on the protected lands.

Effects on Acoustic Resources

Alternative A

Implementation of the no-action alternative would have no discernible change in effect on acoustic resources compared to the existing condition.

Alternatives B–D

Increasing public access to the Missouri River and its tributaries through protected lands would increase vehicular traffic and boat traffic. Both activities may affect the acoustic resources (natural, cultural, or historic soundscape) of the proposed conservation areas. It is not known at this time how much land would actually be placed into protected status nor where public access would occur. The effect on the natural soundscape would be greater



Providing access to view some of the Scenic ORVs like the chalkstone bluffs would enhance visual resources on the protected lands.

than that on cultural or historical sounds. Cultural and historic sounds have not been determined or quantified for the Missouri River or its tributaries. The extent of the effect, which could range from negligible to major, would be determined by actual access sites (such as boat ramps, overlooks, and roadways) and the prevalent use near these sites. For example, a newly developed boat ramp could result in a major effect, while a hiking trail that accesses protected land or an overlook could have a negligible effect.

Effects on Land Features, Soils, Vegetation, and Geology

Alternative A

Implementation of the no-action alternative would have no discernible change in effect on land features, soils, vegetation, and geology compared to the existing condition.

Alternatives B–D

Implementation of any of the action alternatives would generally have negligible effects on land features, soils, vegetation, and geology with the exception of increased access to the river, its tributaries, and protected lands and the promotion of native vegetation.

Increasing access may require road construction (or upgrading), boat ramp construction, and perhaps overlook development. Agency landscape architects and engineers would design access features and other facilities to avoid substantial effects on land features, soils, vegetation, and geologic resources. Utilizing BMPs during construction activities would minimize effects on these resources. Because no specific access plan can be developed until conservation lands are acquired, the effects on these resources are impossible to quantify, but they could range from negligible to minor; substantial effects are not expected with the siting and design considerations and the application of BMPs.

Implementation of alternatives B–D is expected to have negligible to minor effects on land features, soils, vegetation, and geology, depending on the alternative selected.

Effects on Water Resources

Alternative A

Implementation of the no-action alternative would have no discernible change in effect on water resources compared to the existing condition.

Alternatives B–D

Implementation of the action alternatives would have a negligible adverse effect on water resources (surface hydrology, floodplains, and sedimentation.) The action alternatives would not affect the flow regime in the Missouri River or its tributaries because there is no change in streamflow associated with these actions.

Beneficial effects from the action alternatives may include natural bank erosion and floodplain building as a result of natural ecosystem functioning on protected lands. The goals and strategies identified in the LPP may increase aquatic habitat, encourage lateral channel migration, enhance water quality, create sandbars, and restore cottonwood riparian forests as part of a functioning natural ecosystem. These beneficial effects would range from minor to moderate depending on the alternative selected.

Cumulative Effects on the Physical Environment

Cumulative Effects Common to Action Alternatives

Alternatives B, C, and D differ only in the extent of conservation land. In view of this qualitative similarity, the analysis of cumulative effects on physical resources considers the action alternatives collectively. Where the level of contribution to cumulative effects would vary by alternative, it is assumed that the relative contribution would be proportional to the extent of conserved lands associated with each action alternative as described in “Section 5.1—Analysis Methods.”

The existing condition of the physical environment is the result of past human and natural activities. Because the purpose of the action alternatives is conservation, adverse cumulative effects are not anticipated for most components of the physical resources because the alternatives promote restoration of the environment through native vegetation

establishment and conservation of natural ecosystem functions. Overall, beneficial cumulative effects are anticipated for climate change through increased sequestration of carbon as a result of native vegetation restoration and for other resources constituting the physical environment through native vegetation restoration and enhanced ecosystem functioning.

Effects on Climate and Climate Change

Increased access and recreational opportunities have the potential to add incrementally to climate change because of increased vehicular emissions, but this effect is expected to be negligible because of requirements of the Clean Air Act and regulation of emission limits. Prescribed fire on protected lands has the potential to add incrementally to climate change because carbon is released during burning; however, the small areal extent and short duration of prescribed burns would make this effect negligible. Because wildfires may or may not be controllable and are subject to short-term environmental conditions, it is not possible to reach any quantitative conclusion.

Effects on Air Quality

Increased access and recreational opportunities could result in increased vehicular emissions, but this effect is expected to be negligible because of requirements of the Clean Air Act and regulation of emission limits. Prescribed fire on protected lands has the potential to effect air quality; this would be negligible or not detectable when combined with all other sources in the project area vicinity because of dispersal, dilution, and sparse population. Because wildfires may or may not be controllable and are subject to short-term environmental conditions, it is not possible to reach any quantitative conclusion; however, because wildfire management protocols would not change under the action alternatives, there would be no cumulative contribution associated with wildfire.

Effects on Visual Resources

Because the overall effects on visual resources would be beneficial, the cumulative effects would be beneficial as well.

Effects on Acoustic Resources

Increased access and expanded recreational opportunities have the potential to affect the acoustic resources of the project area through increased vehicular and boat traffic. There may be negligible to major cumulative effects on acoustic resources when combined with present and future vehicular and boat

traffic, depending on the location and the sensitivity of wildlife or visitors.

Land Features, Soils, Vegetation, and Geology

Increased access and expanded recreational opportunities have the potential to create cumulative effects on these resources in combination with past human development in the project area, but because conservation and improving the function of natural ecosystems are the driving purpose of the proposed action, no cumulative adverse effects are anticipated. Implementing BMPs and adhering to a strong conservation ethic would further prevent substantial adverse effects.

Water Resources

Because the proposed action would likely result in beneficial effects on water resources in the project area, there would be no contribution to adverse cumulative effects.

5.4 Environmental Consequences for Biological Resources

This section addresses the effects on of the proposed action on biological resources.

Effects on Uplands

Alternative A

Uplands would continue to be protected to a limited extent through voluntary proactive measures by landowners or through programs like the Conservation Reserve Program or Farm and Ranchland Protection Program administered by the NRCS, agreements with the Partners for Fish and Wildlife program, or privately held conservation easements. Without further efforts, though, the future of grasslands in the proposed project area would be uncertain.

Changes in policy and the agricultural economy have historically resulted in changes in tilled acreage (Gerard 1995). Several factors have accelerated the conversion of grassland to cropland production: (1)

recent development of genetically modified grain crops; (2) agricultural policy providing increased crop and income protection; (3) increasing commodity prices; (4) technological advances (Stephens et al. 2008, Sohl et al. 2012). Current and projected grassland conversion rates will undoubtedly accelerate with increasing grain prices and low cattle numbers absent any meaningful effort to protect grasslands that remain in the proposed conservation areas.

- Recent (September 1, 2012) crop prices have increased more than 30 percent since spring 2012 (CME Group 2012):
 - corn—\$8.03 per bushel;
 - soybeans—\$17.70 per bushel;
 - wheat—\$8.90 per bushel.
- Oklahoma State University’s Division of Agricultural Sciences and Natural Resources reports that the beef cowherd in the United States decreased in 12 of the past 14 years. The beef cowherd dropped from a cyclical peak of 35.3 million head in 1996 to 31.3 million head in January 2010—the lowest level since 1963. Furthermore, the combined beef and dairy calf crop in 2010 was expected to be 35.4 million head—the smallest United States calf crop since 1950 (Oklahoma State University 2011).

Conversion of grassland to cropland would increase the pesticide load on the environment. On average across the United States, herbicide active ingredients were applied to 98 percent of acres planted to corn, and almost two-thirds of all active ingredients used on corn were herbicides. Glyphosate isopropylamine salt was the most widely used pesticide overall, and the active ingredient used in the greatest total amount. Fungicide and insecticide active ingredients were applied to 8 percent and 12 percent of acres planted to corn, respectively (NASS 2011). The effects of pesticides on wildlife are variable, but they include the reduction of nesting cover for birds, the direct contamination of egg embryos, and losses in the aquatic invertebrate food base that is critical for many nesting birds, particularly waterfowl (Dwernychuk and Boag 1973, Messmer and Dahl 1991, Pimentel et al. 1992, EPA 2011). Many species of fish, including juvenile pallid and shovelnose sturgeon, also eat aquatic macroinvertebrates (Grohs et al. 2009, Wanner et al. 2007). The correct application of pesticides reduces adverse effects on the environment; however, spills and other nonlabeled use can

unfortunately occur, with resultant adverse environmental effects.

Conversion of grassland to crops has adverse effects on freshwater ecosystems. Intact grassland retains soil and nitrogen. Soil erosion from cropland increases sediment in freshwater systems, raising temperatures and degrading the habitat for fish. Land planted continuously to crops or close to aquatic systems releases high amounts of nitrates to freshwater systems. When these nitrogen-laden waters reach the larger bodies of water, they contribute to increased algal blooms, which increase biological oxygen demand, decrease oxygen levels, and change the vegetative habitats to a point that make it difficult for fish and other aquatic wildlife to survive.

Alternatives B–D

Establishing the NCCA and PBCA would enable us to conserve 20–30 percent of the associated uplands, thereby having minor effects under alternative B (20 percent) and moderate effects under alternatives C and D (25 and 30 percent, respectively).

The agricultural economy—in particular the livestock industry—is cyclical. In general, high prices of grain crops generate accelerated conversion of grassland to cropland and reduce the number of cattle because of the high costs and small profit margins related to feeding and finishing beef cattle. Conversely, low crop prices generate gradual buildup of cattle herds to take advantage of low feed costs. This contributes to the cyclical nature of the beef production industry, which does not benefit from protections provided by farm policy and programs to agricultural crop producers. Upland protection through the proposed action has the potential to moderate the cyclical effects of the livestock industry locally, helping to sustain viable cattle production and ranching industries.

Increasing restoration efforts for native upland ecosystems and reducing the conversion of some grassland to new cropland would slow the increase in volume of pesticide input into the environment. Protected grasslands would also act as buffers for wetlands near pesticide-treated cropland by filtering up to 70 percent of the water runoff (Hartwig and Hall 1980). Such actions may reduce the adverse effects on wildlife, such as nesting ducks, of ingesting contaminated invertebrates, and it may reduce the loss of the invertebrate food base from die-offs caused by pesticides (Grue 1988, Kantrud et al. 1989). In addition, an increase in the extent of upland buffers would provide an even greater benefit to aquatic resources. Importantly, these protected areas would exist regardless of changes in agricultural policy or economy, which are known to affect the rate of grassland conversion (Gerard 1995).

Conservation of uplands would also reduce fragmentation and help maintain larger blocks of native habitat, an important habitat characteristic for grassland nesting birds. With the increasing encroachment of invasive species like eastern red cedar, the spread of residential development, and habitat fragmentation by road networks, it is becoming more difficult to use the combination of prescribed fire and grazing necessary to maintain a healthy mosaic of upland prairie habitat. Increased development could make prescribed fire activities more difficult to implement, allowing tree encroachment in the areas surrounding these developments. By conserving large blocks of intact native grasslands, management tools like prescribed fire could be used more frequently and more safely. Accordingly, effects of the action alternatives on uplands would be beneficial.

Effects on River Bottoms

Alternative A

A significant overall decrease in the quantity and quality of wetlands has resulted from historical modification of the river and floodplain. River downcutting has lowered the water table, drying oxbow ponds. Downcutting has also reduced the quantity of backwater chute wetlands. Oxbow ponds and marshes fill in and change over time without periodic flooding to rejuvenate them. Ponds and seasonally wet areas have been drained for agriculture. Regulation of floods has encouraged conversion of native floodplain vegetation to agriculture and other development. Wetland restoration might result over the long term from proposed changes in riverflow management and from incentives in existing state and federal conservation programs.

Streambank erosion could continue where streambank protection is not in place. Private individuals could continue to apply for streambank protection permits as erosion threatens their property. The USACE could continue to maintain the section 32 streambank protection structures as appropriations are available for such purposes. New structures or extension of old structures in newly eroding areas could occur. Landowners could continue to allow for USACE maintenance of existing structures through permanent easements. Donation of permanent easements to the NPS or others to create wildlife habitat and allow for streambank protection could become an active program.

Dam construction has had a significant indirect effect in reducing wetlands and encouraging flood-

plain development and agriculture. There could be continued maintenance of existing structures along the streambanks. New structures could be built by the USACE. Land use changes without strong controls would ultimately result in adverse effects on wetlands and floodplains. There would be adverse effects on streambanks, even with some mitigation efforts (NPS 1999).

Alternatives B–D

Establishing the NCCA and PBCA would enable us to conserve between 40 and 60 percent of floodplain riparian habitats, resulting in moderate effects under alternatives B and C (40 and 50 percent, respectively) and major effects under alternative D (60 percent).

The Missouri River historically meandered throughout its wide floodplain, often shifting great distances in short periods (1–2 years). Captain William Clark noted:

I observe a great alteration in the current course and appearance of this pt. of the Missouri. in places where there was Sand bars in the fall of 1804 at this time the main current passes, and where the current then passed it is now a Sand bar. Sand bars which were then naked are now covered with willow several feet high. The entrance of some of the Rivers & creeks change owing to the mud thrown into them, and a layer of mud over some of the bottoms of 8 inches thick.

Because these processes sustained the river's biological production and diversity, the pre-regulation Missouri River exhibited a rich heterogeneity of habitat. A typical cross section of the pre-regulation Missouri River contained a deep channel, multiple side channels, oxbow lakes, islands, sandbars and dunes, and backwater habitats interspersed by areas of higher land. These channels and backwater areas provided the slower-moving water critical for the reproduction, shelter, and feeding of native fish species (NRC 2002).

Despite the regulated nature of the Missouri River in both conservation areas because of Fort Randall and Gavins Point Dams, the action alternatives would allow the Missouri to meander in a more natural state and return to the ecological state described above as a result of the decreased presence of bank stabilization (where not needed for health and human safety) and the free-flowing ability of the river to move where the hydrology drives it. A river uninhibited by sideboards would allow for naturally forming sandbars, naturally reproducing cottonwood

galleries, and the presence of backwaters, chutes, and oxbows. The water, sediment, and nutrients would be spread across the floodplain by naturally caused overbank flows and river meandering.

The action alternatives would also aid in flood risk reduction by allowing naturally occurring habitats to establish alongside the river and extend into the floodplain. The presence of these habitats would reduce the chances of extensive damage to personal property as seen in the flood of 2011. Reducing the need for bank stabilization and revetment to protect valuable personal property would also reduce the need for disaster relief recovery funds alongside a river that historically had flows exceeding 200,000 cubic feet per second on an annual basis. The action alternatives would have beneficial effects on river bottoms.

Effects on Invasive Plant Species

Alternative A

The responsibility for the control of invasive species would continue to rest primarily with private landowners and local governments. Invasive species could continue to expand, and they would likely be controlled primarily by chemical and mechanical means. Effects are expected to be negligible under alternative A.

Alternatives B–D

Under the action alternatives, the control of invasive species would be required by either the private landowner in the case of conservation easements or by us if the land is conserved through fee-title acquisition. Rather than relying heavily on chemical and mechanical methods, emphasis would be on biological means (like leafy spurge and purple loosestrife control using beetles) or prescribed fire (to control species like eastern red cedar), although chemical and mechanical methods would be permitted to control salt cedar and phragmites. Overall effects on invasive species are expected to be minor across all alternatives.

Effects on Mammals

Alternative A

Public land would continue to be managed for wildlife. Some private landowners participate in habitat enhancement programs. However, protection of habitat depends on protection of the entire river system. Habitat loss could result from conversion to agriculture, development, and alteration of river flows. Effects on mammals would be negligible.

Alternatives B–D

Alternatives B–D would provide for increased concentration on high-quality wildlife habitat. Populations of mammals such as white-tailed deer, mule deer, elk, bobcats, raccoons, bats, and mice are expected to increase at minor rates under all action alternatives. However, annual hunting regulations established by both Nebraska and South Dakota should provide for sufficient means to control populations at appropriate levels.

Effects on Birds

The proposed project area is especially important to migratory birds for migration, nesting, and wintering. Conservation of this large group of Federal trust species is a core responsibility of the FWS. Literally millions of individual birds of more than two hundred species use the project area for a portion of their lives. These include groups of species such as waterfowl, waterbirds, shorebirds, and landbirds.

Alternative A

Public land in the project area would continue to provide habitats important to birds that use the river for migration, nesting, and wintering. Private lands would continue to provide important habitat; however, over the long term it is likely that development will degrade, fragment, and reduce the amount of these habitats in the absence of long-term protection. Nevertheless, waterfowl, waterbirds, and shorebirds would continue to find suitable habitat for migration, and in some cases nesting and wintering, in and along the river corridor. Riverine wetlands near the mouth of the Niobrara would continue to provide habitat for these groups. Similarly, landbirds that breed in grasslands are not highly reliant on the project area for migration; however, grasslands in the project area

are important for nesting. Grassland bird populations have suffered the largest rate of decline compared to other equivalent bird groups (NABCI 2009). Although grasslands are not the primary focus of this project, conserving them is important for populations of this declining species group. Forest birds are highly reliant on the project area for migration and nesting. Some species, such as the bald eagle, also rely on the project area for wintering.

Along this portion of the Missouri River, the narrow strips of forested habitats are vulnerable and easily severed. Fort Randall Dam was completed in 1956 and Gavins Point Dam in 1957. Since that time, cottonwoods and other riparian forest and shrub species have experienced a long-term decline along the river (Dixon et al. 2012). Dam operations and the dams themselves changed the processes with which cottonwoods evolved (Dixon et al. 2012). Older cottonwoods are maturing and dying without enough young cottonwoods to replace them, resulting in fragmentation of the forest habitat. On a more localized scale, these same riparian forests are being degraded, fragmented, and reduced by development. Despite the risk of flooding, development of cabins, houses, campgrounds, and crop fields is occurring within the floodplain.

Fragmentation and loss of these habitats adversely affects the populations of birds that use them. During migration the limiting factor for survival is oftentimes food. Forest birds such as American redstart, ovenbird, and wood thrush rely on riparian forests to supply their food (typically insects). Birds that cannot maintain their fat reserves perish, or if they do make it to their destination arrive in poor condition for nesting (spring). Moore et al. (1995) and Moore and Yong (1990) revealed how important food is for migrating landbirds.

Habitat degradation, fragmentation, and loss have numerous adverse effects on populations of nesting forest birds. Several species of nest predators are more abundant in the “edge” habitat created by fragmentation (Whitcomb et al. 1981). Similarly, fragmentation provides more habitat suitable for brown-headed cowbirds, resulting in increased rates of brood-parasitism (Brittingham and Temple 1983). When habitat patches become relatively small and isolated from each other, pairing success can decline significantly (Villard et al. 1993). Increased nest predation, increased brood parasitism, and reduced pairing success can have significant adverse effects on populations of nesting forest birds.

The bald eagle is perhaps the most visible and popular migratory bird that winters in the project area. People enjoy watching them in the winter, especially below Fort Randall and Gavins Point Dams. Large numbers of wintering eagles led to the design-

ation of an area below Fort Randall Dam as a National Natural Landmark in 1967. Steenhof et al. (1980) indicated that bald eagles showed a preference for diurnal roosting near food sources, such as the edge of the Missouri River. Food was one important factor for selection of wintering habitat. The other important factor was large cottonwoods that offered protection from high winds and cold temperatures. Steenhof et al. documented a communal nocturnal roost area that offered thermal shelter from winter winds. Protecting habitat that is important to wintering bald eagle populations would enhance their recovery and the chance that they would continue to use the project area, where they can be observed and appreciated by many people.

Alternatives B–D

Alternatives B–D would enhance opportunities to conserve forested habitats on private lands in the proposed conservation areas. Important riparian habitats would be protected from development that could result in degradation, fragmentation, or loss. Bird populations would benefit from long-term protection of the habitats they depend on. Generally, the greater the amount of habitat conserved, the greater the positive effect on bird populations. Species that rely on forest habitats for nesting in the project area would benefit the most (Robbins et al. 1989). Species that would benefit include bald eagle, yellow-billed cuckoo, black-billed cuckoo, eastern screech owl, long-eared owl, eastern whip-poor-will, ruby-throated hummingbird, red-bellied woodpecker, red-headed woodpecker, eastern wood-pewee, least flycatcher, willow flycatcher, eastern phoebe, great crested flycatcher, Bell’s vireo, warbling vireo, red-eyed vireo, tree swallow, black-capped chickadee, white-breasted nuthatch, eastern bluebird, wood thrush, American redstart, ovenbird, eastern towhee, spotted towhee, rose-breasted grosbeak, scarlet tanager, northern cardinal, indigo bunting, orchard oriole, and Baltimore oriole.

Alternative B would allow conservation of 20 percent and 40 percent of upland and riparian habitats, respectively, within the proposed conservation areas. Alternative C would allow conservation of 25 percent and 50 percent of upland and riparian habitats, respectively, and alternative D would allow conservation of 30 percent and 60 percent of upland and riparian habitats of habitats, respectively.

Effects on Fishes

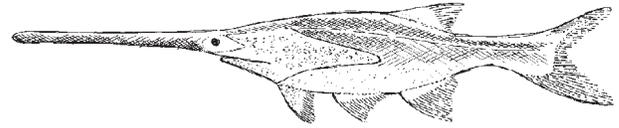
Alternative A

The no-action alternative would have minor to moderate adverse effects on fish communities in the two reaches over the next several decades. Because degradation, lack of sediment, and bank stabilization would either continue or remain static, the effects would continue to reduce habitat, lessen floodplain connectivity, and decrease turbidity in these reaches, causing minor to moderate adverse effects on fish.

Alternatives B–D

Fish in the project area have been subject to effects from many alterations to the natural environment. Flow, sediment, and habitat modifications have reduced and altered the native fish community. The proposed action would not address flow alterations. However, conservation of floodplain and riparian areas could support a more natural hydrologic regime without adversely affecting human infrastructure present in the river's floodplain. One of the primary benefits for fish from a more natural hydrologic regime would be increased floodplain connectivity. However, because of degradation or deepening of the river bottom that has taken place in the river segments involved, connectivity with the historical floodplain is difficult. Conservation efforts that reduce and remove stabilization in these reaches would have a beneficial effect on fish populations as habitat, sediment, and nutrients would be increased in a river system that is allowed to meander. Meandering of the river system, in time, may create a secondary (lower) floodplain that would be accessible to flows, allowing for a small amount of floodplain connectivity. Such connectivity, though far less than historical conditions, would nevertheless enhance fish populations in these reaches through increased nutrients and expanded spawning and rearing areas (NRC 2002, FWS 2003).

Alternatives B–D (including the preferred alternative) would have minor to moderate beneficial effects on the fish community in the conservation reaches. The degree of beneficial effect would vary both spatially and temporally. As habitat and functionality is returned to the system, the fish communities would be expected to increasingly respond. Some benefits would take time to develop; for example, the development of a lower floodplain as a result of increased meandering may require decades. These beneficial effects could be augmented by the implementation of a more natural hydrograph; however, although the proposed action would not address that



Drawing of a paddlefish.

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issue directly, some improvement could evolve as a result of more natural hydrologic conditions.

Alternative B, protecting only 40 percent of the riparian and floodplain area, may not allow for sufficient meandering to enable floodplain connectivity; accordingly this alternative would likely result in minor beneficial effects.

Alternatives C and D would likely result in minor benefits initially with protection of 50 and 60 percent, respectively, of riparian and floodplain areas. Over time, the potential for development of more habitat and a secondary (lower) floodplain would likely result in moderate beneficial effects.

Effects on Other Wildlife

Insects, reptiles, amphibians, and other wildlife have been heavily affected by changes in the amount and functionality of terrestrial and aquatic habitat in the project area. The effects on these species vary from the river and floodplain to the uplands.

Alternative A

The no-action alternative would result in minor adverse effects on other wildlife species that depend on the river and floodplain system as degradation of functionality and habitat is expected to continue in the absence of changes in management. Other wildlife species that rely on uplands would likely experience negligible to minor effects because uplands and grasslands are expected to degrade further under the no-action alternative.

Alternatives B–D

Beneficial effects on insects, reptiles, amphibians, and other wildlife species would likely be realized under all action alternatives. The magnitude of these effects would range from minor to moderate, depending on the alternative selected.

Caddis fly, mayfly, and certain riparian-dependent species of tiger beetle are among some of the many riverine and sandbar insect species that would bene-

fit from the proposed conservation efforts. Mussels and softshell turtles would also benefit. Floodplain wetland and terrestrial species such as multiple salamander and toad species (including plains spadefoot) would experience minor to moderate benefits.

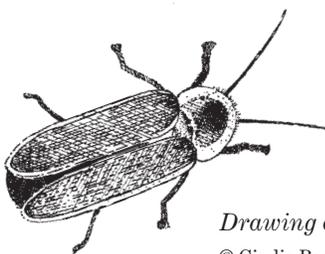
Effects on Threatened and Endangered Species and Species of Concern

Alternative A

Public land would continue to be managed for special-status species in accordance with the recovery plans that have been developed. The recovery plans for pallid sturgeon, least tern, and piping plover call for actions to restore habitats and functions of the Missouri River ecosystem. The USACE now manages the river for recovery of these three species using habitat protection, construction, and flow management under the MRRP. Some private landowners participate in habitat enhancement programs through easements. Habitat loss and decreased populations would continue within the Missouri River if habitat restoration programs were discontinued, if habitat was converted to development, or if river flows were not managed for these species.

Alternatives B–D

Alternatives B–D would provide for more opportunities to protect, develop, and manage for high-quality habitats as required by recovery plans and adaptive management. The proposed action would likely have beneficial effects on pallid sturgeon, least tern, and piping plover populations and habitat under all three action alternatives. This effort is expected to be most successful in cooperation with our partners, such as the USACE through the MRRP, States, private landowners through conservation easements, and other organizations and conservation programs.



Drawing of a firefly.

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Cumulative Effects on Biological Resources

Alternatives B, C, and D differ only in the extent of conservation land. In view of this qualitative similarity, the analysis of cumulative effects on biological resources considers the action alternatives collectively. Where the level of contribution to cumulative effects would vary by alternative, it is assumed that the relative contribution would be proportional to the extent of conserved lands associated with each action alternative as described in “Section 5.1—Analysis Methods.”

The existing biological resources have been affected by past human and natural activities. Increasing the quantity of conservation lands will increase opportunities to enhance and restore ecosystem functions, including wildlife habitat. Because the purpose of the proposed action is to promote restoration of the environment through native vegetation establishment and natural ecosystem functions conservation, adverse cumulative effects are not anticipated. Overall, beneficial cumulative effects are anticipated under all action alternatives for all native fish and wildlife species and their habitats.

5.5 Environmental Consequences for Special Management Areas

Alternative A

Implementation of the no-action alternative would have no discernible change in effect on Special Management Areas compared to the existing condition.

Alternatives B–D

There would be no substantial effects on Special Management Areas. If the proposed conservation areas result in increased visitor use, there may be increased visitor use at the Special Management Areas described in the existing condition. Effects of alternatives B–D as described in the visitor services section are applicable here.

5.6 Environmental Consequences for Visitor Services

Alternative A

Implementation of the no-action alternative would have no discernible change in effect on visitor services compared to the existing condition.

Alternatives B–D

The action alternatives propose protection of up to 40,000–120,000 acres in the project area, depending on alternative. The actual extent of protected land is expected to change over time as lands are acquired or placed under conservation easements; moreover, it is not a foregone conclusion that the selected alternative would meet its target acreage.

All educational and recreational activities and facilities described are compatible with the purposes of the conservation areas. The increase in proposed protected land would provide opportunities to enhance the level of visitor services provided in the project area. The development of increased river access and public access to protected lands would permit more human interaction with the natural environment and offer more opportunities for educating the public on the importance of ecosystem functioning and habitat diversity.

Cumulative Effects on Visitor Services

The development of increased river access and public access to protected lands would permit more human interaction with the natural environment and offer more opportunities for educating the public on the importance of ecosystem functioning and habitat diversity.

There is not expected to be a substantial adverse cumulative effect on visitor services as a result of the action alternatives. The potential increase in protected lands and river access may lead to increased visitation, but development of added river access sites may disperse visitor use, rather than substantially increasing use at any given site. Nevertheless,



The increase in proposed protected land under alternatives B–D would provide opportunities to enhance the level of visitor services provided in the project area.

securing reservations at developed and controlled campgrounds and state parks could become more difficult, and other accessible sites, like hunting areas, could become crowded.

Overall, there may be a reduction in visitor satisfaction if the increased protected lands draw larger numbers of visitors than now use the proposed conservation areas. The level of cumulative effects would likely be associated with the extent of land conserved.

5.7 Environmental Consequences for Cultural Resources

Alternative A

Some cultural resources could be adversely affected by activities such as development and conversion to other uses on lands outside existing public and private conservation lands. There are legitimate concerns that important sites may be destroyed or irreparably disturbed in the absence of protection.

Alternatives B–D

Compliance with applicable laws, regulations, and policies that concern cultural resources would continue under all four alternatives. These laws include section 106 of the National Historic Preservation Act which directs Federal agencies to consider the effect of their undertakings on historic properties (cultural resources that are eligible for the NRHP). The action alternatives would accordingly increase opportunities to identify, document, evaluate and potentially preserve cultural resources.

Greater Federal and State involvement would also spur the potential application of other laws and regulations that concern cultural resources. Although both Nebraska and South Dakota have state laws that govern unmarked human graves (Nebraska Revised Statute 12: 1201-1212; South Dakota Codified Law 34-27-25 to 33), additional Federal land acquisition would increase the potential for the Native American Graves Protection and Repatriation Act to apply to burials and their associated funerary objects. The Archaeological Resource Protection Act and other Federal laws that govern archaeological deposits and the rights of Native Americans would become applicable on these newly acquired lands.

This increased Federal involvement and legal authority affords added protection for significant cultural resources and would promote consultation and research. It would encourage planning that includes diverse concerns and voices and help to us better understand how to best identify and preserve our heritage. This would be a beneficial effect on cultural resources.

5.8 Environmental Consequences for Paleontological Resources

Like the consequences discussed above for cultural resources, increasing the amount of land under Federal ownership brings added protection for paleontological resources on those lands. Under the Omnibus Public Land Management Act of 2009 (Public Law 111-11, Title VI, Subtitle D), paleontological resources may not be collected from FWS or NPS lands without a permit. This law also encourages inventories, protection, public education, and scientific research in association with these resources. The proposed action would result in beneficial effects on paleontological resources.

5.9 Environmental Consequences for the Socioeconomic Environment

Regional economic impact analyses capture the complex interactions of consumers and producers of goods and services in local economies. Economies are complex webs of interacting consumers and producers in which goods produced by one sector of an economy become inputs to another, and the goods produced by that sector can become inputs to yet other sectors. Thus, a change in the final demand for a good or service can generate a ripple effect throughout an economy. For example, if more visitors come to an area, local businesses will purchase extra labor and supplies to meet the increase in demand for more services. The income and employment resulting from visitor purchases from local businesses represent the direct effects of visitor spending within the economy. Direct effects measure the net amount of spending that stays in the local economy after the first round of spending; the amount that does not stay in the local economy is termed a leakage (Carver and Caudill 2007). To increase supplies to local businesses, input suppliers must also increase their purchases of inputs from other industries. The income and employment resulting from these secondary purchases by input suppliers are the indirect effects of visitor spending within the economy. Employees of the directly affected businesses and input suppliers use their incomes to purchase goods and services. The resulting increased economic activity from new employee income is the induced effect of visitor spending. The indirect and induced effects are known as the secondary effects of visitor spending. “Multipliers” (or “response coefficients”) capture the size of the secondary effects, usually as a ratio of total effects on direct effects (Stynes 1998). The sums of the direct and secondary effects describe the total economic impact of visitor spending in the local economy.

Three measures of economic impacts are reported in this analysis: employment, labor income, and value added. Employment impacts represent the change in the number of jobs generated in the region from a change in regional output. These impacts include full time, part time, and temporary jobs. Labor income impacts include employee wages and salaries, payroll benefits, and incomes of sole proprietors. Value added impacts are a measure of the contribution expenditures make to Gross Domestic Product. Value added is equal to the difference between the amount an industry sells a product for and the production cost of the product, and is thus net of intermediate sales.

For the purposes of an economic impact analysis, a region (and its economy) is typically defined as all counties within a 30- to 60-mile radius of the impact area. Only spending that takes place within this regional area is included as stimulating changes in economic activity. The size of the region influences both the amount of spending captured and the multiplier effects. The impact area for the proposed NCCA and PBCA comprises 12 counties: 6 counties in Nebraska (Boyd, Cedar, Dakota, Dixon, Holt, and Knox) and 6 counties in South Dakota (Bon Homme, Charles Mix, Clay, Gregory, Union, and Yankton).

This section presents an analysis of the economic impacts associated with current management and a discussion about how the local economy may be affected under each alternative. The NPS-managed MNRR lies within the boundaries of the proposed conservation areas; therefore, current impacts of the MNRR are addressed under alternative A. The FWS-managed Lake Andes National Wildlife Refuge Complex in southeast South Dakota comprises Lake Andes National Wildlife Refuge, Karl E. Mundt National Wildlife Refuge, and Lake Andes Wetland Management District. The Karl E. Mundt National Wildlife Refuge (which is now closed to the public) and portions of the Lake Andes Wetland Management District lie within the boundaries of the proposed conservation areas (but away from the river corridor). The refuge complex recently developed a CCP to guide the management direction of the refuge complex over the next 15 years. The economic impacts of current and anticipated changes to refuge complex management are addressed in the CCP; accordingly, FWS refuge complex management activities are not addressed in this analysis.

Under each alternative, land acquisition is expected to occur over a 50-year period, so effects on the local economy will happen slowly over an extended period of time. It is important to note that willing sellers and available budgets may not always be available for full implementation of a proposed alternative under the LPP.

Conservation Easements

One of our high-priority objectives is to protect high-priority conservation areas by securing appropriate conservation easements. Conservation easements leave land in private ownership, protecting private property rights, while providing us with a cost-effective conservation strategy that enables the protection of large blocks of habitat. Under the LPP, we propose to purchase conservation easements to permanently protect valuable tracts of habitat to

maintain wildlife populations, plant communities, and ecosystem functions.

A conservation easement is a voluntary legal agreement entered into between a landowner and a conservation entity. Conservation easements are binding in perpetuity; the landowner reserves the right to sell or bequeath the property, but the easement and its associated restrictions remain with the property in perpetuity.

A conservation easement on a parcel of land may have restrictions from all types of human development (for example, surface disturbance from solar, mineral, or wind energy development) and may include restrictions to ensure maintenance of historical water use patterns that help wildlife. Once a conservation easement is purchased, the landowner maintains a number of rights, including: grazing, wetland management, hunting, and other undeveloped recreation. In all cases, the terms of a conservation easement must be mutually agreed upon by the landowner and the FWS or the NPS.

Fee-Title Purchases

In some instances, particularly when public use is expected to be extensive, the construction of new buildings is expected, or major habitat restoration is planned, it may be more appropriate for us to purchase and manage the lands. Under fee-title purchases, full ownership of the land, including the underlying title, is transferred. This gives the new owner maximum interest in the purchased land and allows them to manage the land in any manner that is consistent with local, state, Federal laws and existing easements and rights-of-way. Any fee-title acquisition would be from willing sellers in coordination with the affected county. The anticipated amount of fee-title purchases at fair market value is expected to range from 14,000 acres under alternative B up to 42,000 acres under alternative D. All acquisitions will be subject to the terms and conditions of existing easements, rights-of-way, or other restrictions as legally allowable.

Social and Economic Effects of Conservation Easements and Fee-Title Acquisitions

Lands in conservation easements and fee-title acquisitions can provide public goods that generate benefits for local residents, communities, and governments. Easements and fee-title acquisitions also

reshape future development patterns, change existing land use, affect property values, and inject new money into local communities. There are many dynamic variables at play when considering the social and economic effects of conservation easements and fee-title acquisitions, especially given that potential purchases may span five decades. Because of future uncertainty surrounding such factors as the likelihood and timing of easements and acquisitions, the availability of funds to purchase lands, population growth, land values, and agricultural commodity prices, the economic effects of these easements and acquisitions cannot be quantified in this analysis. However, these effects can be described qualitatively. This analysis estimates the economic effects associated with current management activities and describes how the following could be affected by fee-title and easement acquisition under the alternatives:

- conservation and ecosystem service values in the region
- effects on local communities
- landowner compensation
- effects on local government net revenue
- visitor expenditures
- administration expenditures

Conservation and Ecosystem Service Values

Ecosystems are integrated natural communities stemming from the interactions among and between humans, animals, plants, and the physical environment. The natural functions maintained by a healthy ecosystem provide ecological goods and services that preserve the natural capital required to maintain biodiversity and provide for the social, cultural, and economic needs of humans. The beneficial outcomes of these ecological processes provide “provisioning services” such as food, water, and timber; “regulating services” such as flood and disease regulation; “cultural services” including recreational and spiritual services; and “supporting services” such as soil formation and nutrient cycling (Millennium Ecosystem Service Assessment 2005). The suite of services provided by the ecosystem are “public” and “non-market” in nature, meaning they often help many people, whether or not they pay for them, and they are typically not sold in a traditional market setting where a relative price is revealed for the goods or services

(like cars at a dealership). These characteristics often underrate the true value of such goods and services and lead to them being overlooked or underprovided for the public in private decisionmaking. As a result, conservation and restoration efforts usually stem from the coordination of government agencies and public trusts.

Ecosystem services can have significant economic implications. For instance, one can begin to describe the economic importance of riparian habitat by identifying the role it plays in mitigating destructive flooding to nearby homes, businesses, and crop fields; or how the preservation of grasslands and their resident bee colonies are economically important to a farmer who depends on them for crop pollination; or the value of wetland habitat to local hunters through their relation to waterfowl abundance. It is the link between ecological processes and human well-being that defines ecosystem services and provides context for their economic valuation (Daily 1997, Millennium Ecosystem Service Assessment 2005). A recent study attempted to value the ecosystem services provided by the FWS’s national wildlife refuges in the contiguous United States and determined the various habitats within the Refuge System were providing services valued at, on average, \$2,900 per acre per year (Ingraham and Foster 2008). Conservation easements and fee-title acquisitions preserve and often enhance the ecosystem services provided by the landscape. While often public and non-market in nature, these services certainly have economic relevance to local residents and beyond.

Effects on Local Communities

Although local residents may not be able to explicitly use or access all lands protected by conservation easements or fee-title purchases, protected lands act as a buffer that helps residents through increased biodiversity, recreational quality, and hunting opportunities on publicly accessible wildlife refuges and on some private lands (Rissman et al. 2007). It is well documented that open space carries positive values for local residents and communities, as well as to passersby (McConnell and Walls 2005), as evidenced by the success of open space preservation ballot initiatives at the local, county, and state levels. Banzhaf et al. (2006) point out that between 1997 and 2004, over 75 percent of the more than 1,100 referenda on open space conservation that appeared on ballots across the United States passed, most by a wide margin.

It is also well documented that open space and protected natural areas can increase surrounding property values (see McConnell and Walls (2005) for a comprehensive review). The reciprocating value of open space on property values varies depending on

landscape characteristics and location attributes (for example, distance to the conserved area) (Kroger 2008). The permanence of the open space is also an influencing factor. Typically, open space that is permanently protected (such as refuge lands and lands protected with perpetual conservation easements) will generate a higher enhancement value of local properties than land that has the potential for future development (Geoghegan et al. 2003). Location and demographic factors in the region can also influence the relative level of property enhancement value. For instance, open space may generate larger amenity premiums for property in more urbanized areas and where median incomes are higher (Netusil et al. 2000); this is not to say that property values cannot increase substantially in rural areas as well (Crompton 2001, Phillips 2000, Thorsnes 2002).

Conservation easement and fee-title purchases would inject new money into the local economy. The sale of conservation easements and fee-title lands provides landowners with added revenue. Some percentage of these funds may be spent in the local economy, including purchasing new real estate, consumer goods, or services in the local area. This spending activity can directly affect local industries (such as construction and various service sectors), with added indirect effects following suit.

Conservation easements may also help maintain the character of a region by protecting a traditional and historical way of life and the associated working landscape. Land with historical commercial use, such as ranching, forestry, and farming, is often compatible with or beneficial to Agency objectives (Jordan et al. 2007, Rissman et al. 2007). Conservation easements provide financial benefits for landowners that may enable them to preserve the natural and historical value of their farm, ranch, and open space lands, and to pass this legacy on to their children and grandchildren. Besides maintaining cultural heritages, the preservation of farming and ranching operations can result in maintained economic effects on the local economy. Farmers' costs for equipment, supplies, and materials will be spent in the local economy, thus stimulating local businesses and supporting local employment. Farm workers will also spend their salaries in the local economy, thus supporting further local employment.

Landowner Compensation

We propose to acquire land through fee-title purchase or through conservation easements from willing sellers. For fee-title acquisitions, landowners would be compensated for the fair market value of the land, which is the competitive price the land would sell for on the open market. Accordingly, fee-title purchases are expected to range from \$2,000 to

\$6,000 per acre based on current land prices in the 12-county area. Under fee-title acquisition, landowners forfeit all rights of ownership and turn the property over to the FWS or the NPS. In the case of conservation easements, landowners would be compensated for the fair market value of the easement. The fair market value of a conservation easement is determined through an appraisal process. An appraiser estimates how much the land would sell for unencumbered by the conservation easement (the "before" value) and how much the land would sell for with the conservation easement in place (the "after" value). The value of the conservation easement is equal to the before value minus the after value, or the difference in the fair market value of the property with and without the easement. Landowners may also choose to donate conservation easements. The donation of a conservation easement may qualify as a tax-deductible charitable donation, which may result in Federal income tax benefits. The sale of a conservation easement for less than its fair market value (called a "bargain sale") may also qualify for tax deductions. Landowners may be able to claim a charitable income-tax donation equal to the difference between the fair market value and the bargain sale price of their easement. Income from the sale of a conservation easement may be taxable².

Conservation easements reduce the value of an encumbered property. A conservation easement will reduce the fair market value of an estate, because the easement permanently removes some of the estate's development potential and may place added use restrictions on the land. The reduction in value depends on the potential development value of the land and the level of restriction agreed upon in the easement. In general, an easement on land in an area with high development pressure will have a greater effect on the value of the land than an easement on land in an area with low development pressure, and a wetland easement that is more restrictive will have a greater effect on the value of the land than an agricultural easement that is less restrictive. We will purchase easements at their appraised fair market value; therefore, easements that are more restrictive or on lands with high development pressure will entail higher payments.

² Please note that the NPS and the FWS do not give tax advice. Landowners considering entering into a conservation agreement with the NPS or the FWS should consult a tax advisor or attorney for advice on how a conservation easement would affect their taxes and estate.

Effects on Local Government Net Revenue

Local governments collect revenue through inter-governmental transfers, property taxes, sales taxes, personal income taxes, and other charges, such as permitting. These revenues are then spent to provide community services such as fire and police services, schools, infrastructure, and public spaces. Conservation easements and fee-title purchases affect property tax revenues, intergovernmental transfers, and the location of future development, and therefore can affect both future revenues and costs for local governments. Land values and property taxes are always in flux and are likely to change within the acquisition horizon, and future development patterns are unknown; thus, the effect of conservation easement and fee-title acquisitions on local government net revenue is complex and speculative. The following sections describe the possible effects of fee-title and conservation easement acquisitions in the NCCA and the PBCA on local government revenues and costs.

Effects on Local Government Revenues

We are proposing to acquire lands within the NCCA and PBCA through a combination of conservation easements and fee-title purchases. In the case of conservation easements, the effects on local govern-

ment revenues will depend on the state in which the acquisition occurs (South Dakota or Nebraska). In the case of fee-title purchases, the effects on local government revenues will depend on the managing agency (the FWS or NPS). Figure 14 graphically describes the primary effects on local government revenues of conservation easements and fee-title acquisitions, and the text below describes these effects in greater detail.

Property taxes constitute the largest source of local governments' revenue (Urban Institute and Brookings Institution 2008), and are assessed on the basis of property value. The effect of conservation easements on tax revenues to local governments depends on the assessment methods used to determine the taxable value of a property. These assessment methods are determined by the rules and statutes established by local property tax codes. Since the property tax codes in Nebraska are different from those in South Dakota, the effect of conservation easements on local property tax revenues will vary by state. Methods used to assess property values also vary by land use classification. For most types of properties, county assessors use fair market value to determine property tax liabilities. The fair market value of land is the amount for which a property is estimated to sell. This value includes both the

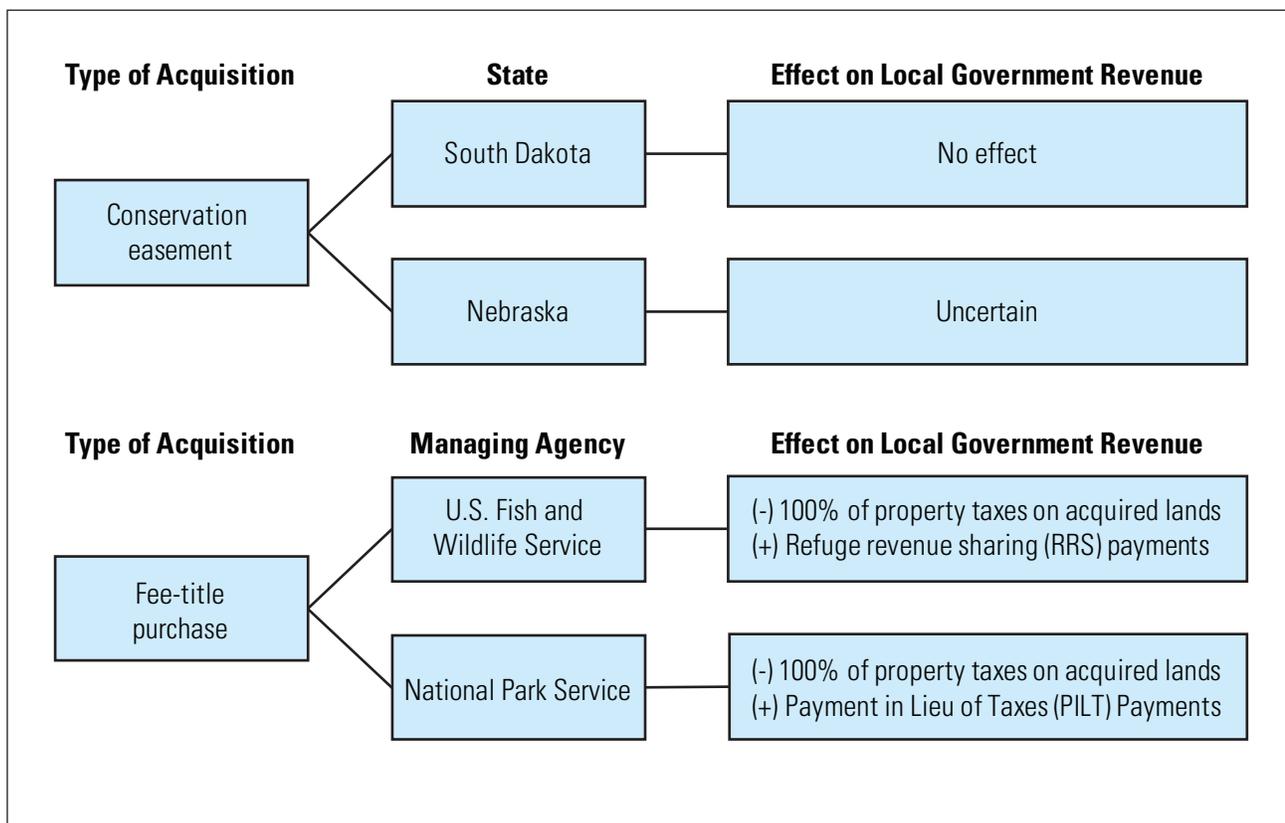


Figure 14. Effects on local governments of conservation easements and fee-title acquisitions in the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

productive or use values of the land and any speculative value associated with the possibility of developing the land. Conservation easements reduce the fair market value of property by removing the speculative value associated with possible development and, depending on land use restrictions agreed upon as part of the easement, may reduce the productive value of the land. It is assumed that the majority of the easements that will be acquired in the NCCA and the PBCA will be on properties classified as agricultural. The primary types of agricultural lands that will be candidates for easements are wastelands (that is, lands that cannot be used economically and are not suitable for agricultural purposes) and grasslands.

In South Dakota, the assessed value of agricultural land is based on the productive value of the land (South Dakota Department of Revenue 2012). Although a conservation easement may change the productive value of a parcel, current South Dakota statutes stipulate that agricultural lands encumbered by conservation easements be assessed as if no easement were in place. Thus, conservation easements purchased on agricultural lands in South Dakota are expected to have no effect on the current property tax base for the six South Dakota counties.

In Nebraska, the assessed value of agricultural land is set at 69–75 percent of the fair market value of the land (Nebraska Department of Revenue 2007). This assessment includes any wasteland that is next to and in common ownership or management with land used for agricultural or horticultural purposes. However, land encumbered by an easement that cannot be used for agricultural purposes cannot be characterized as agricultural land and is therefore assessed at 100 percent of its fair market value. Thus, there are two opposing forces on property tax values for Nebraska wastelands encumbered with conservation easements: (1) the fair market value of the land will decline, thus reducing the assessed value of the land, and (2) the land will no longer be classified as agricultural so will be assessed at 100 percent (as opposed to 69–75 percent) of its fair market value. Under NCCA and PBCA easement agreements, grazing will continue to be allowed on grasslands encumbered by easements. Thus, the fair market value of grasslands will decline, but the land will continue to be classified as agricultural. Because of the opposing forces on property tax values for wastelands and uncertainty in the makeup of easement acquisitions (that is, acres of wasteland and acres of grassland), the impact of conservation easements on the current property tax base for the six Nebraska counties is uncertain.

In both states, the purchase of fee-title lands would reduce the amount of property tax revenue collected by local governments, because we are exempt from taxation on our property holdings. However, the

loss of local government revenues resulting from fee-title purchases would be partially offset by federal reimbursement programs.

Counties with fee-title lands managed by the FWS would qualify for reimbursement under the Refuge Revenue Sharing Act of 1935, which allows the FWS to make annual payments to local governments in areas where fee-title purchases have removed land from the tax rolls. Under provisions of this Act, local counties receive an annual payment for lands that have been purchased in full fee-title acquisition by the FWS. Payments are based on the greater of 75 cents per acre or 0.75 percent of the fair market value. The exact amount of the annual payment depends on Congressional appropriations, which in recent years have tended to be substantially less than the amount required to fully fund the authorized level of payments. In fiscal year 2011, RRS payments were appropriated at only 22 percent of the approved value.

Counties with fee-title lands managed by the NPS would qualify for reimbursement under the Payment in Lieu of Taxes Act of 1976. Local governments receive annual PILT payments in areas where fee title purchases have removed qualified lands from the tax rolls. The exact amount of the annual payment is determined by several factors including acreage of eligible land, population of the county in which the eligible land is located, the amount of the previous year's PILT payments, and the inflation rate (Corn 2011). Prior to 2008, PILT payments were funded by annual appropriations. A 2008 provision for mandatory funding, however, has ensured that all counties receive 100 percent of authorized payment beginning with fiscal year 2008 and continuing through fiscal year 2012. Much uncertainty remains as to whether the mandatory funding provision will be extended (Simpon 2012). If the provision is not extended, the program would return to funding through annual appropriations (Corn 2011).

Effects on Local Government Costs

Land protection through conservation easements and fee-title acquisition could result in a reduction in future expenditures for local governments and municipalities. New residential developments require local governments to provide services such as fire protection, police services, and schools, and to construct new infrastructure such as roads, parks, and water and electric-delivery systems. The costs to provide government services for new residential developments often exceed new revenues derived from the developments. This is especially true for rural residences, which tend to have higher costs to county governments and school districts than urban residences. In 2001, the American Farmland Trust found that, on average, the cost to provide commu-

nity services to new residential developments was \$1.15 for every \$1.00 of revenue generated by those developments (American Farmland Trust 2001, Coupal et al. 2002). A study conducted in Wyoming found that community service costs averaged \$2.01 for every \$1.00 of revenue for rural residential lands; in contrast, the average cost to provide services for lands under agricultural production averaged \$0.54 for every \$1.00 of revenue (Coupal et al. 2002).

Effects of Visitor Expenditures

As previously discussed, the 12-county area provides numerous wildlife-related recreational and educational opportunities on Federal, State, and local county lands for many residents of South Dakota and Nebraska while also attracting visitors from across the United States and other countries. Spending associated with recreational visits generates significant economic activity in the 12-county area. A visitor usually buys a wide range of goods and services while visiting an area. Major expenditure categories include lodging, restaurants, supplies, groceries, and recreational equipment rental. Given the numerous recreational areas and activities within the proposed boundaries of the NCCA and PBCA, estimating the overall current economic contribution of visitor spending as well as potential changes in visitation because of the establishment of the NCCA and PBCA would require a comprehensive visitor use study, which is beyond the scope of this analysis. Instead, we compiled existing visitation and spending estimates to provide an overview of the current contribution of visitor spending within the project area.

Overall Tourism in 12-County Area

Two existing studies quantify the effects of tourism within the 12-county area. The first study, conducted by IHS Global Insight, found that, in 2011, tourism expenditures in South Dakota totaled more than \$3.7 billion in sales and generated more than 27,000 jobs (Norton 2012). Tourism spending in the six South Dakota counties in the project area represented approximately 7.2 percent of South Dakota's total tourism sales for a total of \$253 million in sales and 250 jobs (Norton 2012). The second study, conducted by Dean Runyan Associates, found that, in 2008, tourism spending in the six Nebraska Counties totaled more than \$56 million and created 880 jobs—approximately 2.5 percent of Nebraska's total tourism effects (Dean Runyan Associates 2009). Even though these studies utilized different methods and were conducted in different years, they provide a starting range for the overall importance of tourism jobs in the 12-county area. As shown in table 9 (chapter 4), nonfarm employment accounts for 90.8 percent or approximately 77,700 jobs in the 12-county area.

While tourism employment from the IHS Global Insights and Dean Runyan Associates studies accounts for less than 2 percent of total nonfarm employment in the 12-county area, it is important to note that cities and towns near the recreational river areas are more heavily dependent on tourism spending than other cities in the 12-county area outside the proposed boundaries of the NCCA and PBCA.

Missouri River Recreation in the Proposed NCCA and PBCA

River-dependent recreation accounts for a large portion of tourism in the 12-county area. Two existing studies quantify river recreation for portions of the Missouri River within the proposed conservation areas.

The most recent study, conducted between January 2004 and January 2005, is a multi-agency comprehensive assessment of public use on the 811-mile stretch of the Missouri River from Gavins Point Dam to Saint Louis. The objectives of the assessment were to determine the types and amount of public use on the river and along its banks, estimate fish and wildlife harvest levels, describe user sociodemographic characteristics, and estimate the economic value of the river to the users (Sheriff et al. 2011). The assessment's River Segment 7, from Gavins Point Dam to the Big Sioux River, closely aligns with the proposed boundaries of the PBCA. Survey results for River Segment 7 estimated 192,940 total visits during 2004, with an average visit length of 3.1 hours per visit. Approximately 48 percent of total visits were for nonconsumptive activities, 42 percent were fishing visits, and 5 percent were hunting visits (Sheriff et al. 2011). Based on these visitation levels and expenditure data from the FWS's "National Survey of Fishing, Hunting, and Wildlife-associated Recreation," Sheriff et al. (2011) estimated that there were 685,790 total visits along the Nebraska border river segments for a total of \$16.3 million in expenditures (in 2004 dollars) and 370 jobs in Nebraska. River Segment 7 accounted for approximately 28 percent of the visits along the Nebraska border segments (Sheriff et al. 2011), and associated 2004 expenditures for River Segment 7 totaled \$4.6 million in spending (in 2004 dollars) and 104 jobs in Nebraska.

Unfortunately, the Sheriff et al. assessment did not extend far enough upriver to evaluate the proposed NCCA.

The second study, a 2000 Missouri River Recreational Use Survey (Mestl et al. 2000), sampled visitors from the Fort Randall Dam to the Big Sioux River reach, which encompasses the proposed boundaries of both the NCCA and PBCA. However, this study did not elicit sufficient information to credibly estimate the economic effects of visitation along the river stretch.

Table 10. Economic contribution of Missouri National Recreational River visitor spending to local communities in 2010.

| <i>Current effects (alternative A)</i> | <i>Employment (number of full- and part-time jobs)</i> | <i>Labor income (thousands \$2010)</i> | <i>Value added (thousands \$2010)</i> |
|--|--|--|---|
| Direct effects | 143 | \$1,932 | \$3,047 |
| Secondary effects | 20 | \$506 | \$932 |
| Total effect | 163 | \$2,438 | \$3,979 |

Source: Stynes and Propst 2011.

Current NPS Visitation in the Proposed NCCA and PBCA Project Area

The NPS-managed MNRR lies within the boundaries of the proposed conservation areas. The MNRR is split into two segments: the lower 59-mile reach from about 1 mile below Gavins Point Dam to Nebraska's Ponca State Park; and the upper 39-mile reach, which begins immediately downstream of Fort Randall Dam at Pickstown, South Dakota, and continues to Running Water, South Dakota, and includes 25 miles of the lower Niobrara River and 8 miles of Verdigre Creek. The NPS estimates that in 2010 the MNRR received more than 167,000 recreation visits. According to Stynes and Propst (2011), park visitors spent \$7.94 million in local communities (defined as communities within roughly 60 miles of the MNRR), and these expenditures directly contributed an estimated 143 jobs, \$1.9 million in labor income, and \$3.1 million in value added to the local economy (estimated effects from the Stynes and Propst report are shown in table 10). The secondary or multiplier effects of these expenditures accounted for an additional 20 jobs, \$506,000 in labor income, and \$932 thousand in value added to local communities. Accounting for both the direct and secondary effects, visitor spending in the MNRR generated an estimated total contribution of 163 jobs, \$2.44 million in labor income, and \$3.98 million in value added to the local economy in 2010 (Stynes and Propst 2011). The two local economic sectors most directly affected by nonlocal visitor spending were lodging and restaurants.

Recreation at Nebraska State Parks within the Project Area. The Ponca and Niobrara State Parks lie within the boundaries of the proposed conservation areas, and are major hubs for recreation along the river. A recent report by Southwick (2011) estimated trip-related and equipment expenditures associated with visitation to Nebraska State Parks totaled \$448.8 million in 2010 and generated more than 8,000 jobs and \$265.8 million in labor income in the Nebraska economy (in 2010 dollars). The Ponca State Park is located in the proposed PBCA boundary at the eastern gateway to the 59-mile section of the MNRR boundary. In 2010, Ponca State Park was

the fourth most-visited attraction in Nebraska with approximately 747,000 visits. According to the Nebraska Game and Parks Commission (personal communication), approximately 20,000 of these visits were overnight stays in park cabins or campgrounds.

Niobrara State Park is located within the proposed NCCA at the confluence of the Niobrara and Missouri Rivers. In 2010, Niobrara State Park received a total of 157,000 visits. The Southwick (2011) Nebraska state park impact estimates include equipment expenditures; therefore, the report results cannot be used to estimate visitor spending impacts at the individual park level in a way that would be directly comparable with the MNRR or the other Missouri River visitor spending impacts reported above.

Summary of Missouri River Recreation Estimates in the Proposed Conservation Areas

While comprehensive Missouri River visitor use studies have been conducted for segments of the proposed conservation areas, the most comprehensive river-based recreation survey (Sheriff et al. 2011) only included the PBCA and was conducted almost a decade ago. Visitation levels and trends have certainly increased since then. The most recent economic contribution estimates (Stynes and Propst 2011) only consider MNRR visitation, which does not fully capture all river-based recreation within the proposed conservation areas. Aggregating MNRR visitation estimates with Ponca State Park, Niobrara State Park, USACE, or past Missouri River recreation survey visitation data is not appropriate, because aggregating estimates would result in overestimating visitation by double counting visitors multiple times during one trip. This is because visitor sampling techniques for estimating MNRR visitation include visitors to an NPS interpretive display within Ponca State Park, a visitor overlook near Niobrara State Park, as well as visitors entering the Lewis and Clark Visitor Center, which is next to Gavins Point Dam and jointly administered by the USACE and the NPS. Given these limitations, it is not possible to calculate the current contribution of river-based rec-

recreation within the proposed conservation areas based on existing visitor use studies. However, the existing estimates provide an overview of the range of effects, and the MNRR estimates reported in table 10 serve as a conservative lower bound.

For alternatives B, C, and D, we aim to provide reliable and consistent access to the Missouri River and its tributaries, thereby stimulating local economies through increased visitation, while compensating landowners if they choose to allow public access to their properties. Overall visitation levels are anticipated to increase as public access to the river increases. The overall increase in visitation will be influenced by a number of factors, such as landowner involvement and participation in the program, funds available for conservation, the amount and location of new recreational lands and opportunities, the timing of purchases, and overall demand for recreation along the river.

Administration Expenditures

Current MNRR employees reside and spend their salaries on daily living expenses in the local area, thereby generating effects in the local economy. Household consumption expenditures consist of payments by individuals and households to industries for goods and services used for personal consumption. The economic impacts associated with spending of salaries in the local area by MNRR employees are summarized in table 11. In Fiscal Year 2010 the MNRR employed 13 people with a total payroll of \$625,000 in wages, salaries, and payroll benefits (Stynes and Propst 2011). Including the induced effects of the spending of MNRR wages and salaries in the local region, the total local economic impacts of park payrolls are \$673,000 in labor income, \$726,000 in value added, and 15 jobs including NPS jobs (Stynes and Propst 2011).

Additionally, management of the NCCA and PBCA will require purchasing a wide variety of supplies and services for operations and maintenance activities, and many of these supplies and services will be purchased within the local 12-county area. Purchases made in the 12-county area will contribute

to the local economic impacts associated with the NCCA and PBCA.

The FWS and NPS anticipate hiring more full-time staff, but the increase in the number of staff and nonsalary expenditures required to manage NCCA and PBCA will ultimately depend on landowner involvement and participation in the program, as well as funds available for conservation. Though these effects cannot be quantified at this time, added nonsalary expenditures and staff will have a positive effect on the local economy through the local spending of salaries and through purchases of more goods and services in the local 12-county area.

Cumulative Effects on Socioeconomic Environment

Lands acquired through conservation easements would remain under private ownership, but would provide a cost-effective means to conserve larger blocks of habitat. In some circumstances, when public use is expected to be high or when extensive construction or restoration is expected, land would be acquired through fee-title purchases. We would manage this land, and it would be removed from county tax rolls. Reductions in county taxes would be partially replaced by RRS payments; though, given the declining trend in RRS appropriations, RRS payments are expected to make up only a small portion of the reduction in property taxes collected.

The proposed action would have numerous public benefits. Restoration of wildlife habitat would increase conservation and ecosystem service values by enhancing and preserving wildlife habitat and providing flood mitigation services, and adjacent landowners may experience increased property values through their proximity to permanently protected lands. Newly acquired lands may provide more access points, trails, and wildlife viewing opportunities, which would help local residents. These new and enhanced recreational opportunities are also anticipated to draw more nonlocal visitors to

Table 11. Economic contribution of Missouri National Recreational River payroll to local communities in 2010.

| <i>Current impact (alternative A)</i> | <i>Employment (number of full- and part-time jobs)</i> | <i>Labor income (thousands \$2010)</i> | <i>Value added (thousands \$2010)</i> |
|---|--|--|---|
| NPS payroll | 13 | \$625 | \$625 |
| Induced effects | 2 | \$49 | \$101 |
| Total effect | 15 | \$673 | \$726 |

Source: Stynes and Propst 2011.

the proposed conservation areas, increasing economic activity associated with visitor spending in the local economy. Furthermore, the proposed action would create more local economic activity through increased spending by us on operations and maintenance, and increased salary spending by our staff.

The effects of the proposed action are complex and difficult to quantify. There are many variables at play, and it is not possible to precisely predict the economic impacts of the proposed action. The conversion of private land to federal land will happen incrementally over a 50-year horizon; thus, the changes described in this analysis will happen slowly, giving the local economy time to adjust. Over time, losses in local government revenues and agricultural production will be offset by gains from restoration activities and spending generated through visitation and operations. These changes are well within the normal evolution of an economy (USGS 2012b).

5.10 Irreversible and Irrecoverable Resource Commitments

NEPA requires a discussion of any irreversible or irrecoverable commitment of resources that would result from implementing the alternatives. An irreversible commitment of resources means nonrenewable resources are consumed or destroyed. These resources are permanently lost because of plan implementation. In contrast, an irrecoverable commitment of resources is the loss of resources or resource production, or the use of renewable resources during the period under consideration.

Alternative A

Under alternative A, there would be no added commitment of resources by us. Riparian, grassland, and forest habitats converted to other uses would be irretrievably lost because their natural function would be lost, contributing to the overall loss of fish and wildlife habitat, scenic values, and (potentially) of cultural resources.

Alternatives B–D

The establishment of the NCCA and PBCA would not, of itself, constitute an irreversible or irretriev-

able commitment of resources. However, if interests in land were acquired through the use of Land and Water Conservation Fund monies or other funds and donations, the administration of the easement provisions or donated property would require an irreversible and irretrievable commitment of resources. The monitoring of easements would represent a moderate increase in overall costs borne by the Lake Andes Wetland Management District (FWS) or MNRR (NPS). Federal money for staff and operations would be an irretrievable commitment of resources. These resources would not be available for other Federal programs or projects.

The digging of fossil resources on fee lands for research purposes would be an irreversible commitment of resources. These resources would no longer be in the ground in their original context, although they would continue to be available to the public for research and educational purposes.

Fossil fuel used by motor vehicles, boats, and equipment—either by the FWS or the public—would represent an irreversible commitment of resources because their use is lost for future generations. In addition, they would result in irretrievable adverse effects on air quality and global climate change.

Like fossil fuel, prescribed fires and wildfires would emit carbon and particulates and would result in irretrievable adverse effects on air quality and global climate change. However, there would be an expected benefit to overall habitat conditions.

The potential for properties to be used for tillage agricultural production or subdivision by private landowners would be removed in perpetuity, unless we divested interest in such lands in the future.

5.11 Short-Term Uses of the Environment and Maintenance of Long-Term Productivity

Alternative A

Continued efforts to conserve habitats would be ongoing through the efforts and activities of the MNRR, the FWS's Partners for Fish and Wildlife program, and the efforts of other agency and non-profit partners. Important riparian and upland habitats would be expected to continue to be lost at current rates of conversion, having long-term negative implications for the maintenance of the ecological communities they support.

Alternatives B–D

We would be authorized to purchase perpetual easements or land in fee title only from willing sellers, providing an immediate short-term economic benefit to landowners. This benefit may provide capital for expansion of ranching operations, or it may permit struggling operators to stay in business. This infusion of capital at an opportune time would likely have important long-term benefits to the economy of the Missouri River valley.

The conservation of habitats under the proposed action would also have important short- and long-term ecological benefits. The proposed action would preserve habitat now used by wildlife, including federally protected species. This protection would result in preservation of the area's biodiversity, which is important for long-term ecosystem stability and function of riverine environments. By preventing fragmentation and conversion, particularly in wildlife corridors like riparian areas, the proposed action would promote long-term ecological resiliency to habitat perturbations such as bank stabilization and infiltration of chemicals.

In contrast, the long-term availability of land for tillage agriculture would be reduced and the burden of producing higher yields to maintain growing populations would affect agricultural producers. In addition, the amount of land available to developers of residential properties would be decreased.

5.12 Adherence to Planning Goals

This section describes by goal how each alternative meets that goal for the action. Table 12 summarizes this discussion.

Local Economies and Tourism

Help sustain local economies through preserving working farm and ranch landscapes and conserving lands, both of which will attract tourists from across the Nation.

Alternative A would not permit us to work with private landowners and communities to develop conservation easements or increase tourism. Alternative B would allow minimal interaction, while alternatives C and D would provide progressively increasing

opportunities to work with private landowners. Alternative D would have the greatest effect on local tax bases and could lead to adverse effects on local county revenues.

Partnerships and Collaboration

Develop and foster partnerships with local landowners, communities, tribes, and others by offering financial incentives, sharing knowledge, or collaborating on projects with ecological benefits.

Alternative A would limit the FWS and NPS's ability to work with private landowners, communities, schools, and other organizations to work on natural resources issues. The FWS could still work with private landowners on conservation issues through the Partners for Fish and Wildlife Program. The action alternatives would provide progressively increasing opportunities for partnerships.

Ecological and River Functionality

Increase river and ecological functionality by improving water and air quality, maintaining healthy native plant communities such as cottonwood galleries, increasing floodplain connectivity, promoting active channel processes, and reducing flood risk.

Improving and maintaining ecological and river functionality is a long-term process and will be constrained by the main stem dams on the Missouri River. Under alternative A, the opportunity to improve conditions would be dependent primarily on private landowners and other agencies. Alternative B would provide for some increased function, but without a larger floodplain and upland habitats to rely upon, effects would be minimal and would satisfy the goal marginally. Alternatives C and D provide for the opportunity to restore floodplain function and connectivity by creating a mosaic of lands in protected status.

Cultural Resources

In consultation with our partners, locate, document, and evaluate cultural resources and encourage preservation and interpretation when appropriate.

Table 12. Ratings of alternatives for the proposed Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

| Goal | Alternatives—adherence to goals ¹ | | | |
|---|--|---|---|---|
| | A | B | C | D |
| Local economies and tourism | × | ◊ | • | • |
| Partnerships and collaboration | × | ◊ | • | • |
| Ecological and river functionality | × | ◊ | • | • |
| Cultural resources | ◊ | ◊ | • | • |
| Recreational opportunities | ◊ | ◊ | • | • |
| Wildlife, fisheries, and their habitats | ◊ | ◊ | ◊ | • |

¹ Ratings note that an alternative either satisfies (•) the goal, partially satisfies (◊) the goal, or does not satisfy (×) the goal.

We are working with partners on advancing the preservation and educational opportunities along the Missouri River. Alternatives A and B would partially fulfill the goals set for this project because of our legal mandates to protect cultural resources where we have jurisdiction. Alternatives C and D would provide us with greater flexibility and opportunities to work with partners to proactively conserve cultural resources.

Recreational Opportunities

Increase recreational opportunities for residents and visitors.

This area of the Missouri River is a recreational destination for local residents and visitors—primarily from the four-state region of Iowa, Minnesota, Nebraska, and South Dakota. This level of visitation would likely continue with implementation of alternative A. Alternative B would only partially meet the recreational opportunities goal. Alternatives C and D would allow for increased access to the river, increased public lands for both consumptive and non-consumptive uses, and increased habitat conditions for native species, thereby fulfilling the recreational opportunity goal.

Wildlife, Fisheries, and Their Habitats

Support the recovery and protection of threatened and endangered species and reduce the likelihood of future listings under the ESA, while continuing to provide migration habitats for millions of migrating birds and habitats for resident fish and wildlife populations.

Full recovery of the three focal species identified in the LPP (piping plover, least tern, and pallid sturgeon) is outside the scope of this project and will require full recovery of the Missouri River ecosystem as outlined in the MRRP. The action alternatives would help us achieve this goal to varying degrees by protecting habitats on increasing amounts of riparian and upland areas. Alternative D would be most effective in supporting the recovery of these species by protecting 30 percent of riparian areas and 60 percent of the uplands.

5.13 Unavoidable Adverse Effects

Any adverse effects that may be unavoidable are described below.

Alternative A

The loss of wetland and grassland habitats through conversion to agriculture and development would continue, although protection of some of these habitats would continue through existing acquisition authorities and funding.

Alternatives B–D

The increased protection of riparian and upland habitats would reduce fragmentation, increase water quality, maintain current levels of carbon sequestration, and maintain the area's rich biological diversity. Management of lands for healthy rivers, grasslands and forests would benefit ranching operations but

may reduce the potential production of agricultural crops in the area, although most areas to be protected are not well suited for crop production. In addition, the acquisition of land in fee-title would cause a direct decline in taxes paid to counties.

5.14 Conflicts with Federal, State, Tribal, and Local Agencies

Actions considered in this EIS do not appear to conflict with USACE, NRCS, SDGFP, NGPC, or tribal goals, objectives, policies, or plans. The associated LPP is designed to provide private landowners with an option to consider when desiring to implement conservation actions. While there is a possibil-

ity that a landowner could choose one easement program over another, thereby affecting the program not chosen, this effect is expected to be minor.

Where other agencies, tribes, or organizations have primary jurisdiction, we will have secondary or “junior” jurisdiction. Accordingly, we will ensure that the provisions and regulations of the Wild and Scenic River Act are being met where applicable.

5.15 Comparison of Environmental Consequences

Table 13 summarizes the environmental consequences discussed above to compare the effects of under each alternative.

Table 13. Summary of environmental consequences for alternatives for the Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

| <i>Alternative A</i> | <i>Alternative B</i> | <i>Alternative C</i> | <i>Alternative D</i> |
|--|--|--|--|
| Climate and climate change | | | |
| No discernible effect; conditions would remain unchanged. | Negligible beneficial effects of providing a buffer against climate change through promotion of native ecosystems. | Negligible beneficial effects of providing a buffer against climate change through promotion of native ecosystems. | Negligible beneficial effects of providing a buffer against climate change through promotion of native ecosystems. |
| Air quality | | | |
| No discernible change in effect; conditions would remain unchanged. | Emissions from visitor vehicles would increase, but effects would be negligible because of controls required by the Clean Air Act. | Emissions from visitor vehicles would increase, but effects would be negligible because of controls required by the Clean Air Act. | Emissions from visitor vehicles would increase, but effects would be negligible because of controls required by the Clean Air Act. |
| Visual resources | | | |
| No discernible change in effect; conditions would remain unchanged, but the quality of visual resources is expected to decrease. | Scenic quality would increase as areas would be conserved in a native ecosystem, but the effect is expected to be negligible. | A slight increase in scenic quality over alternative B. | A slight increase in scenic quality over alternative C. |
| Acoustic resources | | | |
| No discernible change in effect. | Negligible to moderate effects based on positioning of access sites. New boat ramps Could be a major effect. | A slight increase in effects over alternative B. | A slight increase in effects over alternative C. |

Table 13. Summary of environmental consequences for alternatives for the Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

| <i>Alternative A</i> | <i>Alternative B</i> | <i>Alternative C</i> | <i>Alternative D</i> |
|---|--|--|--|
| Land features, soils, vegetation, and geology | | | |
| Land features, soils, vegetation and geology would continue to be altered by private landowners. | 20 and 40 percent of the natural land features, soils, vegetation and geology would be conserved in the uplands and floodplain. | 25 and 50 percent of the natural land features, soils, vegetation and geology would be conserved in the uplands and floodplain. | 30 and 60 percent of the natural land features, soils, vegetation and geology would be conserved in the uplands and floodplain. |
| Construction of new public access sites and roads would not occur. | Negligible effects associated with the construction of public access sites and roads would occur. | A slight increase in effects over alternative B. | A slight increase in effects over alternative C. |
| Water resources | | | |
| Water resources would remain primarily unchanged from current conditions. | Minor to moderate beneficial effects on water resources would occur through natural bank erosion and floodplain building. | A slight increase in effects over alternative B. | A slight increase in effects over alternative C. |
| Uplands | | | |
| Uplands would continue to be vulnerable to conversion. | 20 percent of uplands would be conserved. | 25 percent of uplands would be conserved. | 30 percent of uplands would be conserved. |
| Herbicide and pesticide loads would increase over time. | Herbicide and pesticide loads would be filtered by maintaining uplands. | Herbicide and pesticide loads would be filtered by maintaining uplands. | Herbicide and pesticide loads would be filtered by maintaining uplands. |
| Fragmentation and conversion would continue. | Fragmentation of uplands would be reduced by 20 percent. | Fragmentation of uplands would be reduced by 25 percent. | Fragmentation of uplands would be reduced by 30 percent. |
| River bottoms | | | |
| The river would continue to be stabilized and species like cottonwoods would continue to decline. | 40 percent of the river floodplain habitat would be uninhibited to allow the river to meander naturally. | 50 percent of the river floodplain habitat would be uninhibited to allow the river to meander naturally. | 60 percent of the river floodplain habitat would be uninhibited to allow the river to meander naturally. |
| The floodplain would continue to be developed and vulnerable to flooding. | Areas vulnerable to risk of flooding would be decreased by 40 percent. | Areas vulnerable to risk of flooding would be decreased by 50 percent. | Areas vulnerable to risk of flooding would be decreased by 60 percent. |
| Invasive species | | | |
| Invasive species would be controlled through chemical and mechanical means by landowners and county governments. | Invasive species would be controlled more through biological means and prescribed fire by the FWS and NPS. | Invasive species would be controlled more through biological means and prescribed fire by the FWS and NPS. | Invasive species would be controlled more through biological means and prescribed fire by the FWS and NPS. |
| Mammals | | | |
| Mammals could continue to experience habitat loss. | Floodplains and uplands would be conserved and habitat conditions would improve for mammals. | A slight increase in effects over alternative B. | A slight increase in effects over alternative C. |
| Birds | | | |
| Habitat for native grassland and riparian bird species would continue to decline in quantity and quality because of conversion to other uses and fragmentation. | At least 20 and 40 percent of the habitat for native grassland and riparian bird species would be protected in the uplands and riparian areas, respectively. | At least 25 and 50 percent of the habitat for native grassland and riparian bird species would be protected in the uplands and riparian areas, respectively. | At least 30 and 60 percent of the habitat for native grassland and riparian bird species would be protected in the uplands and riparian areas, respectively. |

Table 13. Summary of environmental consequences for alternatives for the Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

| <i>Alternative A</i> | <i>Alternative B</i> | <i>Alternative C</i> | <i>Alternative D</i> |
|--|--|--|---|
| Generalist and parasitic species like brown-headed cowbirds would continue to experience population increases. | Native species such as bald eagles would be expected to experience population increases. | A slight increase in effects over alternative B. | A slight increase in effects over alternative C. |
| Fish | | | |
| Native fish habitat would continue to decline because of degradation, lack of sediment, bank stabilization, and loss of floodplain connectivity. | Minor beneficial effects would occur, but alternative would not provide sufficient floodplain connectivity. | Moderate long-term beneficial effects from potential for floodplain connectivity. | An increase in beneficial effects over alternative C. |
| Other wildlife | | | |
| Negligible effects on other wildlife are expected. | Minor beneficial effects are expected for insects, reptiles, amphibians, and other wildlife. | Minor to moderate beneficial effects are expected for insects, reptiles, amphibians, and other wildlife. | Moderate beneficial effects are expected for insects, reptiles, amphibians, and other wildlife. |
| Threatened and endangered species and species of concern | | | |
| Habitat loss and decreased populations would continue if habitat restoration programs were discontinued or lands converted to other uses. | Habitat restoration and enhancement would lead to population increases. | An increase in beneficial effects over alternative B. | An increase in beneficial effects over alternative C. |
| Special management areas | | | |
| No discernible change in effects are expected. | Although negligible effects are expected, increased visitation to other areas is expected. | An increase in beneficial effects over alternative B. | An increase in beneficial effects over alternative C. |
| Visitor services | | | |
| No discernible change in effects are expected. | The number of visitors and interactions between visitors and other recreationists and wildlife would increase. | An increase in effects over alternative B. | An increase in effects over alternative C. |
| Cultural and historical resources | | | |
| Some cultural resources could be adversely affected by development and conversion to other uses. Some sites could be destroyed. | Increased protection of cultural resources and potential for education would occur on conserved properties. | An increase in beneficial effects over alternative B. | An increase in beneficial effects over alternative C. |
| Paleontological resources | | | |
| Some paleontological resources could be adversely affected by development and conversion to nonnative uses. Some sites could be destroyed. | Increased protection of paleontological resources and potential for education would occur on conserved properties. | An increase in beneficial effects over alternative B. | An increase in beneficial effects over alternative C. |

Table 13. Summary of environmental consequences for alternatives for the Niobrara Confluence and Ponca Bluffs Conservation Areas, Nebraska and South Dakota.

| <i>Alternative A</i> | <i>Alternative B</i> | <i>Alternative C</i> | <i>Alternative D</i> |
|---|---|---|---|
| Conservation and ecosystem service values | | | |
| The ecosystem would remain primarily unchanged. | Increased focus would be placed on a functional native ecosystem and the societal values they produce (such as water, food) | An increase in beneficial effects over alternative B. | An increase in beneficial effects over alternative C. |
| Effects on local economies | | | |
| New funds would not be available to the local communities. | Funds would be invested into the local community through payments to landowners; conservation would increase open space and help maintain rural landscape characteristics. | An increase in beneficial effects over alternative B. | An increase in beneficial effects over alternative C. |
| Landowner compensation | | | |
| Landowners would rely on other agencies or organizations for conservation programs. | Landowners would be compensated for the value of the conservation easement, which may provide beneficial tax implications. | An increase in beneficial effects over alternative B. | An increase in beneficial effects over alternative C. |
| Effects on local government net revenue | | | |
| No change from current conditions is anticipated. | Local governments would see a direct loss in property tax revenue, but a decreased cost in expenditures. | An increase in effects over alternative B. | An increase in effects over alternative C. |
| Visitor expenditures | | | |
| No change from current conditions is anticipated. | Visitor expenditures would increase because of larger areas of public lands and increased access. Increased visitation would result in increased recreational revenue and jobs. | An increase in beneficial effects over alternative B. | An increase in beneficial effects over alternative C. |
| Administrative expenditures | | | |
| No change from current conditions is anticipated. | New positions would be created as the LPP is implemented resulting in salary spending in local communities and increased use of contractors to perform restoration and maintenance actions. | An increase in beneficial effects over alternative B. | An increase in beneficial effects over alternative C. |

